



NORTHWEST ARCTIC SUBSISTENCE
REGIONAL ADVISORY COUNCIL
Meeting Materials

October 25-26, 2017

Kotzebue, Alaska



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Western Arctic tundra is adorned with vibrant fall colors.



WEAR, NPS photo

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NORTHWEST ARCTIC SUBSISTENCE REGIONAL ADVISORY COUNCIL

Northwest Arctic Borough Assembly Room
Kotzebue

October 25–26, 2017
9:00 a.m. to 5:00 p.m. daily

TELECONFERENCE: call the toll free number: 1-877-638-8165 , then when prompted enter the passcode: 9060609.

PUBLIC COMMENTS: Public comments are welcome for each agenda item and for regional concerns not included on the agenda. The Council appreciates hearing your concerns and knowledge. Please fill out a comment form to be recognized by the Council chair. Time limits may be set to provide opportunity for all to testify and keep the meeting on schedule.

PLEASE NOTE: These are estimated times and the agenda is subject to change. Contact staff for the current schedule. Evening sessions are at the call of the chair.

AGENDA

*Asterisk identifies action item.

- 1. Invocation**
- 2. Call to Order** (*Chair*)
- 3. Roll Call and Establish Quorum** (*Secretary*).....4
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- 8. Service Awards**
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12. Agency Reports

(Time limit of 15 minutes unless approved in advance)

Tribal Governments

Native Organizations

NANA Regional Corporation

Wildlife Conservation Society, Arctic Beringia Program

- a. Fisheries research update on collaborative work with the Native Village of Kotzebue, the National Park Service, and the National Oceanic and Atmospheric Administration (*Trevor B. Haynes*)

U.S. Fish and Wildlife Service

- a. Selawik National Wildlife Refuge

Alaska Department of Fish and Game

Bureau of Land Management

National Park Service

- a. Western Arctic National Parklands

- b. Gates of the Arctic National Park and Preserve Subsistence Update (*Marcy Okada*)
- c. Subsistence Study on Ambler Access Project (*Anette Watson*)

Office of Subsistence Management

- a. Legislative Update
- b. Special Actions

13. Future Meeting Dates*

Confirm Winter 2018 meeting dates and location447

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14. Closing Comments

15. Adjourn (*Chair*)

To teleconference into the meeting, call the toll free number: 1-877-638-8165, then when prompted enter the passcode: 9060609.

Reasonable Accommodations

The Federal Subsistence Board is committed to providing access to this meeting for all participants. Please direct all requests for sign language interpreting services, closed captioning, or other accommodation needs to Zach Stevenson, 907-786-3674, zachary_stevenson@fws.gov, or 800-877-8339 (TTY), by close of business on February 10, 2017.

REGION 8

Northwest Arctic Subsistence Regional Advisory Council

Seat	Year Appointed <i>Term Expires</i>	Member Name and Community
1	1993 2019	Raymond Stoney Kiana
2	2016 2019	Beverly M. Moto Deering
3	2011 2019	Hannah P. Loon Kotzebue
4	2010 2019	Michael C. Kramer Kotzebue Vice-Chair
5	1995 2017	Percy C. Ballot Sr. Buckland Secretary
6	2011 2017	Vern J. Cleveland, Sr. Noorvik
7	1993 2017	Louie A. Commack, Jr. Ambler
8	1999 2018	Enoch A. Shiedt Sr. Kotzebue Chair
9	2014 2019	Enoch L. Mitchell Noatak
10	2003 2018	Calvin D. Moto, Sr. Deering

**NORTHWEST ARCTIC
SUBSISTENCE REGIONAL ADVISORY COUNCIL**

Meeting Minutes

March 1-2, 2017

Northwest Arctic Heritage Center, Kotzebue, Alaska

Call to Order

The winter meeting of the Northwest Arctic Subsistence Regional Advisory Council was called to order on 1 March 2017 at 0900 AKST.

Roll Call

A roll call was conducted, with the following council members present: Calvin D. Moto, Sr. (Deering, AK); Enoch Attamuk Shiedt, Sr., Vice-Chair (Kotzebue, AK); Enoch L. Mitchell (Noatak, AK); Hannah Paniyavluk Loon, Secretary (Kotzebue, AK); Louie A. Commack, Jr. (Ambler, AK); Percy C. Ballot, Sr. (Buckland, AK); Michael Chad Kramer (Kotzebue, AK); Raymond Stoney, Chair (Kiana, AK); and Vern J. Cleveland, Sr. (Noorvik, AK). Beverly Moto (Deering, AK) was excused absent from the meeting.

Additional Participants

Additional participants attended some portion of the Northwest Arctic Subsistence Regional Advisory Council meeting either in person, or by teleconference (indicated with an asterix “*”). The following abbreviations are used including AD&FG (Alaska Department of Fish and Game); BIA (Bureau of Indian Affairs); BLM (Bureau of Land Management); USFWS (United States Fish and Wildlife Service); and NPS (National Park Service). Additional participants included:

Name (Location)	Agency	
Alex Hansen, WAH Caribou Biologist (Kotzebue, AK)	ADFG	
Brendan Scanlon, Northwest-North Slope Area Mgmt. Biologist (Fairbanks, AK)*		
Brandon Saito, Area Biologist (Kotzebue, AK)		
Jill Klein, Special Assistant Commissioner’s Office (Anchorage, AK)*		
Bruce Seppi, Wildlife Biologist (Anchorage, AK)	BLM	
Thomas Sparks, Natural Resource Program Coordinator (Anchorage, AK)		
Eva Patton, Subsistence Council Coordinator (Anchorage, AK)*	USFWS	
Gene Peltola, Jr., Assistant Regional Director, OSM (Anchorage, AK)		
Jared Irvine, Special Agent (Anchorage, AK)		
Jared Stone, Fisheries Biologist, Graduate Pathways Pgrm., OSM (Anchorage, AK)*		
Jennifer Hardin, Anthropology Division Chief, OSM (Anchorage, AK)		
Joshua Ream, Cultural Anthropologist, OSM (Anchorage, AK)		
Lisa Maas, Wildlife Biologist, OSM (Anchorage, AK)		
Ryan Cote, Special Agent (Fairbanks, AK)		
Robin Lavine, Anthropologist, OSM (Anchorage, AK)*		
Steven Stringer, Special Agent (Fairbanks, AK)		
Susan Georgette, Refuge Manager, Selawik NWR (Kotzebue, AK)		
Zach Stevenson, DFO, Subsistence Council Coordinator, OSM (Anchorage, AK)		
Hannah Atkinson, Cultural Resource Specialist, WEAR (Kotzebue, AK)		NPS

Hilary Robinson, Biologist, WEAR (Kotzebue, AK)	
Ken Adkisson, Subsistence Program Manager, Alaska Region (Nome, AK)*	
Kumi Rattenbury, Biologist Technician, ARCN (Fairbanks, AK)*	
Marcy Okada, Subsistence Coordinator, YUGA (Fairbanks, AK)*	
Maija Lukin, Superintendent, WEAR (Kotzebue, AK)	
Anette Watson, PhD, College of Charleston (Charleston, South Carolina)*	Public
Jack Barnes, Supporting Louis Cusack*	
Louis Cusack, Sport hunting guide and Alaska Planning Execution Manager, BP America (Chugiak, AK)*	
Charlie Nelson, Maniilaq Association (Kotzebue, AK)	
Millie Stalker, NANA (Kotzebue, AK)	
Tristan Pattee, Storm Water Pollution Plan Manager/Heavy Equipment Operator, Ridge Contracting (Anchorage, AK)*	

Review and Adopt Agenda

Several items were discussed as additions to the agenda, indicated below in underlined text.

9. Public and Tribal Comments on Non-Agenda Items (available each morning)

Legislative update (Hardin/Peltola).

10. Old Business (Chair)

- a. Revisions of draft MOU with State of Alaska. Moved to 12. Agency Reports.
- b. Review of draft RAC correspondence letters (DFO).

11. New Business (Chair)

- a. Review of moose and caribou data (Saito/Robinson).
- b. Call for Federal Wildlife Proposals (Maas and Hadin).
- c. Approve FY 2016 Annual Report (DFO).
- d. Special Action WSA 17-02 (Ream).
- e. U.S. Fish and Wildlife Service Draft Alaska Native Relations Policy (Hardin).
- f. SRC Appointments (Atkinson).

12. Agency Reports

- ADFG (Scanlon)
- Selawik NWR (Georgette)
- WEAR (Lukin/Atkisson/Robinson)
- Gates of the Arctic NPP (Okada/Watson)
- BLM (Sparks)
- OSM (Hardin)

The Council voted to approve the agenda with modification.

Election of Officers

The DFO initiated the election of the Chair. Council Member Shiedt was elected as the new Chair. Council Member Shiedt opened nominations for Vice Chair. Council Member Kramer was elected as the new Vice Chair. The Council elected Council Member Ballot for Secretary.

Review and Approval of Previous Meeting Minutes

Council Member Commack requested a correction to reflect an excused absence from the fall

2016 NWARAC meeting. The Council motioned to adopt the previous meeting minutes as amended.

Reports

Council Member Commack reported residents of the Upper Kobuk area were fortunate to hunt caribou this fall and described the fall caribou migration in Ambler and extending to Shungnak. Few caribou were harvested in Kobuk, possibly because the caribou migrated over to the Seward Peninsula. A lack of caribou to be harvested in the winter has occurred before. Member Commack attended the Gates of the Arctic SRC meeting last year and noted there are many studies happening. Fishing has been favorable. There have been many moose and bear and people have enjoyed hunting. Council Member Commack mentioned the Ambler Mining Project, presumably to be addressed by Ms. Okada of the Park Service.

Council Member Ballot reported caribou have been healthy this year, noting they're around, in bunches. Wolves are okay, though some have sores or infections on them. For the first time, there are reports of wolverines eating trapped wolves and it's unclear whether the wolverines are hungry or not. The river has been flowing up. Hunting was difficult during the first part of the year due to snow conditions. Strange weather conditions have been reported with unusual fluctuations from 40 below and then 10 above within 10 miles or over a couple of days. Fish have been healthy. People are expecting to find some fish trapped in overflow (fresh or salt water from a river, lake, slough, or the sea that emerges through seasonal ice and refreezes on top of the base layer ice) due to flooding in December, as occurred a few years ago. Caribou are around and arrived late. There are a lot of bears. Council Member Ballot responded to a question from Council Member Shiedt regarding moose, noting that 10-15 years ago moose were over-harvested on the Kauk River. Self-quit hunting was done, supported by Jim Dau (AD&FG), and the moose numbers improved.

Council Member Moto reported on efforts to educate some young hunters in Deering about the boundaries of Federal public lands near Bering Land Bridge, in the western Seward Peninsula. Harvests have been good, though a lack of snow restricts overland travel by Honda¹ and snow machine. Caribou have been nice and fat, perfect for agutak². Efforts were made to educate youth about the process for allocating subsistence resources. Unusually high winds (50 mph) have restricted travel. Open water has been seen in January and this is unusual. We live with this and take it day by day. There are too many predators near the village, especially fox and wolverine. Some predators in the village have been relocated or destroyed and distributed locally by AD&FG. There are a lot of caribou and muskox. The muskox harvest should be higher. We should discuss this in the future.

Council Member Cleveland reported it's been a good season and very cold the past few months. Member Cleveland voiced frustration and noted there are non-Federally qualified users hunting caribou on Federal public lands despite the closure. Who is watching over the lands? The

¹ Generic term used regionally for all-terrain vehicle (ATV).

² Pronounced in the Iñupiaq Coastal Dialect like "ahh-goo-tuk". A high-energy food, served cold or at room temperature, consisting of fat, protein, and sugar. Agutak consists of rendered, whipped caribou fat or Crisco, mixed with berries or sugar, and sometimes includes mild-flavored whitefish that have been boiled, flaked, and blended into the mixture.

closure should be year round, not just during the migration time. People need to help enforce the closure. Council Member Shiedt suggested calling the State Troopers for help. Member Cleveland noted they're broke and unable to help. The DFO asked for clarification whether maps and education could help to enforce the closure. Council Member Cleveland noted maps are helpful and have just been delivered to Noorvik. Member Shiedt noted it's helpful for villages to receive maps.

Council Member Mitchell reported there are wolves around Noatak and have killed six caribou. Moose are getting close to the village because wolves are nearby. Fishing has resumed with more daylight and the return of warmer weather. Fish are biting. The first winter harvest of caribou happened the second week in February. The AC submitted two proposals (Proposals 44 and 45) to the Board of Game. Both proposals failed and will be introduced before the RAC. Students were educated about the proposals and invited to submit letters of support.

Council Member Stoney reported the caribou migration in the Kiana area was lower than previous years. Between mid-September to mid-October there were approximately 9,000 caribou traveled through Kiana. Many people didn't harvest caribou because when the caribou migrated, they went through Noatak and traveled further south, around Kotzebue. That's when a few more were seen. This was the first time this has happened in 15 years. People are concerned about when the caribou migrate. Caribou have taken different migration routes and people don't know why.

Council Member Loon reported there has been no snow until now. It has been very difficult to go out on the tundra by snow machine to try and harvest caribou. Wolves have been sighted near the dump site and some people caught wolves near the dump. Last fall people were harvesting whitefish around October 1st. There were some caribou hunting, though if the harvest was low, people usually wait until later in the season, in November, December, or January, to hunt for caribou in the hills surrounding Buckland. Now there is snow, and people have been harvesting caribou near the shelter cabin in Buckland, though some caribou are too far in the hills to access, where there is no snow. The caribou have been small, unlike those from my childhood which were more robust, with larger hips and more meat. I enjoy having caribou in January, a time of year when many are running low on fresh meat. Fishing under the ice has been good. Many people have fresh whitefish until December. Many people enjoyed adult and juvenile sheefish³ for Thanksgiving or qaaq⁴.

Council Member Kramer reported hunting conditions were hit-or-miss last fall. Many people seen in the Kobuk didn't get caribou. I lucked out, harvesting caribou in Onion Portage. A few caribou were seen crossing the river by my cabin in the Park. We heard about a lot of conflicts with bear. A lot of bears were taking caribou meat out of boats. This happened to me. I notice the Board of Game passed the proposal allowing people in GMU 23 to harvest two bears and sell the

³ A type of whitefish endemic to the Northwest Arctic that is an important subsistence resource. The fish are large, muscular, mild in flavor, and sometimes referred to as Arctic Tarpon, for their appearance and behavior when caught.

⁴ Pronounced in the Iñupiaq Coastal Dialect like "Coke". A local delicacy consisting of frozen fish. Some people like to eat the frozen fish dipped in seal oil. The seal oil adds distinctive flavoring and functions metabolically as a vasodilator, keeping you warm in the extreme cold.

hides. This should happen on the Federal side too, but I doubt they'll do it. Hopefully the action on the part of the State will help out. I spoke at the Federal Subsistence Board Meeting in support of WSA 16-03 on behalf of the Council. This is the one where the state is trying to reopen Federal lands. The State should not be allowed to submit proposals like that, undermining the Federal government, and thinking only of the mighty dollar and not about the people. The Park Service is not effectively enforcing WSA 16-01 and does not want to patrol their waterways in Unit 23. Who enforces ANILCA? Whoever enforces ANILCA needs to step up and impose some fines on those that undermine our rulings. Caribou are now traveling around Kotzebue and many people have been getting them. Many people returned with sleds full of caribou. Quite a few moose are around too and I haven't filled my RM 880 yet, though I still have time remaining. Many people are having problems with wolves. I saw wolf tracks near Kiana, less than a tenth –of-a-mile from the village. Above the village, wolves were about a half-mile away. There were about seven sets of wolf tracks in the river. People need to take action to control bears. People should be able to start shooting bears and throwing them in the river as weights for their salmon nets. Something needs to be done to protect people and their property.

Council Member Shiedt delivered the Chair's report. Council Member Shiedt reported the fall caribou harvest was pretty good. Caribou crossed at my camp on the Aggie⁵, though my sons and I let them pass because there were too few crossing the river. Many people report there are too many wolves and bears bothering us. I counted 40 wolves and my son counted 50 wolves above Kiana. The Federal regulations don't allow us to manage wolves. We should manage wolves as an invasive species with bounties. I've seen caribou left half eaten by wolves. Some hunters in Kivalina got six wolves in one day. Something needs to be done to control the wolves because our caribou and moose numbers are down. Council Member Ballot addressed Council Member Shiedt and described a user conflict in the Buckland area, noting the need for enforcement and the checking of hunting licenses. Council Member Shiedt noted that maps should be mailed to all villages to help people understand the boundaries of Federal public lands. Council Member Moto added that confusion over the boundaries of Federal public lands in the Seward Peninsula too, particularly by hunters traveling near Cape Espenberg, in Bering Land Bridge National Preserve.

Public and Tribal Comments on Nonagenda Items

Legislative Update (Hardin and Peltola)

Responding to a request for a legislative update from Council Member Commack, Jennifer Hardin, Anthropology Division Chief, OSM (Anchorage, AK) noted the upcoming call for Federal wildlife regulatory proposals. Adding to the legislative update, Gene Peltola, Jr., Assistant Regional Director, OSM (Anchorage, AK) noting the temporary hold on Federal rulemaking; appointment of the new Secretary of the Interior; and changes in both process and leadership per the new Administration as detailed in the transcripts.

Charlie Nelson, Maniilaq Association (Kotzebue, AK)

Mr. Nelson emphasized that maps are critical for villages to use landmarks. Mr. Nelson encouraged the Council to advocate for the inclusion of maps. Responding to Mr. Nelson,

⁵ Also referred to as the Agashashok River.

Hannah Atkinson, Cultural Resource Specialist, WEAR (Kotzebue, AK), noted some people find satellite maps to be more useful than topographic maps. Responding to Mr. Nelson and Ms. Atkinson, the DFO noted that through the Northwest Arctic Borough Subsistence Mapping Project, approximately 2,000 Iñupiaq place names and traditional land features have been documented incorporating information that was provided both through the participation of the Regional Elders Council, interviews with traditional knowledge holders in seven coastal communities in the Northwest Arctic Borough, as well as using data that was provided by Susan Georgette and her team at the Selawik NWR. These maps are available in 1:65,000 and 1:500,000 Mercator projection scale using both high-resolution satellite imagery, topographic maps useful for search and rescue and overland navigation, and aerial maps for planning flight routes. The Chair asked for the maps to be mailed to the villages.⁶ Council Member Shiedt and Council Member Cleveland expressed interest in trail maps, important to both culturally and for accessing customary and traditional hunting areas.

Old Business

Review of draft RAC correspondence letters (DFO)

The DFO noted there were five correspondence letters needing signature from the Chair. A request was made to move this agenda item to the second day of the meeting, allowing for the letters to be read into the record and for signature of the letters. The Council approved moving the review of draft correspondence to the second day of the meeting. On the second day of the meeting, the DFO provided an update, noting he was informed of the need to postpone the review of correspondence until the fall meeting due to the need for additional review of the correspondence. Responding to a request for clarification requested by the Council, the DFO noted there are five correspondence items, three of which were directed to the Board and two of which were letters directed to the Davis-Ramoth Memorial School in Selawik. The DFO had not shared those items with the leadership team for approval, which is required before correspondence can be submitted to the Council for review and approval. The DFO requested time to share the correspondence items with the leadership team and present the correspondence items for review by the Council at the fall 2017 NWARAC meeting. The Council approved this request.

New Business

Review of moose and caribou data (Saito and Robinson)

Brandon Saito, Area Biologist, AD&FG (Kotzebue, AK) addressed Unit 23 moose data. Mr. Saito described changes in the State RM880 moose harvest regulations; efforts to rebuild moose populations; the timing of moose hunts in the region; harvest objectives; moose population status and density by location; the status of moose surveys; and moose harvest trends by drainage as further described in the transcripts.

⁶ The maps were mailed in print and DVD format to every village and municipality in the Northwest Arctic Borough in the winter of 2016 at the conclusion of the Northwest Arctic Borough Subsistence Mapping Project. The maps are also available for free online. See: <https://www.nwabor.org/subsistence-mapping-program/>. Trail maps are available through the Northwest Arctic Borough on request.

Hilary Robinson, Biologist, WEAR, NPS (Kotzebue, AK) addressed an upcoming moose survey scheduled for April. Ms. Robinson asked Mr. Saito for clarification on the source of moose harvest data by drainage, specifically whether data was sourced from harvest tickets or community harvest surveys. Mr. Saito responded, noting the data came from moose harvest tickets. Ms. Robinson addressed the factors in creating growth in a moose population and the reasons why the NWARAC submitted a Wildlife Special Action to close Federal public lands in Unit 23 to moose hunting by non-Federally qualified users as further described in the transcripts.

Louis Cusack, Sport hunting guide and Alaska Planning Execution Manager, BP America (Chugiak, AK)

Mr. Cusack described his review of harvest data for non-residents and recommended a Federal wildlife regulatory be submitted to the Federal Subsistence Board closing the shooting of cow moose and changing the regulations to one bull for the Federal subsistence areas. Mr. Cusack also asked the Council to consider submitting a proposal that aligns the brown bear and black bear harvest of two bears and baiting as detailed in the transcripts.

Call for Federal Wildlife Proposals (Maas and Hardin)

Lisa Maas, Wildlife Biologist, OSM (Anchorage, AK) noted that the timing for submitting Federal wildlife proposals has been delayed. Jennifer Hardin, Anthropology Division Chief, OSM (Anchorage, AK) emphasized the process and rationale for submitting proposals as further described in the transcripts.

Addressing Moose (Unit 23) – Council Member Kramer introduced a Federal wildlife regulatory proposal to align the Federal and State moose harvest seasons and hunt areas in Unit 23 to address declining moose population in the unit. The proposal would protect cows to allow for an increase in the moose population while decreasing regulatory confusion. The proposal would specify bulls from August 1st to October 31st on Federal lands. Cows would be only open. Antlerless moose with no calf would be from November 1st to December 31st and that is any moose, whether bull or cow. But mainly bulls would be only open between October 1st - August 1st to October 31st. The remainder of December 31st to March 31st for antlerless cows would be eliminated. Member Mitchell seconded the motion. Member Shiedt called the question. The Council voted to submit the proposal with 9 members in-favor and 1 member excused absence. The motion carried.

Addressing the Sharing of Caribou Related Information among RACs throughout the Extent of the Herd – Member Mitchell called for a motion to submit a Federal wildlife regulatory proposal establishing a caribou working group to share information on caribou via teleconference among the affected RACs. Member Shiedt requested this concept be better defined via teleconference.

Addressing Caribou (Unit 23) – Member Mitchell motioned to submit a Wildlife Special Action to close Federal public lands to caribou hunting by non-Federally qualified for the 2017-2018 regulatory year. Member Commack and Member Loon seconded the motion. Member

Shiedt recommended just closing Federal public lands around Noatak, to allow people originally from the region though now residing away, to still hunt on Federal public lands. Member Cleveland called the question. The Council voted to support the Special Action with 9 members in-favor and 1 member excused absent. The motion carried.

Addressing Caribou (Unit 23) – Member Mitchell motioned to submit a Federal wildlife regulatory proposal seeking to permanently close Federal public lands in Unit 23, until reopened, to caribou hunting by non-Federally qualified users. Dissenting opinions voiced concern regarding the length of the proposed closure. Member Loon called the question. The Council voted to submit the proposal with 4 members in-favor, 5 members not in-favor, and 1 member excused absent. The motion failed.

Addressing Brown Bear (Unit 23) – Member Loon and Member Kramer introduced a motion to submit a Federal wildlife regulatory proposal to increase the harvest limit of brown bears in Unit 23 to three bears per year with a year-round season to allow harvest in June and July. Member Kramer noted an over-abundance of brown bears in Unit 23. Member Kramer noted the effects of brown bears on disrupting caribou migratory patterns; destroying cabins; and taking caribou meat from boats. Member Shiedt asked if there was a second. Member Mitchell seconded the proposal. Member called the question. The Council voted to support the proposal with 9 members in-favor and 1 member excused absent. The motion carried.

Addressing Brown Bear (Unit 23) – Member Kramer introduced a Federal wildlife regulatory proposal to allow the sale of two brown bear hides and/or skulls per year, from brown bears harvested by Federally qualified subsistence users on Federal public lands in Unit 23. Member Kramer noted this change is needed to promote alignment with State regulations; promote the increased utilization of harvested brown bears; provide opportunity for profit; reduce the over population of brown bears in Unit 23; reduce user conflict with brown bears in communities and at camps; and reduce danger resulting from human bear integrations. Member Loon noted that traditionally, Iñupait peoples of the region did not make handicrafts from bear skulls and hides as it was taboo. Member Loon also noted that traditionally the Iñupait do not care to obtain coastal brown bear meat and fat because the coastal brown bears feed on carrion. Member Cleveland seconded the motion. Member Shiedt called the question. The Council voted to support the proposal with 9 members in-favor and 1 member excused absent. The motion carried.

Addressing Caribou (Unit 23) – Member Loon introduced a Federal wildlife regulatory proposal to reduce the harvest of caribou from 5 per day to 3 per day per person. The Council noted the change is needed due to decline in population size of the Western Arctic Caribou Herd and because caribou are a vital subsistence resource to the people of the region. Member Shiedt requested a motion to support the proposal. Member Kramer seconded the motion. Member Ballot called the question. The Council voted to support the proposal with 9 members in-favor and 1 member excused absent. The motion carried.

Approve FY 2016 Annual Report (DFO)

Member Loon motioned to approve the FY 2016 annual report. Member Cleveland seconded the motion. Member Cleveland called the question. Member Shiedt called the question. The

Council voted to approve the FY 2016 annual report with 9 members in-favor and 1 member excused absent.

Special Action WSA 17-02 (Ream)

Joshua Ream, Cultural Anthropologist, OSM (Anchorage, AK) provided an overview of the analysis prepared by OSM addressing Wildlife Special Action 17-02 (WSA 17-02) regarding the proposed closure of Federal public lands to moose hunting by non-federally qualified users in Unit 23 as noted in the transcripts. Loon motioned to support WSA 17-02 presented by Joshua Ream. Motion seconded by Member Kramer. Member Shiedt called the question. The Council voted to support WSA 17-02 with 9 members in-favor and 1 member excused absent. The motion carried.

U.S. Fish and Wildlife Service Draft Alaska Native Relations Policy (Hardin)

Jennifer Hardin, Anthropology Division Chief, OSM (Anchorage, AK) provided an overview of the U.S. Fish and Wildlife Service Draft Alaska Native Relations Policy as detailed in the transcripts.

SRC Appointments (Atkinson)

Ms. Atkinson described the Subsistence Resource Commission (SRC) appointment process and answered questions from the Council as noted in the transcripts. Member Cleveland motioned to appoint Enoch Adams, Sr. of Kivalina, Alaska to the Cape Krusenstern SRC) Discussion ensued, with the Council deliberating the appointment of either Enoch Adams or Lance Kramer of Kotzebue. Member Shiedt called for a tally vote. The note reflects 6 members in-favor of Enoch Adams, Sr.; 2 members in-favor of Lance Kramer; 1 member abstaining due to a conflict-of-interest; and 1 member excused absent. Enoch Adams, Sr. was appointed the Cape Krusenstern SRC.

Agency Reports

The following agency reports were delivered.

Alaska Department of Fish and Game (Scanlon)

Brendan Scanlon, Northwest-North Slope Area Mgmt. Biologist (Fairbanks, AK) provided an update on the Fisheries Resource Monitoring Program related research in the region including a Dolly Varden genetics project and a sheefish sonar project , both located on the Kobuk River as detailed in the transcripts.

Selawik National Wildlife Refuge (Georgette)

Susan Georgette, Refuge Manager, Selawik NWR (Kotzebue, AK) provided a handout noting refuge staff; providing an update on projects in the refuge, including a study examining the effects of climate change on sheefish; a project studying the expanding range of spruce trees; and

a project studying the effects on melting permafrost to plankton, small animals that fish eat for food; an update on youth outreach; and hunter education as detailed in the transcripts.

Western Arctic National Parklands (Lukin/Atkisson/Robinson)

Maija Lukin, Superintendent, Western Arctic National Parklands (Kotzebue, AK) described the mission, location, and staff associated with the Park. Superintendent Lukin described the goals of a hunter education group established by the Kobuk Valley Subsistence Resource Commission and noted a related outreach flyer as detailed in the transcripts.

Hannah Atkinson, Cultural Resource Specialist, Western Arctic National Parklands (WEAR) provided an update on an archaeology camp in the Seward Peninsula and responded to a question from Council Member Ballot regarding culture caps, noting the Park Service does not have funding available to fund culture camps as detailed in the transcripts.

Hilary Robinson, Biologist, WEAR noted a handout related to her presentation delivered earlier with Brandon Saito (ADFG) summarizing the results of wildlife surveys conducted in the Park. The surveys include a study on moose in the Lower Kobuk and Squirrel River area in March and April; a study on muskox composition April; a survey on brown bear in the Upper Noatak area in May; a Dall sheep survey in the Baird and DeLong Mountains in July; a whitefish survey in July focused on lagoons and Cape Krusenstern National Monument and Bering Land Bridge National Preserve; and a loon survey in Bering Land Bridge National Preserve in July. Ms. Robinson described recent muskox surveys conducted by the ADFG to understand the health of the muskox population and provided a harvest update. Ms. Robinson provided additional information on brown bear; sheep; Red-throated loon; village outreach regarding the closure of Federal public lands in Unit 2 to caribou hunting by non-Federally qualified users; and youth outreach at Camp Willow as detailed in the transcripts

Gates of the Arctic National Park and Preserve (Okada/Watson)

Marcy Okada, Subsistence Coordinator, Yukon Charley and Gates of the Arctic NPP (Fairbanks, AK) provided an update on sheep hunting in Unit 23 and an update on a Board of Game proposal adopted in Bethel regarding sheep hunting and affecting residents of Ambler, Shungnak, and Kobuk. Ms. Okada provided an update on the Gates of the Arctic Subsistence Resource Commission and an update Ambler Mining District Industrial Access Project and the Park Service's efforts to prepare an Environmental and Economic Analysis which will help decide which route the National Park Service will recommend for the right-of-way potentially affecting a portion of the project crossing the Kobuk River and Gates of the Arctic NPP as detailed in the transcripts.

Anette Watson, PhD, College of Charleston (Charleston, South Carolina) described a new research project, funded by the National Park Service, examining the subsistence use in the vicinity of Gates of the Arctic National Park and Preserve designed to complement the environmental and economic analysis for the Ambler Road Project. The Council indicated interest in receiving update on the project as detailed in the transcripts.

Bureau of Land Management (Sparks)

Thomas Sparks, Natural Resource Program Coordinator (Anchorage, AK) provided an update for the BLM Anchorage Field Office. Mr. Sparks provided an update on the Donlin Pipeline Project and the Kobuk-Seward Land Use Plan as detailed in the transcripts.

Office of Subsistence Management (Hardin)

Jennifer Hardin, Anthropology Division Chief, OSM (Anchorage, AK) provided a staffing update. Ms. Hardin provided an update on the Nonrural Determination Policy and an update on the Memorandum of Understanding between the Federal Subsistence Board and the State of Alaska. Ms. Hardin provided an update on the Fisheries Resource Monitoring Program. Ms. Hardin also provided an update following the Federal Subsistence Board Meeting in January, regarding the Board directing the OSM to work with a small group of Federal and State managers in Unit 23 to begin looking at areas where user conflicts have been prevalent, particularly they relate to caribou hunting and the high density of hunting as detailed in the transcripts.

Future Meeting Dates

Member Shiedt motioned to hold the Fall Meeting in Kotzebue on 25-26 October 2017 and the Spring Meeting in Kotzebue on 28 February – 1 March 2018. Member Moto called the question with 9 members in-favor and 1 member excused absent. The motion carried.

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I hereby certify that, to the best of my knowledge, the foregoing minutes are accurate and complete.

Zach Stevenson, Designated Federal Official, OSM

Date

Enoch Attamuk Shiedt, Chair

Date

These minutes will be formally considered by the Western Interior Alaska Subsistence Regional Advisory Council at its fall 2017 public meeting, and any corrections or notations will be incorporated in the minutes of that meeting.

Presentation Procedure for Proposals

- 1. Introduction and presentation of analysis**
- 2. Report on Board Consultations:**
 - a. Tribes;
 - b. ANCSA Corporations
- 3. Agency Comments:**
 - a. ADF&G;
 - b. Federal;
 - c. Tribal
- 4. Advisory Group Comments:**
 - a. Other Regional Council(s);
 - b. Fish and Game Advisory Committees;
 - c. Subsistence Resource Commissions
- 5. Summary of written public comments**
- 6. Public testimony**
- 7. Regional Council recommendation** (motion to adopt)
- 8. Discussion/Justification**
 - Is the recommendation consistent with established fish or wildlife management principles?
 - Is the recommendation supported by substantial evidence such as biological and traditional ecological knowledge?
 - Will the recommendation be beneficial or detrimental to subsistence needs and uses?
 - If a closure is involved, is closure necessary for conservation of healthy fish or wildlife populations, or is closure necessary to ensure continued subsistence uses?
 - Discuss what other relevant factors are mentioned in OSM analysis
- 9. Restate final motion for the record, vote**

WP18–41/42 Executive Summary	
General Description	<p>Proposal WP18–41 requests that moose seasons be modified throughout Unit 23 to a two month cow season of Nov. 1-Dec. 31, a shortening of the bull season from July 1-Mar. 31 to July 1 – Dec. 31, and alignment of Federal and State hunt areas. <i>Submitted by: Northwest Arctic Subsistence Regional Advisory Council</i></p> <p>Proposal WP18–42 requests that moose seasons be modified throughout Unit 23 to include a winter any moose Federal registration permit hunt with a harvest quota aimed at reducing total cow harvest by 20%, and that the harvest limit be modified from one moose to one bull moose during the rest of the season. <i>Submitted by: Louis Cusack of Chugiak</i></p>
Proposed Regulation	<p><u>WP18-41</u></p> <p>Unit 23—Moose</p> <p><i>Unit 23—that portion north and west of and including the Singoalik River drainage, and all lands draining into the Kukpuk and Ipewik Rivers—1 moose</i></p> <p><i>Bulls may be harvested</i> <i>July 1–Mar.Dec. 31</i></p> <p><i>Cows may be harvested</i> <i>Nov. 1 – Dec. 31</i></p> <p><i>No person may take a calf or a cow accompanied by a calf</i></p> <p><i>Unit 23—that portion lying within the Noatak River drainage—1 moose; however, antlerless moose may be taken only from Nov. 1 Mar. 31; no person may take a calf or a cow accompanied by a calf</i> <i>Aug. 1 Mar. 31</i></p> <p><i>Unit 23, remainder—1 moose</i></p> <p><i>Bulls may be harvested</i> <i>Aug. 1–Mar.Dec. 31</i></p>

WP18-41/42 Executive Summary

	<p><i>Cows may be harvested</i> <i>Nov. 1 – Dec. 31</i></p> <p><i>No person may take a calf or a cow accompanied by a calf</i></p> <p><u>WP18-42</u></p> <p>Unit 23—Moose</p> <p><i>Unit 23—that portion north and west of and including the Singoalik River drainage, and all lands draining into the Kukpuk and Ipewik Rivers</i></p> <p><i>1 bull may be harvested</i> <i>July 1-Mar. 31</i></p> <p>Or</p> <p><i>1 moose may be harvested by Federal registration permit</i> <i>Nov. 1 – Mar. 31</i></p> <p><i>No person may take a calf or a cow accompanied by a calf</i></p> <p><i>Unit 23—that portion lying within the Noatak River drainage</i></p> <p><i>1 bull may be harvested</i> <i>Aug. 1-Mar. 31.</i></p> <p>Or</p> <p><i>1 moose may be harvested by Federal registration permit</i> <i>Nov. 1 – Mar. 31.</i></p> <p><i>No person may take a calf or a cow accompanied by a calf</i></p> <p><i>Unit 23, remainder</i></p> <p><i>1 bull may be harvested</i> <i>Aug. 1-Mar. 31.</i></p> <p>Or</p>
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WP18–41/42 Executive Summary	
	<p><i>1 moose may be harvested by Federal registration permit</i> <i>Nov. 1 – Mar. 31.</i></p> <p><i>No person may take a calf or a cow accompanied by a calf</i></p>
OSM Preliminary Conclusion	<p>Support Proposal WP18-41 with modification to change the harvest limit to one antlered bull July 1 (Aug. 1) – Dec. 31 and create a Nov. 1-Dec. 31 antlerless season by Federal registration permit and delegate authority to the Federal land manager to determine quotas and to close the season via a delegation of authority letter; and Take no action on Proposal WP18-42.</p>
Southeast Alaska Subsistence Regional Advisory Council Recommendation	
Southcentral Alaska Subsistence Regional Advisory Council Recommendation	
Kodiak/Aleutians Subsistence Regional Advisory Council Recommendation	
Bristol Bay Subsistence Regional Advisory Council Recommendation	
Yukon-Kuskokwim Delta Subsistence Regional Advisory Council Recommendation	
Western Interior Alaska Subsistence Regional Advisory Council Recommendation	

WP18-41/42 Executive Summary	
Seward Peninsula Subsistence Regional Advisory Council Recommendation	
Northwest Arctic Subsistence Regional Advisory Council Recommendation	
Eastern Interior Alaska Subsistence Regional Advisory Council Recommendation	
North Slope Subsistence Regional Advisory Council Recommendation	
Interagency Staff Committee Comments	
ADF&G Comments	
Written Public Comments	None

**DRAFT STAFF ANALYSIS
WP18-41/42**

ISSUES

Proposal WP18-41, submitted by the Northwest Arctic Subsistence Regional Advisory Council, requests that moose seasons be modified throughout Unit 23 to a two month cow season of Nov. 1-Dec. 31, a shortening of the bull season from July 1-Mar. 31 to July 1 – Dec. 31, and alignment of Federal and State hunt areas.

Proposal WP18-42, submitted by Louis Cusack of Chugiak, Alaska, requests that moose seasons be modified throughout Unit 23 to include a winter any moose Federal registration permit hunt with a harvest quota aimed at reducing total cow harvest by 20%, and that the harvest limit be modified from one moose to one bull moose during the rest of the season.

DISCUSSION

The Northwest Arctic Subsistence Regional Advisory Council (Council) voted to submit WP18-41 at its March 2017 meeting. The proponent stated that they would like to align the Federal and State moose seasons and hunt areas in Unit 23 in order to address a declining moose population in the unit. The proponent also noted that Alaska Department of Fish and Game (ADF&G) reports have shown a decline in the moose population throughout a majority of Unit 23 and the State has taken steps to reduce harvest by adopting more restrictive regulations for both resident and nonresident hunters. Council members stated that local users typically harvest cow moose during the winter months. Due to the need to conserve cows in the unit, the proponent is requesting that the Jan. 1-Mar. 31 portion of the Unit 23 moose season be eliminated to align with State regulations, but that they would also like to maintain a two month cow moose harvest season from Nov. 1 - Dec. 31 in order to provide for subsistence needs in local communities. The proponent stated that as caribou populations decline in Unit 23, some subsistence users are relying more heavily on moose to meet their needs. It was expressed by the proponent that this two month cow season would provide much needed food resources for subsistence users who were not able to harvest caribou for the year, while also limiting overall cow harvest during the season in order to allow for reproductive growth in the population.

Similarly, Louis Cusack of Chugiak submitted WP18-42 to address a declining moose population so that more aggressive measures do not need to be taken in the future. The proponent stated that ADF&G and National Park Service (NPS) reports have shown a decline in the moose population throughout a majority of Unit 23 and the State has taken steps to reduce harvest by adopting more restrictive regulations for both resident and nonresident hunters. The proponent also stated that all users have a stake in this moose resource and that all users need to work together to improve the health of the moose population in the unit.

Existing Federal Regulation

Unit 23—Moose

Unit 23—that portion north and west of and including the Singoalik River drainage, and all lands draining into the Kukpuk and Ipewik Rivers—1 moose; no person may take a calf or a cow accompanied by a calf July 1-Mar. 31

Unit 23—that portion lying within the Noatak River drainage—1 moose; however, antlerless moose may be taken only from Nov. 1-Mar. 31; no person may take a calf or a cow accompanied by a calf Aug. 1-Mar. 31

Unit 23, remainder—1 moose; no person may take a calf or a cow accompanied by a calf Aug. 1-Mar. 31

Proposed Federal Regulations

WP18-41

Unit 23—Moose

Unit 23—that portion north and west of and including the Singoalik River drainage, and all lands draining into the Kukpuk and Ipewik Rivers—1 moose

Bulls may be harvested July 1-~~Mar.~~Dec. 31

Cows may be harvested Nov. 1 – Dec. 31

No person may take a calf or a cow accompanied by a calf

~~*Unit 23—that portion lying within the Noatak River drainage—1 moose; however, antlerless moose may be taken only from Nov. 1-Mar. 31; no person may take a calf or a cow accompanied by a calf*~~ Aug. 1-Mar. 31

Unit 23, remainder—1 moose

Bulls may be harvested Aug. 1-~~Mar.~~Dec. 31

Cows may be harvested Nov. 1 – Dec. 31

No person may take a calf or a cow accompanied by a calf
WP18-42

Unit 23—Moose

Unit 23—that portion north and west of and including the Singoalik River drainage, and all lands draining into the Kukpuk and Ipewik Rivers

1 bull may be harvested *July 1-Mar. 31*

Or

1 moose may be harvested by Federal registration permit *Nov. 1 – Mar. 31*

No person may take a calf or a cow accompanied by a calf

Unit 23—that portion lying within the Noatak River drainage

1 bull may be harvested *Aug. 1-Mar. 31.*

Or

1 moose may be harvested by Federal registration permit *Nov. 1 – Mar. 31.*

No person may take a calf or a cow accompanied by a calf

Unit 23, remainder

1 bull may be harvested *Aug. 1-Mar. 31.*

Or

1 moose may be harvested by Federal registration permit *Nov. 1 – Mar. 31.*

No person may take a calf or a cow accompanied by a calf

Existing State Regulation

Unit 23—Moose

Unit 23, north of Residents—One antlered bull by permit available *July 1-Dec 31*

<i>and including Singolik River drainage</i>	<i>in person at license vendors within Unit 23 villages June 1-July 15</i> <i>or</i> <i>Residents—One bull with 50-inch antlers or antlers with 4 or more brow tines on at least one side</i> <i>Nonresidents—One bull with 50-inch antlers or antlers with 4 or more brow tines on at least one side by permit</i>	<i>Sept 1-Sept 20</i> <i>Sept 1-Sept 20</i>
<i>Unit 23, remainder</i>	<i>Residents—One antlered bull by permit available in person at license vendors within Unit 23 villages June 1-July 15</i> <i>or</i> <i>Residents—One bull with 50-inch antlers or antlers with 4 or more brow tines on at least one side</i> <i>Nonresidents—One bull with 50-inch antlers or antlers with 4 or more brow tines on at least one side by permit</i>	<i>Aug 1-Dec 31</i> <i>Sept 1-Sept 20</i> <i>Sept 1-Sept 20</i>

Extent of Federal Public Lands

Federal public lands comprise approximately 71% of Unit 23 and consist of 40% National Park Service (NPS) managed lands, 22% Bureau of Land Management (BLM) managed lands, and 9% U.S. Fish and Wildlife Service (USFWS) managed lands (**Figure 1**).

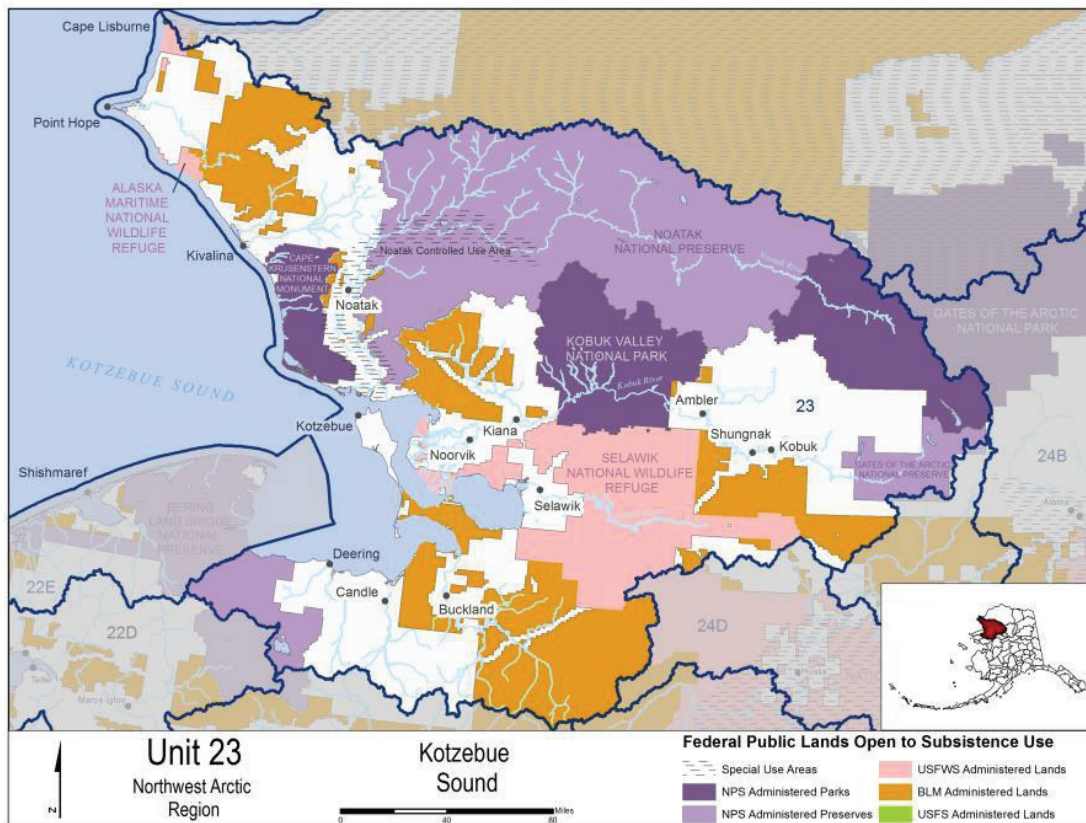


Figure 1. Federal public lands in Unit 23.

Customary and Traditional Use Determinations

Residents of Unit 23 have a customary and traditional use determination for moose in Unit 23.

Regulatory History

In March of 1988, the Native Village of Noatak submitted a proposal to the Alaska Board of Game (BOG) to establish the Noatak Controlled Use Area. This area was originally adopted, in part, “to help reduce harvests on a declining moose population” (ADF&G 1988:47, Alaska Board of Game 1995: 1). The BOG modified the request to include approximately one third of the land area requested by the Native Village of Noatak and unanimously approved the Noatak Controlled Use Area in 1988 (Fall 1990: 87), which was expanded in 1994 to maintain opportunities for hunters using boats without overly restricting aircraft

(Alaska Board of Game 1995: 1). From 1994-2016, the Noatak Controlled Use Area consisted of a 10-mile-wide corridor along the Noatak River from its mouth to Sapun Creek, encompassing more than 160 river miles, which is closed from Aug. 15-Sept. 30 to the use of aircraft for big game hunting (Betchkal 2015). These regulations apply on State, private, and Federal public lands.

State moose regulations became more restrictive in 2003 when BOG approved amended Proposal 15 (effective starting with the 2004/05 regulatory year), making it more difficult for nonlocal residents to hunt moose, creating four registration hunts in the unit with permits (RM880) only available in person at licensed vendors in Unit 23 villages from June 1-July 15. This early availability of permits occurred before most of the seasons opened, requiring nonlocal hunters to make a special trip to a Unit 23 village in order to receive a permit. These permits also allowed better tracking of harvest.

In 2005, Proposal WP05-18, submitted by the Northwest Arctic Subsistence Regional Advisory Council, requested prohibiting the harvest of calves in addition to shortening the season for moose in most of Unit 23 from July 1 (or Aug. 1)-Mar. 31 to Aug. 1-Dec. 31 (a 5 month season), combining the Noatak drainage with the remainder hunt area, and allowing antlerless moose to be harvested only in November and December. The Board chose to table this proposal in response to a Northwest Arctic Regional Advisory Council recommendation to give local villages time to review the proposal and provide their input due to differing viewpoints related to the moose population and local subsistence needs (FSB 2005). In 2006, Proposal WP06-54 was submitted by the Northwest Arctic Subsistence Regional Advisory Council to replace WP05-18, requesting the harvest of moose calves be prohibited and that the two week seasonal closure (Sept. 16-30) in the Noatak River drainage be removed. The Board adopted WP06-54 as a consensus agenda item.

Proposals requesting modifications to aircraft restrictions and/or closures of portions of Unit 23 to the taking of moose except by Federally qualified subsistence users have been submitted multiple times throughout the years. Proposal WP99-049 requested a closure to non-Federally qualified subsistence users in the Noatak and Squirrel River drainages and WP02-40 requested a Controlled Use Area on the Selawik National Wildlife Refuge. The latter of these proposals would only have impacted Federally qualified subsistence users, which was not the initial intent of the proponent. Both WP08-50 and WP08-51 requested that the time period for aircraft restrictions in the Noatak Controlled Use Area be changed to cover more of the fall season. Many of these proposals cited user conflict issues as the justification. Most of these proposals were withdrawn by the proponent, or deferred by the Board, due to the lack of any effect on non-Federally qualified users since the Board only has authority over Federal regulations. In 2007, the State endorsed the creation of a Unit 23 User Conflict Working Group (Working Group) to do an in-depth study documenting and quantifying the extent of observed problems between local subsistence hunters, nonlocal hunters, and commercial enterprises, such as transporters and guides.

In 2010, Proposals WP10-82, WP10-83, and WP10-85, requested modifications to the time period during which aircraft were restricted in the Noatak Controlled Use Area. These proposals were analyzed together with no action taken on WP10-82 and -83. The Board adopted WP10-85 with modification to use current Federal regulatory language and adjust the dates as requested (Aug. 15-Sept. 30) which aligned with recent

actions taken (the passing of Proposal 22 in 2009) by the BOG to change the effective dates of the Noatak Controlled Use Area from Aug. 25-Sept. 15 to Aug. 15-Sept. 30.

At the January 2017 BOG meeting in Bethel, amended Proposal 36 was adopted to change the antlerless moose season in Unit 23 to one antlered bull (ADF&G 2017a) due to conservation concerns. During the discussion of this change, it was stated that nonresident drawing permits have been reduced 25% the last two years and that the number of these permits has declined since the creation of the hunt in 2004. According to the Alaska Draw Supplement document produced by ADF&G (2017b) for the 2016/17 season, 50 permits were available across drawing permit hunts in Unit 23 (DM871, 872, 874, 875, 876, 877, and 885). Amended Proposal 44, which shifted the area of the Noatak Controlled Use Area to extend from the Agashashok River to the Nimiuktuk River, was also adopted at the January 2017 BOG meeting.

At the Northwest Arctic Subsistence Regional Advisory Council public meeting, that took place on March 1-2, 2017 in Kotzebue, ADF&G mentioned that the non-resident hunt has been canceled for the current regulatory year and that permits that were sent out to non-resident users were all rendered void (NWARAC 2017, Saito 2017, pers. comm.). In April of 2017 the Board rejected Temporary Special Action WSA17-02, which requested that Federal public lands in Unit 23 be closed to all non-Federally qualified users for moose harvest during the 2017/18 regulatory year. The Board stated that they wanted to allow time to assess the effects of recent State actions prior to considering a unit-wide closure.

Biological Background

Moose expanded into Unit 23 from the east relatively recently, with the first moose appearing in the unit during the 1920s. Over the next 20-30 years, they expanded their range in Unit 23 to the Chukchi Sea coast (LeResche et al. 1974, Tape et al. 2016, Westing 2012). The Unit 23 moose population grew through the late-1980s (Westing 2012). This rise in population was followed by severe winters and extensive flooding from 1988-1991 which, in conjunction with predation by brown bears and wolves, reduced the population and overall moose density (Westing 2012).

State management goals for moose in Unit 23 include maintaining a unit wide combined population of 8,100-10,000 moose while maintaining a minimum November bull:cow ratio of 40:100, except in the Lower Kobuk which is disproportionally inhabited by maternal cows (Westing 2012). The higher bull:cow ratio goals are due to the low densities and wide distribution of moose throughout Unit 23.

Moose population surveys have been conducted in Unit 23 by ADF&G staff and Federal partners since the early 1990s. Census areas have fluctuated throughout the years due to time and financial restraints as well as evolving survey techniques available to biologists (Saito 2017, pers. comm.). Area biologists have tried different methods to obtain the most accurate population counts with the resources available. The most recent census area modification was the addition of the previously unsurveyed area between the Lower and Upper Kobuk census areas to the Upper Kobuk census area (Saito 2017, pers. comm.). It is planned for the current census areas to be in place for the foreseeable future (**Figure 2**).

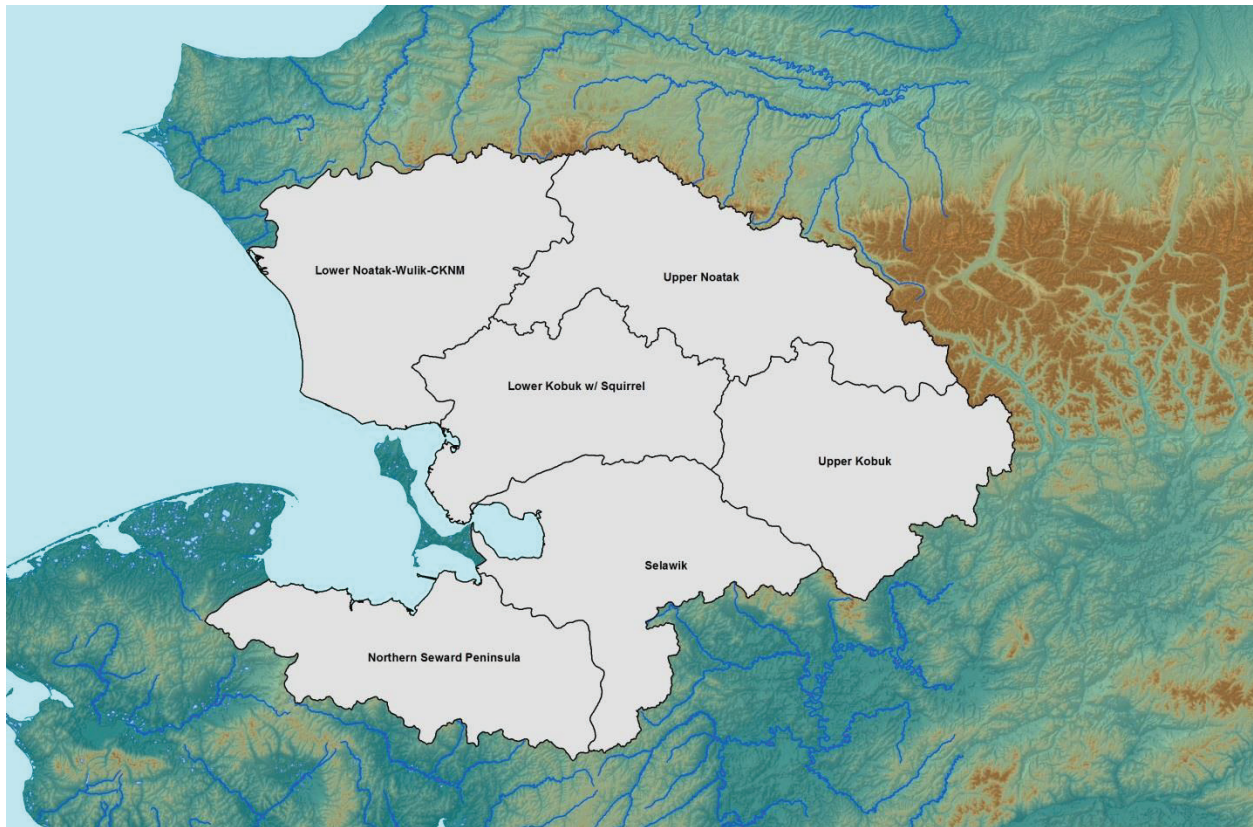


Figure 2. ADF&G moose census areas in 2017 (figure from Saito 2017, pers. comm.).

Between 2000 and 2011, spring geospatial population estimates showed adult moose densities throughout Unit 23 ranged from 0.03-0.59 moose/mi² (Westing 2012). During this time period, moose densities appeared to be stable. Since then, new spring geospatial population censuses have been conducted across each Unit 23 study area (**Table 1**). The most recent data shows adult moose densities throughout Unit 23 range from 0.03-0.44 moose/mi² depending on the census area (**Table 2**; ADF&G 2017a). Population census surveys are conducted in different census areas annually with each census area being surveyed approximately every five years (Alaska Board of Game 2017). The most recent population surveys were conducted for each of the census study areas as follows: Upper Noatak-2010, Lower Kobuk-2012, Lower Noatak-2013, Upper Kobuk-2014, Northern Seward Peninsula-2015, and Selawik-2016 (**Table 2**). While the Noatak drainages, Lower Kobuk, Selawik, and Northern Seward Peninsula populations have declined and are below population objectives, the Upper Kobuk has remained relatively stable (**Table 1, Figure 3**; Saito 2016a, pers. comm.).

At the Alaska Board of Game's Arctic and Western Region meeting in January 2017, the State biologist stated the current estimated moose population for Unit 23 was approximately 7,500 moose (ADF&G 2017a). This is below the overall population goal of 8,100-10,000 moose for Unit 23.

The last year that all fall composition surveys were done in all survey areas consistently (Lower Kobuk, Lower Noatak, Selawik, and Seward Peninsula) was 2007. From 2004-2007 the bull:cow ratio averaged

39:100 with average ratios ranging from 26-50 bulls:100 cows in the drainages surveyed and calf:cow ratios averaged 21:100 with average ratios ranging from 12-34 calves:100 cows (Saito 2016a, pers. comm.,

Table 1. Overview of most recent population estimates throughout Unit 23. Harvest rates are set at 6% of the population. The Upper Kobuk census area represents the updated census area that was created in 2014. Extrapolated total incorporates estimated populations in non-surveyed portions of Unit 23 (Saito 2016a, pers. comm.).

Unit 23 Study Area	Population Estimate	Population Objectives	Harvestable Surplus
Noatak River Drainages	1631	2000-2300	98
Lower Kobuk River Drainage	2546	2800-3400	153
Upper Kobuk River Drainage	727	600-800	44
Selawik/Tag River Drainage	940	2000-2500	56
Northern Seward Peninsula	617	700-1000	37
Total	6461		388
Extrapolated Total	7499.9		450

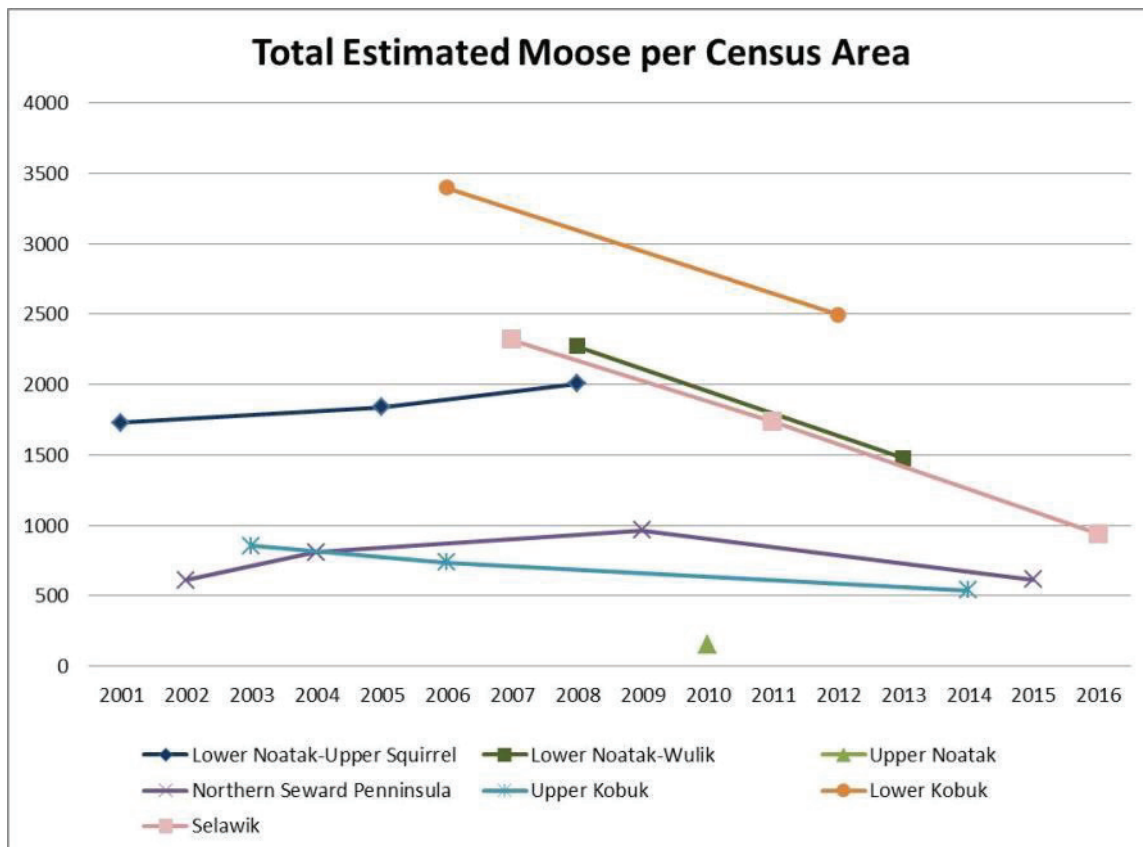


Figure 3. Total moose population estimates from 2001 to 2016 by census area. The old Upper Kobuk census area population estimates are shown here due to improved comparability across years (Saito 2016a, pers. comm.).

Table 2. Moose population data collected during spring population census surveys in Unit 23 since 2001. The Upper Kobuk was surveyed in 2014 using both the older census area and the updated census area (Saito 2016a, pers. comm.).

Census Area	Year	Moose Observed	Total Moose Estimated	Census Area (mi ²)	Area Surveyed (mi ²)	Total Density (/mi ²)	Adult Density (/mi ²)	Calves :100 adults
Lower Noatak-Upper Squirrel	2001	709	1731	5230.2	832.0	0.33	0.30	10
	2005	575	1838	5349.7	915.5	0.34	0.30	13
	2008	596	2008	5349.7	1510.4	0.38	0.33	13
Lower Noatak-Wulik	2008	685	2273	6404.5	--	0.35	0.31	14
	2013	413	1478	6404.5	1310.2	0.23	0.21	11
Upper Noatak	2010	100	153	4485.6	1972.1	0.03	0.03	12
N. Seward Peninsula	2002	520	612	5888.5	1220.7	0.10	0.10	7
	2004	610	810	5882.9	1934.3	0.14	0.12	12
	2009	293	966	5773.2	1271.2	0.17	0.16	8
	2014	264	--	--	--	--	--	12
	2015	310	617	5767.8	1791.2	0.11	0.09	15
Upper Kobuk	2003	252	856	4001.5	895.4	0.21	0.19	12
	2006	219	737	4001.5	973.7	0.18	0.16	15
	2014	136	538	3990.8	839.2	0.13	0.13	7
	2014	186	727	5056.8	1082.5	0.14	0.13	7
Lower Kobuk	2006	1532	3398	4870.5	1457.6	0.70	0.59	15
	2012	789	2497	4870.5	1457.6	0.51	0.48	8
Lower Kobuk-Squirrel	2012	789	2546	5338.0	1290.8	0.48	0.44	8
Selawik	2007	678	2319	6580.1	1845.2	0.35	0.32	10
	2011	448	1739	6559	1289.1	0.27	0.24	11
	2015	532	--	--	--	--	--	14
	2016	520	940	6559	2273	0.14	0.13	14

Westing 2012). The proportion of moose surveyed each year was estimated at 20-35% of the population (Westing 2012). Since 2007, fall composition surveys have been conducted sporadically in the four survey areas (**Table 3**; Saito 2016a, pers. comm.). According to Stout (2010) population guidelines, a ratio of less than 20 calves:100 cows may indicate the population is in decline while a ratio of 20-40 calves:100 cows may indicate a stable population. Taking this information into account, recent fall composition surveys show the Lower Kobuk population appears to be relatively stable while moose populations in the other survey areas appear to be in decline.

Table 3. Bull:Cow ratios in fall composition surveys conducted after 2007 (Saito 2016b, pers. comm.).

Survey Area	Year	Bulls:100 Cows	Calves:100 Cows
Selawik	2008	54	18
	2010	47	19
	2015	43	20
Lower Kobuk	2011	45	15
	2016	38	24
Lower Noatak	2013	53	4
Seward Peninsula	2014	34	16

The most recent survey completed was in the Selawik census area. The Selawik area spring moose survey was conducted in 2007, 2011, and 2016. In 2011, the moose population was estimated at 1,739 animals (Saito 2016b). This represented a 7% annual decline from the 2007 estimate of 2,319. In 2016, the population was estimated at 940; a 12% annual population decline from the 2011 survey (Saito 2016b). Fall composition surveys from 2008-2015 showed bull:cow ratios between 43-54:100. Calf recruitment remained steady during this time, ranging from 10-14 calves:100 adults for spring surveys, with fall composition ranging from 18-20 calves:100 cows (Saito 2016b).

At the Northwest Arctic Subsistence Regional Advisory Council public meeting in March (2017) NPS presented information on the importance of cow moose to overall population growth. It was stated that cow moose begin producing calves at three years of age and often produce twins every third year (NWARAC 2017). By maintaining cows in a region, a manager is potentially ensuring continued growth of that population.

Moose in Unit 23 are not evenly distributed across the landscape, with some drainages experiencing higher densities of moose than other drainages. During winter months large congregations of moose have been observed near villages, which can make these moose highly susceptible to harvest (Alaska Board of Game 2017). In areas with low moose densities, the harvest of congregations of moose near villages can lead to population crashes and possible population extirpation within the area.

Habitat

Moose moved into Unit 23 around the 1920s (**Figure 4**), as suitable shrub and willow productivity and cover increased concurrently with rising average temperatures in the northern regions of the state (Tape et al. 2016). From 1860 to present day, willow heights have increased from an estimate of approximately 1.10 meters in 1860 to approximately 2 meters in 2009 and shrub habitat has spread in these Arctic habitats (Tape et al. 2016). Moose rely on willow and shrub habitats for browsing and for cover from predators. The taller vegetation heights estimated in the northern and western portions of the state provide more

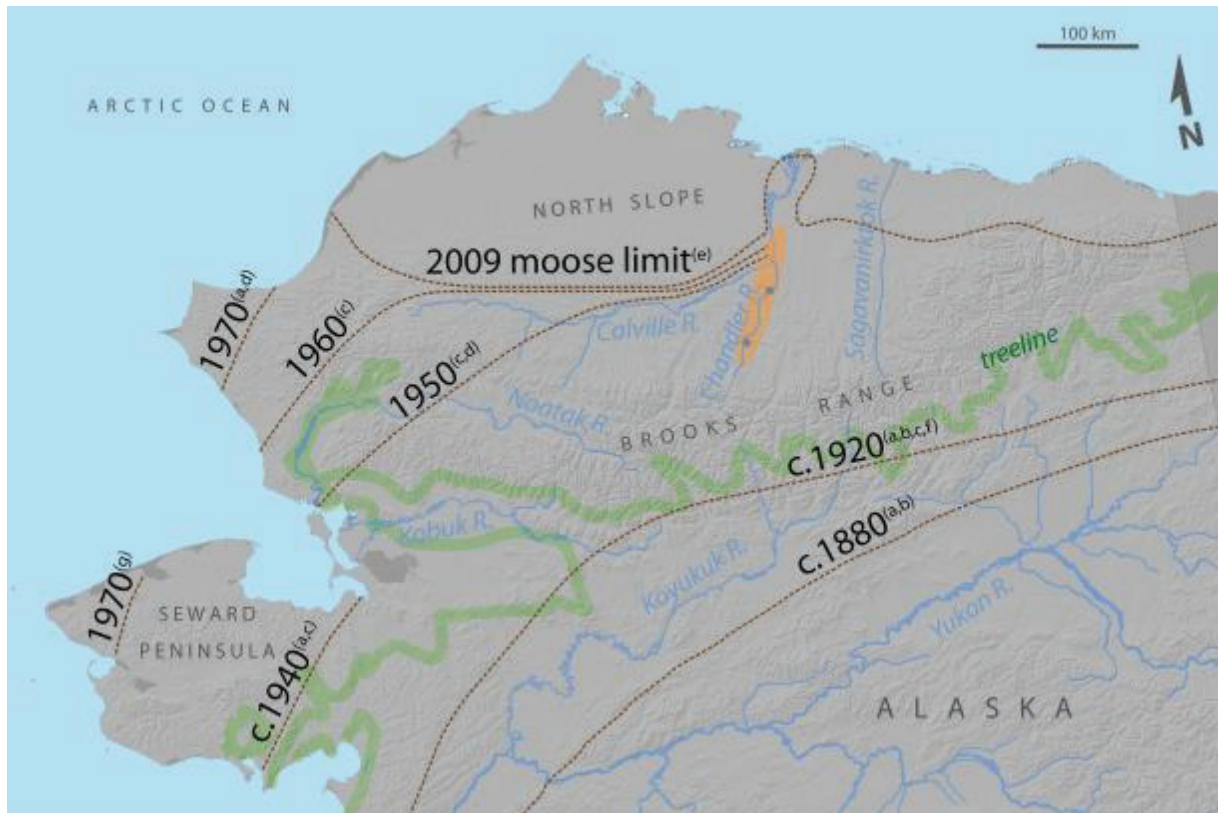


Figure 4. Temporal moose distribution changes in northern Alaska (figure from Tape et al. 2016).

suitable cover and increased available forage above the snowpack for moose populations than was present in the past (Tape et al. 2016). This expansion of moose habitat into northern latitudes has been found in other Arctic areas, such as Siberia (Frost and Epstein 2014). Wildfire (the primary driver of boreal forest succession) frequency is forecast to increase as the Arctic climate warms, causing projected moose habitat to increase by 19-64% in present day Western Arctic Caribou Herd core winter range (**Figure 5**; Joly et al. 2012). As statistical models show, this present day broad scale temporal habitat expansion of shrub habitat will continue to push north and west in Alaska as average temperatures increase across years (Swanson 2015).

With the expansion of shrub/willow habitat, migration of species reliant on this habitat resource can also be expected. Besides moose, snow shoe hare have also broadened their range into these northern regions (Tape et al. 2016). Herbivory can negatively impact habitat that is not yet stable in a newly established

area. In these areas it is necessary to monitor browsing of vegetation to understand overall habitat conditions for a species. During a habitat survey conducted in 2005, willows did not appear to be over-browsed by moose in Unit 23 (Westing 2012). Moose browse surveys were conducted in 30 plots within the Lower Kobuk survey area in Unit 23 from April 12-16, 2017. Although this data has not been analyzed at this time, past surveys showed that preferred browse removal rates are well below 20% (Hughes 2017, pers. comm.).

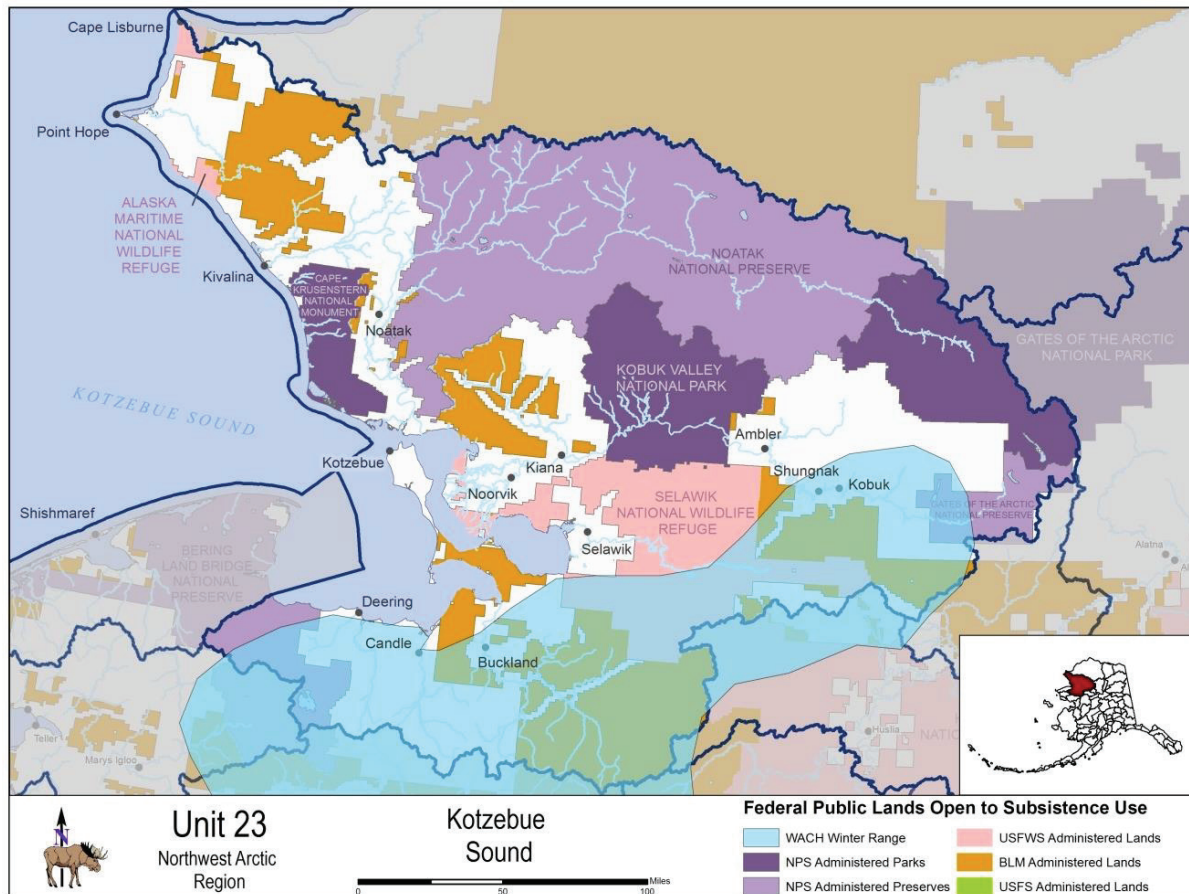


Figure 5. The location of the Western Arctic Caribou Herd winter migratory range in Unit 23 where moose habitat is expected to increase by 19-64% (Joly et al. 2012).

Cultural Knowledge and Traditional Practices

Game Management Unit 23 encompasses the Northwest Arctic Borough which was established in 1986 and is home to 7,523 residents from 11 communities (NAB 2016). Approximately 86% of the residents identify as Alaska Native or part Native, with the majority of these identifying as Inupiat Eskimo (NAB 2016). The borough comprises approximately 39,000 mi² on which subsistence activities are a vital part of the lifestyle for local residents (NAB 2016).

Documentation on the earliest archaeological sites to-date suggests the presence of communities in the Northwest Arctic beginning around 7900 B.C., especially inland near present-day Onion Portage

(Anderson 1984: 81). Coastal habitation in this region has been documented beginning 4,500 to 4,200 years before present (Anderson 1984: 84). By 1800, ten relatively autonomous societal territories had formed in what is commonly referred to as the “Kotzebue Region”, unified by several preceding centuries of prehistoric Thule culture (Burch 1984: 304). Contact with Russians likely began in the 17th century and was followed by the arrival of Captain James Cook in Northern Alaska in 1778 (Anderson 1984: 93). The first recorded Russian contact in the Kotzebue Sound area was in 1818 by the German Lt. Otto Von Kotzebue, sailing under the Russian flag (NAB 2016).

Historically, the people of the Northwest Arctic lived in small family clusters that were spread widely across the landscape (Burch 1980: 265). It wasn’t until the 20th century that most residents of the region became centralized in more permanent winter villages (Georgette and Loon 1993: 3). Kotzebue became the largest community in the region and is currently considered the hub of economic activity in the area. In 1985, Kotzebue was more than eight times larger than the average community in the region by population (2,633 individuals), and four times larger than the second largest community – Selawik (Georgette and Loon 1993: 3). In 2010 the population of Kotzebue was recorded as 3,201 individuals (DCCED 2016). The community is near the mouth of several major river systems. It is surrounded by the marine waters of Kotzebue Sound, and the original village was named “Qikiqtagruk” (Georgette and Loon 1993: 4).

The resources of the Northwest Arctic region are relatively rich and varied despite its high latitude (Burch 1984: 306). A variety of animal species are available and utilized for subsistence including marine mammals, terrestrial mammals, birds, and fish (Burch 1984: 306). Caribou has been a staple in the diet of many Inupiat peoples for centuries (Georgette and Loon 1993: 78). In many parts of the Northwest Arctic however, shifts in herd migration and size often causes variability in the availability of this resource, with the use of caribou and harvest strategies often changing accordingly over time (Georgette and Loon 1993: 78).

Despite the diversity of resources in the region, moose are considered a relatively recent addition, especially in lowland and coastal areas (Georgette and Loon 1993: 83). Archaeological sites in tundra and northern tree-line areas of Alaska have reported few moose remains until the mid-20th century and this is consistent with historical accounts and minor representation in Inupiat culture (Hall 1973, Coady 1980, Tape et al. 2016). Reports of nineteenth century explorers also lacked observations of moose along the Kobuk, Noatak, or Colville Rivers, as well as along the Arctic coast (Coady 1980).

Moose were present in the tributaries of the upper and middle Noatak River in the 1940s and became more common downriver after 1960 (Georgette and Loon 1993: 83). In the upper Kobuk River moose did not appear until the 1920s but soon thereafter populated the entirety of the drainage (Georgette and Loon 1993: 83). Uhl and Uhl (1977) reported that residents of the Cape Krusenstern area lacked historic traditions that included moose. By the 1980s, moose were present in suitable habitat throughout northwest Alaska (Georgette and Loon 1993: 84).

According to Georgette and Loon (1993), residents of Kotzebue continued to consider moose as secondary to caribou in their importance and desirability as a subsistence food; they were taken to add dietary variety. Residents hunted moose in the fall, but moose were also harvested throughout the winter as need

necessitated (Georgette and Loon 1993: 84). The relative size of moose makes them more difficult to butcher and pack than caribou, and hunters often prefer to harvest the species as close as possible to the edge of a river or a lake in proximity to their boat (Georgette and Loon 1993: 84). Moose is generally prepared and preserved by similar means as caribou, most often aged and frozen (Georgette and Loon 1993: 84). The cartilaginous parts of the nose were the only part of the heads used. Because moose hides were not generally smoked or tanned, they were rarely salvaged (Georgette and Loon 1993: 84).

The average per capita harvest of moose in Kotzebue in 1986 was 13 pounds, accounting for only 3% of the average household harvest (Georgette and Loon 1993: 84). Approximately 8% of Kotzebue households harvested moose (compared to 45% harvesting caribou), but 18% indicated that they hunted for moose but were unsuccessful (Georgette and Loon 1993: 84). Despite the small percentage of households harvesting moose, sharing of this resource was widespread with approximately 42% of households using it (Georgette and Loon 1993: 84). The use and harvest of moose by Kotzebue residents was similar in 2012 with approximately 13 pounds of this resource harvested per capita, 9% of households harvesting moose, and 37% of households using moose (ADF&G 2012).

The harvest and use of a resource in regional hubs may be different than that of a rural village since the former tends to be more heterogeneous in “culture, birthplace, education, employment, and length of residency” (Georgette and Loon 1993: 4). In 1992, the rural northwest arctic community of Kivalina harvested approximately 26 pounds of moose per capita, with 23% of the households harvesting the resource and 47% of households using the resource (ADF&G 1992). In 2010, residents of Kivalina harvested approximately 19 pounds of moose per capita with 13% of household harvesting the resource and 16% using the resource (ADF&G 2010).

Changes in harvest and use patterns may be attributable to many factors including the availability of moose and other resources in a given year. Georgette and Loon (1993) suggested that future declines in caribou availability in the region could result in increased reliance on moose to meet the subsistence harvest demands of Kotzebue residents. Given that the Western Arctic Caribou Herd (WACH) has been declining since 2003 (Dau 2015), moose may already be becoming a more prominently sought after resource for meeting subsistence needs in the region.

Harvest History

Harvest numbers are collected from both State harvest reports and community household surveys. Community household surveys collect a broad range of information and are used as a method to determine, among other things, whether harvest is being reported accurately in State harvest reports. Harvest reports provide data on an annual basis. Community household surveys gather data from local communities pertaining to subsistence harvest on an irregular basis, with many communities only being visited once over a five year time span. In Unit 23, community household surveys show that moose harvest is underreported by local users, but nonlocal user harvest can be assumed accurate based on the requirement of registration permits and drawing permits in some areas. This section will discuss State harvest report data prior to reviewing community household survey data.

Prior to 2005 a greater percentage of the total reported moose harvest in Unit 23 was from non-Federally qualified users. In 2003 approximately 80% of the reported harvest was from non-Federally qualified users (ADF&G 2016). In 2005, after the implementation of registration hunts (RM880) by the BOG, this percentage dropped to approximately 56% (ADF&G 2016). According to the ADF&G (2016) harvest report website, the average annual reported harvest in Unit 23 from 2005-2015 was 153 moose, which is below the harvestable surplus (450) for the unit (**Table 1 and 4**). A majority of moose taken over these years have been bulls. Local residents, defined as those residing within Unit 23, accounted for 50.4% of the total reported harvest from 2005-2015 and 51.5% in 2015 alone (**Figure 6**; ADF&G 2016). Harvest success by local residents remained flat between 2004-2014 (**Figure 7**). In 2015, 165 moose (144 male, 21 female) were reported harvested (\approx 115 taken in September) with 35.1% hunter success by all users and local users making up 58% of all moose hunters throughout the unit (**Figure 7 and 8, Table 4 and 5**; ADF&G 2016, Saito 2016a, pers. comm., WINFONET 2017). In the last few years a majority of the moose harvest in Unit 23 was taken from the Kobuk drainage (**Figure 9**; ADF&G 2017a). In 2015, a majority of nonlocal users used aircraft to access hunting areas (19 nonresidents, 20 nonlocal residents, and 2 local residents), whereas most local residents reported using boats (1 nonresident, 20 nonlocal residents, 51 local residents) or snow machines (1 nonlocal resident, 22 local residents) to access hunting areas (WINFONET 2017). Community household survey data was not included in any of these values and will be discussed later in the analysis.

Table 4. Reported moose harvest in Unit 23 for 2005-2015 (ADF&G 2016).

Year	Species	Local Resident Harvest	Nonlocal Resident Harvest	Total Resident Harvest	Unknown Residency Harvest	Nonresident Harvest	Total Harvest	Male	Female	Unknown Gender
2015	Moose	85	59	144	1	20	165	144	21	0
2014	Moose	74	40	114	0	10	124	109	14	1
2013	Moose	88	53	141	2	21	164	151	12	1
2012	Moose	75	57	132	0	24	156	146	10	0
2011	Moose	72	45	117	1	26	144	133	11	0
2010	Moose	102	63	165	2	22	189	169	17	3
2009	Moose	80	50	130	2	23	155	144	10	1
2008	Moose	62	48	110	1	40	151	143	7	1
2007	Moose	64	29	93	5	25	123	116	7	0
2006	Moose	79	49	128	1	30	159	150	7	2
2005	Moose	65	41	106	1	41	148	137	10	1
Total:		846	534	1380	16	282	1678	1542	126	10

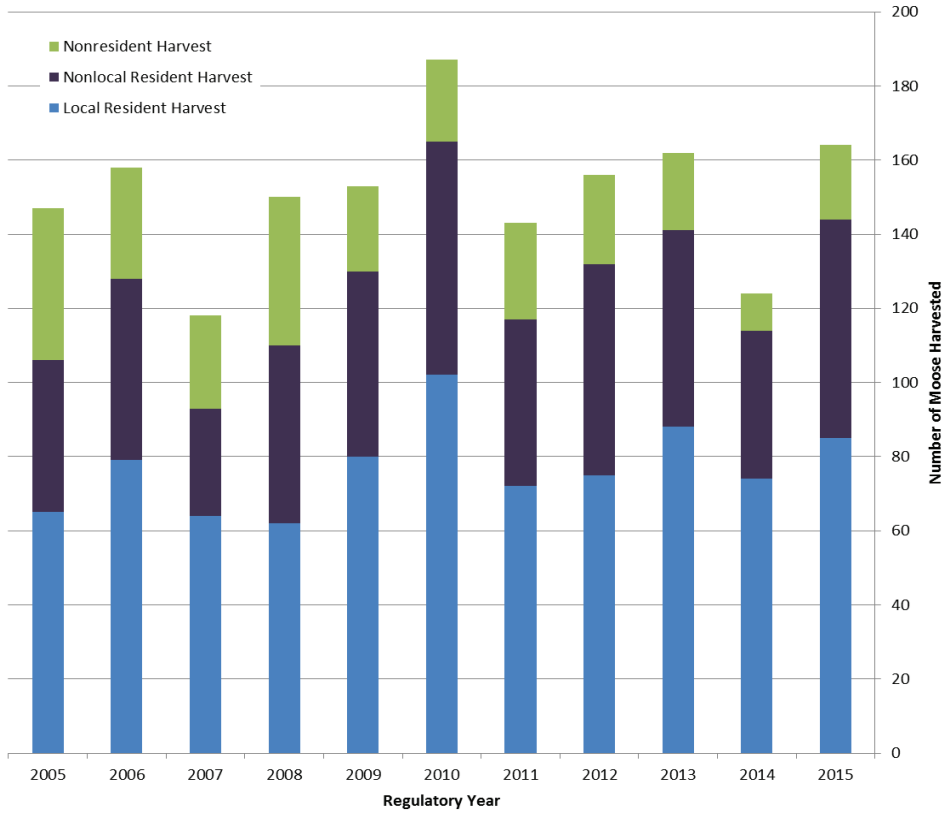


Figure 6. Number of moose harvested in Unit 23 from 2005-2015 according to State harvest reports (ADF&G 2016).

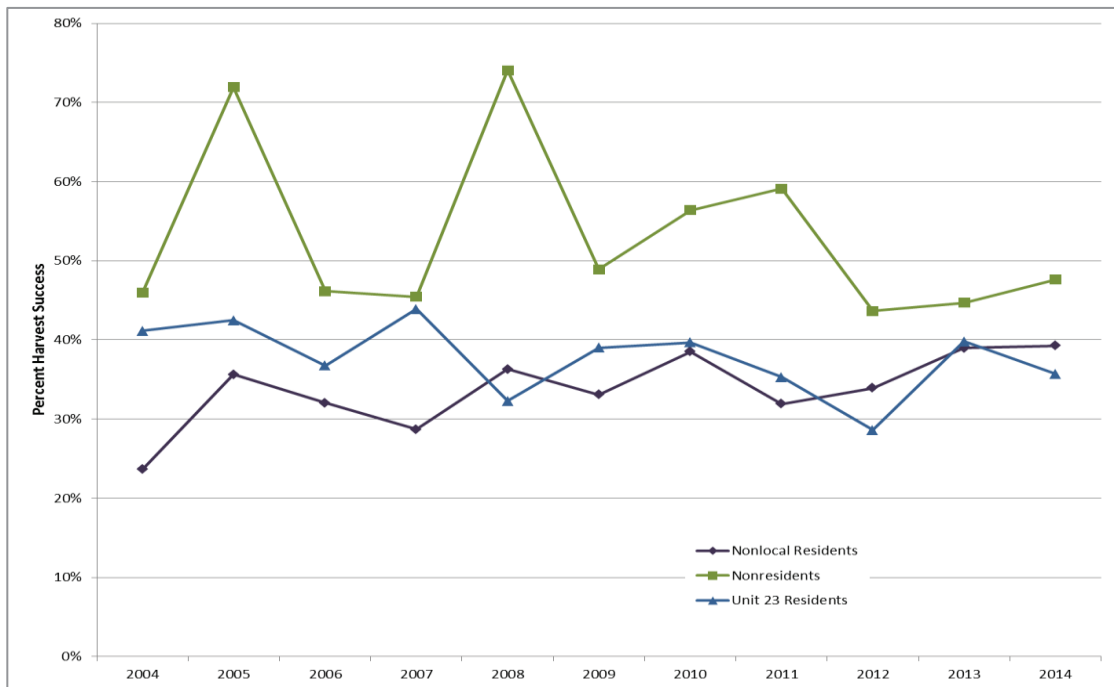


Figure 7. Moose harvest success among users of Unit 23 from 2004-2014 according to State harvest reports (Saito 2016a, pers. comm.).

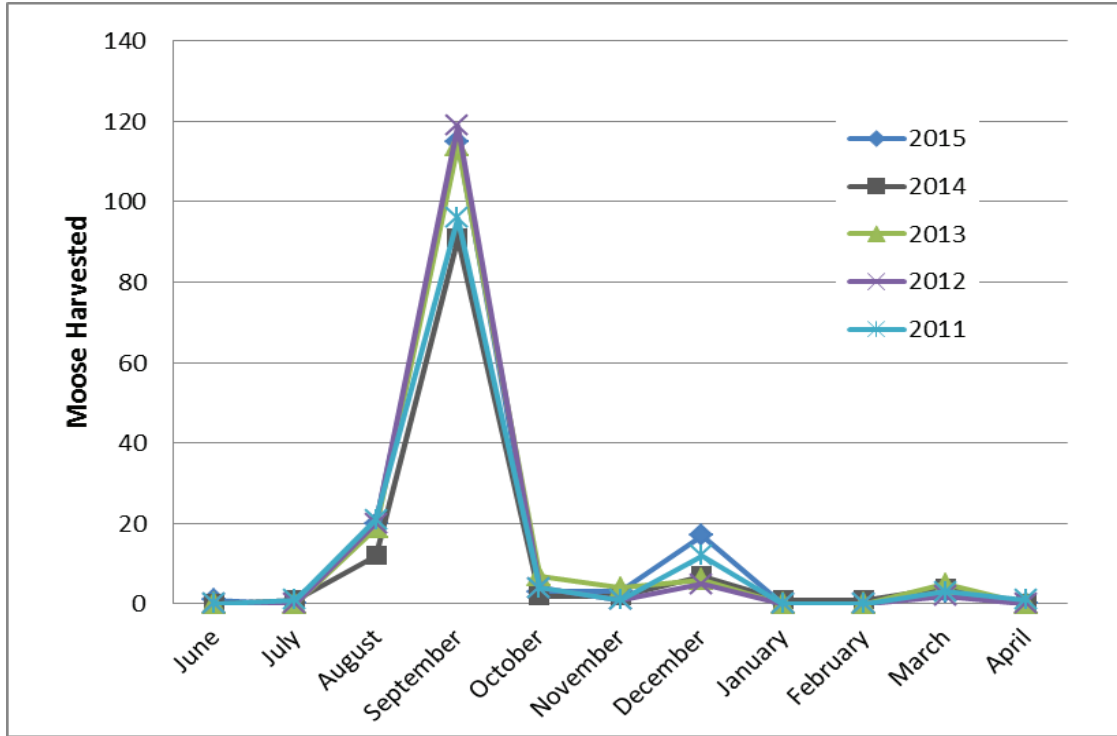


Figure 8. Moose harvest, by month, among users of Unit 23 from 2011-2015 according to State harvest reports (WINFONET 2017).

Table 5. Unsuccessful hunters that took part in moose hunts in Unit 23 according to ADF&G harvest reports compared to overall hunter participation according to State harvest reports (ADF&G 2016).

Year	Unsuccessful Local Resident	Unsuccessful Nonlocal Resident	Unsuccessful Nonresident	Unsuccessful Unspecified	Total Unsuccessful Hunters	Total Successful Hunters	Total Hunters Overall
2015	189	94	24	1	308	165	473
2014	130	76	11	1	218	124	342
2013	133	83	26	1	243	164	407
2012	187	111	31	1	330	156	486
2011	131	96	18	2	247	144	391
2010	154	102	17	0	273	189	462
2009	124	102	24	2	252	155	407
2008	127	87	14	3	231	151	382
2007	83	72	30	3	188	123	311
2006	136	104	34	3	277	159	436
2005	88	74	16	1	179	148	327

ADF&G issues both drawing permits to nonresidents (DM871, 872, 874, 876, 885) and registration permits to residents (RM880) in Unit 23. According to ADF&G harvest statistics, DM885 permits were not available until 2013 and permits available from DM871-877 hunts varied throughout the years (ADF&G 2017c). The total number of nonresident drawing permits given out in Unit 23 has declined since 2010

(Table 6). The number of registration hunt permits handed out in Unit 23 has increased since 2011 (Table 7). Harvest reporting is required under registration permits, drawing permits, and harvest tickets, although it is more difficult to enforce reporting under the harvest ticket system.

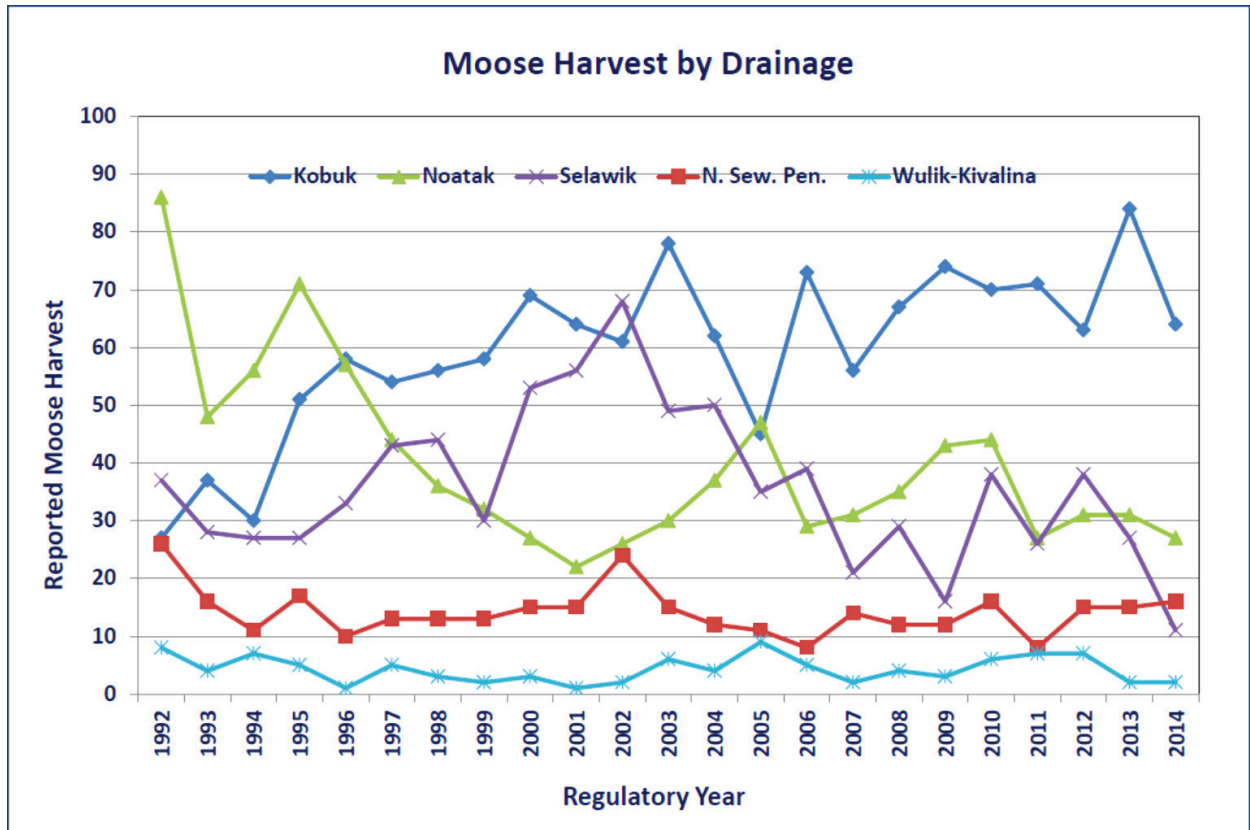


Figure 9. Moose harvest, by drainage, among users of Unit 23 from 1992-2014 according to State harvest reports (figure from ADF&G 2017a).

Table 6. Number of drawing permits available from ADF&G from 2011-2015 (ADF&G 2017c). Number of hunters is the number of individuals who received permits that actually went hunting.

Drawing Permit Hunts in Unit 23		
Year	Number of Permits	Number of Hunters
2011	68	43
2012	68	49
2013	65	51
2014	68	49
2015	50	37

Table 7. Number of registration permits given out by ADF&G from 2011-2015 (ADF&G 2017c). Number of hunters is the number of individuals who received permits that actually went hunting.

Registration Permit Hunt in Unit 23		
Year	Number of Permits	Number of Hunters
2011	446	261
2012	534	308
2013	522	299
2014	587	318
2015	569	336

Although Federally qualified subsistence users are required to obtain a harvest ticket from the State and report their harvest accordingly, community household surveys show that harvest reporting is generally low in Unit 23 (NWARAC 2016). Annual community harvest data is only intermittently available for any given community and annual study periods often do not match up with State regulatory years. However, in 2011, seven moose were reported as harvested by Selawik locals (ADF&G 2017d) while community household survey data in Selawik showed that approximately 40 moose were harvested by local residents that year (NWARAC 2016, Saito 2016b). Taking this disparity into account, ADF&G estimated that approximately 70 moose are taken from the Selawik drainage annually. This translates to a 7% harvest, which is high for the area (NWARAC 2016). Similar disparities can be seen in other communities over the last five years (**Table 8**). In 2011 and 2012, two and five communities were surveyed, respectively, with the number of moose harvested being greater than 50% and 150% of the entire reported local moose harvest for Unit 23 (**Table 9**; ADF&G 2017d, Saito 2016a, pers. comm.). These discrepancies are not taken into account when total harvest for the unit is reported on the ADF&G harvest report site. Although an average of 153 moose are reported in the ADF&G harvest reports, it is estimated from taking into account community household surveys that approximately 300 moose are harvested annually in Unit 23 (NWARAC 2017). The actual harvest of cow moose, in particular, is similarly expected to be approximately double of what is reported in harvest reports (Alaska Board of Game 2017). This is most likely a conservative estimate of overall harvest due to community surveys not being conducted in every community each year.

Table 8. Recorded moose harvest based on community surveys and harvest reports for those Unit 23 communities (ADF&G 2017d, Saito 2016a, pers. comm.).

Year	Community	Moose Harvested	
		Community Survey	Harvest Reports
2011	Noatak	14	5
	Selawik	40	7
2012	Ambler	14	3
	Kobuk	4	1
	Kotzebue	72	36
	Noorvik	24	9
	Shungnak	5	1
2013	Deering	1	3
2014	Point Hope	0	0

Table 9. Number of moose harvested according to community surveys vs. the number of moose harvested according to harvest reports for all of Unit 23 (ADF&G 2017d, Saito 2016a, pers. comm.).

Year	Overall Moose Harvested by Local Residents	
	Community Surveys (number of communities surveyed)	Harvest Reports For Unit 23
2011	54 (2)	72
2012	119 (5)	75
2013	1 (1)	88
2014	0 (1)	74

Other Alternative(s) Considered

Federal regulations could be modified to align with recent changes to State regulations in Unit 23, which eliminated the antlerless season and changed the harvest limit to one antlered bull. This would simplify regulations and protect cow moose in a declining moose population. Since cow moose are the keystone to population growth, conserving cows is essential to maintaining a healthy moose population. Eliminating cow harvest and shortening the overall moose seasons could aid in increasing the moose population in the unit. This modification would result in an additional reduction of harvest opportunity to Federally qualified subsistence users. Further discussion is warranted with the relevant Councils and the public before this alternative can be considered further.

Another option that could be considered is to modify Federal regulations to include a shorter cow season as requested and to provide Federal land managers with a delegated authority to close the cow hunt if deemed necessary to protect the moose population within specified drainages. This option would require up-to-date moose population data within drainages managed by the in-season manager. Due to census surveys only taking place approximately every five years in each census area, it could be difficult to detect population declines in specified drainages in a timely manner needed to make management decisions of this nature. This alternative would require up-to-date moose population data and interagency cooperation within drainages managed by the in-season manager.

Federal regulations could also be modified to create separate antlered and antlerless seasons rather than simply having bull and cow seasons, shorten the antlerless season, as requested, and include a Federal registration permit to better monitor cow harvest within Unit 23. Since the harvest of antlerless moose is no longer permitted on non-Federal lands, the harvest of cow moose may already be reduced. Shortening the antlerless moose harvest season on Federal lands could additionally reduce cow harvest. Since it is currently expected that much of the cow harvest is unreported, the addition of a registration permit may increase harvest reporting and provide a better understanding of the antlerless moose harvest within Unit 23. However, this alternative may not reduce cow harvest enough to make a substantial impact on the moose population in Unit 23.

Effects of the Proposal

If adopted, proposal WP18-41 would shorten the moose season, reduce cow harvest, create a bull season, and reduce regulatory complexity between Federal and State hunt areas. According to community household surveys, local users may be responsible for as much as 73% of the moose harvest in the unit. Although better harvest reporting is needed, reducing overall harvest by local users could have a positive effect on the moose population. Browse surveys show that habitat is not currently a limiting factor for moose in Unit 23 and therefore, limiting harvest may allow for increased moose production.

A majority of the moose harvest by Federally qualified subsistence users takes place in September with another small peak of harvest occurring in December. Shortening the Federal season in Unit 23 by three months would result in reduced opportunity, but closing the season on December 31 would still allow Federally qualified users to harvest moose during their typical peak harvest dates.

Combining Federal hunt areas to align with State hunt areas would simplify harvest regulations and limit user confusion. Currently, the Noatak River drainage and the remainder hunt areas (**Figure 10**) have identical seasons and the Noatak drainage has a 5 month cow season. If the shortened cow season is adopted throughout the unit, combining these areas into a single hunt area would help to simplify regulations and help reduce regulatory complexity for Federally qualified subsistence users.

Overall, many of the effects of adopting proposal WP18-42 are similar to the effects of adopting proposal WP18-41. Proposal WP18-42 would reduce cow moose harvest by limiting current harvest limits during the regular season to one bull moose, and creating a winter registration permit hunt for any moose in Unit 23 that would include a target quota that would reduce the total cow harvest by 20% of current harvest levels.

In Unit 23, 21 cow moose were reported as harvested in 2015. If this proposal were adopted, the winter any moose registration hunt quota would be set at 17 moose. This reduction would most likely not have a significant impact on the moose population in Unit 23, since in previous years (2010-2014), annual cow moose harvest was reported to be between 10-17 cows and yet, the moose population still showed a decline. Requiring Federal registration permits for this season could lead to better harvest reporting among local users, but it could alternatively lead to greater confusion and lead to worse harvest reporting.

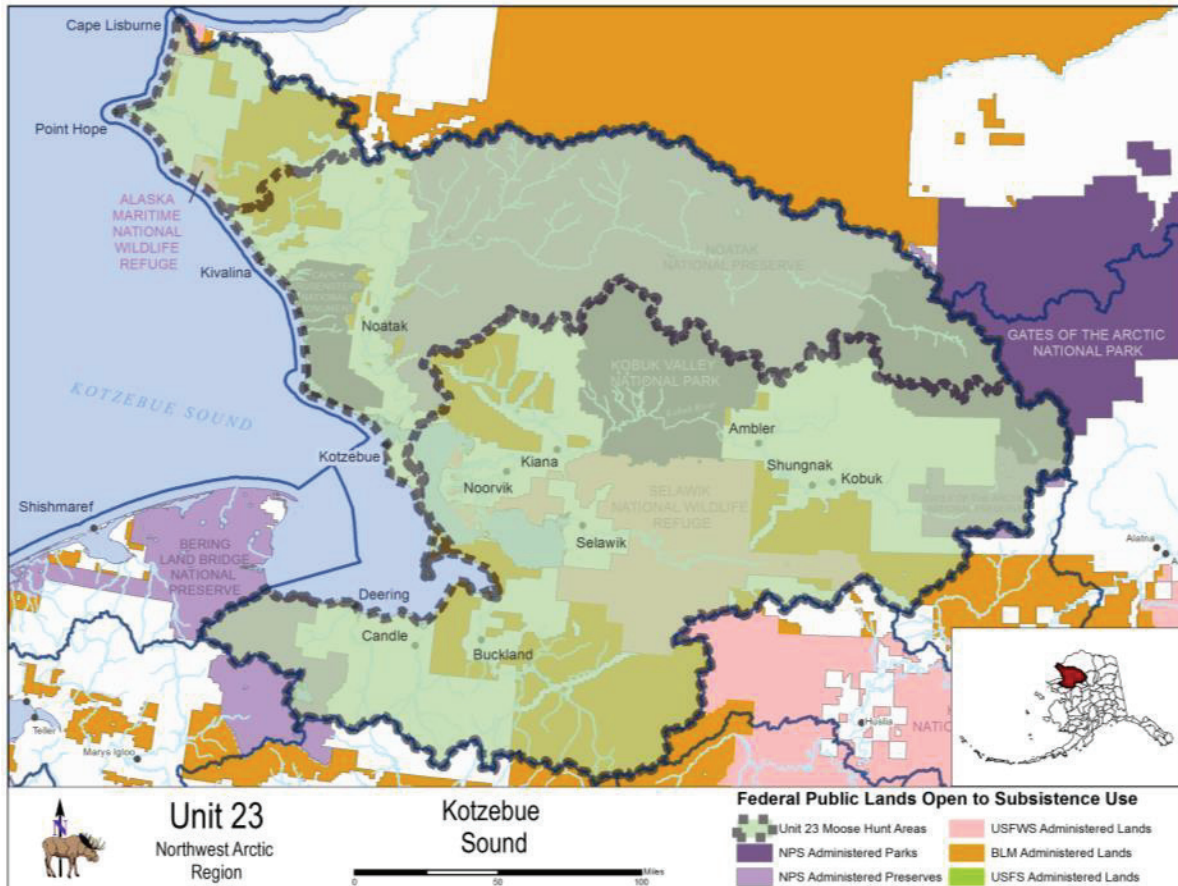


Figure 10. Current Federal moose hunting areas within Unit 23. If this proposal is adopted then the Noatak drainage would be combined with the southernmost remainder hunt area.

OSM PRELIMINARY CONCLUSION

Support Proposal WP18-41 **with modification** to change the harvest limit to one antlered bull July 1 (Aug. 1) – Dec. 31 and create a Nov. 1-Dec. 31 antlerless season by Federal registration permit and delegate authority to the Federal land manager to determine quotas and to close the season via a delegation of authority letter only (**Appendix I**); and **take no action** on Proposal WP18-42.

The modified regulation should read:

Unit 23—Moose

Unit 23—that portion north and west of and including the Singoalik River drainage, and all lands draining into the Kukpuk and Ipewik Rivers.

1 antlered bull

July 1–~~Mar.~~–Dec. 31

Or

1 antlerless moose by Federal registration permit. No person may take a calf or a cow accompanied by a calf. **Nov. 1-Dec. 31**

~~Unit 23 that portion lying within the Noatak River drainage—1 moose; however, antlerless moose may be taken only from Nov. 1-Mar. 31; no person may take a calf or a cow accompanied by a calf~~ **Aug. 1-Mar. 31.**

Unit 23, remainder

1 antlered bull **Aug. 1-Mar. Dec. 31**

Or

1 antlerless moose by Federal registration permit. No person may take a calf or a cow accompanied by a calf. **Nov. 1-Dec. 31**

Justification

The moose population in Unit 23 is in decline across most of the unit. This trend can be seen in decreased census population estimates and calf:cow ratios below 20:100, both of which indicate a declining population. Areas, such as the Selawik drainage, have been experiencing up to a 12% annual decline between 2011 and 2016. Due to spring population census surveys, in each drainage, only taking place approximately every five years, it is difficult to assess the moose population decline across the unit as a whole. Moose densities vary by drainage and winter populations can be highly concentrated near villages, which can make them susceptible to harvest. If low density populations congregate near villages during the winter months during the moose season, then moose populations can quickly be locally extirpated.

Since cow moose are the keystone to population growth, conserving cows is essential to maintaining a healthy moose population. Obtaining better antlerless moose harvest data via a Federal registration hunt may assist in understanding cow moose harvest levels and related impacts to the moose population in Unit 23 as a whole. Changing to an antlered bull season, rather than a general bull season, will help reduce the risk of inadvertent cow harvest during a time when many bulls have dropped their antlers. Additionally, limiting the antlerless moose harvest to a two month season, setting an antlerless moose quota, and shortening the overall moose seasons could aid in increasing the moose population in the unit.

We recommend that the initial antlerless moose quota be set to reduce annual cow harvest by 20% based on the average of the last ten years of reported cow harvest. Using harvest data from 2006-2015 (**Table 4**), the initial quota would be set at nine antlerless moose. The Federal land manager will have the authority to modify the quota annually and specify drainages within Unit 23 in which the hunt will take place, based on the moose population status.

The State has already taken steps to limit moose harvest in the unit to allow for population growth including elimination of the antlerless season and the withdrawal of nonresident drawing permits for the 2017 fall moose season due to conservation concerns. Since local users may be responsible for as much as 73% of the total harvest in Unit 23 and much of this harvest goes unreported, shortening the overall season in

Federal regulations, changing to an antlered moose hunt, and establishing a limited antlerless moose hunt during a two month season, may provide an additional benefit to the moose population.

A majority of moose harvested by Federally qualified subsistence users takes place in September with another small peak of harvest occurring in December. Closing the season on December 31 would still allow Federally qualified subsistence users to harvest moose during their typical peak harvest dates. Combining Federal hunt areas would simplify harvest regulations and limit user confusion.

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APPENDIX I

_____ Manager

_____, Alaska ____

Dear ____ Manager:

This letter delegates specific regulatory authority from the Federal Subsistence Board (Board) to the _____ Manager to issue emergency or temporary special actions if necessary to ensure the conservation of a healthy wildlife population, to continue subsistence uses of wildlife, for reasons of public safety, or to assure the continued viability of a wildlife population. This delegation only applies to the Federal public lands subject to Alaska National Interest Land Conservation Act (ANILCA) Title VIII jurisdiction within Unit 23 as it applies to moose on these lands.

It is the intent of the Board that actions related to management of moose by Federal officials be coordinated, prior to implementation, with the Alaska Department of Fish and Game (ADF&G), the Bureau of Land Management (BLM), Gates of the Arctic National Park and Preserve, Western Arctic Parklands, Selawik National Wildlife Refuge, Alaska Maritime National Wildlife Refuge, and the Chairs of the Northwest Arctic and North Slope Subsistence Regional Advisory Councils (Councils) to the extent possible. Federal managers are expected to work with managers from the State and other Federal agencies, the Council Chairs, and applicable Council members to minimize disruption to subsistence resource users and existing agency programs, consistent with the need for special action.

DELEGATION OF AUTHORITY

1. Delegation: The ____ Manager is hereby delegated authority to issue emergency or temporary special actions affecting moose on Federal lands as outlined under the **Scope of Delegation** below. Any action greater than 60 days in length (temporary special action) requires a public hearing before implementation. Special actions are governed by regulation at 36 CFR 242.19 and 50 CFR 100.19.

2. Authority: This delegation of authority is established pursuant to 36 CFR 242.10(d)(6) and 50 CFR 100.10(d)(6), which states: “The Board may delegate to agency field officials the authority to set harvest and possession limits, define harvest areas, specify methods or means of harvest,

specify permit requirements, and open or close specific fish or wildlife harvest seasons within frameworks established by the Board.”

3. Scope of Delegation: The regulatory authority hereby delegated is limited to the following authorities within the limits set by regulation at 36 CFR 242.26 and 50 CFR 100.26:

- To set annual harvest quotas for antlerless moose and close the antlerless moose season on Federal lands in Unit 23 once the quota has been reached.
- To specify drainages within Unit 23 in which the antlerless moose season will occur.

This delegation may be exercised only when necessary to conserve moose populations, to continue subsistence uses, for reasons of public safety, or to assure the continued viability of the population.

All other proposed changes to codified regulations, such as customary and traditional use determinations, adjustments to methods and means of take, or closures and restriction for take for only non-Federally qualified users shall be directed to the Federal Subsistence Board.

The Federal public lands subject to this delegated authority are those within Unit 23.

3. Effective Period: This delegation of authority is effective from the date of this letter and continues until superseded or rescinded.

4. Guidelines for Delegation: You will become familiar with the management history of the wildlife species relevant to this delegation in the region, with current State and Federal regulations and management plans, and be up-to-date on population and harvest status information. You will review special action requests or situations that may require a special action and all supporting information to determine (1) consistency with 36 CFR 242.19, (2) if the request/situation falls within the scope of authority, (3) if significant conservation problems or subsistence harvest concerns are indicated, and (4) what the consequences of taking an action or no action may be on potentially affected subsistence users and non-Federally qualified users. Requests not within your delegated authority will be forwarded to the Federal Subsistence Board for consideration. You will maintain a record of all special action requests and rationale for your decision. A copy of this record will be provided to the Administrative Records Specialist in the Office of Subsistence Management (OSM) no later than sixty days after development of the document.

You will notify OSM and coordinate with local ADF&G managers, Federal land managers, and the Chairs of the Northwest Arctic and North Slope Subsistence Regional Advisory Councils

regarding special actions under consideration. You will issue decisions in a timely manner. Before the effective date of any decision, reasonable efforts will be made to notify the public, OSM, affected State and Federal managers, law enforcement personnel, and Council representatives. If an action is to supersede a State action not yet in effect, the decision will be communicated to the public, OSM, affected State and Federal Managers, and the local Council representatives at least 24 hours before the State action would be effective. If a decision to take no action is made, you will notify the proponent of the request immediately. A summary of special action requests and your resultant action must be provided to the coordinator of the appropriate Subsistence Regional Advisory Council(s) at the end of each calendar year for presentation to the Council(s).

You may defer a special action request, otherwise covered by this delegation of authority, to the Federal Subsistence Board in instances when the proposed management action will have a significant impact on a large number of Federal subsistence users or is particularly controversial. This option should be exercised judiciously and may be initiated only when sufficient time allows for it. Such deferrals should not be considered when immediate management actions are necessary for conservation purposes. The Federal Subsistence Board may determine that a special action request may best be handled by the Board, subsequently rescinding the delegated regulatory authority for the specific action only.

5. Support Services: Administrative support for regulatory actions will be provided by the Office of Subsistence Management, U.S. Fish & Wildlife Service, Department of the Interior.

Sincerely,

Anthony Christianson
Chair, Federal Subsistence Board

cc: Assistant Regional Director, Office of Subsistence Management
Deputy Assistant Regional Director, Office of Subsistence Management
Subsistence Council Coordinators, Office of Subsistence Management
Chair, Northwest Arctic Subsistence Regional Advisory Council
Chair, North Slope Subsistence Regional Advisory Council
Commissioner, Alaska Department of Fish and Game
Federal Subsistence Liaison Team Leader, Alaska Department of Fish and Game
Federal Subsistence Board
Interagency Staff Committee
Administrative Record

WP18-43 Executive Summary	
General Description	Proposal WP18-43 requests that the Unit 23 brown bear harvest limit be increased from one to three bears and that the season be extended to year-round. <i>Submitted by: Northwest Arctic Subsistence Regional Advisory Council.</i>
Proposed Regulation	<p style="text-align: center;">Unit 23—Brown Bear</p> <p><i>Unit 23—1 3 bears by State subsistence registration permit</i> Aug. 1 May 31. July 1 – June 30</p>
OSM Preliminary Conclusion	<p>Support Proposal WP18-43 with modification to increase the harvest limit to two bears per year.</p> <p>The modified regulation should read:</p> <p style="text-align: center;">Unit 23—Brown Bear</p> <p><i>Unit 23—1 2 bears by State subsistence registration permit</i> Aug. 1 May 31. July 1 – June 30</p>
Southeast Alaska Subsistence Regional Advisory Council Recommendation	
Southcentral Alaska Subsistence Regional Advisory Council Recommendation	
Kodiak/Aleutians Subsistence Regional Advisory Council Recommendation	
Bristol Bay Subsistence Regional Advisory Council Recommendation	
Yukon-Kuskokwim Delta Subsistence Regional Advisory Council	

WP18–43 Executive Summary	
Recommendation	
Western Interior Alaska Subsistence Regional Advisory Council Recommendation	
Seward Peninsula Subsistence Regional Advisory Council Recommendation	
Northwest Arctic Subsistence Regional Advisory Council Recommendation	
Eastern Interior Alaska Subsistence Regional Advisory Council Recommendation	
North Slope Subsistence Regional Advisory Council Recommendation	
Interagency Staff Committee Comments	
ADF&G Comments	
Written Public Comments	1 Oppose

**DRAFT STAFF ANALYSIS
WP18-43**

ISSUES

Proposal WP18-43, submitted by the Northwest Arctic Subsistence Regional Advisory Council, requests that the Unit 23 brown bear harvest limit be increased from one to three bears and that the season be extended to year-round.

DISCUSSION

The proponent notes an overabundance of brown bears in Unit 23 and states that the proposed regulation changes would reduce human-bear conflicts, particularly the destruction of cabins and taking of meat from boats. The proponent also claims that disturbance of caribou migration by brown bears may also be reduced.

Existing Federal Regulation

Unit 23—Brown Bear

Unit 23—1 bear by State subsistence registration permit *Aug. 1-May 31.*

Proposed Federal Regulation

Unit 23—Brown Bear

Unit 23—1 3 bears by State subsistence registration permit ~~*Aug. 1-May 31.*~~
July 1 – June 30

Existing State Regulation

Unit 23—Brown Bear

Residents: Two bears every regulatory year *Aug. 1 – May 31*

Nonresidents: One bear every regulatory year by permit *DB761-767 Aug. 1 – Oct. 31*
OR

Nonresidents: One bear every regulatory year by permit *DB771-777 Apr. 15-May 31*
OR

Nonresidents: One bear every regulatory year by permit
available at ADF&G in Kotzebue, Nome, and Galena
beginning July 31 *RB761-767 Aug. 1-Oct. 31*

OR

Nonresidents: One bear every regulatory year by permit available at ADF&G in Kotzebue, Nome, and Galena beginning Apr. 14 RB771-777 Apr. 15-May 31

In addition to other regulations, subsistence regulations apply to the following “Residents Only” hunt
Residents: Two bears every regulatory year by permit available in Kotzebue and Unit 23 license vendors beginning July 1 RB700 Aug. 1-May 31

Extent of Federal Public Lands

Federal public lands comprise approximately 71% of Unit 23 and consist of 40% National Park Service (NPS) managed lands, 22% Bureau of Land Management (BLM) managed lands, and 9% U.S. Fish and Wildlife Service (USFWS) managed lands.

Customary and Traditional Use Determinations

Residents of Units 21 and 23 have a customary and traditional use determination for brown bear in Unit 23.

Regulatory History

State brown bear hunting regulations were established for Unit 23 in 1961. From 1961 until the early 1990s, State regulations were geared toward trophy hunting (Westing 2013). Since the 1980s, brown bear hunting regulations across northern Alaska have become more liberal, including longer seasons, higher harvest limits, and the waiving of resident tag fees (Miller et al. 2011).

Federal brown bear hunting regulations for Unit 23 were adopted from State regulations in 1990. The season was Sept. 1-Oct. 10 and Apr. 15-May 25 with a harvest limit of one bear every four years. Residents of Units 21 and 23 were considered Federally qualified subsistence users for brown bear in Unit 23.

In 1992, seven proposals (P92-074, 075, 076, 078, 079, 086, 167) were submitted to change brown bear regulations in Unit 23. Proposals P92-74, and 78 sought to liberalize the brown bear harvest limit. Proposals P92-76, 79, and 86 sought to liberalize both the harvest limit and season. Proposals P92-075 and 167 requested eliminating the sealing requirement, prohibiting transfer of hides outside of Unit 23 unless to one’s residence in Unit 21, requiring the salvage of all edible meat and the submittal of a harvest report and both ears to a Federally authorized representative within 30 days of harvest. These proposals were submitted because the current regulations conflicted with traditional practices, including restrictive seasons and harvest limits, failure to salvage edible meat, and sealing requirements. The Federal Subsistence Board (Board) considered these proposals concurrently and adopted them with modification to create the Northwest Alaska Brown Bear Management Area (NWABBMA), which included Unit 23 except for the Baldwin Peninsula north of the Arctic Circle (Kotzebue). The sealing requirement was removed

and the use of aircraft in any manner for brown bear subsistence hunting was prohibited. The season in the new hunt area was expanded to Sept. 1 – May 31 and the harvest limit became one bear by State registration permit. The harvest limit and season in Unit 23 remainder was unchanged.

In 1992, the Alaska Board of Game (BOG) also modified Unit 23 brown bear regulations in recognition of traditional harvest of bears by Inupiat hunters for meat, hides, and fat (Westing 2013). The BOG also established the NWABBMA and subsistence registration hunt (RB700) in line with recent changes under Federal regulations.

In 2005, the Board adopted proposal WP05-17 with modification to combine the Unit 23 brown bear hunt areas and to expand the season to Aug. 1 – May 31. This was done to provide more opportunity to Federally qualified subsistence users, to reduce regulatory complexity by aligning State and Federal regulations, and because there were no conservation concerns.

In 2007, Proposal WP07-50 proposed eliminating the permit requirement to hunt brown bear in Unit 23 because it was a burden on Federally qualified subsistence users and often permits were not available in villages. The proposal was withdrawn by the proponent before it went to the Board in order to allow more time to discuss the issue with the Councils and various agencies.

In 2008, the Board adopted Proposal WP08-52 to allow the sale of handicrafts made from nonedible parts of brown bears (i.e. fur, claws) taken in Unit 23 so that subsistence users could more fully utilize the brown bear resource.

In 2012, the Board adopted Proposal WP12-01 to require sealing of brown bear hides or claws prior to selling handicrafts incorporating these parts. This was done in order to ensure that marketed handicrafts are made from legally harvested bears.

In 2014, Proposal WP14-40 proposed eliminating the permit requirement to hunt brown bear in Unit 23 to reduce confusion about hunting regulations and to allow for more opportunistic harvests. The Board adopted WP14-40 with modification to insert the word “subsistence” into regulations (1 bear by State *subsistence* registration permit) in order to clarify that permits were required under both State and Federal subsistence hunting regulations versus State sport hunting regulations, which require sealing of hides and skulls. Eliminating the permit requirement was not adopted as it was an essential mechanism to monitor harvest and to inform brown bear management in the unit. Additionally, Federally qualified subsistence users would then be required to seal harvested bears. (However, sealing is required under the subsistence registration permit if the bear is removed from the unit or parts are sold as handicrafts).

In 2016, the BOG adopted Proposal 57 to allow the sale of brown bear hides and/or skulls by Alaska residents in units where the harvest limit is two or more bears annually. The proposal was submitted by the Nushagak Advisory Committee with the stated intent of encouraging brown bear harvest to 1) reduce predation on moose and caribou and 2) to reduce bear hazards around communities.

In 2017, the BOG adopted Proposal 40 to increase the resident brown bear harvest limit in Unit 23 to 2 bears per regulatory year. The BOG supported Proposal 40 because it provides more harvest opportunity, there were no conservation concerns, and because it was supported by five local Fish and Game Advisory Committees (ACs). Chairman Spraker also stated a second bear has not often been harvested in other units with a two bear harvest limit and that bear harvests in other units with long seasons have been sustainable (ADF&G 2017a). Proposals 37, 38, and 39 requested lengthening the nonresident brown bear season in Unit 23. The BOG adopted Proposal 37 to extend the nonresident season from Sept. 1-Oct. 31 to Aug. 1-Oct. 31 and took no action on Proposals 38 and 39. The BOG supported Proposal 37 in order to provide nonresidents more opportunity, to alleviate user conflicts during September by spreading nonresident hunting out over a longer season, and because all the local ACs supported it.

The Noatak Controlled Use Area (Noatak CUA) prohibits the use of aircraft in any manner for big game hunting from Aug. 15-Sept. 30 within a 10 mile corridor (5 miles either side) along the Noatak River. The Noatak CUA under State regulations extends from the mouth of the Agashashok River upstream to the mouth of the Nimiuktuk River. The Noatak CUA under Federal regulations extends from the mouth of the Noatak River upstream to the mouth of Sapun Creek. The purpose of this CUA is to reduce conflicts between local and nonlocal hunters and to improve subsistence harvests and caribou migration.

Current Events

Proposal WP18-44 requests that up to two raw/untanned brown bear hides (with claws attached) and/or skulls from brown bears harvested on Federal public lands in Unit 23 could be sold per regulatory year. The decision on WP18-44 could have ramifications on this proposal (i.e. permit requirements).

Biological Background

State management objectives for brown bear in Unit 23 are as follows (Westing 2013):

- Maintain a population that sustains a 3-year mean annual reported harvest of at least 50% males.
- Conduct a brown bear population estimate for some portion on Unit 23 in cooperation with Department of Interior (DOI) staff at least once every reporting period.
- Continue community-based assessments to collect brown bear harvest information from residents of Unit 23.
- Seal bear skins and skulls, determine sex, and extract a tooth for aging.
- Monitor harvest data (age, sex, and skull size) for changes related to selective pressure.
- Improve communication between the public and the Alaska Department of Fish and Game (ADF&G) to improve harvest reporting and prevent defense of life and property situations from occurring.

Biological information and trends for brown bear in most of Unit 23 is lacking. As brown bears in Interior Alaska are wide ranging and occur at low densities, population estimates are difficult and expensive to

obtain (Miller et al. 1997, 2011, Mowat et al. 2013, Schmidt et al. 2017). Brown bear densities are classified as adult bears (3+ years-old) and bears of all ages (bears), which includes sows with cubs.

In the early 1990s, surveys were conducted in the Western Brooks Range to obtain baseline data on bear abundance. Brown bear density was estimated as 29.5 bears of all ages/1,000 km² (Miller et al. 1997). Brown bear density within Gates of the Arctic National Park & Preserve (GAAR) is currently considered relatively low (July 2017, pers. comm.).

Aerial bear surveys were conducted in the lower Noatak Drainage in 1987, 2008, and 2016. While data seems to suggest that the brown bear population is increasing in this area, these surveys are not directly comparable due to differing methodologies and scales (NPS 2017). In 1987, a brown bear census was conducted in the lower Noatak River drainage to provide a benchmark of bear abundance before the Red Dog Mine was constructed (Westing 2013). Density was estimated at 1 adult bear/26 mi² (Westing 2013) and 17.9 bears/1000 km² (Miller et al. 1997). However, the study area was relatively small (2,000 km²) and may not be representative of all of Unit 23. Preliminary results from the 2008 survey using the 1987 sightability correction factor (SCF) indicated a brown bear density of 3.4 bears/26 mi² (ADF&G 2017b, Saito 2017, pers. comm.). However, this estimate is likely not accurate due to violations of sampling protocols (e.g. sampling adjacent areas on different days) and use of a SCF from another study using different sampling methods (Robison 2017, pers. comm.).

The 2016 brown bear density estimate for the lower Noatak Drainage was 67.5 bears/1000 km². NPS conducted an aerial bear survey of the upper Noatak Drainage in May 2017. The preliminary density estimate is 30.6 bears/1000 km² (Robison 2017, pers. comm.).

While the population status of brown bears across all of Unit 23 is uncertain, the current population estimate is 3500 bears, which is extrapolated from 2008 density estimates within the Lower Noatak survey area (ADF&G 2017b). As this was derived from a small study area, it is not a correct unit-wide estimate.

Bear density estimates in Unit 22 on the Seward Peninsula may be more representative of southern Unit 23 (e.g. Buckland/Deering area) than estimates from northern Unit 23. Surveys conducted from 2013-2015 in western Unit 22 yielded brown bear density estimates of 21 adult bears/1000 km² and 35.6 bears of all ages/1000 km² (Schmidt et al. 2017).

Local residents have described substantial population increases in the Unit 23 brown bear population since the 1940s and observations by ADF&G staff suggest a stable or increasing population (Westing 2013, ADF&G 2017b). Several factors may contribute to this trend (Westing 2013). Growing populations of moose, caribou and musk ox in the early 2000s have provided a stable prey base for brown bears and shifted subsistence harvest increasingly toward large ungulates. Possible declines in commercial salmon fishing may have allowed more salmon to reach inland areas, increasing food for bears. Regulations protecting sows with cubs curtailed the traditional practice of “denning” or killing all den occupants, which occurred when bears were relied upon more to meet subsistence needs. Finally, selection of large male bears by

sport hunters may allow survival of cubs that otherwise could have been killed by large boars (Westing 2013).

Bear density is related to food availability. Salmon availability may be the primary determinant of high and low bear densities across Alaska (Miller et al. 1997, Mowat et al. 2013). The short growing season and absence of salmon make the western Brooks Range poor brown bear habitat; although salmon runs may be seasonally important sources of food in other portions on Unit 23 (Miller et al. 1997). Social factors can also influence bear distribution. For example, a sow with cubs may avoid areas with large male bears that could kill her offspring (Mowat et al. 2013).

In northern Alaska, brown bear populations are often managed conservatively for several reasons: Large home ranges are required to meet resource needs, resulting in low density populations (McLoughlin et al. 2002); Female brown bears do not successfully reproduce until they are > 5 years old and have low reproductive rates, small litters, and long intervals between litters (Reynolds 1987, USFWS 1982, Miller et al. 2011); Sows exhibit high fidelity to home ranges with little emigration or immigration (Reynolds 1993); and monitoring methods are imprecise and expensive (Miller et al. 2011).

In 1991, radio-collared brown bears in the vicinity of Red Dog Mine emerged from their dens between April 10 and May 15 (Ayres 1991). Between 2014 and 2016, the few deaths of radio-collared brown bears within GAAR tracked thus far have been human-related (July 2017, pers. comm.). Brown bear habitat in northwestern Alaska is predicted to improve due to climate change causing increases in shrub and forest cover as well as wildfires, which create edge habitats that are often preferred by bears (Nielson et al. 2010, Joly et al. 2012, Rupp et al. 2000, Swanson 2015).

Cultural Knowledge and Traditional Practices

Brown bears have long been a highly respected and utilized subsistence resource in northwest Alaska and the species has a prominent physical and symbolic role in the lives of local people (Loon and Georgette 1989). These animals provide a source of meat, raw materials, and medicine within the Inupiaq culture of the region (Loon and Georgette 1989). Brown bears have also been prized as trophy sport hunting animals in the region, largely by non-Native residents of the regional hubs of Nome and Kotzebue (Loon and Georgette 1989). Loon and Georgette (1989) provide a thorough ethnographic account of traditional brown bear harvest and use in the region and is the source of cultural information included in this section, unless otherwise noted.

The hunting of brown bears in Inupiaq culture traditionally required strict adherence to prescribed practices designed to show respect to the animal, and a hunter's success was considered dependent on adherence to these protocols. The Inupiat people believed that bears have excellent hearing and that hunters should not discuss their intentions to kill these animals. Bragging, threatening a bear, acting with too much confidence, or even suggesting a craving for bear meat was considered taboo, potentially leading to harming of the hunter or his family. In modern times, some residents of the region continue to adhere to these protocols and will often refer to "that animal" rather than mentioning it by name. While no longer adhered to,

the Inupiaq also believed that it was taboo for women and girls to eat bear meat (Loon and Georgette 1989, Anderson et al. 1977). Dogs were also not fed bear meat as it was said to make them vicious.

The use of brown bears for food in the region is variable among communities, depending on geographic location. Inland communities eat brown bears more frequently while coastal communities rarely eat this species unless it is harvested in interior areas where bears feed on fish and berries (Loon and Georgette 1989, Burch 1985, Burch 2006). Coastal bears are often considered unpalatable due to their tendency to consume marine mammal carcasses along the beaches. Loon and Georgette (1989) found that some coastal communities avoid bears in the fall because this is when bears have the greatest access to sea mammal carcasses. Noatak hunters also avoid bears in the upper Noatak River drainage because the bear diet in this area consists of squirrels, a prey species causing unpalatable flavor in brown bear meat. Kotzebue displays a mixture of brown bear harvest patterns, likely due to a variety of geographical and cultural backgrounds of residents residing in this regional hub.

Loon and Georgette (1989) found that the consumption of brown bears differs between Unit 23 (Northwest Arctic) and Unit 22 (Seward Peninsula). While communities in Unit 23 often consume brown bears, consumption of bears is uncommon in Unit 22 (Sobelman 1985, Thomas 1982, Loon and Georgette 1989).

For the communities that consume brown bears, Georgette and Loon (1989) found that hunters rarely, if ever, take a bear in defense of life and property. While nuisance animals may be killed, it is more likely for residents of these communities to use the meat and not report the animal as killed in defense of life and property. Some communities considered bears a nuisance; reindeer hunters also commonly held this view. In the 1980s, brown bear was not a substantial component of the diet in any northwest Alaska community as compared to moose or caribou, but it likely plays a vital seasonal role in the subsistence diet when other large land mammals are not available.

Among the edible parts of a brown bear, the fat is the most prized product (Loon and Georgette 1989). Local hunters time their hunting to correspond with when bears have the most fat and the meat is of highest quality (Loon and Georgette 1989; Burch 2006). Brown bears are predominantly hunted in northwest Alaska during the spring and fall (Loon and Georgette 1989; Burch 2006). Spring hunting takes place earlier inland where warmer conditions arrive sooner. When bears emerge from their dens in the spring, they are still relatively fat and gradually become lean; thus subsistence brown bear harvests occur between spring emergence from hibernation until snow machine travel is no longer possible (Loon and Georgette 1989).

Many residents prefer to hunt smaller bears because the meat is tender (Loon and Georgette 1989). Brown bear meat is preserved dried, half-dried, frozen and aged. The fat is also aged then cooked before being eaten. It is also common for dried fish and meat to be dipped in bear fat similar to the way that seal oil is used. Bear livers are not consumed. Bear fat is also considered a valuable source of medicine in the region for curing illnesses and sores. It has been used to treat colds, itchy throats, and coughs by ingesting or applying to the chest. Cooked bear meat with fat is said to increase appetite among the ill. It is also used to treat persistent sores and boils.

Usually the hide is in good condition at the same time the bear is the fattest (Loon and Georgette 1989). Some residents of the region harvest brown bears in the fall once their diet has transitioned to berries, roots, fish, and caribou. Later in the fall, bears regain much of their body fat before hibernation, and therefore, harvest at this time is also preferred. In the spring, hunters utilize tracks to locate bears, and in the fall, they concentrate efforts along salmon spawning streams and in areas with prolific berries.

In modern times, brown bears are rarely hunted in the winter or summer because they are considered lean and their hides are of lesser quality (Loon and Georgette 1989). In the summer, bears are also considered more dangerous. Traditionally the Inupiaq people hunted brown bears in their dens in the winter. These bears were less likely to fight, and before firearms were available, killing a hibernating bear with a spear was likely easier and safer as compared to outside of the den in other seasons. This was also a good source of winter meat when other resources were depleted or unavailable. Some hunters would stake bear dens in the late fall and return to the den later in the year to harvest the bear. In Noatak some hunters routinely pursue bears at night along rivers and streams in the fall; a technique that is considered quite dangerous.

Brown bear hunting is a very specialized activity (Loon and Georgette 1989). Before the arrival of firearms, bears were largely hunted with spears and arrows. Traditionally, bears harvested by the Inupiat were almost exclusively harvested by a small number of men from each community and the harvest was distributed to other local households. Men continue to be the primary bear hunters in the region. Often, bears are harvested opportunistically while in pursuit of other subsistence resources or while traveling for other purposes. Hunting areas are generally accessed by boat in the fall and by snow machine in spring. Traditionally however, travel was often accomplished by dog team. Hides are sometimes discarded in the field if packing it out presents logistical challenges.

It is a cultural tradition in the region for a hunter to remove the hyoid bone from beneath a bear's tongue immediately after it is killed (Loon and Georgette 1989). In some places this bone is placed between willow branches, on a tussock, or simply discarded in the field. This practice was meant to ensure that the spirit of the bear has left the area and that there would be no retaliation on the hunter. Traditionally, the head of a brown bear was never brought back to the village and was either buried or placed on a tree or shrub (Burch 2006). When meat is served, family members could not discuss or make comments about the meal. The hunters believed that these practices prevented bad luck, safeguarded their camps, and reduced the potential for future conflict with bears. Removing the hyoid bone and leaving the head in the field remains a common practice.

Beyond nutritional value, brown bears also provide the raw materials for production. Bear hides, bones, teeth, and claws were traditionally used to make spearheads, fishhooks, rope, snowshoe bindings, dog harnesses, scraping tools, doors, mattresses, ruffs, and mukluks (Loon and Georgette 1989). More recently, bear hides have been used primarily for mattresses, rugs, ruffs, mukluks and masks while claws are sometimes used for necklaces. Rope made of bear hide is said to be tougher and last longer than that of caribou or bearded seal. Narrow bones of the bear foreleg were used for spearheads and snares while knee joints were made into scraping tools. The hides were traditionally used to make dog harnesses and were preferred since dogs did not chew them as they did for other species. Travelers often carried bear hides to use as mattresses and as doors for sod houses; today they are carried as winter survival gear.

Sharing of brown bear meat, fats, and raw materials is common in northwest Alaska. Loon and Georgette (1989) stated that all of the hunters interviewed in their study shared their brown bear harvests with other households. The hunter typically only keeps a small amount of the bear meat and fat for his family and the rest is given to elders, widows, sick people, and other residents of the community. The hides were traditionally retained by the member of the hunting party that made the most decisive moves in killing the bear (Burch 2006).

Harvest History

There are two resident and four nonresident brown bear hunts in Unit 23 under State regulations. Residents can hunt under the general season, which requires sealing or under the State's subsistence hunt, which requires a registration permit and has similar requirements as the Federal hunt (i.e. salvage of edible meat, no use of aircraft, no sealing required). Spring and fall drawing and registration permits are available to nonresidents. To date, nonresident hunts have been undersubscribed (ADF&G 2017a).

Brown bear harvest from Unit 23 has increased steadily since 1992, although the number of bears taken for food by local residents is low (Westing 2013, Braem et al. 2015). The liberalization of brown bear hunting regulations in Unit 23 in order to reduce bear densities, human-bear conflicts, and bear predation on moose as well as to provide for traditional hunting practices and increase opportunity for other hunters has contributed to increased harvests (Westing 2013). Harvest data is from harvest reports and community household surveys and also includes bears taken in defense of life or property (DLP). However, many DLP kills are not reported because Unit 23 residents consider the reporting requirement as onerous or fear they have broken the law (Westing 2013). Local and nonlocal residents are considered Alaska residents living within and outside of Unit 23, respectively.

Between 1990 and 2016, reported Unit 23 brown bear harvest averaged 50 bears/year, ranging from 30-78 bears/year (**Figure 1**, Westing 2013, Saito 2017, pers. comm.). Over the same time period, Unit 23 residents, nonlocal residents, and nonresidents averaged 28%, 44%, and 27% of the reported Unit 23 brown bear harvest, respectively (**Figure 1**, Westing 2013, Saito 2017, pers. comm.). Prior to 1981, nonresidents accounted for most of the reported brown bear harvest in Unit 23; however, since 1992, nonlocal residents have reported the higher harvests (Westing 2013).

Most brown bears in Unit 23 are harvested under the general hunt by both local and nonlocal residents (**Figure 2**). Between 2002 and 2016, 68% of the harvest occurred under the general hunt and averaged 37 bears/year. Over the same time period, harvest under the subsistence registration permit accounted for only 3.5% of the harvest and averaged 1.8 bears/year (**Figure 2**, Westing 2013, Saito 2017, pers. comm.). Between 2011 and 2016, DLP kills averaged 1 bear/year and ranged from 0-3 bears/year (Saito 2017, pers. comm.).

Many bears taken by local residents are not reported (Ayers 1991, Westing 2013). According to household surveys between 1998 and 2012, brown bear harvest by Unit 23 communities (excluding Kotzebue) was approximately 17 bears/year and annual per capita harvest averaged 0.004 bears/person (Westing 2013).

Westing (2013) combined the average annual Kotzebue brown bear harvest (8 bears/year) with the village per capita harvest estimates to determine that an estimated 20-30 brown bears are taken annually by local hunters. This is substantially more than the reported harvest by local residents, which averaged 14 bears/year between 1990 and 2016 (28% of 50 bears/year).

Between 1992 and 2011, the percent of males in the Unit 23 brown bear harvest exceeded the State management goal of a 3-year mean annual reported harvest of >50% boars (**Figure 3**). Harvest data do not indicate that overharvesting is occurring in Unit 23 based on data from the Lower Noatak River drainage (Westing 2013, ADF&G 2017a). However, due to the large number of unreported bear harvests and lack of population data across most of Unit 23, the impact of hunting on the Unit 23 brown bear population is unknown.

Additionally, overharvesting may already be occurring within accessible areas of GAAR such as floatable fishing rivers, which attract both people and bears. As bear density and productivity is low within GAAR, low levels of harvest may impact the population (July 2017, pers. comm.).

Bears are traditionally harvested in the spring and fall (FSB 1992). Most Unit 23 brown bear harvest occurs in September, often opportunistically when hunting moose or caribou. The second highest harvest month is April (Westing 2013). Airplanes are the most common transport method used to hunt brown bears in Unit 23, followed distantly by snowmachines and boats (Westing 2013). Federally qualified subsistence users usually access brown bear hunting locations by boat and snowmachines (Loon and Georgette 1989). Many local residents view brown bears as a nuisance or threat to subsistence activities (i.e. picking berries, drying fish) and conflicts with bears seem to be increasing (Westing 2013, ADF&G 2017a).

Most brown bears are harvested from the Noatak River drainage followed by the Kobuk River drainage. Few brown bears are harvested from the Selawik River, Wulik/Kivalina Rivers, and Northern Seward Peninsula drainages (Westing 2013). Westing (2013) suggests that heavily hunted portions of Unit 23 may be acting as “population sinks” where bears, especially boars, are continually replaced by bears from lightly hunted areas such the upper Noatak drainage and Brooks Range.

Between regulatory years 1992/93 and 2011/12, the annual mean skull size for male and female brown bears sealed in Unit 23 remained stable and averaged 21.63” and 19.5” across all years, respectively. Over the same time period, annual mean age for male and female brown bears averaged 7.5 years (range: 5.6-9.6 years) and 7.3 years (range: 3.4-10.2 years), respectively (Westing 2013).

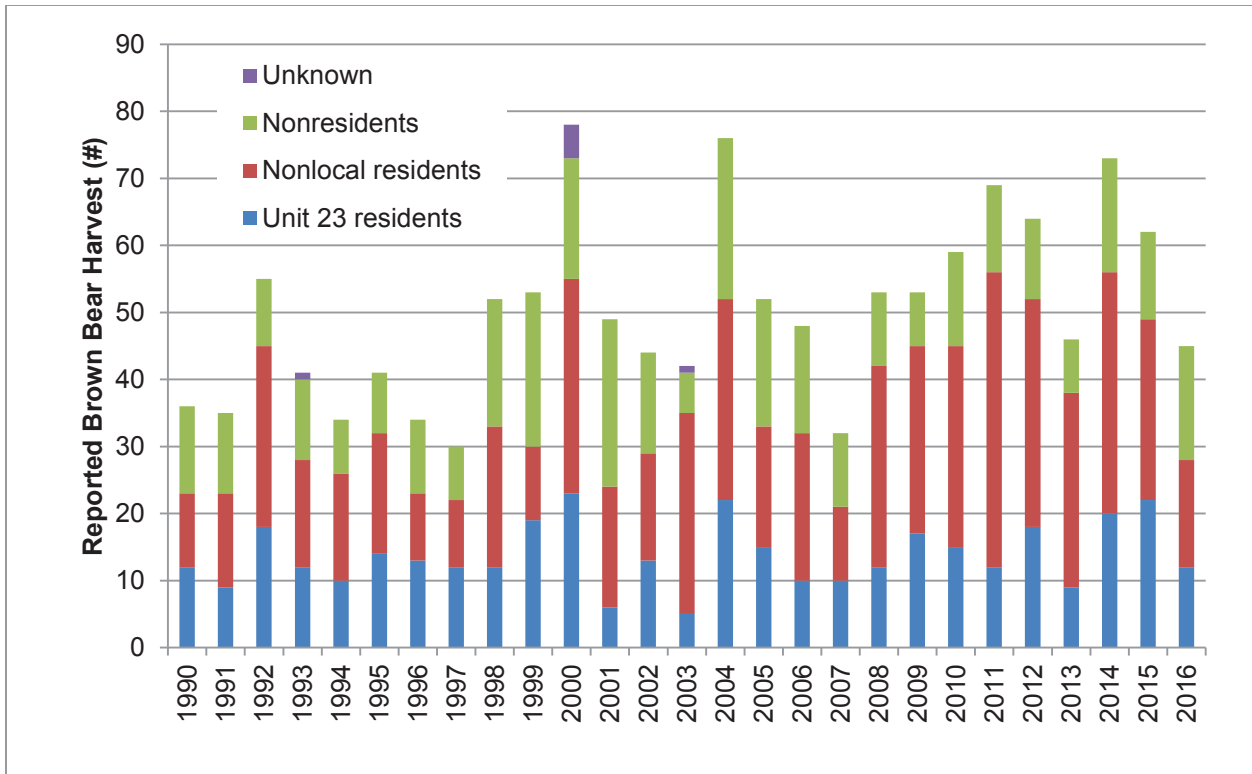


Figure 1. Reported Unit 23 brown bear harvest by residency (Westing 2013, Ayres 1991, Saito 2017, pers. comm.).

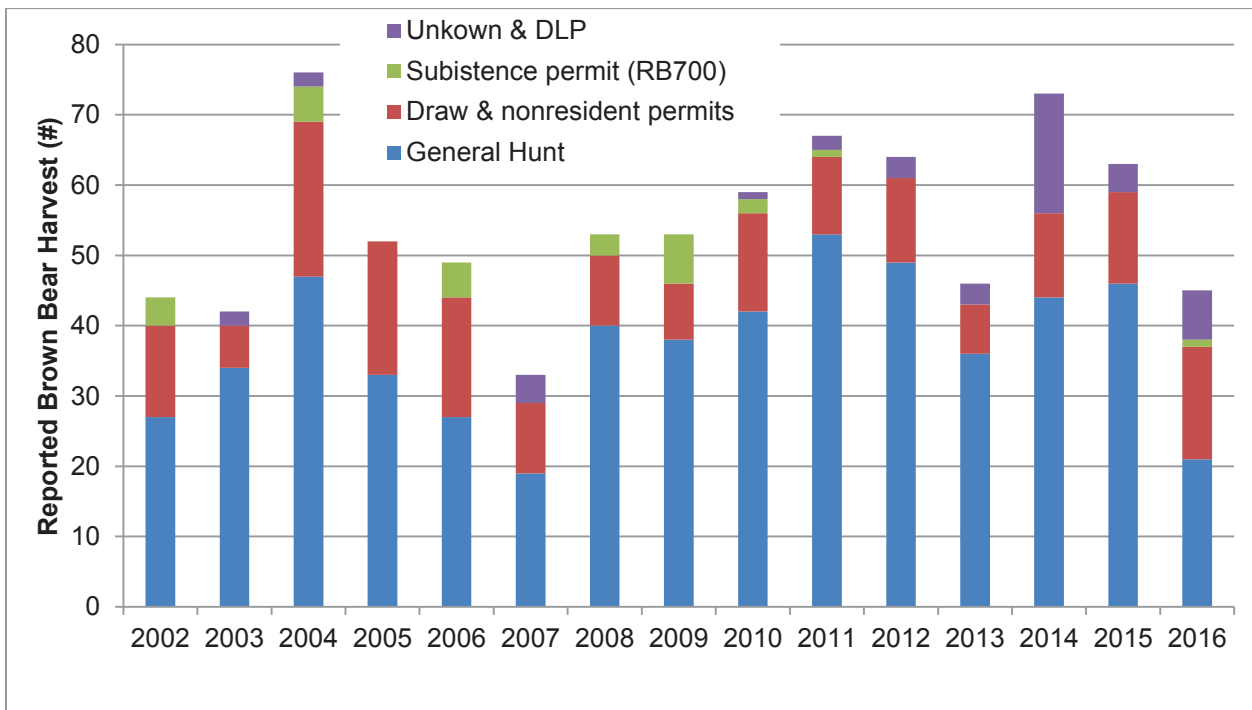


Figure 2. Reported Unit 23 brown bear harvest by hunt type (Westing 2013, Saito 2017, pers. comm.).

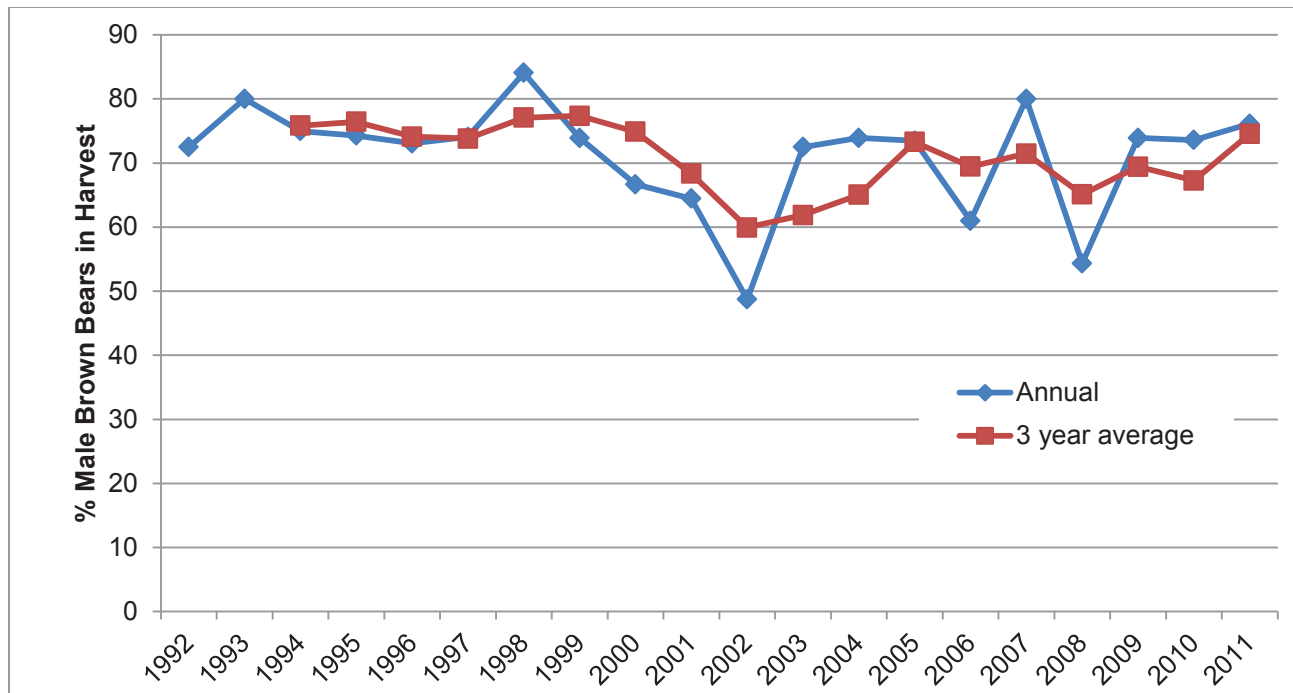


Figure 3. Percent of male brown bears in Unit 23 harvest.

Other Alternatives Considered

One alternative considered was to increase the harvest limit to two bears per year instead of three. As there are many uncertainties about brown bear populations and harvest in Unit 23 and because brown bear populations are slow to recover from overharvest, a more conservative approach may be warranted. A two bear harvest limit would be consistent with State regulations, reducing regulatory complexity and user confusion. A year round season would provide for a subsistence priority and increased opportunity for Federally qualified subsistence users.

Effects of the Proposal

If this proposal is adopted, the Unit 23 brown bear harvest limit would increase to three bears and the season would be year round, which would provide more opportunity for Federally qualified subsistence users. However, for this regulation to be adopted, concurrence would be needed from the State to allow Federally qualified subsistence users to use a State registration permit with season dates and harvest limits that differ from existing State regulations. Additionally, action taken on WP18-44 may influence the outcome of this proposal.

It is difficult to determine if adoption of this proposal would increase actual harvest or harvest reporting. As bears are traditionally harvested in fall and spring and most of the reported harvest has occurred in September and April, few bears are expected to be harvested during the extended season in June and July. As subsistence use of brown bears has been low, all edible meat must be salvaged, and two bears can already be harvested per year under State regulations, increasing the harvest limit to three bears/year is not

expected to result in a substantial increase in harvest. Additionally, the harvest of a second bear in other units with a two bear harvest limit has been low (ADF&G 2017a). However, as regional sheep, moose, and caribou populations are currently declining, brown bears may become a more important subsistence resource.

There may be conservation concerns for this proposal. While biological data on brown bears in Unit 23 is sparse, the best available information suggests that the brown bear population is stable or increasing (Westing 2013, ADF&G 2017b, NPS 2017). Recent liberalization of State brown bear regulations (increase resident harvest limit, extend nonresident season) were widely supported by local ACs, ADF&G, and the BOG, indicating no conservation concerns. While brown bear densities in GAAR are low and overharvesting may already be occurring in this area (July 2017, pers. comm.), GAAR comprises a minority of the Federal public lands in Unit 23. Additionally, most of the Unit 23 reported harvest occurs within the lower, not the upper, Noatak river drainage (Westing 2013). Therefore, the density estimates from the Lower Noatak survey area should be considered more appropriate for this proposal analysis. However, there are still many uncertainties regarding brown bear populations and harvest in Unit 23 and brown bear population are slow to recover from overharvest. A three bear harvest limit would be the highest in the state and may be unsustainable.

Additionally, this proposal would only apply to Federally qualified subsistence users who comprise a minority of reported Unit 23 brown bear harvest and an unknown proportion of total harvest. Adoption of this proposal would provide a subsistence priority for Federally qualified subsistence users. Currently, Federal regulations are more restrictive than State regulations.

A year round season and higher harvest limit may also increase reporting of DLP kills as legality concerns as well as the burden of submitting the hide and skull to the State would be eliminated (provided Federally qualified subsistence users are able to use the State registration permit). Indeed, property damage caused by bears was one reason this proposal was submitted. Adoption of this proposal would also allow the take and eating of nuisance bears (i.e. habituated to disturbing fish camps or cabins) during the summer that would not be legal under DLP.

However, as harvest is often biased toward large male bears, increasing the harvest limit could potentially increase human-bear conflicts as older bears learn to avoid people and kill younger bears, which are responsible for most of the human-bear conflicts (July 2017, pers.comm.).

OSM PRELIMINARY CONCLUSION

Support Proposal WP18-43 **with modification** to increase the harvest limit to two bears per year.

The modified regulation should read:

Unit 23—Brown Bear

Unit 23—~~4~~ 2 bears by State subsistence registration permit

~~Aug. 1–May 31.~~

July 1 – June 30

Justification

A year round season will increase opportunity for Federally qualified subsistence users. As most bears are traditionally taken in the spring and fall, only a slight increase in harvest is expected from extending the season through the summer.

Increasing the harvest limit will also provide more opportunity for Federally qualified subsistence users. Federally qualified subsistence users comprise a minority of the reported harvest in Unit 23 and all Alaska residents can already harvest two bears under State regulations. There are many uncertainties regarding brown bear populations and harvest in Unit 23, warranting a more conservative harvest limit increase than was proposed.

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WRITTEN PUBLIC COMMENTS

12
July 13, 2017

Federal Subsistence Board
Office of Subsistence Management
1011 East Tudor Road, MS 121
Anchorage, Alaska 99503
EMAILED TO: subsistence@FWS.gov



RE: Comments on subsistence proposals WP18-43 and WP18-44 and some general recommendations on approaches toward similar proposals

Sirs:

We write out of concern with the above-mentioned proposals to urge that they not be adopted.

Neither proposal provides any justification that includes mention of a “customary and traditional” use that would support their adoption. The Board should not adopt proposals that do not have a credible justification in customary and traditional use of the resource much less one that has no justification whatsoever of such a use.

Although we are aware that Loon and Georgette (1989) document customary and traditional use of brown bear meat in non-coastal areas of Unit 23, Proposal 43 (to increase the federal subsistence bag limit to 3 bears/year) is undercut by the acknowledgement in Proposal 44 (to allow sale of bear hides) that “...traditionally the Iñupiat do not care to obtain coastal brown bear meat and fat because they feed on carrion”. Proposal 44 also states that “traditionally, Iñupiat peoples of the region did not make handicrafts from bears skulls and hides as this was taboo”. Given these acknowledgements and the absence of description of how bears are/were used in a customary and traditional way, there is no basis provided that would support these proposals. Given the lack of direct justification based on customary and traditional uses, we believe these proposals have a basis in the desire of the proponents to reduce the bear population to some unspecified lower level because they find bears to be inconvenient in the various ways identified in the proposals. Inconvenience is not a customary and traditional use. What is customary and traditional is the ways the Native Americans of northwestern Alaska found to cope with co-existing with bears.

The justification for Proposal 43 has the following justifications which are addressed below:

1. The proponents assert that there is an “over-abundance” of brown bears in Unit 23”. No basis for this assertion is provided except for mentions of ways bears are inconvenient. The closest density estimates are in GMU 22 (Schmidt et al. 2017; Miller et al. 1997) and another one in Red Dog Mine area in Unit 23 (Ballard et al. 1993 and also reported in Miller et al. 1997). These estimates are both in the range considered typical for interior Alaska (Miller et. al. 1997). Another estimate by NPS for the Lower Noatak was recently conducted 2017 and is in process of being prepared; this estimate is reportedly higher than the others. Ecologically brown bears are an archetypical “K-selected” species characterized by low reproductive rates and population stability at carrying capacity of their environments or lower. We further note that harvests have been increasing in GMU 23 since the State initiated its “intensive management” program in 1995 (see figure at end of this letter). The 3 year running average harvest in 1997 was 29 bears

1

compared to 59 bears in 2015 (see figure below). This is a doubling of harvest over a 20 year period and if there is any demographic consequence from this it is unlikely to be an "overpopulation of bears".

2. "Reduce conflicts with brown bears". We have little doubt that such conflicts occur. However, the proponents of this proposal provide no information documenting levels of these conflicts or trends. Neither is information provided indicating an increase in bag limit would reduce such conflicts. Human-bear conflicts are best addressed by techniques that eliminate or reduce the ability of bears to obtain anthropogenic foods. If these steps are not taken, such conflicts will persist regardless of the level to which bears are reduced. We note that in North American, no group has a longer history of co-existence with bears (all 3 species) than native Alaskans and that some of this expertise could and should be used to reduce conflicts without reducing bear abundance. These techniques included elevated food caches which are proven effective and have been adopted by non-native peoples around the world to reduce conflicts with bears. Solar-powered electric fences are a modern innovation that could be usefully adopted as well to prevent bears from accessing cabins or food storage areas without resorting to killing bears.
3. "Reduce the effects of brown bears on disrupting caribou migratory patterns". The authors provide no support for the assertion that bears "disrupt" such patterns or that a change in bag limit would address such disruptions if they do exist. Bears will congregate where food is available and if this is, for example, in areas where caribou traditionally cross rivers or other natural corridors, bears will continue to seek out caribou in these areas of food availability. Trying to eliminate "disruptions" if they occur in such areas is a classic case of a population "sink" for bears. Bears will continue to show up in such attractive areas and be killed thereby depopulating bears from the much larger "source" population.
4. "Reduce destruction of cabins and taking of meat from boats by brown bears". We address this in point #2 above. Although these activities by bears are doubtless nuisances to some local residents, it is hard to see how they would be reduced without greatly reducing bear numbers to the point of near elimination.

Proposal 44 proposes to allow the sale of up to 2 raw/untanned brown bear hides (with claws attached and/or skulls) per regulatory year for qualified CT users. Such sales were initially allowed by state regulations last year and everyone in the state can already do this including all residents of Unit 23. Justifications offered are:

1. "Promote alignment with state with state regulations." We note that no "alignment" is needed as under state regulations such sales are already permitted for bears taken in Unit 23 under the state's general hunting regulations with a bag limit of 2/year. Adoption of this proposal would, in fact, misalign with state regulations with regard to where take can occur that would allow such sales. Most significantly, extension of subsistence regulations designed to reduce numbers of bears in federal conservation areas like National Parks, National Preserves, and National Wildlife Refuges will likely conflict with federal obligations to manage such areas for "natural diversity" consistent with NPS regulations adopted last year and published in the Federal Register. There should be a compelling reason based on well-established CT uses by qualified subsistence users before undercutting federal mandates to manage these areas in the national interest rather in the parochial interests of local residents. We further observe that a federal

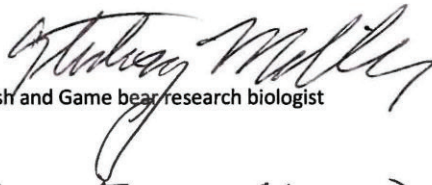
subsistence bag limit of 3 bears/year would “misalign” these regulations from the state bag limit and create confusion about whether the federal bag limit was additive to the state bag limit.

2. “Promote the increased utilization of harvested brown bears”. No “utilization” of brown bears is mentioned in this proposal which is internally inconsistent as it specifically acknowledges that brown bears are not traditionally used by Iñupiat people for either food or the making of handicraft items from brown bear parts. What this proposal would actually do is allow the commercialization by sale of hides from brown bears taken in National Parks, National Preserves, and National Wildlife Refuges (created by ANILCA in 1980) where only qualified CT users are allowed to hunt. This proposal provides no valid justification based on need or customary and traditional use that would justify such commercialization of wildlife on these National Interest Conservation units.
3. “Provide opportunity for profit”. The sale of untanned bear hides with claws attached and skulls is already allowed, since last year, under state regulations. Since this was just adopted last year there can be no recent customary and traditional use based on such sales and it would very likely be exceedingly dangerous to bear populations to institutionalize commercialization of bear parts especially on federal conservation areas like National Parks, Preserves, and Refuges. The commercialization of bears taken on federal national interest conservation lands conflicts with the objectives for management of these lands by federal land managers as described above in point #1 for Proposal 43. We believe that the subsistence provisions that are part of ANILCA are designed to assure continuation of customary and traditional uses by subsistence users and that the opportunity to “profit” by sale of wildlife parts is inconsistent with the intent of ANILCA.
4. “Reduce the overpopulation of bears in Unit 23.” This assertion is addressed above in point # 1 for Proposal 43.
5. “Reduce conflicts with brown bears in communities and camps”. This assertion is addressed above in point # 2 for Proposal 43.
5. “Reduce danger resulting from human and bear interactions.” This point is addressed above in point #2 for Proposal 43. We further note that the State has regulations allowing the take of bears in Defense of Life and Property situations so this justification is redundant.

As a general comment, we believe that the most likely reason for these proposals and others like them is to reduce the abundance of bears and other predators in the hope that this will result in making it easier for hunters to harvest caribou and moose in Unit 23. Although the western Arctic caribou is declining, there exist no evidence that this is a result of natural predation which has occurred for millennia and is cyclic. We believe the federal subsistence board should not adopt proposals designed to reduce predators on National Conservation Units and certainly not without sound justifications based on solid science. We suspect that such “uses” predicated on the assumed need for reducing predators are outside the intended scope of the subsistence provisions of ANILCA, conflict with other federal mandates to manage wildlife on National Interest Conservation Units for natural diversity in the national interest, have little likelihood of accomplishing the desired objectives absent extreme reductions in predator abundance, and have no justification based on the ways aboriginal Americans utilized wildlife populations during historical or prehistorical periods.

Thanks you for your consideration of these comments.

Sterling Miller
 Retired, Alaska Dept. Fish and Game bear research biologist
 PO Box 822
 Lolo, MT 59847-0822



Clait E. Braun
 Past President, The Wildlife Society
 Former editor, *Journal of Wildlife Management*
 5572 N. Ventana Vista Road
 Tucson, AZ 85750-7204



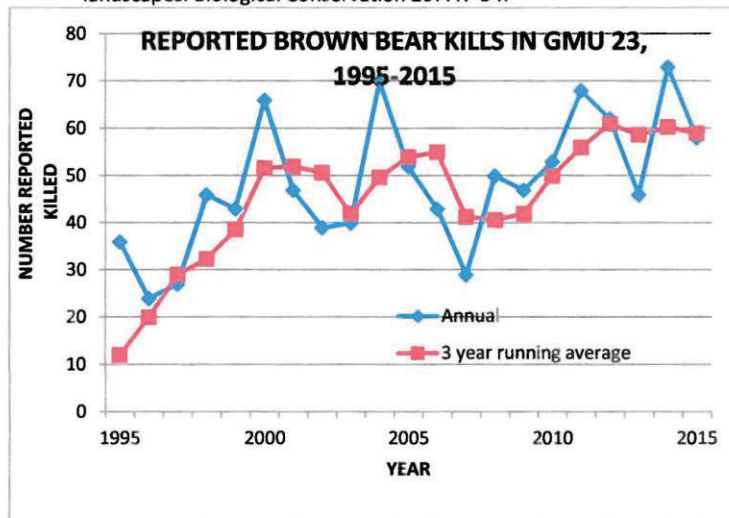
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WP18-44 Executive Summary	
General Description	<p>Proposal WP18-44 requests regulations allowing the sale of up to two raw/untanned brown bear hides (with claws attached) and/or skulls per regulatory year, from brown bears legally harvested by Federally qualified subsistence users on Federal public lands in Unit 23.</p> <p><i>Submitted by: Northwest Arctic Subsistence Regional Advisory Council</i></p>
Proposed Regulation	<p><i>(j) Utilization of fish, wildlife, or shellfish</i></p> <p><i>(13) You may sell the raw/untanned and tanned hide or cape from a legally harvested caribou, deer, elk, goat, moose, musk ox, and sheep.</i></p> <p><i>(i) You may sell, through customary trade, the skull or raw/untanned or tanned hide, with claws attached, and the skull, from up to two brown bears legally harvested on Federal public lands in Unit 23, annually. Any skull or hide must be sealed by an ADF&G representative prior to its sale.</i></p>
OSM Preliminary Conclusion	Oppose
Southeast Alaska Subsistence Regional Advisory Council Recommendation	
Southcentral Alaska Subsistence Regional Advisory Council Recommendation	
Kodiak/Aleutians Subsistence Regional Advisory Council Recommendation	
Bristol Bay Subsistence Regional Advisory Council Recommendation	
Yukon-Kuskokwim Delta Subsistence Regional Advisory Council	

WP18–44 Executive Summary	
Recommendation	
Western Interior Alaska Subsistence Regional Advisory Council Recommendation	
Seward Peninsula Subsistence Regional Advisory Council Recommendation	
Northwest Arctic Subsistence Regional Advisory Council Recommendation	
Eastern Interior Alaska Subsistence Regional Advisory Council Recommendation	
North Slope Subsistence Regional Advisory Council Recommendation	
Interagency Staff Committee Comments	
ADF&G Comments	
Written Public Comments	1 Oppose

DRAFT STAFF ANALYSIS WP18-44

ISSUES

Proposal WP18-44, submitted by the Northwest Arctic Subsistence Regional Advisory Council, requests regulations allowing the sale of up to two raw/untanned brown bear hides (with claws attached) and/or skulls per regulatory year, from brown bears legally harvested by Federally qualified subsistence users on Federal public lands in Unit 23.

DISCUSSION

The Northwest Arctic Regional Advisory Council (Northwest Arctic Council) voted to submit this proposal to align State and Federal regulations in Unit 23 by adding a provision in Federal regulations allowing the sale of up to two skulls and raw/untanned hides of brown bears legally harvested on Federal public lands by Federally qualified subsistence users, per regulatory year. The Council also voted to submit a companion proposal (WP18-43) to increase the Federal harvest limit for brown bears from one bear to three bears per regulatory year and extend the season to year round. The proponent clarified that they only seek to allow the sale of two brown bear skulls and raw/untanned hides (with claws attached) per regulatory year.

The Northwest Arctic Council offered several justifications for this request including 1) alignment with State regulations, 2) increased utilization of harvested bears, 3) opportunity for profit, 4) overpopulation of brown bears in Unit 23, 4) increased conflicts with bears in communities and at camps, and 5) increased danger due to increased bear activity. Some members of the Council also indicated that traditionally, Inupiat peoples of the region did not make handicrafts from bear skulls and hides as this was taboo, therefore the regulation change would most appropriately apply to raw/unaltered hides and skulls.

At the January 2017 meeting the Alaska Board of Game (BOG) modified State brown bear hunting regulations in Unit 23 from one bear per year to two bears per year. According to 5 AAC 92.200(b):

a person may not purchase, sell, advertise, or otherwise offer for sale any part of a brown bear, except an article of handicraft made from the fur of a brown bear, and except for skulls and hides with claws attached of brown bears harvested in areas where the harvest limit is two bears per regulatory year.

Because of the State increase in the brown bear harvest limit to two bears per regulatory year in Unit 23, the sale of brown bear skulls and hides (with claws attached) will be legal under general State regulations in Unit 23 as of July 1, 2017 per 5 AAC 092.200(b). However, brown bears harvested under a State subsistence registration permit in Unit 23 (as currently required under Federal regulations) that are either removed from the subsistence area or presented for commercial tanning must be sealed by a designated sealing officer and the skin of the head and front claws must be removed and kept by the Alaska Department of Fish and Game (ADF&G). Federal regulations currently allow the harvest of 1 brown bear annually in

Unit 23 by State registration permit, therefore requiring that the front claws be removed and kept by ADF&G upon sealing.

Existing Federal Regulation

(j) Utilization of fish, wildlife, or shellfish

(13) You may sell the tanned and raw/untanned hide or capes from a legally harvested deer, elk, goat, sheep, caribou, muskox, and moose.

Unit 23—Brown Bear

Unit 23—1 bear by State subsistence registration permit

Aug 1-May 31

Proposed Federal Regulation

(j) Utilization of fish, wildlife, or shellfish

(13) You may sell the raw/untanned and tanned hide or cape from a legally harvested caribou, deer, elk, goat, moose, musk ox, and sheep.

(i) You may sell, through customary trade, the skull or raw/untanned or tanned hide, with claws attached, and the skull, from up to two brown bears legally harvested on Federal public lands in Unit 23, annually. Any skull or hide must be sealed by an ADF&G representative prior to its sale.

Note: The proposal as submitted omitted “or tanned hide”. However, this was an oversight as the proponent’s intention was to align State and Federal regulations.

Existing State Regulation

Use of Game

Game taken under a hunting license MAY NOT be used for the following purposes:

Buying or selling of any part of a brown/grizzly bear, EXCEPT:

-brown bears taken in areas with a two brown bear bag limit per regulatory year, raw and untanned brown bear hides (with claws attached) and skulls may be sold, after sealing.

Unit 23—Brown Bear

Residents: Two bears every regulatory year Aug. 1 – May 31

Nonresidents: One bear every regulatory year by permit DB761-767 Aug. 1 – Oct. 31
OR

Nonresidents: One bear every regulatory year by permit DB771-777 Apr. 15-May 31
OR

Nonresidents: One bear every regulatory year by permit available at ADF&G in Kotzebue, Nome, and Galena beginning Aug. 31. RB761-767 Aug. 1-Oct. 31

OR

Nonresidents: One bear every regulatory year by permit available at ADF&G in Kotzebue, Nome, and Galena beginning Apr. 14. RB771-777 Apr. 15-May 31

In addition to other regulations, subsistence regulations apply to the following “Residents Only” hunt

Residents: Two bears every regulatory year by permit available in Kotzebue and Unit 23 license vendors beginning July 1 RB700 Aug. 1-May 31

Extent of Federal Public Lands

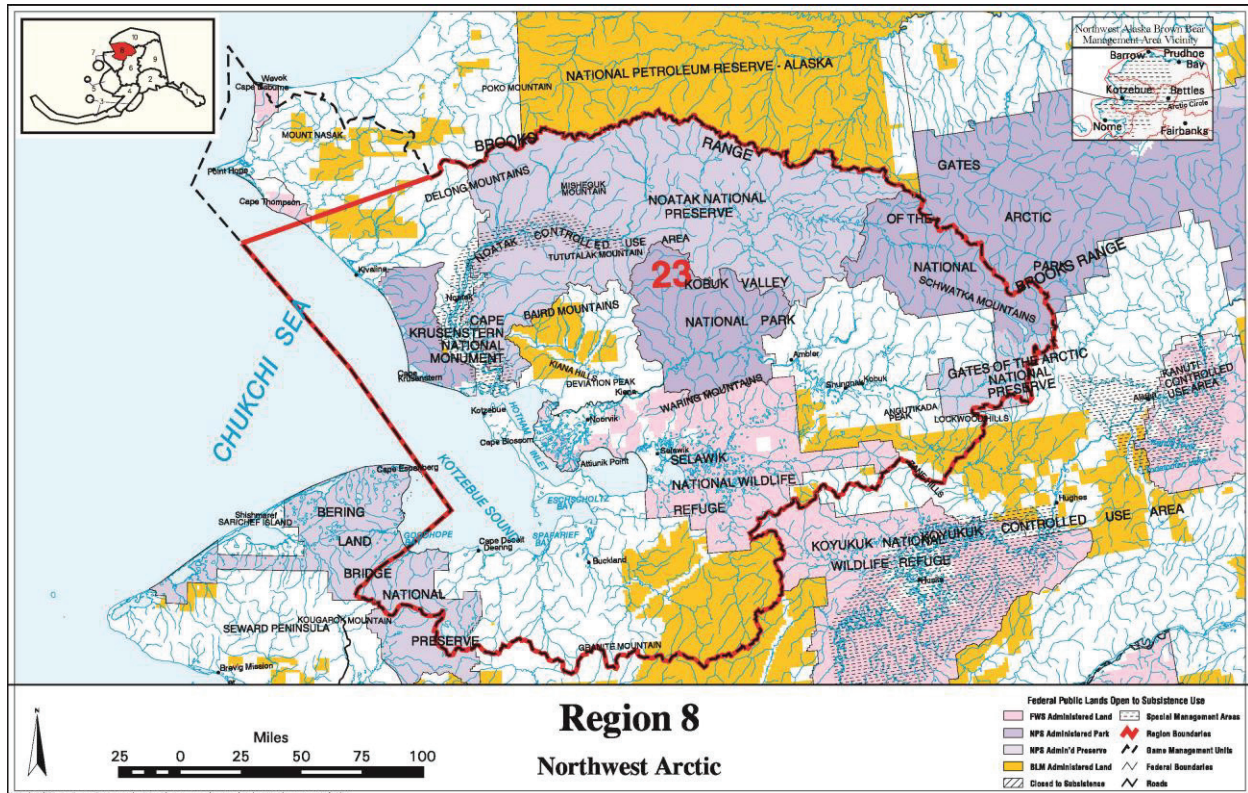
Federal public lands comprise approximately 71% of Unit 23 and consist of 40% National Park Service (NPS) managed lands, 22% Bureau of Land Management (BLM) managed lands, and 9% U.S. Fish and Wildlife Service (USFWS) managed lands (see **Unit 23 Map**).

Customary and Traditional Use Determinations

Residents of Units 21 and 23 have a customary and traditional use determination for brown bear in Unit 23.

Regulatory History

State brown bear hunting regulations were established for Unit 23 in 1961. From 1961 until the early 1990s, State regulations were geared toward trophy hunting (Westing 2013). Since the 1980s, brown bear hunting regulations across northern Alaska have become more liberal, including longer seasons, higher harvest limits, and waived resident tag fees (Miller et al. 2011).



Unit 23 Map

Federal brown bear hunting regulations for Unit 23 were adopted from State regulations in 1990. The season was Sept. 1-Oct. 10 and Apr. 15-May 25 with a harvest limit of one bear every four years. Residents of Units 21 and 23 were established as Federally qualified subsistence users for brown bear in Unit 23.

In 1992, seven proposals (P92-074, P92-075, P92-076, P92-078, P92-079, P92-086, and P92-167) were submitted to change Federal subsistence brown bear regulations in Unit 23. Proposals P92-74, and P78 sought to increase the brown bear harvest limit. Proposals P92-76, P79, and P86 sought to liberalize both the harvest limit and season. Proposals P92-075 and P167 requested eliminating the sealing requirement, requiring all edible meat to be salvaged, prohibiting transfer of hides outside of Unit 23 unless to one's residence in Unit 21, and submittal of a harvest report and both ears to a Federally authorized representative within 30 days of the taking. These proposals were submitted because then current regulations, which included restrictive seasons and harvest limits, failure to salvage edible meat, and sealing requirements conflicted with traditional practices. The Federal Subsistence Board (Board) considered these proposals concurrently and adopted them with modification to remove the sealing requirement, and to prohibit the use of aircraft in any manner for brown bear subsistence hunting. The season in the new hunt area was expanded to Sept. 1 – May 31 with a harvest limit of one bear per regulatory year by State registration permit. The harvest limit and season in Unit 23 remainder was unchanged.

In 1992, BOG also modified Unit 23 brown bear regulations in recognition of traditional patterns of harvest of bears by Inupiat hunters for meat, hides, and fat (Westing 2013). BOG established the Northwest Alaska Brown Bear Management Area (NWABBMA) and a subsistence registration hunt (RB700).

In 2005, the Board adopted Proposal WP05-17 with modification to combine the Unit 23 brown bear hunt areas and to expand the season from Sept 1 – May 31 to Aug 1 – May 31. This was done to provide more opportunity to Federally qualified subsistence users, to reduce regulatory complexity by aligning State and Federal regulations, and because there were no conservation concerns.

In 2007, Proposal WP07-50 proposed eliminating the permit requirement to hunt brown bear in Unit 23 because it was a burden on Federally qualified subsistence users and permits were often not available in villages. The proposal was withdrawn by the proponent before it went to the Board in order to allow more time to discuss the issue with the Councils and various agencies.

In 2008, the Board adopted Proposal WP08-52 to allow the sale of handicrafts made from the fur of a brown bear taken in Unit 23 so that subsistence users could more fully utilize the brown bear resource.

In 2012, the Board adopted Proposal WP12-01 to require sealing of brown bear hides or claws prior to selling handicrafts incorporating these parts. This was done in order to ensure that marketed handicrafts were made from legally harvested bears. The proposal was submitted by the Brown Bear Claw Handicraft Working Group.

In 2014, Proposal WP14-40 proposed eliminating the permit requirement to hunt brown bear in Unit 23 to reduce confusion about hunting regulations and to allow for more opportunistic harvests. The Board adopted WP14-40 with modification to insert the word “subsistence” into regulations (1 bear by State *subsistence* registration permit) in order to clarify that permits were required under both State and Federal regulations, which require sealing of hides and skulls. Eliminating the permit requirement was not recommended as it was an essential mechanism to monitor harvest and to inform brown bear management in the unit. Also, Federally qualified subsistence users would then be required to seal harvested bears. (However, sealing is required under the subsistence registration permit if the bear is removed from the unit or parts are sold as handicrafts).

In 2016, the BOG adopted Proposal 57 to allow the sale of brown bear hides and/or skulls by Alaska residents in units where the harvest limit is two or more bears annually. The proposal was submitted by the Nushagak Advisory Committee with the stated intent of encouraging brown bear harvest to 1) reduce predation on moose and caribou and 2) to reduce bear hazards around communities.

In 2017, the BOG adopted Proposal 40 to increase the resident brown bear harvest limit in Unit 23 to 2 bears per regulatory year. The BOG supported Proposal 40 because it provided more harvest opportunity, because there were no conservation concerns, and because it was supported by five local Fish and Game Advisory Committees (ACs). Chairman Spraker also stated that a low number of second bears have been taken in other units with 2 bear harvest limits and that bear harvests in other units with long seasons and higher harvest numbers have been sustainable (ADF&G 2017a). Proposals 37, 38, and 39 requested

lengthening the nonresident brown bear season in Unit 23. The BOG adopted Proposal 37, extending the nonresident season from Sept. 1-Oct. 31 to Aug. 1-Oct. 31 and took no action on Proposals 38 and 39. The BOG supported Proposal 37 in order to alleviate user conflicts during September, by spreading nonresident hunting out over a longer season, and because all the local ACs supported it.

In November of 2017 the BOG will hear Proposal 49, which requests that a permit be required before brown bear skulls and hides with claws attached can be sold. This proposal was submitted by ADF&G because there is currently no method to track the sale of bears harvested in areas where the harvest limit is two brown bears per year (ADF&G 2017a). The proponent states that this proposal will allow ADF&G to track and quantify the interest in selling brown bear skulls and hides with claws attached (ADF&G 2017a). The proponent also states that there are concerns about the potential to commercialize the harvest of brown bears and that there is interest in knowing the magnitude of this use (ADF&G 2017a).

Handicrafts and customary trade regulations

The sale of animal products under Federal law is permitted as handicrafts or through customary trade. If harvesting bears under the state's general hunting regulations for residents where there is a two brown bear per regulatory year harvest limit, the tanned and untanned hides (with claws attached) and skulls may be sold, after sealing. While the proponent has expressed in public testimony that raw/untanned brown bear hides that are prepared for sale typically require much more time and skill in ensuring that there are no rips or tears during processing as compared to those prepared for personal use (NWA RAC 2017), this does not appear to meet the definition of a handicraft as defined in 50 CFR §100.4:

Handicraft means a finished product made by a rural Alaskan resident from the nonedible byproducts of fish or wildlife and is composed wholly or in some significant respect of natural materials. The shape and appearance of the natural material must be substantially changed by the skillful use of hands, such as sewing, weaving, drilling, lacing, beading, carving, etching, scrimshawing, painting, or other means, and incorporated into a work of art, regalia, clothing, or other creative expression, and can be either traditional or contemporary in design. The handicraft must have substantially greater monetary and aesthetic value than the unaltered natural material alone.

Raw/untanned hides (with claws attached) and skulls are unlikely to align with the definition of a handicraft but these items may be sold more appropriately under customary trade. Federal subsistence regulations define customary trade in 50 CFR §100.4 as:

“Exchange for cash of fish and wildlife resources regulated in this part, not otherwise prohibited by Federal law or regulation, to support personal and family needs; and does not include trade which constitutes a significant commercial enterprise.”

Customary trade is also addressed in 50 CFR §7(b):

“You may not exchange in customary trade or sell fish or wildlife or their parts, taken pursuant to the regulations in this part, unless provided for in this part.”

State regulations define customary trade as “limited, non-commercial exchange, for minimal amounts of cash, as restricted by the appropriate board, of fish or game resource” (AS 16.05.940). Both State and Federal subsistence regulations provide for customary trade of fish, however neither currently provide for customary trade of large land mammals (5 AAC 92.200; 50 CFR §100.7); though this does not preclude the Board from doing so. According to 50 CFR §100.10(4)(x) regarding the Board’s authorities, this part indicated that the Board may “Determine what types and forms of trade of fish and wildlife taken for subsistence uses constitute allowable customary trade.”

If defined as customary trade, the sale of raw/untanned hides and skulls of brown bears under Federal regulations would still require adherence to the meat salvage regulations, including, 50 CFR §100.25 j(1-3):

- (1) You may not use wildlife as food for a dog or furbearer, or as bait, except as allowed for in §100.26, §100.27, or §100.28, or except for the following:
 - (i) The hide of a wolf, wolverine, coyote, fox, lynx, marten, mink, weasel, or otter;
 - (ii) The hide and edible meat of a brown bear, except that the hide of brown bears taken in Units 5, 9B, 17, 18, portions of 19A and 19B, 21D, 22, 23, 24, and 26A need not be salvaged;
 - (iii) The hide and edible meat of a black bear;
 - (iv) The hide or meat of squirrels, hares, marmots, beaver, muskrats, or unclassified wildlife.
- (2) If you take wildlife for subsistence, you must salvage the following parts for human use:
 - (i) The hide of a wolf, wolverine, coyote, fox, lynx, marten, mink, weasel, or otter;
 - (ii) The hide and edible meat of a brown bear, except that the hide of brown bears taken in Units 5, 9B, 17, 18, portions of 19A and 19B, 21D, 22, 23, 24, and 26A need not be salvaged;
 - (iii) The hide and edible meat of a black bear;
 - (iv) The hide or meat of squirrels, hares, marmots, beaver, muskrats, or unclassified wildlife.
- (3) You must salvage the edible meat of ungulates, bear, grouse, and ptarmigan.

Federal subsistence fisheries regulations regarding customary trade are defined by region and fishery. Examples of limitations placed on customary trade as written in 50 CFR §100.27 include restrictions on who can participate in customary trade of subsistence resources (only rural residents [50 CFR §100.27(11)], only those residents with a customary and traditional use determination [50 CFR §100.27(11)(iii)]), annual limitations on cash value (\$400-\$500 with record-keeping requirements [50 CFR §100.27(12)(i/ii)]), and a percentage of a household’s annual harvest [50 CFR §100.27(12)(ii)]. Given that this proposal requests the sale of up to two raw/unaltered brown bear hides (with claws attached) and skulls per regulatory year, it is unlikely that this would be defined as a significant commercial enterprise and would thus meet the definition of customary trade.

The issue of claw retention was examined extensively by the Brown Bear Claw Handicraft Working Group that was formed by the Board in 2009 to discuss a range of issues relating to brown bear claws including their use in handicrafts, the feasibility of tracking, and potential changes to regulations. The group was

composed of representatives from nine of the ten Councils, staff from ADF&G, and staff of Federal agencies. Of particular concern to this group was preventing the illegal harvest and sale of brown bear parts that can garner significant monetary value in worldwide markets, and which may incentivize illegal harvest of brown bear populations elsewhere in North America where conservation concerns are prevalent (OSM 2010).

Unpublished meeting minutes from the Working Group indicate that the USFWS Office of Law Enforcement was concerned about further developing a market for brown bear products. Rory Stark, a law enforcement officer, noted that brown bear claws, paws, and gall bladders are the primary illegal items sought for these markets and that all other parts of the bear are often wasted (OSM 2010). He explained that documentation through sealing and tagging is necessary to ensure that handicraft materials are made from legally harvested bears and that this certification could result in a more valuable handicraft. According to Stark, law enforcement across the United States was engaged in 146 cases of illegal sale of black and brown bear parts between 2000 and 2010.

In 2012, the working group submitted a proposal to the Board (WP12-01) requesting that prior to selling a handicraft incorporating a brown bear claw(s), the hide or claw(s) not attached to a hide, must be sealed by an authorized ADF&G representative and that a copy of the ADF&G sealing certificate must accompany the handicraft when sold. WP12-01 was adopted with modification to add language that old claws may be sealed if an affidavit is signed to verify that the brown bear was harvested by a Federally qualified subsistence user on Federal public lands. Germane to this proposal are sealing requirements that help to track the sale of wildlife parts, to increase product value by validating that the animal was legally harvested, and to provide documentation to allow individuals traveling to another country to obtain a Commission on the International Trade of Endangered Species (CITES) permit for the item to be legally transported across international borders.

During BOG deliberations on proposal 57 (sale of brown bear hides and/or skulls) in March of 2017, some concerns were expressed by BOG members regarding tracking bear products, worldwide black markets, and the potential for hunters to falsify records regarding the unit of harvest (ADF&G 2016). Lieutenant Paul Fussey of the Alaska Wildlife Troopers testified that law enforcement tracks internet activity for hides and that these individuals attempt to verify permit and sealing records when bear products are encountered. At the time of the testimony, all bear hides sold by Alaska residents were appropriately harvested under a predator control permit. Very few brown bear hides had been encountered. A representative of ADF&G's Division of Subsistence also testified that the ability of subsistence users to sell hides and/or skulls of bears harvested for subsistence could aid users in engaging in a mixed cash-subsistence economy by providing additional means of purchasing gasoline and other products (ADF&G 2016). Current Events

Proposal WP18-43 requests that the Unit 23 brown bear harvest limit be increased from one to three bears and that the season be extended to year round. The decision on WP18-43 could have ramifications on this proposal (i.e. harvest limits and determining the number of brown bear hides and skull to be sold).

Biological Background

State management objectives for brown bear in Unit 23 are as follows (Westing 2013):

- Maintain a population that sustains a 3-year mean annual reported harvest of at least 50% males.
- Conduct a brown bear population estimate for some portion on Unit 23 in cooperation with Department of Interior (DOI) staff at least once every reporting period.
- Continue community-based assessments to collect brown bear harvest information from residents of Unit 23.
- Seal bear skins and skulls, determine sex, and extract a tooth for aging.
- Monitor harvest data (age, sex, and skull size) for changes related to selective pressure.
- Improve communication between the public and the Alaska Department of Fish and Game (ADF&G) to improve harvest reporting and prevent defense of life and property situations from occurring.

Biological information and trends for brown bear in most of Unit 23 is lacking. As brown bears in Interior Alaska are wide ranging and occur at low densities, population estimates are difficult and expensive to obtain (Miller et al. 1997, 2011, Mowat et al. 2013, Schmidt et al. 2017). Brown bear densities are classified as adult bears (3+ years-old) and bears of all ages (bears), which includes sows with cubs.

In the early 1990s, surveys were conducted in the Western Brooks Range to obtain baseline data on bear abundance. Brown bear density was estimated as 29.5 bears of all ages/1,000 km² (Miller et al. 1997). Brown bear density within Gates of the Arctic National Park & Preserve (GAAR) is currently considered relatively low (Joly 2017, pers. comm.).

Aerial bear surveys were conducted in the lower Noatak Drainage in 1987, 2008, and 2016. While data seems to suggest that the brown bear population is increasing in this area, these surveys are not directly comparable due to differing methodologies and scales (NPS 2017). In 1987, a brown bear census was conducted in the lower Noatak River drainage to provide a benchmark of bear abundance before the Red Dog Mine was constructed (Westing 2013). Density was estimated at 1 adult bear/26 mi² (Westing 2013) and 17.9 bears/1000 km² (Miller et al. 1997). However, the study area was relatively small (2,000 km²) and may not be representative of all of Unit 23. Preliminary results from the 2008 survey using the 1987 sightability correction factor (SCF) indicated a brown bear density of 3.4 bears/26 mi² (ADF&G 2017c, Saito 2017, pers. comm.). However, this estimate is likely not accurate due to violations of sampling protocols (e.g. sampling adjacent areas on different days) and use of a SCF from another study using different sampling methods (Robison 2017, pers. comm.).

The 2016 brown bear density estimate for the lower Noatak Drainage was 67.5 bears/1000 km². NPS conducted an aerial bear survey of the upper Noatak Drainage in May 2017. The preliminary density estimate is 30.6 bears/1000 km² (Robison 2017, pers. comm.).

While the population status of brown bears across all of Unit 23 is uncertain, the current population estimate is 3500 bears, which is extrapolated from 2008 density estimates within the Lower Noatak survey area (ADF&G 2017c). As this was derived from a small study area, it is not a correct unit-wide estimate.

Bear density estimates in Unit 22 on the Seward Peninsula may be more representative of southern Unit 23 (e.g. Buckland/Deering area) than estimates from northern Unit 23. Surveys conducted from 2013-2015 in western Unit 22 yielded brown bear density estimates of 21 adult bears/1000 km² and 35.6 bears of all ages/1000 km² (Schmidt et al. 2017).

Local residents have described substantial population increases in the Unit 23 brown bear population since the 1940s and observations by ADF&G staff suggest a stable or increasing population (Westing 2013, ADF&G 2017c). Several factors may contribute to this trend (Westing 2013). Growing populations of moose, caribou and musk ox in the early 2000s have provided a stable prey base for brown bears and shifted subsistence harvest increasingly toward large ungulates. Possible declines in commercial salmon fishing may have allowed more salmon to reach inland areas, increasing food for bears. Regulations protecting sows with cubs curtailed the traditional practice of “denning” or killing all den occupants, which occurred when bears were relied upon more to meet subsistence needs. Finally, selection of large male bears by sport hunters may allow survival of cubs that otherwise could have been killed by large boars (Westing 2013).

Bear density is related to food availability. Salmon availability may be the primary determinant of high and low bear densities across Alaska (Miller et al. 1997, Mowat et al. 2013). The short growing season and absence of salmon make the western Brooks Range poor brown bear habitat; although salmon runs may be seasonally important sources of food in other portions on Unit 23 (Miller et al. 1997). Social factors can also influence bear distribution. For example, a sow with cubs may avoid areas with large male bears that could kill her offspring (Mowat et al. 2013).

In northern Alaska, brown bear populations are often managed conservatively for several reasons: Large home ranges are required to meet resource needs, resulting in low density populations (McLoughlin et al. 2002); Female brown bears do not successfully reproduce until they are > 5 years old and have low reproductive rates, small litters, and long intervals between litters (Reynolds 1987, USFWS 1982, Miller et al. 2011); Sows exhibit high fidelity to home ranges with little emigration or immigration (Reynolds 1993); and monitoring methods are imprecise and expensive (Miller et al. 2011).

In 1991, radio-collared brown bears in the vicinity of Red Dog Mine emerged from their dens between April 10 and May 15 (Ayres 1991). Between 2014 and 2016, the few deaths of radio-collared brown bears within GAAR tracked thus far have been human-related (Joly 2017, pers. comm.). Brown bear habitat in northwestern Alaska is predicted to improve due to climate change causing increases in shrub and forest cover as well as wildfires, which create edge habitats that are often preferred by bears (Nielson et al. 2010, Joly et al. 2012, Rupp et al. 2000, Swanson 2015).

Cultural Knowledge and Traditional Practices

Brown bears have long been a highly respected and utilized subsistence resource in northwest Alaska and the species has a prominent physical and symbolic role in the lives of local people (Loon and Georgette 1989). These animals provide a source of meat, raw materials, and medicine within the Inupiaq culture of the region (Loon and Georgette 1989). Brown bears have also been prized as trophy sport hunting animals in the region, largely by non-Native residents of the regional hubs of Nome and Kotzebue (Loon and Georgette 1989). Loon and Georgette (1989) provide a thorough ethnographic account of traditional brown bear harvest and use in the region and is the source of cultural information included in this section, unless otherwise noted.

The hunting of brown bears in Inupiaq culture traditionally required strict adherence to prescribed practices designed to show respect to the animal and a hunter's success was considered dependent on adherence to these protocols. The Inupiat people believed that bears have excellent hearing and that hunters should not discuss their intentions to kill these animals. Bragging, threatening a bear, acting with too much confidence, or even suggesting a craving for bear meat was considered taboo, potentially leading to harming of the hunter or his family. In modern times some residents of the region continue to adhere to these protocols and will often refer to "that animal" rather than mentioning it by name. While no longer adhered to, the Inupiaq also believed that it was taboo for women and girls to eat bear meat (Loon and Georgette 1989, Anderson et al. 1977). Dogs were also not fed bear meat as it was said to make them vicious.

The use of brown bears for food in the region is variable among communities, depending on geographic location. Inland communities eat brown bears more frequently while coastal communities rarely eat this species unless it is harvested in interior areas where bears feed on fish and berries (Loon and Georgette 1989, Burch 1985, Burch 2006). Coastal bears are often considered unpalatable due to their tendency to consume marine mammal carcasses along the beaches. Loon and Georgette (1989) found that some coastal communities avoid bears in the fall because this is when bears have the greatest access to sea mammal carcasses. Noatak hunters also avoid bears in the upper Noatak River drainage because the bear diet in this area consists of squirrels, a prey species causing unpalatable flavor in brown bear meat. Kotzebue displays a mixture of brown bear harvest patterns, likely due to a variety of geographical and cultural backgrounds of residents residing in this regional hub.

Loon and Georgette (1989) found that the consumption of brown bears differs between Unit 23 (Northwest Arctic) and Unit 22 (Seward Peninsula). While communities in Unit 23 often consume brown bears, consumption of bears is uncommon in Unit 22. Among the communities for which the researchers had information in Unit 22, only White Mountain and Golovin reported regular use of bear meat. Many communities in this Unit reported use of brown bear in the past, particularly before moose arrived in the area. There was limited evidence of brown bear use for food in the regional hub of Nome and while one respondent said that hunters would sometimes bring home small quantities of bear meat, he also indicated that this was not a common resource consumed in the community. Other studies have documented limited harvest of brown bears for food in Shishmaref (Sobelman 1985) and Shaktoolik (Thomas 1982); Wales and Teller are suspected to have similar patterns (Loon and Georgette 1989). Respondents in Unalakleet

indicated that they could not imagine using a brown bear for food (Loon and Georgette 1989). Another Unalakleet respondent stated that bears were more palatable before walrus carcasses began washing up on the shores in such large numbers.

For the communities that consume brown bears, Georgette and Loon (1989) found that hunters rarely, if ever, take a bear in defense of life and property. While nuisance animals may be killed, it is more likely for residents of these communities to use the meat and not report the animal as killed in defense of life and property. Some communities considered bears a nuisance; reindeer hunters also commonly held this view. In the 1980s brown bear was not a substantial component of the diet in any northwest Alaska community as compared to moose or caribou, but it likely plays a vital seasonal role in the subsistence diet when other large land mammals are not available.

Among the edible parts of a brown bear, the fat is the most prized product (Loon and Georgette 1989). Local hunters time their hunting to correspond with when bears have the most fat and the meat is of highest quality (Loon and Georgette 1989; Burch 2006). Brown bears are predominantly hunted in northwest Alaska during the spring and fall (Loon and Georgette 1989; Burch 2006). Spring hunting takes place earlier inland where warmer conditions arrive sooner. When bears emerge from their dens in the spring, they are still fat and gradually become lean; thus subsistence brown bear harvests occur between spring emergence from hibernation until snow machine travel is no longer possible.

Many residents prefer to hunt smaller bears because the meat is tender (Loon and Georgette 1989). Brown bear meat is preserved dried, half-dried, frozen and aged. The fat is also aged then cooked before being eaten. It is also common for dried fish and meat to be dipped in bear fat similar to the way that seal oil is used. Bear livers are not consumed. Bear fat is also considered a valuable source of medicine in the region for curing illnesses and sores. It has been used to treat colds, itchy throats, and coughs by ingesting or applying to the chest. Cooked bear meat with fat is said to increase appetite among the ill. It is also used to treat persistent sores and boils.

Usually the hide is in good condition at the same time the bear is the fattest (Loon and Georgette 1989). Some residents of the region harvest brown bears in the fall once their diet has transitioned to berries, roots, fish, and caribou. Later in the fall bears regain much of their body fat before hibernation and therefore harvest at this time is also preferred. In the spring hunters utilize tracks to locate bears and in the fall they concentrate efforts along salmon spawning streams and in areas with prolific berries.

In modern times brown bears are rarely hunted in the winter or summer because they are considered lean and their hides are of lesser quality (Loon and Georgette 1989). In the summer, bears are also considered more dangerous. Traditionally the Inupiaq people hunted brown bears in their dens in the winter. These bears were less likely to fight and before firearms were available, killing a hibernating bear with a spear was likely easier and safer as compared to outside of the den in other seasons. This was also a good source of winter meat when other resources were depleted or unavailable. Some hunters would stake bear dens in the late fall and return to the den later in the year to harvest the bear. In Noatak some hunters routinely pursue bears at night along rivers and streams in the fall, a technique that is considered quite dangerous.

Brown bear hunting is a very specialized activity (Loon and Georgette 1989). Before the arrival of firearms bears were largely hunted with spears and arrows. Traditionally, bears harvested by the Inupiat were almost exclusively harvested by a small number of men from each community and the harvest was distributed to other local households. Men continue to be the primary bear hunters in the region. Often, bears are harvested opportunistically while in pursuit of other subsistence resources or while traveling for other purposes. Hunting areas are generally accessed by boat in the fall and by snow machine in spring. Traditionally however, travel was often accomplished by dog team. Hides are sometimes discarded in the field if packing it out presents logistical challenges.

It is a cultural tradition in the region for a hunter to remove the hyoid bone from beneath a bear's tongue immediately after it is killed (Loon and Georgette 1989). In some places this bone is placed between willow branches, on a tussock, or simply discarded in the field. This practice was meant to ensure that the spirit of the bear has left the area and that there would be no retaliation on the hunter. Traditionally, the head of a brown bear was never brought back to the village and was either buried or placed on a tree or shrub (Burch 2006). When meat is served, family members could not discuss or make comments about the meal. The hunters believed that these practices prevented bad luck, safeguarded their camps, and reduced the potential for future conflict with bears. Removing the hyoid bone and leaving the head in the field remains a common practice.

Beyond nutritional value, brown bears also provide the raw materials for production. Bear hides, bones, teeth, and claws were traditionally used to make spearheads, fishhooks, rope, snowshoe bindings, dog harnesses, scraping tools, doors, mattresses, ruffs, and mukluks (Loon and Georgette 1989). More recently bear hides have been used primarily for mattresses, rugs, ruffs, mukluks and masks while claws are sometimes used for necklaces. Rope made of bear hide is said to be tougher and last longer than that of caribou or bearded seal. Narrow bones of the bear foreleg were used for spearheads and snares while knee joints were made into scraping tools. The hides were traditionally used to make dog harnesses and were preferred since dogs did not chew them as they did for other species. Travelers often carried bear hides to use as mattresses and as doors for sod houses; today they are carried as winter survival gear.

Sharing of brown bear meat, fats, and raw materials is common in northwest Alaska. Loon and Georgette (1989) stated that all of the hunters interviewed in their study shared their brown bear harvests with other households. The hunter typically only keeps a small amount of the bear meat and fat for his family and the rest is given to elders, widows, sick people, and other residents of the community. The hides were traditionally retained by the member of the hunting party that made the most decisive moves in killing the bear (Burch 2006).

Customary trade

Customary trade is a long-standing practice among Alaska Native cultures and closely resembles bartering practices with the introduction of monetary exchange (Ikuta and Slayton 2012, Magdanz et al. 2007). Within all rural communities in Alaska there are customary and traditional patterns of distributing and exchanging subsistence goods (Wolfe et al. 2000). In the literature, the term trade often refers to many different kinds of reciprocal exchanges including sharing, barter, purchasing, and sales (Magdanz et al.

2007, Ikuta and Slayton 2012). These forms of distribution may be understood as a continuum of subsistence activities rather than discreet or fundamentally separate activities (Ikuta and Slayton 2012).

Trading relationships are common and have been documented among the Inupiaq (Huntington 1966, Burch 1970, Burch 1988, Magdanz et al. 2007, Braem et al. 2013). Burch (1988) identified nine categories of property transfer (including subsistence foods) among the Inupiaq, ranging from a free gift with no expectation of reciprocity to exchange for cash, though traditionally this was for other subsistence foods, other products, or raw materials (Krieg et al. 2007). By the 18th century, Russian goods and Siberian reindeer skins were traded along the northwest coast of Alaska for furs, maritime products, jade and wood (Burch 1988, Ikuta and Slayton 2012).

Cash was introduced relatively recently to trading networks of exchange and has become another commodity that facilitates local, noncommercial distribution of subsistence goods (Wheeler 1998, Ikuta and Slayton 2012). The influx of cash into trading networks may also represent the replacement of a portion of bartering networks that facilitate local, noncommercial distribution of subsistence products in rural Alaska (Ikuta and Slayton 2012). Cash in a mixed cash-subsistence economy has been adopted to enhance the importance of wild foods and is used among many resources; there is not a conflict between cash and subsistence products (Wheeler 1998:268). Similar to other resources, the value of cash is relative, varies by availability, and is often controlled by the season (Wheeler 1998). Wheeler (1998) notes that strategies to use cash are similar to the use of other resources “when it is available, use it to the maximum extent possible, and when it is not available, make do with other resources.”

In 2010, data on customary trade for one Inupiaq community in the Northwest Arctic Borough (NAB), Selawik, was documented by ADF&G. Selawik is the second largest among 12 communities in the NAB and had a population of approximately 829 individuals as of 2010 (Braem et al. 2013). During the study year (2010-2011), approximately 32% of households engaged in customary trade (Braem 2013). The average estimated amount per trade was \$109 and the total reported trades for the community was \$3,675 (Braem et al. 2013). Households primarily traded berries and whitefish and lesser amount of caribou and other fish species (Braem et al. 2013). Most customary trades (82%) occurred among Selawik residents with fewer trades occurring between Selawik and Noatak, Kivalina, Noorvik, and Kotzebue (Braem et al 2013).

While the Board has not yet authorized the use of brown bears in customary trade, the species may play a role in local subsistence distribution and sharing networks given its availability and relationships to cultural practice (see Cultural Knowledge and Traditional Practices section above).

Harvest History

There are two resident and four nonresident brown bear hunts in Unit 23 under State regulations. Residents can hunt under the general season, which requires sealing or under the State’s subsistence hunt, which requires a registration permit and has similar requirements as the Federal hunt (i.e. salvage of edible meat, no use of aircraft, no sealing required). Spring and fall drawing and registration permits are available to nonresidents. To date, nonresident hunts have been undersubscribed (ADF&G 2017b).

Brown bear harvest from Unit 23 has increased steadily since 1992, although the number of bears taken for food by local residents is low (Westing 2013, Braem et al. 2015). The liberalization of brown bear hunting regulations in Unit 23 in order to reduce bear densities, human-bear conflicts, and bear predation on moose as well as to provide for traditional hunting practices and increase opportunity for other hunters has contributed to increased harvests (Westing 2013). Harvest data is from harvest reports and community household surveys and also includes bears taken in defense of life or property (DLP). However, many DLP kills are not reported because Unit 23 residents consider the reporting requirement as onerous or fear they have broken the law (Westing 2013). Local and nonlocal residents are considered Alaska residents living within and outside of Unit 23, respectively.

Between 1990 and 2016, reported Unit 23 brown bear harvest averaged 50 bears/year, ranging from 30-78 bears/year (**Figure 1**, Westing 2013, Saito 2017, pers. comm.). Over the same time period, Unit 23 residents, nonlocal residents, and nonresidents averaged 28%, 44%, and 27% of the reported Unit 23 brown bear harvest, respectively (**Figure 1**, Westing 2013, Saito 2017, pers. comm.). Prior to 1981, nonresidents accounted for most of the reported brown bear harvest in Unit 23; however, since 1992, nonlocal residents have reported the higher harvests (Westing 2013).

Most brown bears in Unit 23 are harvested under the general hunt by both local and nonlocal residents (**Figure 2**). Between 2002 and 2016, 68% of the harvest occurred under the general hunt and averaged 37 bears/year. Over the same time period, harvest under the subsistence registration permit accounted for only 3.5% of the harvest and averaged 1.8 bears/year (**Figure 2**, Westing 2013, Saito 2017, pers. comm.). Between 2011 and 2016, DLP kills averaged 1 bear/year and ranged from 0-3 bears/year (Saito 2017, pers. comm.).

Many bears taken by local residents are not reported (Ayers 1991, Westing 2013). According to household surveys between 1998 and 2012, brown bear harvest by Unit 23 communities (excluding Kotzebue) was approximately 17 bears/year and annual per capita harvest averaged 0.004 bears/person (Westing 2013). Westing (2013) combined the average annual Kotzebue brown bear harvest (8 bears/year) with the village per capita harvest estimates to determine that an estimated 20-30 brown bears are taken annually by local hunters. This is substantially more than the reported harvest by local residents, which averaged 14 bears/year between 1990 and 2016 (28% of 50 bears/year).

Between 1992 and 2011, the percent of males in the Unit 23 brown bear harvest exceeded the State management goal of a 3-year mean annual reported harvest of >50% boars (**Figure 3**). Harvest data do not indicate that overharvesting is occurring in Unit 23 based on data from the Lower Noatak River drainage (Westing 2013, ADF&G 2017b). However, due to the large number of unreported bear harvests and lack of population data across most of Unit 23, the impact of hunting on the Unit 23 brown bear population is unknown.

Additionally, overharvesting may already be occurring within accessible areas of GAAR such as floatable fishing rivers, which attract both people and bears. As bear density and productivity is low within GAAR, low levels of harvest may impact the population (July 2017, pers. comm.).

Bears are traditionally harvested in the spring and fall (FSB 1992). Most Unit 23 brown bear harvest occurs in September, often opportunistically when hunting moose or caribou. The second highest harvest month is April (Westing 2013). Airplanes are the most common transport method used to hunt brown bears in Unit 23, followed distantly by snowmachines and boats (Westing 2013). Federally qualified subsistence users usually access brown bear hunting locations by boat and snowmachines (Loon and Georgette 1989). Many local residents view brown bears as a nuisance or threat to subsistence activities (i.e. picking berries, drying fish) and conflicts with bears seem to be increasing (Westing 2013, ADF&G 2017b).

Most brown bears are harvested from the Noatak River drainage followed by the Kobuk River drainage. Few brown bears are harvested from the Selawik River, Wulik/Kivalina Rivers, and Northern Seward Peninsula drainages (Westing 2013). Westing (2013) suggests that heavily hunted portions of Unit 23 may be acting as “population sinks” where bears, especially boars, are continually replaced by bears from lightly hunted areas such the upper Noatak drainage and Brooks Range.

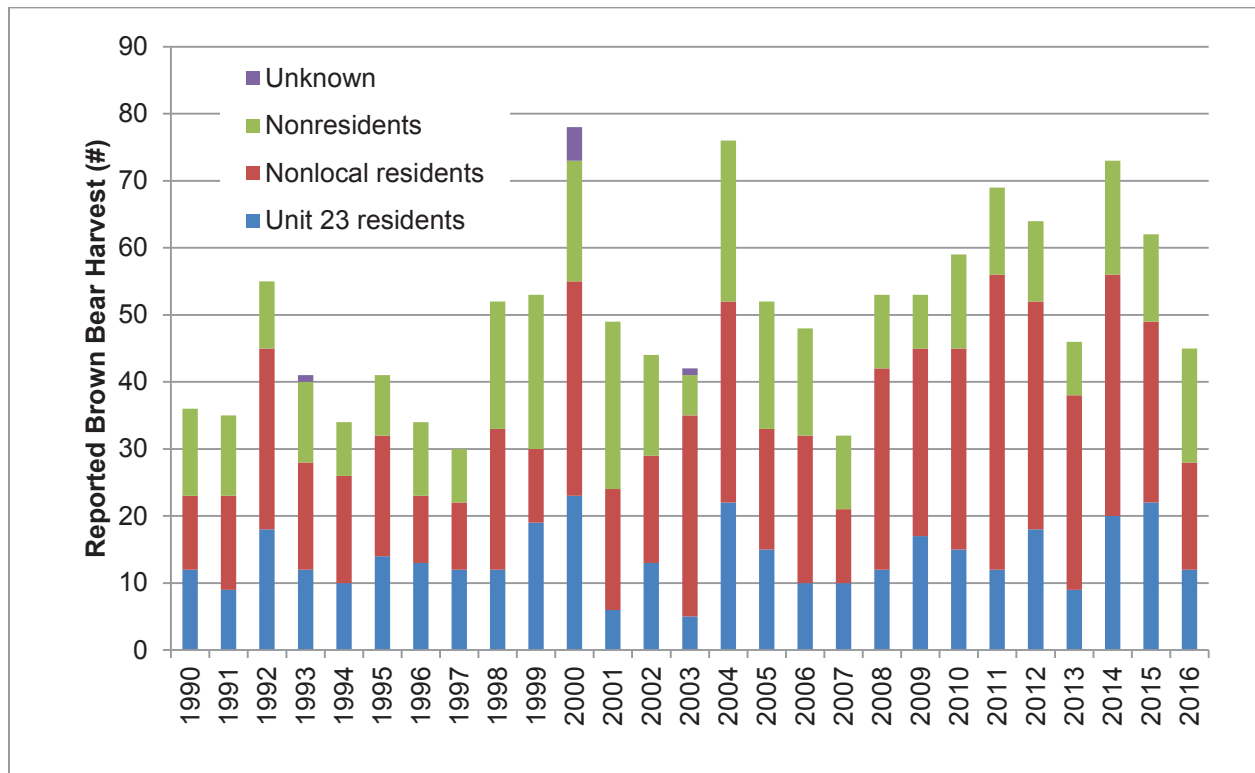


Figure 1. Reported Unit 23 brown bear harvest by residency (Westing 2013, Ayres 1991, Saito 2017, pers. comm.).

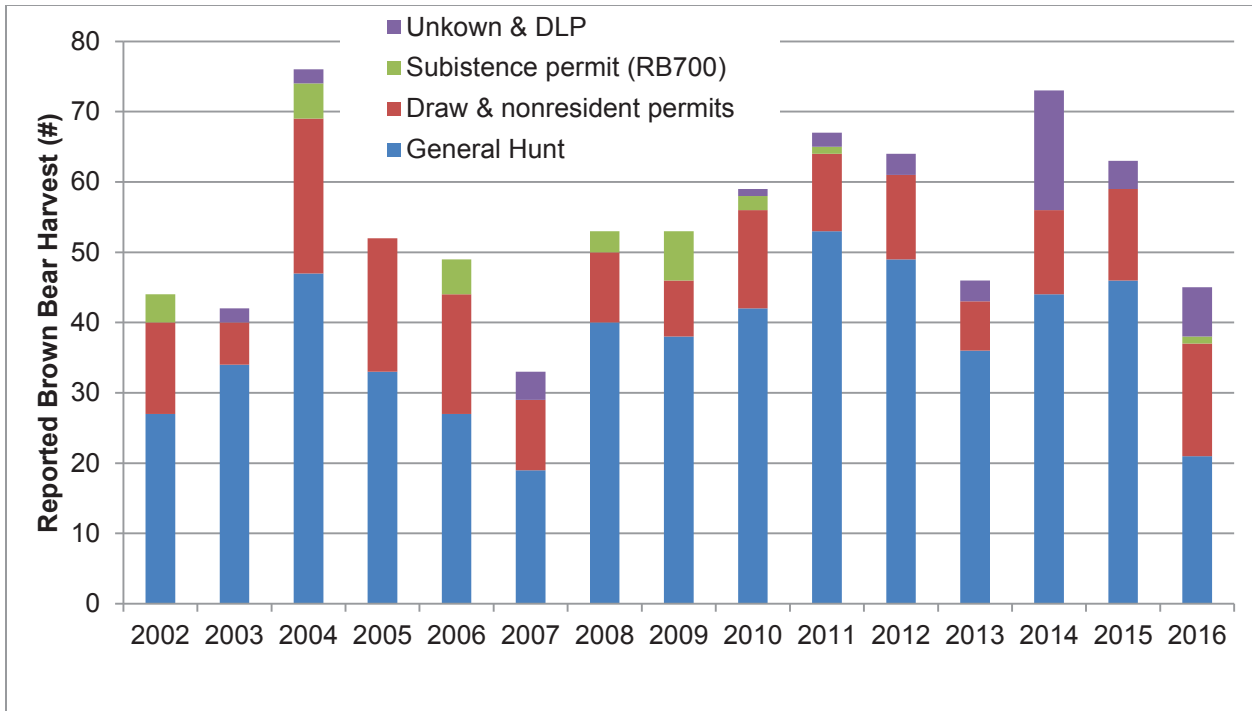


Figure 2. Reported Unit 23 brown bear harvest by hunt type (Westing 2013, Saito 2017, pers. comm.).

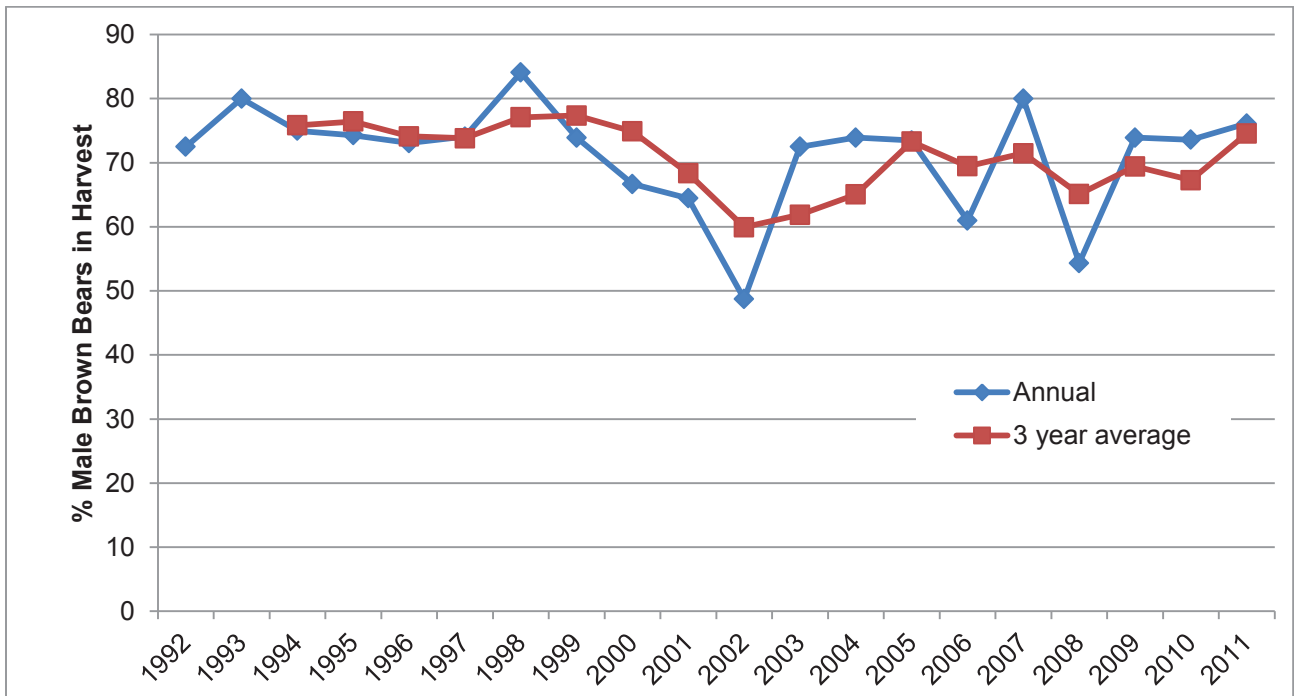


Figure 3. Percent of male brown bears in Unit 23 harvest.

Other Alternatives Considered

One alternative considered would be to adopt this proposal with modification to create a general season for brown bears in Unit 23 and authorize the customary trade of brown bear hides and skulls in Unit 23.

The modified regulation would read:

(j) Utilization of fish, wildlife, or shellfish

(13) You may sell the raw/untanned and tanned hide or cape from a legally harvested caribou, deer, elk, goat, moose, musk ox, and sheep.

*(i) You may sell **through customary trade**, the skull or raw/untanned or tanned hide, with claws attached, and the skull, from up to two brown bears legally harvested on Federal public lands in Unit 23, annually. Any skull or hide must be sealed by an ADF&G representative prior to its sale.*

Unit 23 – Brown Bear

Unit 23 – 1 bear by State subsistence registration permit Aug. 1 – May 31

OR

1 bear by Federal registration permit Aug. 1 – May 31

This alternative would provide Federally qualified subsistence users with additional opportunities to utilize, through customary trade, parts of legally harvested brown bears without significant modification of those parts under Federal regulations. Under this scenario, creating a general season for brown bears in Unit 23 would be necessary to provide a hunt that is uncoupled from the State's subsistence registration permit, given that State regulations for this hunt require that the front claws be removed and retained by the State at the time of sealing. While the proponent does not explicitly request the creation of a Federal general hunt, they do request the ability to retain and sell the front claws as is currently allowed under the State's general hunt. However, it should be made clear that according to 50 CFR 100.25(j)(2)(ii), the edible meat of any bear harvested under this general hunt would still need to be salvaged for human use.

This alternative may also increase harvest reporting as a result of sealing requirements associated with the sale of brown bear hides and skulls. However, if a Federally qualified subsistence user did not wish to sell the skull and hide of a harvested brown bear as provided for in this proposal, there would be no way to track

harvest of bears in Unit 23. Requiring the use of a Federal registration permit would alleviate this concern and allows for better management of the species.

Effects of the Proposal

If this proposal is adopted, the unaltered/untanned hides (with claws attached) and skulls of up to two brown bears annually could be sold under customary trade, provided that the brown bears are legally harvested by Federally qualified subsistence users on Federal public lands in Unit 23. This would provide Federally qualified subsistence users with an increased ability to legally utilize brown bear parts that are sometimes discarded in the field.

It is difficult to determine if adoption of this proposal would increase actual harvest or harvest reporting. As subsistence use of brown bears has been low, and all edible meat must be salvaged under Federal regulations, allowing the sale of up to two unaltered hides and skulls per year is not expected to result in a substantial increase in harvest. Additionally, Federally qualified subsistence users can already sell the unaltered hides and/or skulls of brown bears legally harvested in Unit 23 under State regulations. Furthermore, current Federal regulations require Federally qualified subsistence users to acquire a State subsistence registration permit to hunt brown bears in Unit 23. This permit allows hides and skulls of up to two bears annually to remain unsealed, unless “removed from subsistence area or presented for commercial tanning.” If sealing is required under the State subsistence permit, the skin of the head and front claws are removed and kept by ADF&G. However, this proposal request seeks the retention of hides with claws attached. If this proposal is adopted, there may be an increase in reporting of harvested brown bears due to the sealing requirements.

The sale of raw/unaltered brown bear hides under customary trade would need to support personal and family needs and not constitute a significant commercial enterprise as per the definition of customary trade set forth in 50 CFR §100.4. Because Federal hunting regulations link brown bear harvest in Unit 23 to the State’s subsistence registration permit for this species, and because the State now provides a resident harvest limit of two bears per regulatory year, unaltered brown bear hides and skulls may already be sold without sealing, provided that they are not removed from the subsistence area or presented for commercial tanning. If hides and skulls of bears legally harvested under State subsistence registration regulations are removed from the subsistence area or presented for commercial tanning, the skin of the head and front claws are removed and kept by ADF&G. Conversely, residents hunting under general State regulations may sell two tanned or untanned hides (with claws attached) and skulls, after sealing. The proponent of this proposal wishes to sell the raw / untanned hides (with claws attached) and skulls of brown bears under Federal subsistence regulations, which would require both the removal of the link to the State’s subsistence registration hunt in order to be able to retain and sell the front claws of brown bears after sealing, and the adoption of specific regulatory language authorizing the customary trade of brown bear hides and skulls in Unit 23.

There may be conservation concerns for this proposal. While biological data on brown bears in Unit 23 is sparse, the best available information suggests that the brown bear population is stable or increasing (Westing 2013, ADF&G 2017c, NPS 2017). Recent liberalization of State brown bear regulations

(increase resident harvest limit, extend nonresident season) were widely supported by local ACs, ADF&G, and the BOG, indicating no conservation concerns. While brown bear densities in GAAR are low and overharvesting may already be occurring in this area (July 2017, pers. comm.), GAAR comprises a minority of the Federal public lands in Unit 23. Additionally, most of the Unit 23 reported harvest occurs within the lower, not the upper, Noatak river drainage (Westing 2013). Therefore, the density estimates from the Lower Noatak survey area should be considered more appropriate for this proposal analysis. However, there are still many uncertainties regarding brown bear populations and harvest in Unit 23 and brown bear population are slow to recover from overharvest.

Additionally, this proposal would only apply to Federally qualified subsistence users who comprise a minority of reported Unit 23 brown bear harvest and an unknown proportion of total harvest. Adoption of this proposal would allow for increased utilization of harvested brown bears and provide an economic opportunity to Federally qualified subsistence users. It would also recognize a general pattern of customary trade of wildlife in Unit 23 and provide increased opportunity to engage in this practice within the mixed cash-subsistence economy of the region.

OSM PRELIMINARY CONCLUSION

Oppose Proposal WP18-44.

Justification

Adoption of this proposal is unlikely to significantly increase subsistence opportunities for area residents. Federally qualified subsistence users can already sell the unaltered hides and/or skulls of brown bears legally harvested in Unit 23 under the State's general hunting regulations. This includes brown bears harvested on Federal public lands (excluding NPS managed parks and monuments). Few residents of Unit 23 hunt brown bears under Federal or State subsistence regulations due to meat salvage and sealing requirements; these requirements would remain in place if this proposal was adopted.

There are law enforcement and conservation concerns regarding the sale of brown bear products. Global markets drive high prices for brown bear parts and are known to encourage poaching. Increasing market availability and/or prices of brown bear products may intensify illegal harvest from those populations. Tracking the illegal harvest and sale of brown bear products is difficult. Furthermore, customary trade of animal products may not rise to the level of a "significant commercial enterprise", but defining and enforcing the parameters of this is challenging. Given the unaltered nature of the products requested in this proposal, these products also do not meet the requirements of a "handicraft" which may already be sold under Federal subsistence regulations.

While there is evidence of a general pattern of customary trade of wildlife in Unit 23, there is no documented pattern as it relates specifically to brown bears, especially the hides and skulls of this species. The most recently documented harvest data for brown bears suggests that harvest by local residents for food is low. Additionally, the proponent lists several justifications for their request but none of these indicate that adoption of this proposal would facilitate patterns of customary trade. A member of the Northwest Arctic Council indicated that people of the region traditionally discarded the skull of brown bears in the field, and

that they do not generally utilize the hide of brown bears, but rather they more frequently utilize the meat and fat of the species.

Lastly, population data for brown bears in Unit 23 is sparse and variable. In GAAR, brown bear populations are considered low and overharvest may already be occurring. Brown bear populations are slow to recover from overharvest and commercial incentivization may increase the risk of overharvest from potentially vulnerable populations.

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WRITTEN PUBLIC COMMENTS

12
July 13, 2017

Federal Subsistence Board
Office of Subsistence Management
1011 East Tudor Road, MS 121
Anchorage, Alaska 99503
EMAILED TO: subsistence@FWS.gov



RE: Comments on subsistence proposals WP18-43 and WP18-44 and some general recommendations on approaches toward similar proposals

Sirs:

We write out of concern with the above-mentioned proposals to urge that they not be adopted.

Neither proposal provides any justification that includes mention of a “customary and traditional” use that would support their adoption. The Board should not adopt proposals that do not have a credible justification in customary and traditional use of the resource much less one that has no justification whatsoever of such a use.

Although we are aware that Loon and Georgette (1989) document customary and traditional use of brown bear meat in non-coastal areas of Unit 23, Proposal 43 (to increase the federal subsistence bag limit to 3 bears/year) is undercut by the acknowledgement in Proposal 44 (to allow sale of bear hides) that “...traditionally the Iñupiat do not care to obtain coastal brown bear meat and fat because they feed on carrion”. Proposal 44 also states that “traditionally, Iñupiat peoples of the region did not make handicrafts from bears skulls and hides as this was taboo”. Given these acknowledgements and the absence of description of how bears are/were used in a customary and traditional way, there is no basis provided that would support these proposals. Given the lack of direct justification based on customary and traditional uses, we believe these proposals have a basis in the desire of the proponents to reduce the bear population to some unspecified lower level because they find bears to be inconvenient in the various ways identified in the proposals. Inconvenience is not a customary and traditional use. What is customary and traditional is the ways the Native Americans of northwestern Alaska found to cope with co-existing with bears.

The justification for Proposal 43 has the following justifications which are addressed below:

1. The proponents assert that there is an “over-abundance” of brown bears in Unit 23”. No basis for this assertion is provided except for mentions of ways bears are inconvenient. The closest density estimates are in GMU 22 (Schmidt et al. 2017; Miller et al. 1997) and another one in Red Dog Mine area in Unit 23 (Ballard et al. 1993 and also reported in Miller et al. 1997). These estimates are both in the range considered typical for interior Alaska (Miller et. al. 1997). Another estimate by NPS for the Lower Noatak was recently conducted 2017 and is in process of being prepared; this estimate is reportedly higher than the others. Ecologically brown bears are an archetypical “K-selected” species characterized by low reproductive rates and population stability at carrying capacity of their environments or lower. We further note that harvests have been increasing in GMU 23 since the State initiated its “intensive management” program in 1995 (see figure at end of this letter). The 3 year running average harvest in 1997 was 29 bears

1

compared to 59 bears in 2015 (see figure below). This is a doubling of harvest over a 20 year period and if there is any demographic consequence from this it is unlikely to be an "overpopulation of bears".

2. "Reduce conflicts with brown bears". We have little doubt that such conflicts occur. However, the proponents of this proposal provide no information documenting levels of these conflicts or trends. Neither is information provided indicating an increase in bag limit would reduce such conflicts. Human-bear conflicts are best addressed by techniques that eliminate or reduce the ability of bears to obtain anthropogenic foods. If these steps are not taken, such conflicts will persist regardless of the level to which bears are reduced. We note that in North American, no group has a longer history of co-existence with bears (all 3 species) than native Alaskans and that some of this expertise could and should be used to reduce conflicts without reducing bear abundance. These techniques included elevated food caches which are proven effective and have been adopted by non-native peoples around the world to reduce conflicts with bears. Solar-powered electric fences are a modern innovation that could be usefully adopted as well to prevent bears from accessing cabins or food storage areas without resorting to killing bears.
3. "Reduce the effects of brown bears on disrupting caribou migratory patterns". The authors provide no support for the assertion that bears "disrupt" such patterns or that a change in bag limit would address such disruptions if they do exist. Bears will congregate where food is available and if this is, for example, in areas where caribou traditionally cross rivers or other natural corridors, bears will continue to seek out caribou in these areas of food availability. Trying to eliminate "disruptions" if they occur in such areas is a classic case of a population "sink" for bears. Bears will continue to show up in such attractive areas and be killed thereby depopulating bears from the much larger "source" population.
4. "Reduce destruction of cabins and taking of meat from boats by brown bears". We address this in point #2 above. Although these activities by bears are doubtless nuisances to some local residents, it is hard to see how they would be reduced without greatly reducing bear numbers to the point of near elimination.

Proposal 44 proposes to allow the sale of up to 2 raw/untanned brown bear hides (with claws attached and/or skulls) per regulatory year for qualified CT users. Such sales were initially allowed by state regulations last year and everyone in the state can already do this including all residents of Unit 23. Justifications offered are:

1. "Promote alignment with state with state regulations." We note that no "alignment" is needed as under state regulations such sales are already permitted for bears taken in Unit 23 under the state's general hunting regulations with a bag limit of 2/year. Adoption of this proposal would, in fact, misalign with state regulations with regard to where take can occur that would allow such sales. Most significantly, extension of subsistence regulations designed to reduce numbers of bears in federal conservation areas like National Parks, National Preserves, and National Wildlife Refuges will likely conflict with federal obligations to manage such areas for "natural diversity" consistent with NPS regulations adopted last year and published in the Federal Register. There should be a compelling reason based on well-established CT uses by qualified subsistence users before undercutting federal mandates to manage these areas in the national interest rather in the parochial interests of local residents. We further observe that a federal

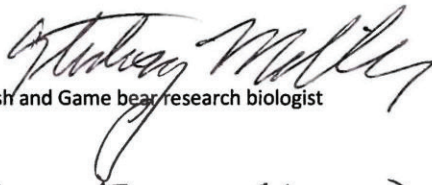
subsistence bag limit of 3 bears/year would “misalign” these regulations from the state bag limit and create confusion about whether the federal bag limit was additive to the state bag limit.

2. “Promote the increased utilization of harvested brown bears”. No “utilization” of brown bears is mentioned in this proposal which is internally inconsistent as it specifically acknowledges that brown bears are not traditionally used by Iñupiat people for either food or the making of handicraft items from brown bear parts. What this proposal would actually do is allow the commercialization by sale of hides from brown bears taken in National Parks, National Preserves, and National Wildlife Refuges (created by ANILCA in 1980) where only qualified CT users are allowed to hunt. This proposal provides no valid justification based on need or customary and traditional use that would justify such commercialization of wildlife on these National Interest Conservation units.
3. “Provide opportunity for profit”. The sale of untanned bear hides with claws attached and skulls is already allowed, since last year, under state regulations. Since this was just adopted last year there can be no recent customary and traditional use based on such sales and it would very likely be exceedingly dangerous to bear populations to institutionalize commercialization of bear parts especially on federal conservation areas like National Parks, Preserves, and Refuges. The commercialization of bears taken on federal national interest conservation lands conflicts with the objectives for management of these lands by federal land managers as described above in point #1 for Proposal 43. We believe that the subsistence provisions that are part of ANILCA are designed to assure continuation of customary and traditional uses by subsistence users and that the opportunity to “profit” by sale of wildlife parts is inconsistent with the intent of ANILCA.
4. “Reduce the overpopulation of bears in Unit 23.” This assertion is addressed above in point # 1 for Proposal 43.
5. “Reduce conflicts with brown bears in communities and camps”. This assertion is addressed above in point # 2 for Proposal 43.
5. “Reduce danger resulting from human and bear interactions.” This point is addressed above in point #2 for Proposal 43. We further note that the State has regulations allowing the take of bears in Defense of Life and Property situations so this justification is redundant.

As a general comment, we believe that the most likely reason for these proposals and others like them is to reduce the abundance of bears and other predators in the hope that this will result in making it easier for hunters to harvest caribou and moose in Unit 23. Although the western Arctic caribou is declining, there exist no evidence that this is a result of natural predation which has occurred for millennia and is cyclic. We believe the federal subsistence board should not adopt proposals designed to reduce predators on National Conservation Units and certainly not without sound justifications based on solid science. We suspect that such “uses” predicated on the assumed need for reducing predators are outside the intended scope of the subsistence provisions of ANILCA, conflict with other federal mandates to manage wildlife on National Interest Conservation Units for natural diversity in the national interest, have little likelihood of accomplishing the desired objectives absent extreme reductions in predator abundance, and have no justification based on the ways aboriginal Americans utilized wildlife populations during historical or prehistorical periods.

Thanks you for your consideration of these comments.

Sterling Miller
 Retired, Alaska Dept. Fish and Game bear research biologist
 PO Box 822
 Lolo, MT 59847-0822



Clait E. Braun
 Past President, The Wildlife Society
 Former editor, *Journal of Wildlife Management*
 5572 N. Ventana Vista Road
 Tucson, AZ 85750-7204



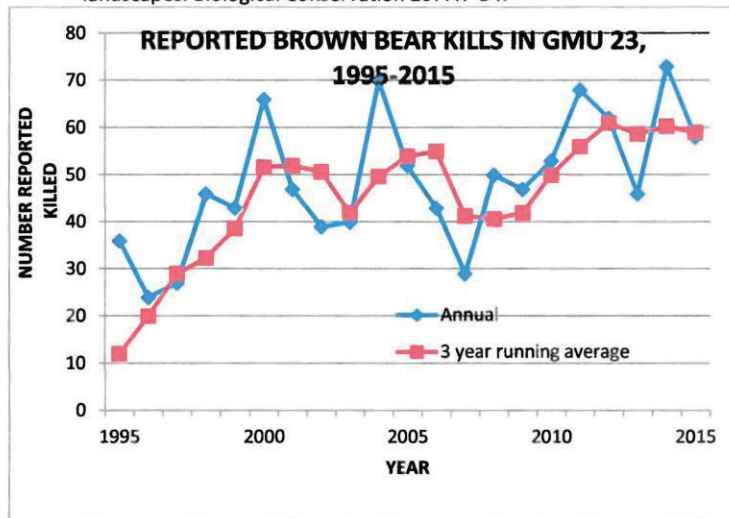
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WP18–45 Executive Summary	
General Description	Proposal WP18-45 requests that the caribou harvest limit in Unit 23 be reduced from 5 caribou per day to 3 caribou per day. <i>Submitted by: Northwest Arctic Subsistence Regional Advisory Council.</i>
Proposed Regulation	<p>Unit 23—Caribou</p> <p><i>Unit 23—that portion which includes all drainages north and west of, and including, the Singoalik River drainage</i> 3 5 <i>caribou per day as follows:</i></p> <p><i>Calves may not be taken.</i></p> <p><i>Bulls may be harvested</i> <i>July 1–Oct. 14</i> <i>Feb. 1–June 30</i></p> <p><i>Cows may be harvested.</i> <i>July 15–Apr. 30</i> <i>However, cows accompanied by calves may not be taken July 15–Oct. 14.</i></p> <p><i>Unit 23, remainder</i> 3 5 <i>caribou per day as follows:</i></p> <p><i>Calves may not be taken.</i></p> <p><i>Bulls may be harvested</i> <i>July 1–Oct. 31</i> <i>Feb. 1–June 30</i></p> <p><i>Cows may be harvested.</i> <i>July 31–March 31</i> <i>However, cows accompanied by calves may not be taken July 31–Oct. 14.</i></p>
OSM Preliminary Conclusion	Oppose
Southeast Alaska Subsistence Regional Advisory Council Recommendation	
Southcentral Alaska Subsistence Regional Advisory Council Recommendation	

WP18–45 Executive Summary	
Kodiak/Aleutians Subsistence Regional Advisory Council Recommendation	
Bristol Bay Subsistence Regional Advisory Council Recommendation	
Yukon-Kuskokwim Delta Subsistence Regional Advisory Council Recommendation	
Western Interior Alaska Subsistence Regional Advisory Council Recommendation	
Seward Peninsula Subsistence Regional Advisory Council Recommendation	
Northwest Arctic Subsistence Regional Advisory Council Recommendation	
Eastern Interior Alaska Subsistence Regional Advisory Council Recommendation	
North Slope Subsistence Regional Advisory Council Recommendation	

WP18–45 Executive Summary	
Interagency Staff Committee Comments	
ADF&G Comments	
Written Public Comments	None

**DRAFT STAFF ANALYSIS
WP18-45**

ISSUES

Proposal WP18-45, submitted by the Northwest Arctic Subsistence Regional Advisory Council (Northwest Arctic Council), requests that the caribou harvest limit in Unit 23 be reduced from 5 caribou per day to 3 caribou per day.

DISCUSSION

The proponent states that the proposed change is needed to conserve the Western Arctic caribou herd (WACH) population, which is currently declining and is a vital subsistence resource. The proponent notes that the requested change will still meet the needs of Federally qualified subsistence users.

Existing Federal Regulations**Unit 23—Caribou**

<i>Unit 23—that portion which includes all drainages north and west of, and including, the Singoalik River drainage</i>	<i>5 caribou per day as follows:</i>	
	<i>Calves may not be taken.</i>	
	<i>Bulls may be harvested</i>	<i>July 1–Oct. 14 Feb. 1–June 30</i>
	<i>Cows may be harvested. However, cows accompanied by calves may not be taken</i>	<i>July 15–Apr. 30 July 15–Oct. 14.</i>
<i>Unit 23, remainder</i>	<i>5 caribou per day as follows:</i>	
	<i>Calves may not be taken.</i>	
	<i>Bulls may be harvested</i>	<i>July 1–Oct. 31 Feb. 1–June 30</i>
	<i>Cows may be harvested. However, cows accompanied by calves may not be taken</i>	<i>July 31–March 31 July 31–Oct. 14.</i>

Proposed Federal Regulations

Unit 23—Caribou

<i>Unit 23—that portion which includes all drainages north and west of, and including, the Singoalik River drainage</i>	<i>3 5-caribou per day as follows:</i>		
	<i>Calves may not be taken.</i>		
	<i>Bulls may be harvested</i>		<i>July 1–Oct. 14 Feb. 1–June 30</i>
	<i>Cows may be harvested. However, cows accompanied by calves may not be taken</i>		<i>July 15–Apr. 30</i>
	<i>July 15–Oct. 14.</i>		
<i>Unit 23, remainder</i>	<i>3 5-caribou per day as follows:</i>		
	<i>Calves may not be taken.</i>		
	<i>Bulls may be harvested</i>		<i>July 1–Oct. 31 Feb. 1–June 30</i>
	<i>Cows may be harvested. However, cows accompanied by calves may not be taken</i>		<i>July 31–March 31</i>
	<i>July 31–Oct. 14.</i>		

Existing State Regulations

Unit 23—Caribou

<i>23, north of and including Singoalik River drainage</i>	<i>Residents—Five caribou per day; however, calves may not be taken.</i>	<i>Bulls</i>	<i>RC907</i>	<i>July 1-Oct. 14 Feb. 1-June 30</i>
		<i>Cows</i>	<i>RC907</i>	<i>Jul. 15-Apr. 30</i>
			<i>HT</i>	<i>Aug. 1-Sept. 30</i>
<i>23 remainder</i>	<i>Residents—Five caribou per day; however, calves may not be taken.</i>	<i>Bulls</i>	<i>RC907</i>	<i>July 1-Oct. 14 Feb. 1-June 30</i>
		<i>Cows</i>	<i>RC907</i>	<i>Sept. 1-Mar. 31</i>
			<i>HT</i>	<i>Aug. 1-Sept. 30</i>
	<i>Nonresidents—One bull; however, calves may not be taken</i>			

Extent of Federal Public Lands

Federal public lands comprise approximately 71% of Unit 23 and consist of 40% National Park Service (NPS) managed lands, 22% Bureau of Land Management (BLM) managed lands, and 9% U.S. Fish and Wildlife Service (USFWS) managed lands.

Customary and Traditional Use Determinations

Residents of Unit 21D west of the Koyukuk and Yukon Rivers, Galena, 22, 23, 24 including residents of Wiseman but not including other residents of the Dalton Highway Corridor Management Area, and 26A have a customary and traditional use determination for caribou in Unit 23 (**Map 1**).

Regulatory History

In 1990, the caribou hunting season in Unit 23 was open year round with a 5 caribou per day harvest limit and a restriction on the take of cows May 16-June 30.

In 1995, the Federal Subsistence Board (Board) adopted Proposal P95-51 to increase the caribou harvest limit from 5 to 15 caribou per day so that subsistence hunters could maximize their hunting efforts when caribou were available (FWS 1995a).

In 1997, the Board adopted Proposal P97-66 with modification to provide a customary and traditional use determination for caribou in Unit 23 for rural residents of Unit 21D west of the Koyukuk and Yukon rivers, Galena, Units 22, 23, 24 including residents of Wiseman, but not other residents of the Dalton Highway Corridor Management Area and Unit 26A (**Map 1**, FWS 1995b, 1997).

In 2000, the Board adopted Proposal WP00-53 with modification, allowing the use of snowmachines to position a hunter to select individual caribou for harvest in Units 22 and 23. This was done to recognize a customary and traditional practice in the region (FWS 2000a).

In 2013, an aerial photo census indicated significant declines in the Teshekpuk Caribou herd (TCH), WACH, and possibly the Central Arctic Caribou Herd (CACH) populations (Caribou Trails 2014). In response, the Alaska Board of Game (BOG) adopted modified Proposal 202 (RC76) in March 2015 to reduce harvest opportunities for both Alaska residents and nonresidents within the range of the WACH and the TCH. These regulation changes – which included lowering bag limits for nonresidents from two caribou to one bull, reductions in bull and cow season lengths, the establishment of new hunt areas, and prohibiting calf harvest – were adopted to slow or reverse the population decline. The regulatory changes took effect on July 1, 2015.

In 2015, four special actions, WSA15-03/04/05/06, requesting changes to caribou regulations in Units 23, 24, and 26, were submitted by the North Slope Council and approved with modification by the Board, effective July 1, 2015. Temporary Special Action WSA15-03 requested designation of a new hunt area for caribou in the northwest corner of Unit 23 where the harvest limit would be reduced from 15 to 5 caribou per day, the harvest season would be shortened for bulls and cows, and the take of calves would be

prohibited. The Board did not establish a new hunt area, applying the restrictions to all of Unit 23 and also prohibited the take of cows with calves. These State and Federal regulatory changes were the first time that harvest restrictions had been implemented for the WACH in over 30 years.

Five proposals (WP16-37, WP16-48, WP16-49/52, and WP16-61) concerning caribou regulations in Unit 23 were submitted to the Board for the 2016-2018 wildlife regulatory cycle. The Board adopted WP16-48 with modification to allow the positioning of a caribou, wolf, or wolverine for harvest on BLM lands only. Proposal WP16-37 requested that Federal caribou regulations mirror the new State regulations across the ranges of the WACH and TCH (Units 21D, 22, 23, 24, 26A, and 26B). The Board adopted Proposal WP16-37 with modification to reduce the harvest limit to 5 caribou per day, restrict bull season during rut and cow season around calving, prohibit the harvest of calves and the harvest of cows with calves before weaning (mid-Oct.), and to create a new hunt area in the northwest corner of Unit 23. The Board took no action on the remaining proposals (WP16-49/52, and WP16-61) because of action taken on WP16-37.

In 2015, the Northwest Arctic Council submitted a temporary special action request (WSA16-01) to close caribou hunting on Federal public lands in Unit 23 to non-Federally qualified users (NFQU) for the 2016/17 regulatory year. The Council stated that their request was necessary for conservation purposes but also needed because nonlocal hunting activities were negatively affecting subsistence harvests. In April 2016, the Board approved WSA16-01, basing its decision on the strong support of the Northwest Arctic and North Slope Councils, public testimony in favor of the request, as well as concerns over conservation and continuation of subsistence uses (FSB 2016).

In June 2016, the State submitted a special action request (WSA16-03) to reopen caribou hunting on Federal public lands in Unit 23 to NFQU, providing new biological information (e.g. calf recruitment, weight, body condition) on the WACH. The State specified that there was no biological reason for the closure and that it could increase user conflicts. In January 2017, the Board rejected WSA16-03 due to the position of all four affected Councils (Northwest Arctic, North Slope, Seward Peninsula, and Western Interior) as well as public testimony and Tribal consultation comments opposing the request. Additionally, the Board found the new information provided by the State to be insufficient to rescind the closure.

In January 2017, the BOG adopted Proposal 2, requiring registration permits for residents hunting caribou within the range of the Western Arctic and Teshekpuk herds in Units 21, 23, 24, and 26 (a similar proposal was passed for Unit 22 in 2016). The Alaska Department of Fish and Game (ADF&G) submitted the proposal in order to better monitor harvest and improve management flexibility. Also in January 2017, the BOG rejected Proposal 45, which proposed requiring big game hunting camps to be spaced at least three miles apart along the Noatak, Agashashok, Eli, and Squirrel Rivers. The proposal failed as it would be difficult to enforce.

In March 2017, the Northwest Arctic and North Slope Councils submitted temporary special action requests (WSA17-03 and -04, respectively) to close caribou hunting on Federal public lands in Unit 23 and in Units 26A and 26B, respectively, to non-Federally qualified users for the 2017/18 regulatory year. Both Councils stated that the intent of the proposed closures was to ensure subsistence use in the 2017/18

regulatory year, to protect declining caribou populations, and to reduce user conflicts. The Board voted to approve WSA17-03 with modification to close all Federal public lands within a 10 mile wide corridor (5 miles either side) along the Noatak River from the western boundary of Noatak National Preserve upstream to the confluence with the Cutler River; within the northern and southern boundaries of the Eli and Agashashok River drainages, respectively; and within the Squirrel River drainage, to caribou hunting except by Federally qualified subsistence users for the 2017/18 regulatory year. The Board considered the modification a reasonable compromise for all users and that closure of the specified area was warranted in order to continue subsistence use. The Board rejected WSA17-04 due to recent changes to State regulations that should reduce caribou harvest.

Controlled Use Areas

In 1988, the Traditional Council of Noatak submitted a proposal to the BOG to create the Noatak Controlled Use Area (CUA) in order to restrict the use of aircraft in any manner for big game hunting Aug. 15 - Sept. 20 due to user conflicts (Fall 1990:86). The proposed CUA extended five miles on either side of the Noatak River, from the mouth of the Eli River upstream to the mouth of the Nimiuktuk River, including the north side of Kivivik Creek (ADF&G 1988:47). The BOG adopted the proposal with modification to close a much smaller area extending from the Kugururok River to Sapun Creek from Aug. 20-Sept. 20.

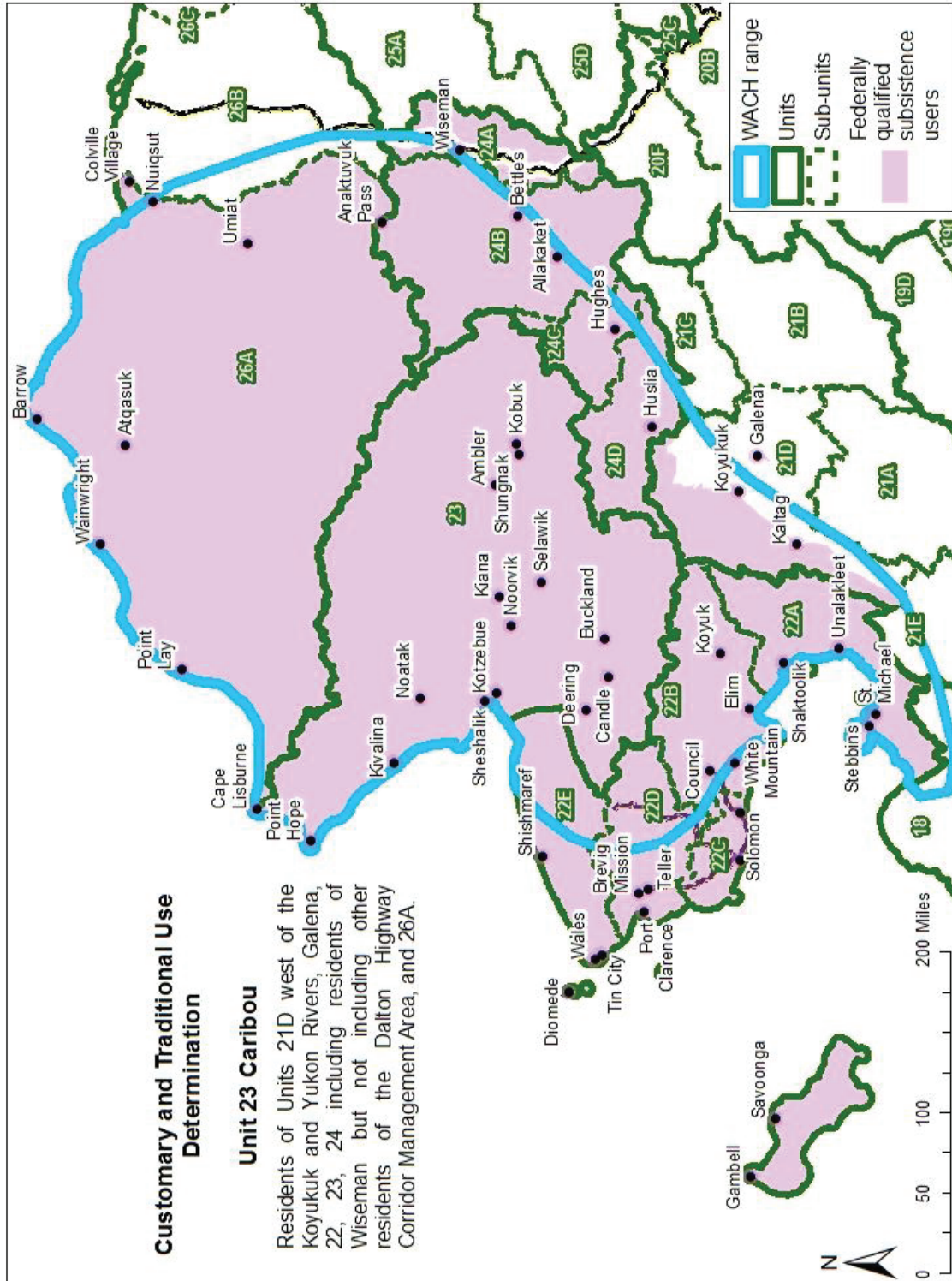
The CUA was expanded in 1994 and modified in 2017 (Betchkal 2015, Halas 2015, ADF&G 2017a). From 1994-2016, the Noatak CUA consisted of a 10-mile wide corridor (5 miles either side) along the Noatak River from its mouth to Sapun Creek with approximately 80 miles of the CUA within Noatak National Preserve (NP) (**Map 2**, Betchkal 2015). The closure dates from 1994-2009 were Aug. 25-Sept. 15. In 2009 (effective 2010), the BOG adopted Proposal 22 to expand the closure dates to Aug. 15-Sept. 30 in response to the timing of caribou migration becoming less predictable (ADF&G 2009). During the 2016/17 BOG regulatory cycle, the Noatak/Kivalina & Kotzebue AC proposed (Proposal 44) extending the upriver boundary of the Noatak CUA to the Cutler River, citing increased user conflicts as their rationale (ADF&G 2017b). In January 2017, the BOG approved amended Proposal 44 to shift the boundaries of the Noatak CUA to start at the mouth of the Agashashok River and end at the mouth of the Nimiuktuk River with approximately 105 miles within Noatak NP (**Map 2**, ADF&G 2017a).

In 1990, the Noatak CUA was adopted under Federal regulations. In 1995, the Board adopted Proposal P95-50 to expand the time period and area of the CUA to Aug. 25-Sept. 15 and the mouth of the Noatak River upstream to the mouth of Sapun Creek, respectively, which aligned with current State regulations. In 2008, Proposals WP08-50 and 51 requested modifications to the Noatak CUA dates. These proposals were submitted in response to caribou migration occurring later in the season, to improve caribou harvest for subsistence users, and to decrease conflicts between local and nonlocal hunters. The Board deferred these proposals to the next regulatory cycle. In 2010, Proposals WP10-82, 83, and 85 requested similar date changes. The Board adopted WP10-85 to expand the time period during which aircraft are restricted in the Noatak CUA to Aug. 15-Sept. 30, which aligned with the current State regulations.

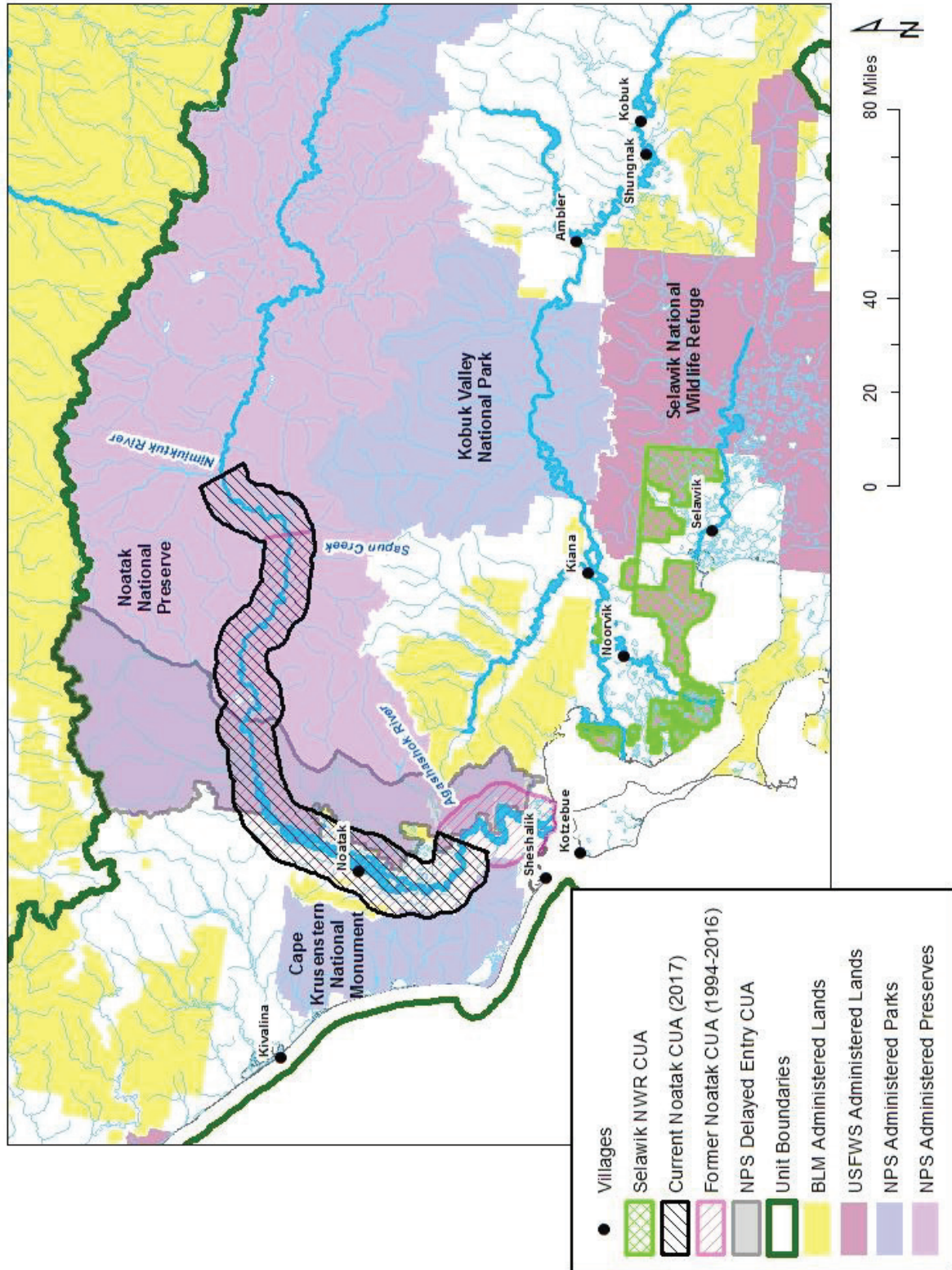
In 2011, Selawik National Wildlife Refuge (NWR) designated refuge lands in the northwest portion of the refuge as closed to big game hunting by commercial guides and transporters through their comprehensive

conservation plan (FWS 2011, 2014). These refuge lands are intermingled with private lands near the villages of Noorvik and Selawik (**Map 2**). The purpose of this closure was to minimize trespass on private lands and to reduce user conflicts (FWS 2011).

In 2012, the NPS established a Special Commercial Use Area or “delayed entry zone” in the western portion of the Noatak NP (Halas 2015, Fix and Ackerman Fix 2015). Within this zone, transporters can only transport nonlocal caribou hunters after September 15 unless otherwise specified by the Western Arctic Parklands (WEAR) superintendent in consultation with commercial operators, other agencies and local villages (Halas 2015). The purpose of this zone is to allow a sufficient number of caribou to cross the Noatak River and establish migration routes, to limit interactions between local and nonlocal hunters, and to allow local hunters the first opportunity to harvest caribou in that area (**Map 2**, FWS 2014, Halas 2015). To date, the Superintendent has not used his/her authority to alter the closure dates in response to changes in caribou herd migration or to meet the needs of local hunters (Halas 2015).



Map 1. Customary and Traditional (C&T) Use Determination for caribou in Unit 23. C&T Determinations indicate which Alaska rural residents are Federally qualified subsistence users. The WACH range indicates which residents are considered local in State management reports.



Map 2. Controlled Use Areas (CUAs) in Unit 23.

Current Events

Several other proposals concerning Federal caribou harvest regulations in Unit 23 and the WACH were submitted for the 2018-2020 wildlife regulatory cycle (WP18-32, 46/47, 48/49, and 57). The outcome of these related proposals could impact the effects of this proposal (i.e. closures).

At the WACH Working Group meeting in December 2016, the group voted to submit two wildlife proposals. Proposal WP18-46 is to close Federal public lands in Unit 23 to caribou hunting by NFQUs. Proposal WP18-48 is to require registration permits for caribou hunting in Units 22, 23, and 26A, which are also required under State regulations. Louis Cusack also submitted Proposal WP18-49 to require registration permits in these units.

At the Western Interior Council meeting in February 2017, the Council voted to submit Proposal WP18-32 to align caribou seasons across the ranges of the WACH, TCH, and CACH. The intent of this proposal is to protect cows during migration. The Council intends to submit a similar proposal to the BOG.

At the North Slope Council meeting in March 2017, the Council voted to submit Proposal WP18-57 to close Federal public lands to caribou hunting by NFQUs in Units 26A and 26B (similar to WSA17-04). This is in response to declines in the WACH, TCH, and CACH, which are seasonally present in the area.

Enoch Mitchell also submitted Proposal WP18-47 to close Federal public lands in Unit 23 to caribou hunting by NFQUs for the 2018/19- 2020/21 regulatory years. The Native Village of Noatak, Cape Krusenstern National Monument Subsistence Resource Commission (SRC), Kobuk Valley National Park SRC, and the Noatak/Kivalina Fish and Game Advisory Committee co-sponsored the proposal.

Biological Background

Caribou abundance naturally fluctuates over decades (Gunn 2001, WACH Working Group 2011). Gunn (2001) reports the mean doubling rate for Alaskan caribou as 10 ± 2.3 years. Although the underlying mechanisms causing these fluctuations are uncertain, climatic oscillations (i.e. Arctic and Pacific Decadal Oscillations) may play an important role (Gunn 2001, Joly et al. 2011). Climatic oscillations can influence factors such as snow depth, icing, forage quality and growth, wildfire occurrence, insect levels, and predation, which all contribute to caribou population dynamics (Joly et al. 2011). Density-dependent reduction in forage availability, resulting in poorer body condition may exacerbate caribou population fluctuations (Gunn 2001).

Caribou calving generally occurs from late May to mid-June (Dau 2013). Weaning generally occurs in late October and early November before the breeding season (Taillon et al. 2011). Calves stay with their mothers through their first winter, which improves calves' access to food and body condition (Holand et al. 2012). Calves orphaned after weaning (October) have greater chances of survival than calves orphaned before weaning (Holand et al. 2012, Joly 2000, Russell et al. 1991, Rughetti and Fest-Bianchet 2014).

The TCH, WACH, and CACH have ranges that overlap in Unit 26A (**Map 3**), and there can be considerable mixing of herds during the fall and winter. During the 1970s, there was little overlap between these herds,

but the degree of mixing seems to be increasing. Currently, the WACH, TCH, and CACH populations are all declining (Dau 2011, 2015a, Lenart 2011, Parrett 2011, 2015c, 2015d).

The WACH has historically been the largest caribou herd in Alaska and has a home range of approximately 157,000 square miles in northwestern Alaska. In the spring, most mature cows move north to calving grounds in the Utukok Hills, while bulls and immature cows lag behind and move toward summer range in the Wulik Peaks and Lisburne Hills (**Map 4**, Dau 2011, WACH Working Group 2011).

Dau (2013) determined the calving dates for the WACH to be June 9–13. This is based upon long-term movement and distribution data obtained from radio-collared caribou (these are the dates cows ceased movements). After the calving period, cows and calves move west toward the Lisburne Hills where they mix with the bulls and non-maternal cows. During the summer, the herd moves rapidly to the Brooks Range.

In the fall, the herd moves south toward wintering grounds in the northern portion of the Nulato Hills. Rut occurs during fall migration (Dau 2011, WACH Working Group 2011). Dau (2013) determined the WACH rut dates to be October 22–26 based on back-calculations from calving dates using a 230 day gestation period. Since about 2000, the timing of fall migration has been less predictable, often occurring later than in previous decades (Dau 2015a). From 2010-2015, the average date that GPS collared caribou crossed the Noatak River ranged from Sep. 30 – Oct. 23 (Joly and Cameron 2017). The proportion of caribou using certain migration paths varies each year (**Figure 1**, Joly and Cameron 2017). In recent years (2012-2014), the path of fall migration has shifted east (Dau 2015a).

The WACH Working Group developed a WACH Cooperative Management Plan in 2003, and revised it in 2011 (WACH Working Group 2011). The WACH Management Plan identifies seven plan elements: cooperation, population management, habitat, regulations, reindeer, knowledge, and education as well as associated goals, strategies, and management actions. As part of the population management element, the WACH Working Group developed a guide to herd management determined by population size, population trend, and harvest rate. Population sizes guiding management level determinations were based on recent (since 1970) historical data for the WACH (WACH Working Group 2011). Revisions to recommended harvest levels under liberal and conservative management (+/- 100 - 2,850 caribou) were made in December 2015 (WACH Working Group 2015, **Table 1**). The State of Alaska manages the WACH to protect the population and its habitat, provide for subsistence and other hunting opportunities on a sustained yield basis, and provide for viewing and other uses of caribou (Dau 2011). State management objectives for the WACH are the same as the goals specified in the WACH Management Plan (Dau 2011, WACH Working Group 2011) and include:

- Encourage cooperative management of the WACH among State, Federal, local entities, and all users of the herd.
- Manage for healthy populations using management strategies adapted to fluctuating population levels and trends.
- Assess and protect important habitats.
- Promote consistent and effective State and Federal regulations for the conservation of the WACH.

- Seek to minimize conflict between reindeer herders and the WACH.
- Integrate scientific information, traditional ecological knowledge of Alaska Native users, and knowledge of all users into management of the herd.
- Increase understanding and appreciation of the WACH through the use of scientific information, traditional ecological knowledge of the Alaska Native users, and knowledge of all other users.

The WACH population declined rapidly in the early 1970s, bottoming out at about 75,000 animals in 1976. Aerial photo censuses have been used since 1986 to estimate population size. The WACH population increased throughout the 1980s and 1990s, peaking at 490,000 animals in 2003 (**Figure 2**). Since 2003, the herd has declined at an average annual rate of 7.1% from approximately 490,000 caribou to 200,928 caribou in 2016 (Caribou Trails 2014; Dau 2011, 2014, Parrett 2016a).

Between 1982 and 2011, the WACH population was within the liberal management level prescribed by the WACH Working Group (**Figure 2, Table 1**). In 2013, the herd population estimate fell below the population threshold for liberal management of a decreasing population (265,000), slipping into the conservative management level. ADF&G conducted a successful photocensus of the WACH on July 1, 2016. This census resulted in a minimum count of 194,863 caribou with a point estimate of 200,928 (Standard Error = 4,295), suggesting the WACH is still within the conservative management level, although close to the threshold for preservative management (**Figure 2, Table 1**). Results of this census indicate an average annual decline of 5% per year since 2013, representing a much lower rate than the 15% annual decline between 2011 and 2013. The large cohorts of 2015 and 2016, which currently comprise a substantial proportion of the herd, contributed to the recent decreased rate of decline, but remain vulnerable to difficult winter conditions due to their young age (Parrett 2016a). ADF&G is planning to conduct another photocensus in the summer of 2017 and is also transitioning from film to digital cameras, which will enhance their ability to complete successful and timely censuses (Parrett 2016a, Parrett 2017, pers. comm.).

Between 1970 and 2016, the bull:cow ratio exceeded critical management levels in all years except 1975, 2001, and 2014 (**Figure 3**). Reduced sampling intensity in 2001 likely biased the 2001 bull:cow ratio low (Dau 2013). Since 1992, the bull:cow ratios has trended downward (Dau 2015a). The average annual number of bulls:100 cows was greater during the period of population growth (54:100 between 1976–2001) than during the recent period of decline (44:100 between 2004–2016). Additionally, Dau (2015a) states that while trends in bull:cow ratios are accurate, actual values should be interpreted with caution due to sexual segregation during sampling and the inability to sample the entire population, which likely account for more annual variability than actual changes in composition.

Although factors contributing to the decline are not known with certainty, increased adult cow mortality, and decreased calf recruitment and survival played a role (Dau 2011). Since the mid-1980s, adult mortality has slowly increased while recruitment has slowly decreased (Dau 2013, **Figure 4**). In a population model developed specifically for the WACH, Prichard (2009) found adult survival to have the largest impact on population size.

Calf production has likely had little influence on the population trajectory (Dau 2013, 2015a). Between 1990 and 2003, the June calf:cow ratio averaged 66 calves:100 cows/year. Between 2004 and 2016, the June calf:cow ratio averaged 71 calves:100 cows/year (**Figure 5**). In June 2016, 85 calves:100 cows were observed, which approximates the highest parturition level ever recorded for the herd (86 calves:100 cows in 1992) (Dau 2016a).

Decreased calf survival through summer and fall and recruitment into the herd are likely contributing to the current population decline (Dau 2013, 2015a). Fall calf:cow ratios indicate calf survival over summer. Between 1976 and 2016, the fall calf:cow ratio ranged from 35 to 59 calves:100 cows/year, averaging 46 calves:100 cows/year (**Figure 5**). Fall calf:cow ratios declined from an average of 46 calves:100 cows/year between 1990-2003 to an average of 42 calves:100 cows/year between 2004-2016 (Dau 2015a, **Figure 5**). Since 2008, ADF&G has recorded calf weights at Onion Portage as an index of herd nutritional status. In September 2015, calf weights averaged 100 lbs., the highest average ever recorded (Parrett 2015b).

Similarly, the ratio of short yearlings (SY, 10-11 months old caribou) to adults provides a measure of overwintering calf survival and recruitment. Between 1990 and 2003, SY:adult ratios averaged 20 SY:100 adults/year. Since the decline began in 2003, SY:adult ratios have averaged 16 SY:100 adults/year (2004-2016, **Figure 5**). However, 23 SY:100 adults were observed during spring 2016 surveys, the highest ratio recorded since 2007 (Dau 2016b). The overwinter calf survival for the 2015 cohort (Oct. 2015-Jun. 2016) was 84% (Parrett 2016b). While 2016 indices suggest improvements in recruitment, the overall trend since the early 1980s has been downward (Dau 2015a, 2016b).

Increased cow mortality is likely affecting the trajectory of the herd as well (Dau 2011, 2013). The annual mortality rate of radio-collared adult cows increased from an average of 15% between 1987 and 2003 to 23% from 2004–2014 (Dau 2011, 2013, 2014, 2015a, **Figure 4**). Estimated mortality includes all causes of death including hunting (Dau 2011). Dau (2015a) states that cow mortality estimates are conservative due to exclusion of unhealthy (i.e. diseased) and yearling cows. Dau (2013) attributed the high mortality rate for 2011–2012 (33%, **Figure 4**) to a winter with deep snows, which weakened caribou and enabled wolves to prey on them more easily. Prior to 2004, estimated adult cow mortality only exceeded 20% twice, but has exceeded 20% in 7 out of 9 regulatory years between 2004 and 2012 (**Figure 4**). The annual mortality rate was 8% as of April 2016 (Dau 2016b). This may fluctuate substantially throughout the year based on changing local conditions and harvest levels. Dau (2015a) indicates that mortality rates may also change in subsequent management reports as the fate of collared animals is determined, and that these inconsistencies are most pronounced for the previous 1–3 years.

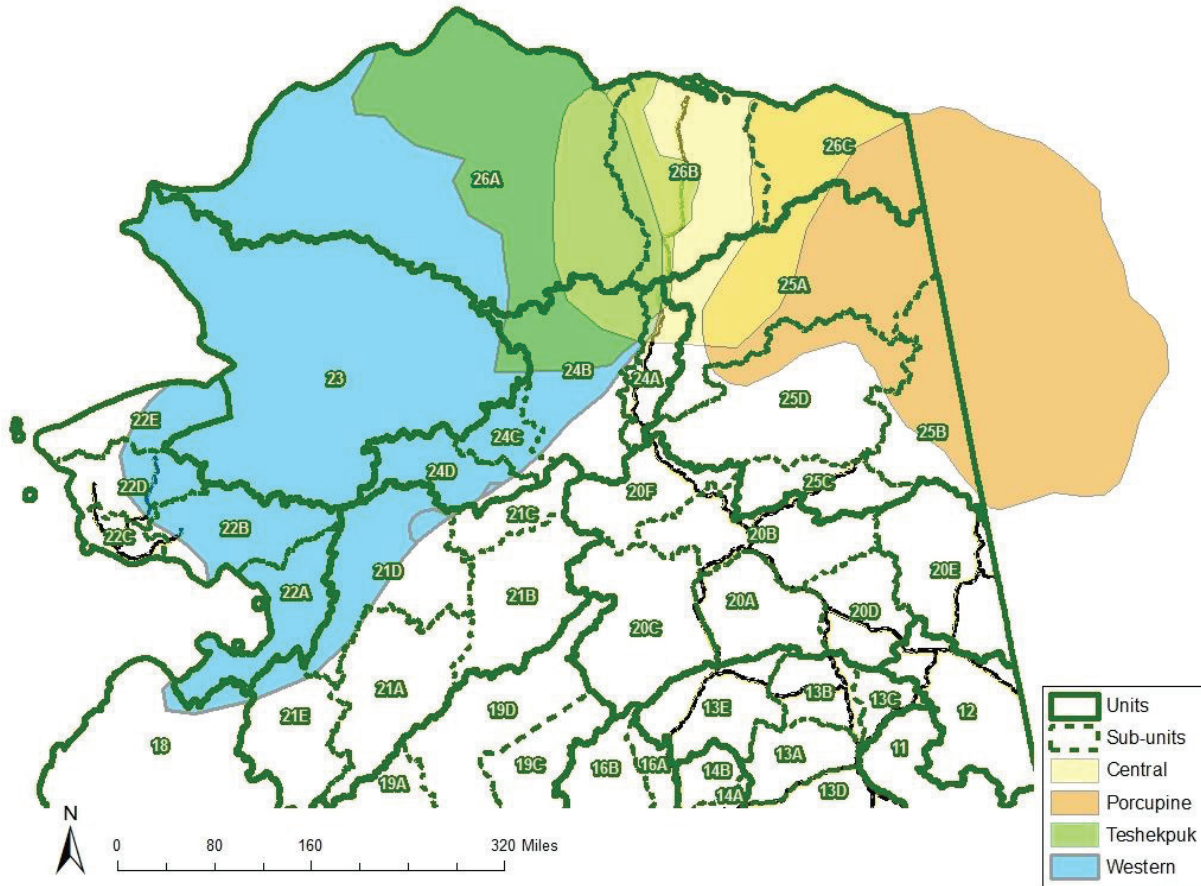
Far more caribou died from natural causes than from hunting between 1992 and 2012 (Dau 2013). Cow mortality remained constant throughout the year, but natural and harvest mortality for bulls spiked during the fall. Predation, particularly by wolves, accounted for the majority of natural mortality (Dau 2013). However as the WACH has declined and estimated harvest has remained relatively stable, the percentage of mortality due to hunting has increased relative to natural mortality. For example, during the period October 1, 2013 to September 30, 2014, estimated hunting mortality was approximately 42% and estimated natural mortality about 56% (Dau 2014). In previous years (1983–2013), the estimated hunting mortality

exceeded 30% only once in 1997-1998 (Dau 2013). Additionally, Prichard (2009) and Dau (2015a) suggest that harvest levels and rates of cows can greatly impact population trajectory. If bull:cow ratios continue to decline, harvest of cows may increase, exacerbating the current population decline.

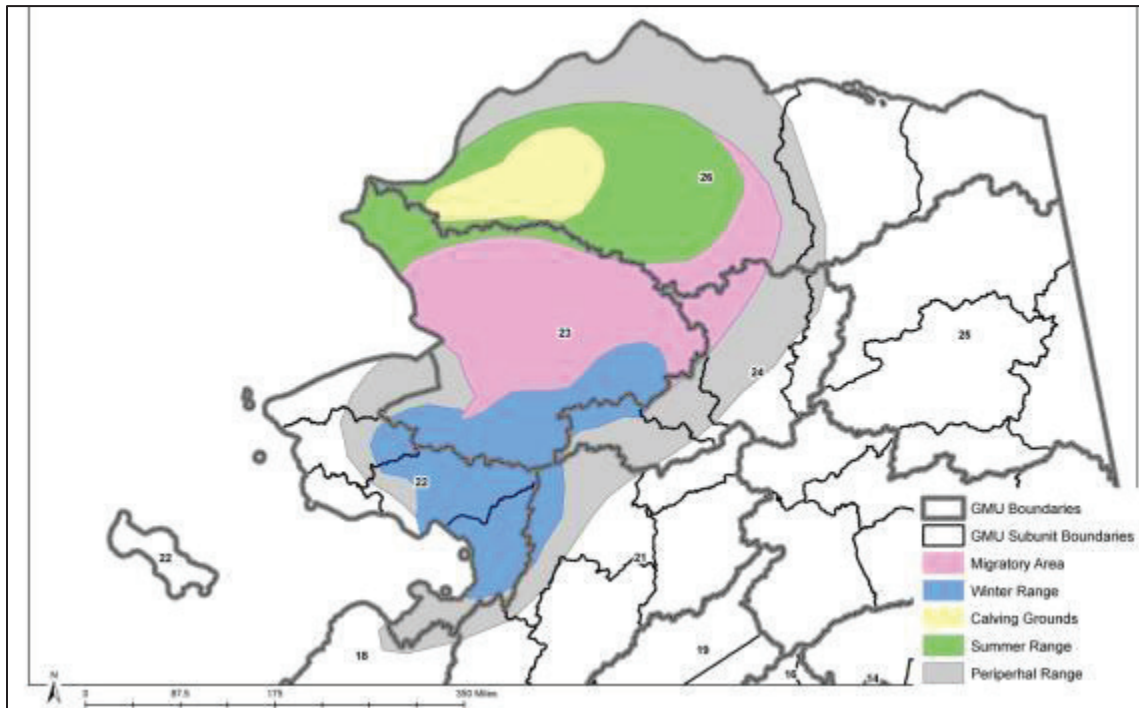
Dau (2015a) cites fall and winter icing events as the primary factor initiating the population decline in 2003. Increased predation, hunting pressure, deteriorating range condition (including habitat loss and fragmentation), climate change, and disease may also be contributing factors (Dau 2015a, 2014). Joly et al. (2007) documented a decline in lichen cover in portions of the wintering areas of the WACH. Dau (2011, 2014) reported that degradation in range condition is not thought to be a primary factor in the decline of the herd because animals have generally maintained good body condition since the decline began. Body condition is assessed on a subjective scale from 1-5. The fall body condition of adult females in 2015 was characterized as “fat” (mean= 3.9/5) with no caribou being rated as skinny or very skinny (Parrett 2015b). However, the body condition of the WACH in the spring may be a better indicator of the effects of range condition versus the fall when the body condition of the herd is routinely assessed and when caribou are in prime condition (Joly 2015, pers. comm.).

Habitat

Caribou feed on a wide variety of plants including lichens, fungi, sedges, grasses, forbs, and twigs of woody plants. Arctic caribou depend primarily on lichens during the fall and winter, but during summer they feed on leaves, grasses and sedges (Miller 2003).



Map 3. Herd overlap and ranges of the WACH, TCH, CACH, and PCH.



Map 4. Range of the WACH.

Table 1. Western Arctic Caribou Herd management levels using herd size, population trend, and harvest rate (WACH Working Group 2011, 2015).

Management and Harvest Level	Population Trend			Harvest Recommendations May Include:
	Declining Low: 6%	Stable Med: 7%	Increasing High: 8%	
Liberal	Pop: 265,000+	Pop: 230,000+	Pop: 200,000+	<ul style="list-style-type: none"> • Reduce harvest of bulls by nonresidents to maintain at least 40 bulls: 100 cows • No restriction of bull harvest by resident hunters unless bull:cow ratios fall below 40 bulls:100 cows
	Harvest: 16,000-22,000	Harvest: 16,000-22,000	Harvest: 16,000-22,000	
Conservative	Pop: 200,000-265,000	Pop: 170,000-230,000	Pop: 150,000-200,000	<ul style="list-style-type: none"> • No harvest of calves • No cow harvest by nonresidents • Restriction of bull harvest by nonresidents • Limit the subsistence harvest of bulls only when necessary to maintain a minimum 40:100 bull:cow ratio
	Harvest: 12,000-16,000	Harvest: 12,000-16,000	Harvest: 12,000-16,000	
Preservative	Pop: 130,000-200,000	Pop: 115,000-170,000	Pop: 100,000-150,000	<ul style="list-style-type: none"> • No harvest of calves • Limit harvest of cows by resident hunters through permit hunts and/or village quotas • Limit the subsistence harvest of bulls to maintain at least 40 bulls:100 cows • Harvest restricted to residents only, according to state and federal law. Closure of some federal public lands to nonqualified users may be necessary
	Harvest: 8,000-12,000	Harvest: 8,000-12,000	Harvest: 8,000-12,000	
Critical Keep Bull: Cow ratio ≥ 40 Bulls:100 Cows	Pop: < 130,000	Pop: < 115,000	Pop: < 100,000	<ul style="list-style-type: none"> • No harvest of calves • Highly restrict the harvest of cows through permit hunts and/or village quotas • Limit the subsistence harvest of bulls to maintain at least 40 bulls:100 cows • Harvest restricted to residents only, according to state and federal law. Closure of some federal public lands to nonqualified users may be necessary
	Harvest: 6,000-8,000	Harvest: 6,000-8,000	Harvest: 6,000-8,000	

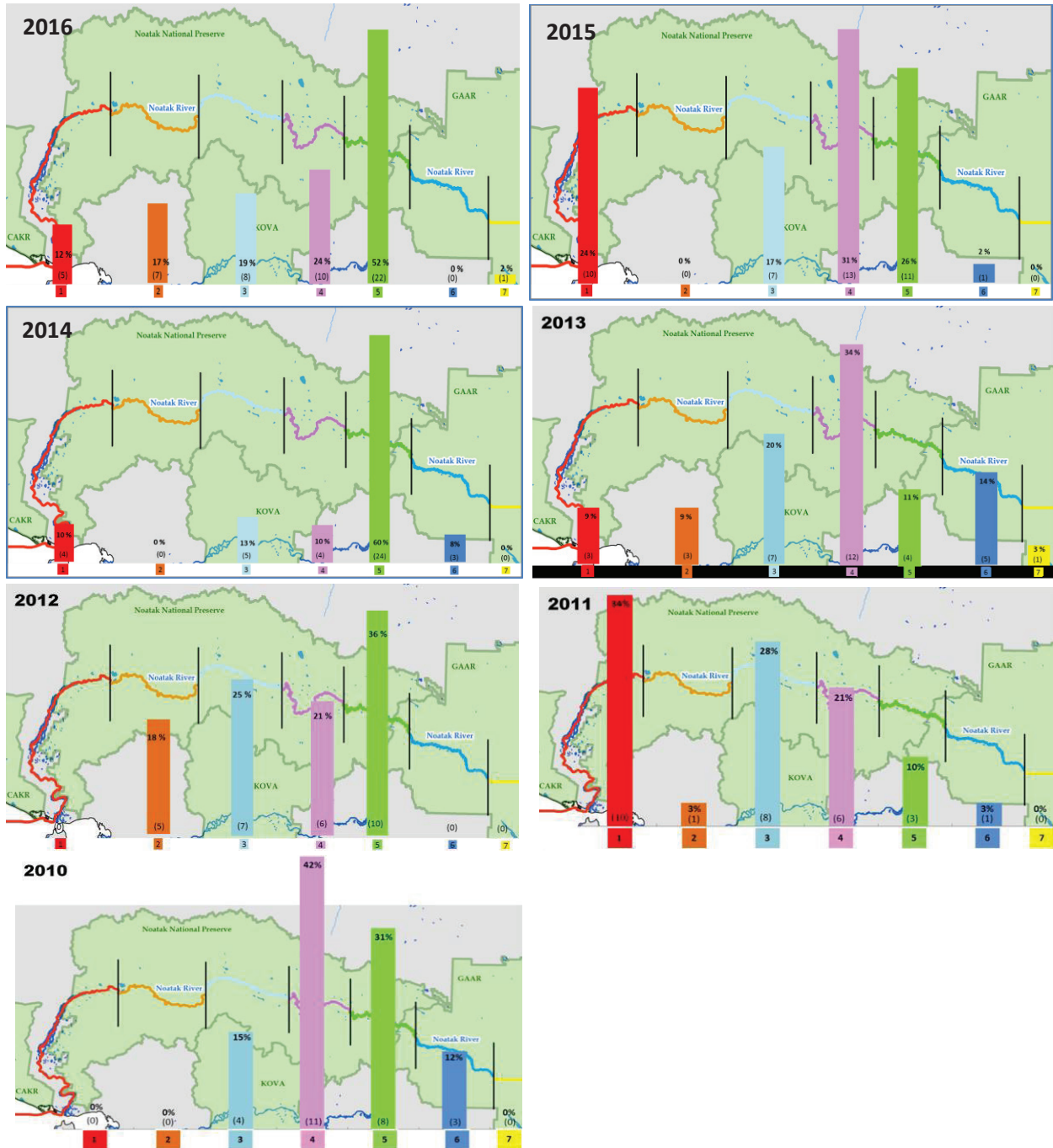


Figure 1. Distribution of caribou crossing the Noatak River during fall. Histograms depict where collared female caribou crossed the Noatak River, generally from north to south, on their fall migration. Relative percentages (top number) and the absolute number (middle number) of caribou are provided. The river is divided into seven (lowest number) color-coded segments which are displayed in the background. The middle five segments are 100 river kilometers long, while the westernmost segment (red) is 200 km (before extending into the Chukchi Sea) and the easternmost (yellow) runs as far east as WAH caribou are known to migrate. The number of caribou with GPS collars ranged from 39-79 caribou/year with later years having more collared caribou than earlier years (Joly and Cameron 2017).

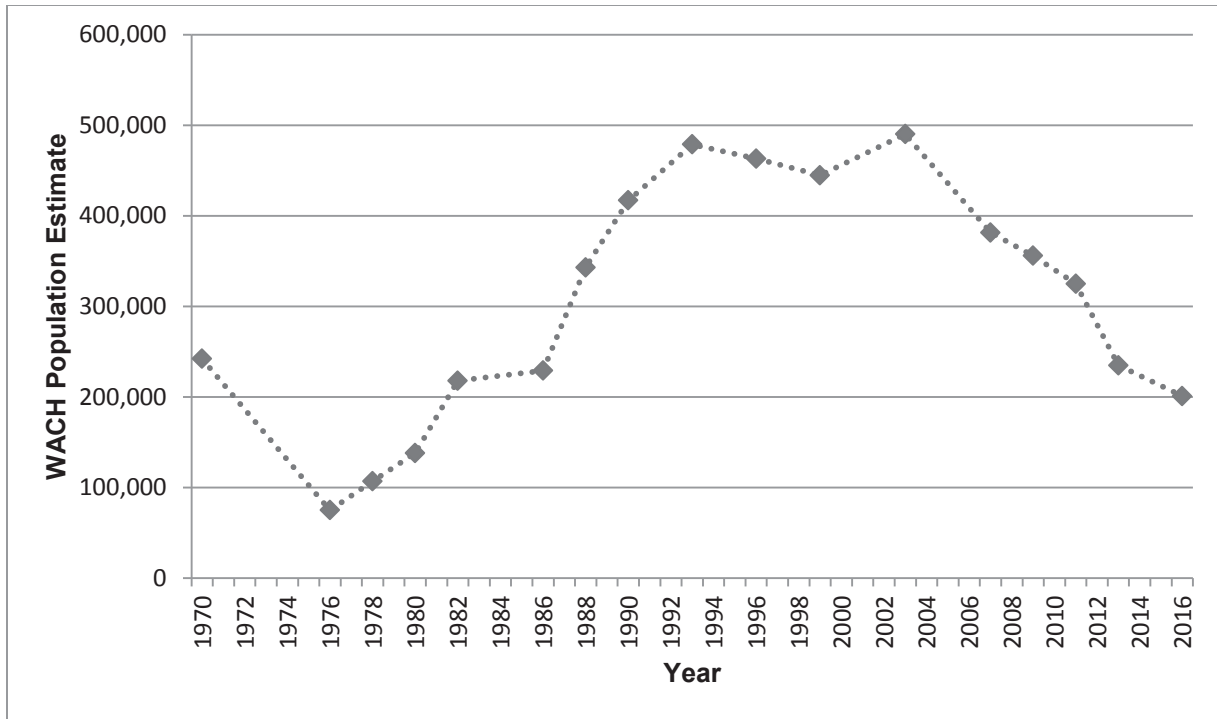


Figure 2. The WACH population estimates from 1970–2015. Population estimates from 1986–2016 are based on aerial photographs of groups of caribou that contained radio-collared animals (Dau 2011, 2013, 2014, Parrett 2016a).

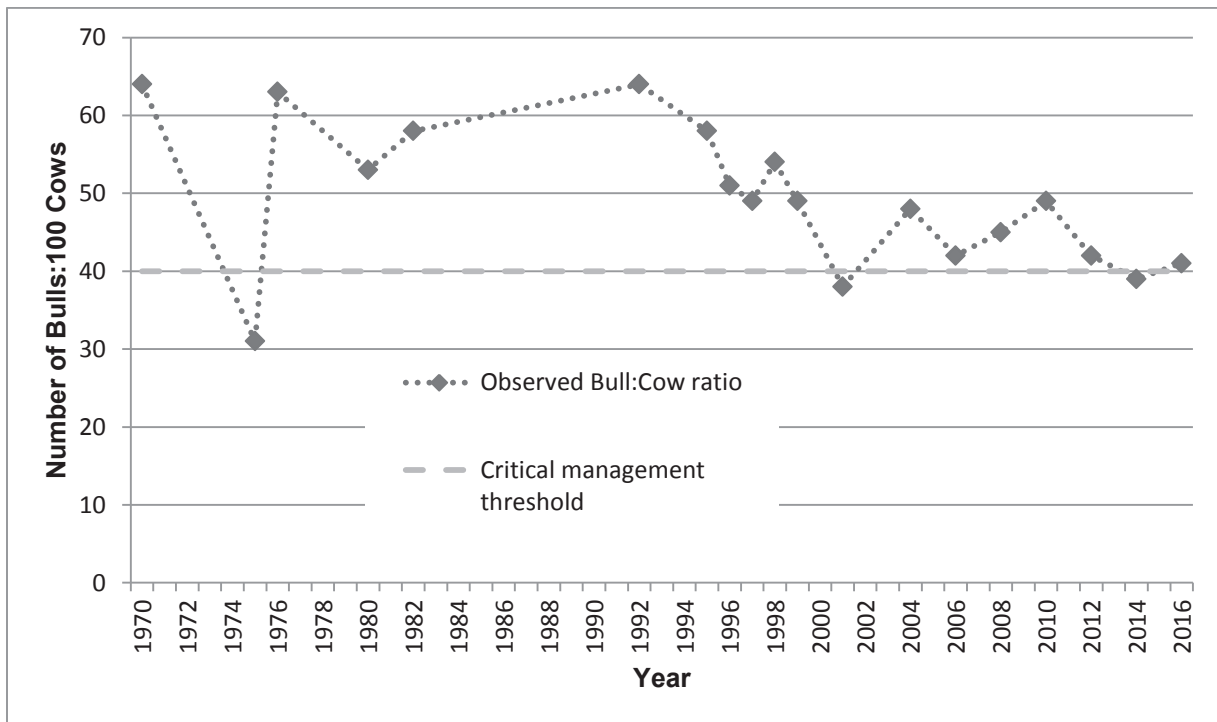


Figure 3. Bull: Cow ratios for the WACH (Dau 2015a, ADF&G 2017c).

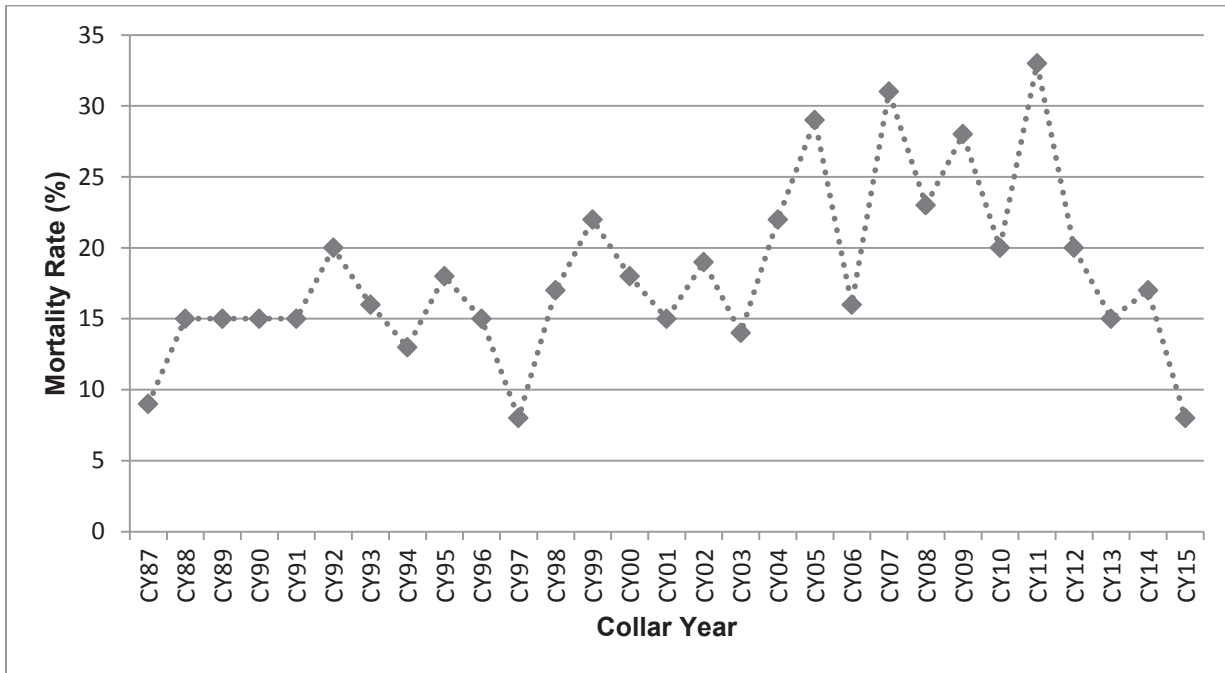


Figure 4. Mortality rate of radio-collared caribou in the Western Arctic caribou herd (Dau 2013, 2015a, 2016b). Collar Year = 1 Oct-30 Sept. 2015 collar year is Oct. 2015-Apr. 2016.

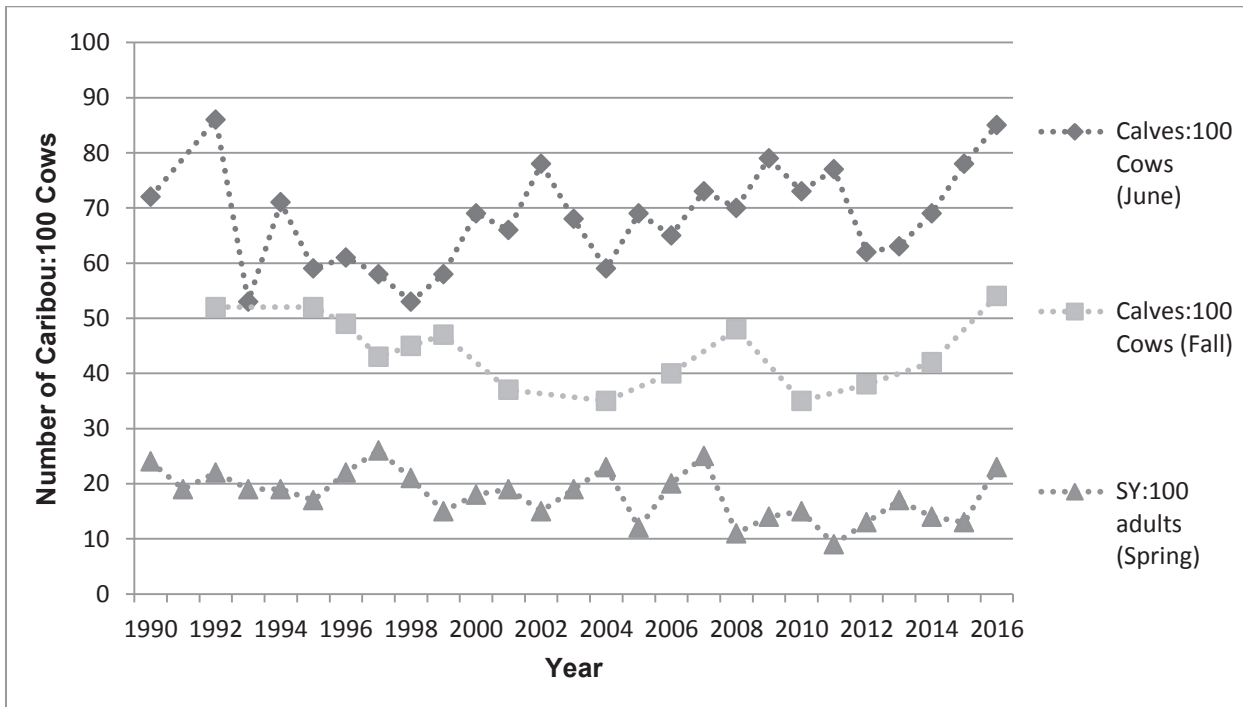


Figure 5. Calf:cow and short yearling (SY):adult ratios for the WACH (Dau 2013, 2015a, 2016a, ADF&G 2017c). Short yearlings are 10-11 months old caribou.

Cultural Knowledge and Traditional Practices

Meeting the nutritional and caloric needs of Arctic communities is vitally important and is the foundation of subsistence activities. Still, the meaning of subsistence extends far beyond human nutrition for Alaska's native peoples. Holthaus (2012) describes subsistence as the base on which Alaska Native culture establishes its identity through "philosophy, ethics, religious belief and practice, art, ritual, ceremony, and celebration." Fienup-Riordan (1990) also describes subsistence in terms of the cultural cycles of birth and death representing the close human relationship and reciprocity between humans and the natural world. Concerning caribou specifically, Ms. Esther Hugo – a lifelong resident of Anaktuvuk Pass - describes the human-caribou relationship as a "way of life."

Caribou have been a primary resource for the Inupiat of the Northwest Arctic Region for thousands of years. Caribou bones dating from 8,000 to 10,000 years ago have been excavated from archeological sites on the Kobuk River (ADF&G 1992). Foote (1959, 1961) wrote about caribou hunting in the Noatak region forty years ago, noting that life would not be possible in Noatak without this source of meat. Caribou were traditionally a major source of both food and clothing and continues today to be the most important land animal consumed in this region (Burch 1984, 1994, 1998, ADF&G 1992). Uhl and Uhl (1979) documented the importance of caribou as a main source of red meat for Noatak residents as well as other communities in the region. Betcher (2016) also documents the critical contemporary importance of caribou to people residing throughout the Northwest Arctic.

Historically, during fall and spring caribou migrations, people built "drive fences" out of cairns, bundles of shrubs, or upright logs. These fences were sometimes several miles long and two to three miles wide. Ideally, the closed end of the fence crossed a river, and caribou were harvested while crossing the river and retrieved later; or the fence would end in a corral where caribou were snared and killed with spears (Burch 2012). Burch (2012:40) notes, "The landscape of Northwest Arctic, especially in hills and mountains, is littered with the remains of drive fences that were in every stage of construction when they were abandoned."

The WACH population declined rapidly in the Northwest Arctic beginning in the late 1800s. At its low point, its range had shrunk to less than half its former size. Famine ensued, primarily due to the absence of caribou. In the early 1900s, reindeer were introduced to fill the need for food and hides. The WACH began to rebound in the 1940s. Currently, among large terrestrial mammals, caribou are among the most abundant; however, the population in any specific area is subject to wide fluctuations from year to year as caribou migration routes change (Burch 2012).

Caribou were traditionally harvested any month of the year they were available in the Northwest Arctic Region. The objective of the summer hunt was to obtain the hides of adult caribou with their new summer coats. They provided the best clothing material available to the Inupiat. The fall hunt was to acquire large quantities of meat to freeze for winter (Burch 1994). The timing and routing of migration determined caribou hunting. Hunting seasons change from year to year according to the availability of caribou (ADF&G 1991). The numbers of animals and the duration of their stays varies from one year to the next (Burch 1994) and harvest varies from community to community depending on the availability of caribou.

Generally, communities in the southern portion of Unit 23 (Buckland, Deering) take caribou in the winter and spring, while the other communities in Unit 23 take caribou in the fall, winter, and spring. Kivalina and Point Hope also take caribou in the summer in July (ADF&G 1992) and Selawik residents regularly hunt in the fall (Georgette 2016, pers. comm.).

Currently, caribou hunting by Federally qualified subsistence users in the Northwest Arctic Region is most intensive from September through November. Caribou can be harvested in large numbers, when available, and can be transported back to villages by boat before freeze-up. Hunters search for caribou and attempt to intercept them at known river crossings. Ideally, caribou harvesting occurs when the weather is cool enough to prevent spoilage of meat. If not, meat is frozen for later use. Prior to freeze-up, bulls are preferred because they are fatter than cows (Braem et al. 2015, Georgette and Loon 1993).

Small groups of caribou that have over-wintered may be taken by hunters in areas that are accessible by snowmachine. Braem et al. (2015:141) explain, “Hunters harvest cows during the winter because they are fatter than bulls . . . Caribou harvested during the winter can be aged completely without removing the skin or viscera . . . Then in the spring, the caribou is thawed. Community members cut it into strips to make dried meat, or they package and freeze it.” In spring, caribou start their northward migration. The caribou that are harvested are “lean and good for making dried meat (*paniqtuq*) during the warm, sunny days of late spring” (Georgette and Loon 1993:80).

Today, the human population in Unit 23 is comprised primarily of 11 regional Inupiaq groups (Burch 1998). Kotzebue is the regional hub of transportation and commerce and is the home to the majority of non-Natives in the region. The population of Unit 23 was approximately 7,500 in 2010, according to the U.S. Census (ADOLWD 2016). Caribou dominate the subsistence harvest of the region. In household harvest surveys conducted between 1964 and 2012, caribou were often the most harvested species, more than any other wild resource, in lbs. of edible weight (**Appendix 1**, ADF&G 2016a). Based on these surveys, in a typical study year, the harvest of caribou was between 100 and 200 lbs. per person in northwest Alaska (**Appendix 1**, ADF&G 2016a).

User Conflicts

User conflicts are likely to intensify when resources are scarce and when food security is threatened (Homer-Dixon 1994, Cohen and Pinstrup-Andersen 1999, Pomeroy et al. 2016). Such conflicts between local and nonlocal hunters have been well documented in Unit 23, specifically in the Noatak NP, the Squirrel River area, and along the upper Kobuk River (Georgette and Loon 1988, Jacobson 2008, Harrington and Fix 2009 in Fix and Ackerman 2015, Halas 2015, NWARAC 2015, Braem et al. 2015), even during times of high caribou abundance. Local hunters have expressed concerns over aircraft and “non-local” hunters disrupting caribou migration by “scaring” caribou away from river crossings, landing and camping along migration routes, and shooting lead caribou (Halas 2015, Fix and Ackerman 2015, NWARAC 2015).

Northwest Arctic Council members have testified that user conflicts have confounded their ability to successfully harvest caribou for subsistence purposes in some areas, and that these conflicts have caused degradation to their subsistence lifestyle through landscape modifications (e.g. abandoned structures and

trash; landing strips; ATV trails), herd diversion and positioning (e.g. pushing or scaring caribou with low-flying aircraft for hunting, sightseeing, photography and other purposes; creating camp structures along migratory paths), and hunting of lead caribou. Aircraft activity was of particular concern and includes operations by transporters, guides, “nonlocal” hunters utilizing personal aircraft, and recreational users. Specifically, aircraft in the vicinity of the Squirrel River has been cited as particularly problematic (NWARAC 2015).

Halas (2015), in a case study of Noatak caribou hunters and their interactions with transported hunters, examined the links between caribou behavior and migration, user group interactions, and changes to subsistence caribou hunting. In describing observations by Noatak hunters in 2012 and 2014 Halas (2015:81) explained,

Observations of caribou behavior (“spooked” caribou, deflected caribou groups from river crossings) due to aircraft are likely witnessed as a dramatic event not easily forgotten by a waiting Noatak hunter. Whether the aircraft intentionally or unintentionally may be “influencing” caribou movement, observing “scared” caribou can be a powerful experience for hunters.

Repeated observations of airplanes affecting individual or group caribou behavior have been documented, and cumulative observations of this over time could lead an observer to conclusions about herd deflection (Halas 2015). Some studies and local observations of WACH caribou response to aircraft have suggested that animal response is limited in temporal and spatial scale (Fullman et al. 2017, BHA Alaska 2017) and that many factors contribute to larger scale shifts in migration. Fullman et al. (2017) studied the effects of environmental features and sport hunting on caribou migration in northwestern Alaska. These authors found that caribou tended to avoid rugged terrain and that the migration of caribou through Noatak NP does not appear to be hindered by sport hunting activity. They indicated that their results do not preclude the possibility of short-term effects (< 8 hours) altering the availability of caribou for individual hunters, and that the lack of observed influence of hunting activity could be related to limitations in the telemetry and sport hunter datasets used in the study (i.e. caribou locations were only recorded every 8 hours, not every sport hunter camp was included, and only landings events from transporter aircraft were considered).

Concerns were expressed by residents of Ambler, Shungnak, Noatak and Kobuk, as well as by members of the Northwest Arctic Council, that many nonlocal hunter practices clash with local hunting traditions such as shooting caribou for trophies or sport instead of food and wasting meat by letting it spoil in the field (Braem et al. 2015, NWARAC 2015, Halas 2015). Additional conflicts between user groups include competition for and overcrowding of campsites, litter, human waste, lack of law enforcement, degradation of the landscape from four-wheelers, and displacement from traditional hunting sites (Braem et al. 2015, Fix and Ackerman 2015, NWARAC 2015).

In 2008, the Unit 23 Working Group was established to address fall hunting related issues and to develop solutions to cooperatively solve hunting conflicts and to preserve traditional Inupiaq values, while also allowing for reasonable opportunities for non-local hunters (ADF&G 2016b). It is made up of 20 members, including representatives of regional and tribal governments and organizations, land and wildlife

management agencies, the Big Game Commercial Services Boards, the Alaska Professional Hunters Association (including representatives from hunting guide and transport industries), Fish and Game Advisory Committees, the Northwest Arctic Council, the BOG, and the Federal Subsistence Board (ADF&G 2016b). In 2010, the group proposed a mandatory orientation session for all pilots transporting big game in Unit 23. ADF&G implemented this, developed and distributed outreach materials, and established conflict planning processes (**Map 2**, Dau 2015a). The orientation suggests maintaining a minimum altitude of 2000 feet in the vicinity of camps (Betchkal 2015). Flight restrictions were also implemented by both State and Federal agencies (see Regulatory History).

Shifts in caribou migration paths, regardless of the reason for these shifts, have created difficulty for Noatak, Kivalina, and Kotzebue hunters, among others (Dau 2015a). Local WACH harvest has been relatively stable in Unit 23 since the 1990s, but residents of some communities have had to “greatly increase their expenditure of money and effort to maintain these harvest levels” (Dau 2015a:14-30). This is due in part to having to travel farther, more frequently, and for longer durations to find caribou (Halas 2015). In addition, many have had to switch from taking bulls to cows because of temporal shifts in access.

Harvest History

The State manages the WACH on a sustained yield basis (i.e. managing current harvests to ensure future harvests). The harvestable surplus when the WACH population is declining is calculated as 6% of the estimated population (WACH working group 2011, Parrett 2017, pers. comm.). In recent years, as the WACH population has declined, the total harvestable surplus for the WACH has also declined (Dau 2011, Parrett 2015a). In 2016, the WACH harvestable surplus was 12,056 caribou (6% of 200,928 caribou). This is down from a harvestable surplus of 14,085 caribou in 2013 when the WACH numbered approximately 234,757 caribou. While there is substantial uncertainty in harvestable surplus estimates, it is likely that sustainable harvest will soon be exceeded (Parrett 2015a, Dau 2015a). Of particular concern is the overharvest of cows, which has probably occurred since 2010/11 (Dau 2015a). Dau (2015a:14-29) states, “even modest increases in the cow harvest above sustainable levels could have a significant effect on the population trajectory of the WACH.”

Harvest from the WACH, which has remained fairly consistent since 1990, now represents a larger proportion of the annual mortality. This is one of the factors that prompted the BOG and the Board to enact restrictions on WACH harvest in March 2015 and April 2016, respectively. These regulatory restrictions addressed recommendations in the WACH working group’s management plan under conservative management (i.e. prohibiting the take of calves, shortening seasons, decreasing harvest limits) (**Table 1**).

Caribou harvest by local hunters is estimated from community harvest surveys, if available, and from models developed by A. Craig with ADF&G’s Division of Wildlife Conservation Region V. These models incorporate factors such as community size, availability of caribou, and per capita harvests for each community (Dau 2015a). In 2015, Craig’s models replaced models developed by Sutherland (2005), resulting in changes to local caribou harvest estimates from past years. While Craig’s models accurately reflect harvest trends, they do not accurately reflect actual harvest numbers (Dau 2015a). (Note: no model

accurately reflects harvest numbers). This analysis only considers the updated harvest estimates using Craig's new model as cited in Dau (2015a). Caribou harvest by nonlocal residents and nonresidents are based on harvest ticket reports (Dau 2015a).

Local and nonlocal hunters are defined in ADF&G management reports as living within and outside the range of the WACH, respectively. Federally qualified subsistence users and NFQU are close, but not identical, to local and nonlocal hunters, respectively. Residents of Galena, Wiseman, and several communities on the western Seward Peninsula are Federally qualified subsistence users, but are not within the range of the WACH by definition (**Map 1**).

From 2000–2014, the average estimated total harvest from the WACH was 11,984 caribou/year, ranging from 10,666–13,537 caribou/year (Dau 2015a, **Figure 6**). These harvest levels are within or below the conservative harvest level specified in the WACH Management Plan (**Table 1**). However, harvest estimates do not include wounding loss, which may be hundreds of caribou (Dau 2015a).

Local hunters account for approximately 95% of the total WACH harvest and residents of Unit 23 account for approximately 58% of the total harvest on average (**Figure 7**, ADF&G 2017c). Comparison of caribou harvest by community from household survey data (**Appendix 1**) with **Figure 1** demonstrates that local community harvests parallel WACH availability rather than population trends. For example, Ambler only harvested 325 caribou when the WACH population peaked in 2003, but harvested 685 caribou in 2012 when most of the WACH migrated through eastern Unit 23. Similarly, Noatak only harvested 66 caribou in 2010 when no GPS-collared caribou migrated through western Unit 23. Harvest increased substantially (360 caribou) the following year when 37% of the GPS-collared caribou (and thus, a greater proportion of the WACH) migrated through western Unit 23.

On average, 76% of WACH caribou harvested by nonlocals are taken in Unit 23. From 2001–2013, total and Unit 23 nonlocal WACH harvest averaged 598 caribou/year and 456 caribou/year, respectively (**Figure 8**). In recent regulatory years (2012/13–2013/14), numbers of nonlocal hunters are slightly lower, partially because transporters have had to travel further to find caribou and thus, could not book as many clients (Dau 2015a).

Between 1998 and 2014, the number of NFQU hunting caribou and the number of caribou harvested by NFQU in Unit 23 averaged 487 hunters (range: 404–662) and 511 caribou (range: 248–669), respectively (**Figure 9**, ADF&G 2016c, FWS 2016). In 2015, after the BOG enacted restrictions, the number of NFQU and caribou harvested by NFQU decreased appreciably (340 hunters and 230 caribou). In 2016, during the closure of Federal lands to NFQU, the number of NFQU and caribou harvested by NFQU decreased even further (149 hunters and 111 caribou), although there may still be some outstanding 2016 harvest reports from nonlocal residents (**Figure 9**, WINFONET 2017).

The major and minor river drainages in which people hunt and harvest caribou are included in harvest reporting data (WINFONET 2017). This data can be used to compare caribou harvest and hunting intensity (measured as the number of hunters) by NFQU across Unit 23 at both coarse (major river

drainage) and fine (minor river drainages) scales. On a coarse scale, cumulative caribou harvest by NFQU from 2005-2014 was highest in the Noatak River drainage. On a fine scale, caribou harvest over the same time period was highest in the Squirrel River drainage and on the Baldwin Peninsula. Hunting intensity paralleled harvest on both coarse and fine scales. While the total number of nonlocal hunters and harvest decreased in 2016 due to the Federal lands closure, the Noatak and Squirrel River Drainages still experienced the highest relative hunting intensity at the coarse and fine scales, respectively (WINFONET 2017).

From 1999-2013, 72% of nonlocal hunters on average accessed the WACH by plane. Most nonlocal harvest (85-90%) occurs between Aug. 25 and Oct. 7. In contrast, most local, subsistence hunters harvest WACH caribou whenever they are available using boats, 4-wheelers, and snowmachines (Dau 2015a, Fix and Ackerman 2015). In Unit 23, caribou are generally available during fall migration. The temporal concentration of nonlocal hunters during times of intensive subsistence hunting is responsible for user conflicts in Unit 23 (Dau 2015a).

Commercially licensed transporters and guides assist approximately 60% and 10% of nonlocal hunters in Unit 23, respectively (Unit 23 Working Group 2016). In the Noatak NP, nonlocal transporter clients primarily consist of nonresidents and Alaska residents from urban areas such as Anchorage, Fairbanks, and communities on the Kenai Peninsula (Fix and Ackerman 2015, ADF&G 2016c).

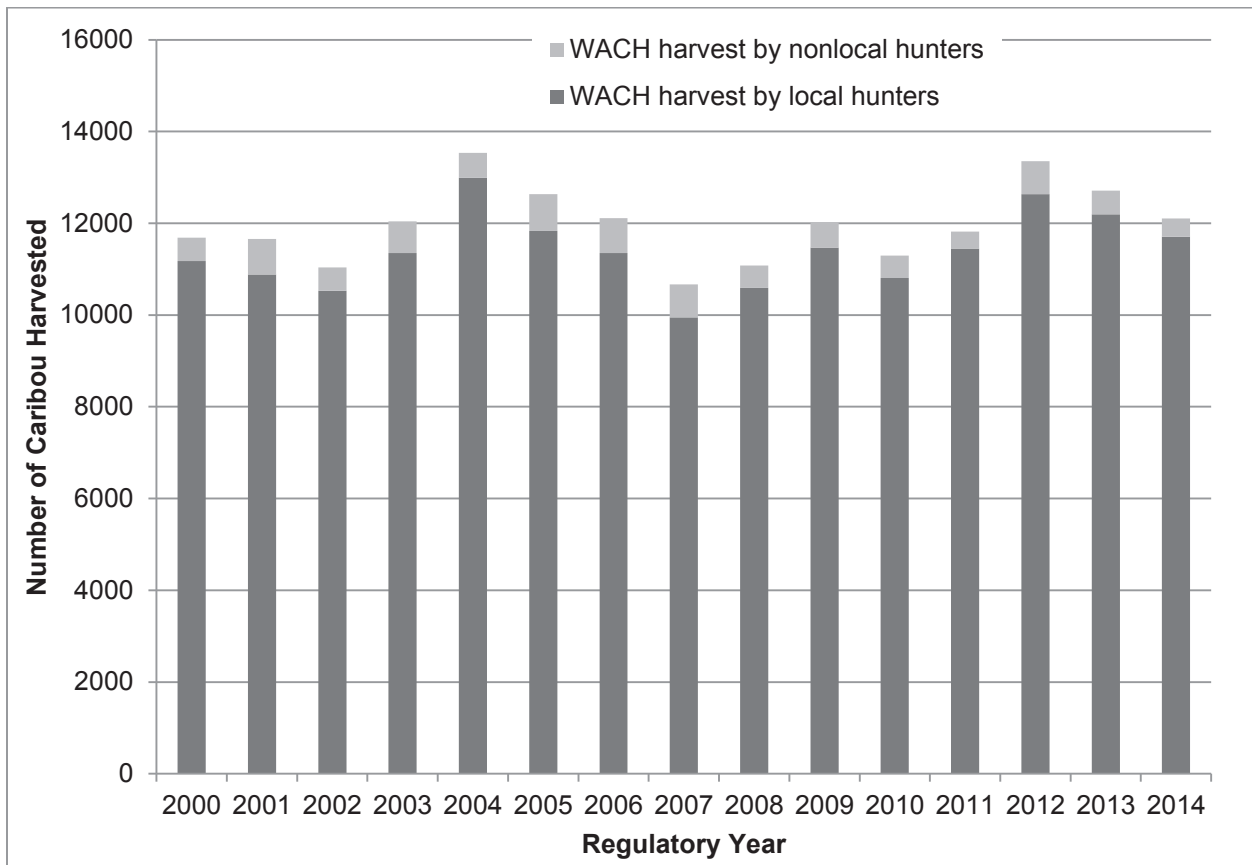


Figure 6. Estimated number of caribou harvested from the WACH by residency (Dau 2015a).

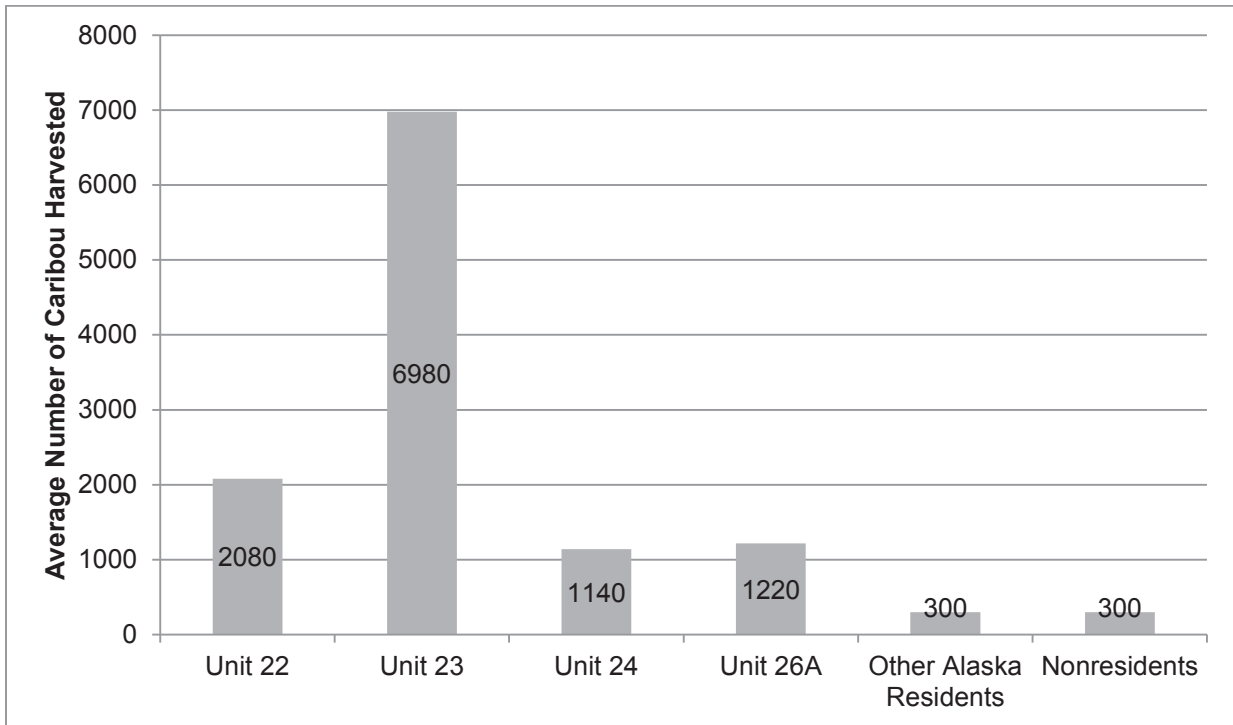


Figure 7. Average number of caribou harvested by unit and residency from 1998-2015 (ADF&G 2017c).

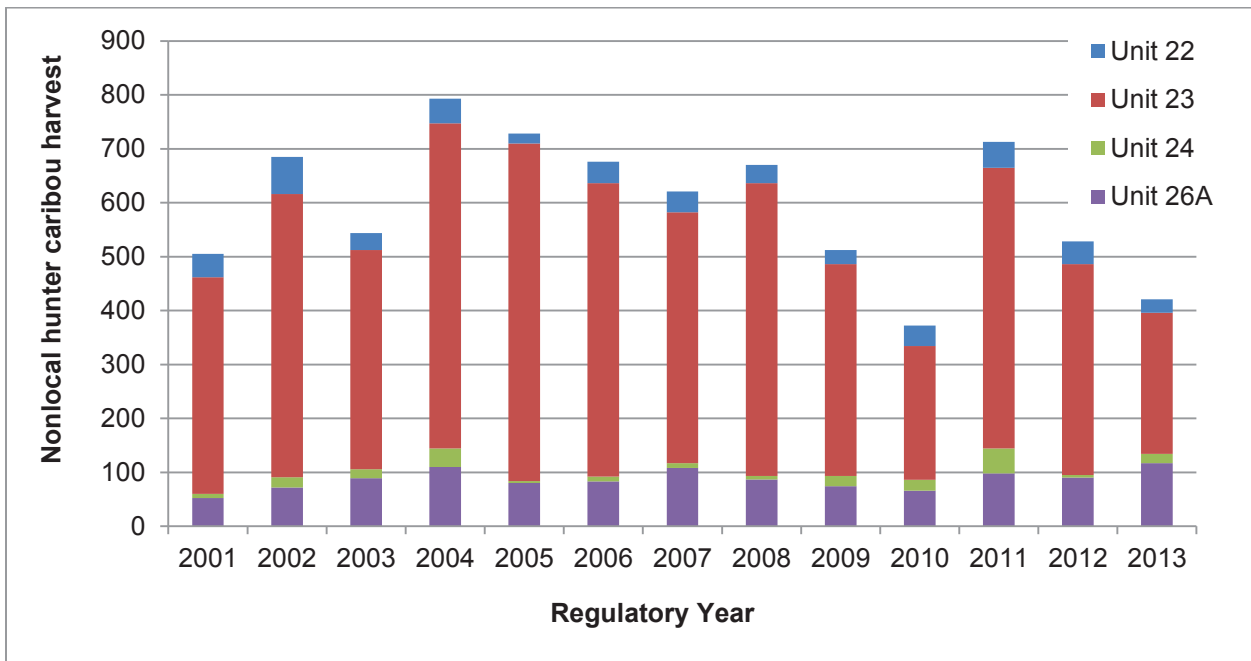


Figure 8. Nonlocal WACH harvest by unit (Dau 2015a, Dau 2013). Unit 21D was not included as only 0-2 caribou have been harvested from this unit each year.

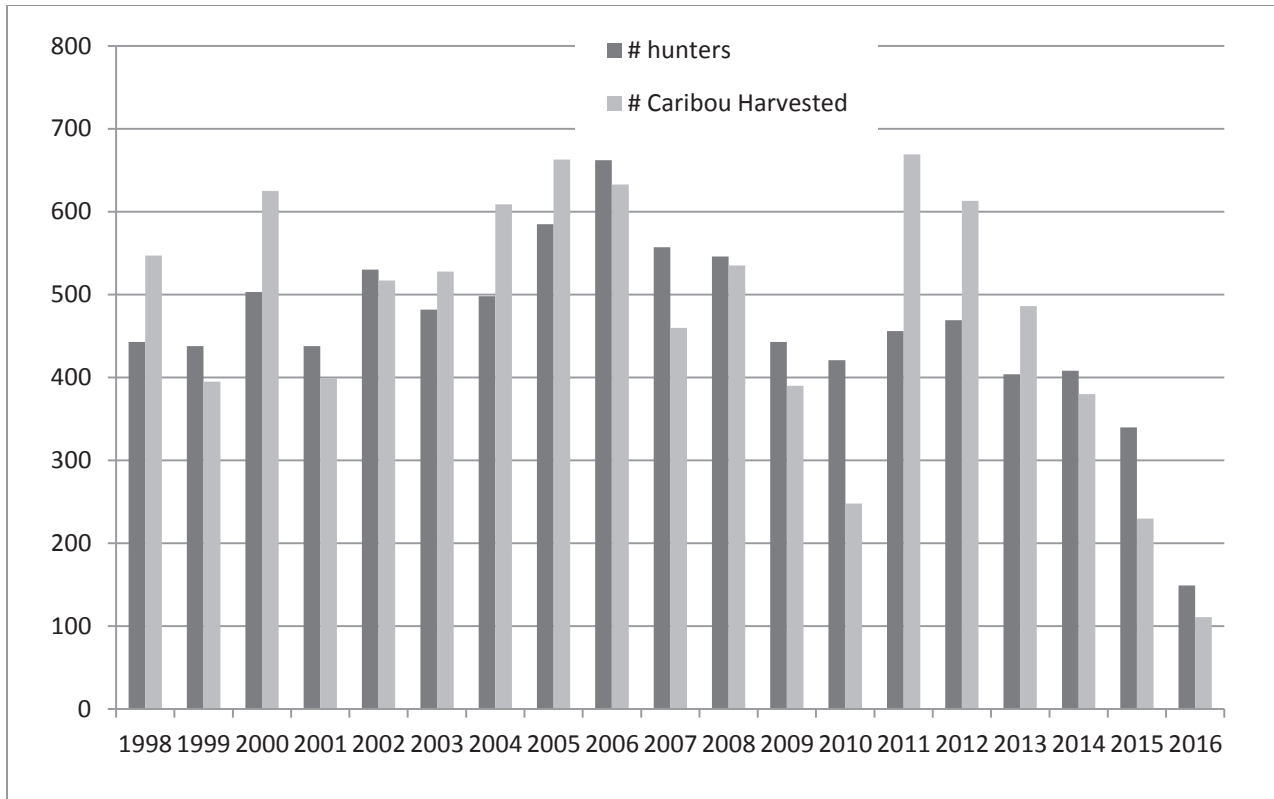


Figure 9. Number of non-Federally qualified users (NFQU) and number of caribou harvested by NFQU in Unit 23 (ADF&G 2016c, FWS 2016, WINFONET 2017).

Other Alternatives Considered

One alternative considered was to defer this proposal in order to allow for additional time to evaluate the effectiveness of the 2016 regulatory changes and to obtain additional information (e.g. population estimates) on the WACH. However, unless the State reduces the caribou harvest limit in Unit 23, this proposal would have no conservation effect and would restrict subsistence use in National Parks and areas open only to Federally qualified subsistence users.

Effects

If this proposal is adopted, the caribou harvest limit in Unit 23 would be reduced from 5 to 3 caribou per day, which reduces opportunity for Federally qualified subsistence users. This would also cause Federal regulations to be more restrictive than State regulations, contrary to the subsistence priority mandated by Title VIII of the Alaska National Interest Lands Conservation Act. State and Federal regulations would be further misaligned, which increases regulatory complexity and could add to user confusion.

While the WACH population is declining, reducing the Federal daily harvest limit is not expected to impact population recovery or reduce overall WACH harvest as all residents would still be able to harvest 5 caribou per day in Unit 23 under State regulations. Harvest in national parks and monuments may be reduced (i.e. Kobuk Valley and portions of Gates of the Arctic National Parks), but is not expected to

impact WACH conservation as these areas are not targeted by Federally qualified subsistence users for caribou hunting. In 2016, the harvest limit for caribou in Unit 23 was reduced from 15 to 5 caribou per day. Time is needed to evaluate the effectiveness of recent regulatory restrictions before enacting further restrictions. The outcomes of Proposals WP18-32, 46/47, and 48/49 may influence the effects of this proposal, if adopted.

OSM PRELIMINARY CONCLUSION

Oppose Proposal WP18-45.

Justification

Adoption of this proposal reduces opportunity for Federally qualified subsistence users, could negatively affect continuation of subsistence uses, and eliminates the subsistence priority. Additionally, impact to conservation of the WACH would be minimal. More time is needed to evaluate the regulatory changes which took effect in 2016 before further reducing the harvest limit under Federal regulations.

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Appendix 1

Estimated total caribou harvest by community, per capita caribou harvest by community, and data sources for Unit 23: Western Arctic caribou herd (ADF&G 2015).

Unit 23				
Community	Year/Period	Est Caribou Harv.	# caribou per capita	Source
Ambler	2003	325	1.12	Georgette et al. 2005, unpublished data
	2009	456	1.75	Braem 2012
	2012	685	2.54	Braem et al. 2015
Buckland	2003	637	1.56	Magdanz et al. 2011
	2009	561	1.30	Braem 2012
Deering	1994	142	0.96	Magdanz et al. 2002
	2007-2008	182	1.37	Braem 2011
	2011-2012	237	1.91	Braem 2011
	2013	393	2.85	ADF&G unpublished data
Kiana	1999	488	1.23	ADF&G unpublished data
	2006	306	0.77	Magdanz et al. 2011
	2009	440	1.18	Braem 2012
Kivalina	1982	346	0.48	CSIS
	1983	564	0.78	CSIS
	1992	351	0.49	CSIS
	2007	268	0.67	Magdanz et al. 2010
	2010-2011	86	0.23	Braem et al. 2014
Kobuk	2004-2005	134	1.06	ADF&G unpublished data
	2009	210	1.72	Braem 2012
	2012	119	0.84	Braem et al. 2015
Kotzebue	1986	1917	0.71	Georgette and Loon 1993
	1991	3782	1.04	CSIS
	2001	2376	0.77	Whiting 2003
	2002	1719	0.56	Whiting 2003
	2003	1915	0.61	Whiting 2003
	2012-2013	1804	0.56	CSIS
2013-2014	1629	0.51	ADF&G unpublished data	
Noatak	1994	615	1.62	Magdanz et al. 2002
	1999	683	1.61	Georgette et al 2000., unpubd data
	2002	410	0.90	Georgette et al. 2004, unpubd data
	2007	441	0.90	Magdanz et al. 2010
	2010	66	0.13	Braem et al. 2014
	2011	360	0.66	Mikow et al. 2014
Noorvik	2002	988	1.46	Georgette et al. 2004, unpubd data
	2008	767	1.19	Braem et al. 2012
	2012	851	1.36	CSIS

-continued-

Unit 23, continued

Community	Year/Period	Est Caribou Harv.	# caribou per capita	Source
Point Hope	1994-1995	355	0.49	Bacon et al. 2009, rev. 2011
	2000-2001	219	0.31	Bacon et al. 2009, rev. 2011
Selawik	1999	1289	1.68	CSIS
	2006	934	1.11	CSIS
	2011	683	0.79	Braem et al. 2013
Shungnak	1998	561	2.17	Georgette 1999, unpubd data
	2002	403	1.62	Magdanz et al. 2004
	2008	416	1.53	Braem 2012
	2012	396	1.47	Braem et al. 2015

WP18–46/47 Executive Summary	
General Description	<p>Proposal WP18-46 requests that Federal public lands in Unit 23 be closed to caribou hunting except by Federally qualified subsistence users. <i>Submitted by: Western Arctic Caribou Herd Working Group.</i></p> <p>Proposal WP18-47 requests that Federal public lands in Unit 23 be closed to caribou hunting except by Federally qualified subsistence users from 2018/19 to 2020/21 only. <i>Submitted by: Enoch Mitchell of Noatak.</i></p>
Proposed Regulation	<p><u>WP16-46</u></p> <p>Unit 23—Caribou</p> <p><i>Unit 23—that portion which includes all drainages north and west of, and including, the Singoalik River drainage</i></p> <p style="padding-left: 40px;"><i>5 caribou per day as follows:</i></p> <p style="padding-left: 80px;"><i>Calves may not be taken</i></p> <p style="padding-left: 80px;"><i>Bulls may be harvested July 1–Oct. 14</i></p> <p style="padding-left: 120px;"><i>Feb. 1–June 30</i></p> <p style="padding-left: 80px;"><i>Cows may be harvested. July 15–Apr. 30</i></p> <p style="padding-left: 80px;"><i>However, cows accompanied by calves may not be taken July 15–Oct. 14.</i></p> <p style="padding-left: 40px;"><i>Federal public lands in Unit 23 are closed to caribou hunting except by Federally qualified subsistence users.</i></p> <p><i>Unit 23, remainder</i></p> <p style="padding-left: 40px;"><i>5 caribou per day as follows:</i></p> <p style="padding-left: 80px;"><i>Calves may not be taken</i></p> <p style="padding-left: 80px;"><i>Bulls may be harvested July 1–Oct. 31</i></p> <p style="padding-left: 120px;"><i>Feb. 1–June 30</i></p> <p style="padding-left: 80px;"><i>Cows may be harvested. July 31–March 31</i></p> <p style="padding-left: 80px;"><i>However, cows accompanied by calves may not be taken July 31–Oct. 14.</i></p>

WP18–46/47 Executive Summary

	<p><i>Federal public lands in Unit 23 are closed to caribou hunting except by Federally qualified subsistence users.</i></p> <p><u>WP18-47</u></p> <p>Unit 23—Caribou</p> <p><i>Unit 23—that portion which includes all drainages north and west of, and including, the Singoalik River drainage</i></p> <p><i>5 caribou per day as follows:</i></p> <p><i>Calves may not be taken</i></p> <p><i>Bulls may be harvested</i> <i>July 1–Oct. 14</i> <i>Feb. 1–June 30</i></p> <p><i>Cows may be harvested.</i> <i>July 15–Apr. 30</i> <i>However, cows accompanied by calves may not be taken July 15–Oct. 14.</i></p> <p><i>Beginning July 1, 2018, Federal public lands in Unit 23 are closed to caribou hunting by non-Federally qualified subsistence users for two years. The closure shall end on June 30, 2020.</i></p> <p><i>Unit 23, remainder</i></p> <p><i>5 caribou per day as follows:</i></p> <p><i>Calves may not be taken</i></p> <p><i>Bulls may be harvested</i> <i>July 1–Oct. 31</i> <i>Feb. 1–June 30</i></p> <p><i>Cows may be harvested.</i> <i>July 31–March 31</i> <i>However, cows accompanied by calves may not be taken July 31–Oct. 14.</i></p> <p><i>Beginning July 1, 2018, Federal public lands in Unit 23 are closed to caribou hunting by non-Federally qualified subsistence users for two years. The closure shall end on June 30, 2020.</i></p>
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WP18–46/47 Executive Summary

<p>OSM Preliminary Conclusion</p>	<p>Support Proposal WP18-46 with modification to close all Federal public lands within a 10 mile wide corridor (5 miles either side) along the Noatak River from the western boundary of Noatak National Preserve upstream to the confluence with the Cutler River; north of the Noatak River between, and including, the Kelly and Nimiuktuk River drainages; within the northern and southern boundaries of the Eli and Agashashok River drainages, respectively; and within the Squirrel River drainage to caribou hunting except by Federally qualified subsistence users and Take No Action on Proposal WP18-47.</p> <p>The modified regulation should read:</p> <p>Unit 23—Caribou</p> <table border="0"> <tr> <td style="vertical-align: top;"><i>Unit 23—that portion which includes all drainages north and west of, and including, the Singoalik River drainage</i></td> <td style="vertical-align: top;"> <p><i>5 caribou per day as follows:</i></p> <p><i>Calves may not be taken</i></p> <p><i>Bulls may be harvested</i> <i>July 1–Oct. 14</i> <i>Feb. 1–June 30</i></p> <p><i>Cows may be harvested.</i> <i>July 15–Apr. 30</i> <i>However, cows accompanied by calves may not be taken July 15–Oct. 14.</i></p> </td> </tr> <tr> <td style="vertical-align: top;"><i>Unit 23, remainder</i></td> <td style="vertical-align: top;"> <p><i>5 caribou per day as follows:</i></p> <p><i>Calves may not be taken</i> <i>July 1–Oct. 31</i> <i>Feb. 1–June 30</i></p> <p><i>Cows may be harvested.</i> <i>July 31–March 31</i> <i>However, cows accompanied by calves may not be taken July 31–Oct. 14.</i></p> <p><i>Federal public lands within a 10 mile wide corridor (5 miles either side) along the Noatak River from the western boundary of Noatak National Preserve upstream to</i></p> </td> </tr> </table>	<i>Unit 23—that portion which includes all drainages north and west of, and including, the Singoalik River drainage</i>	<p><i>5 caribou per day as follows:</i></p> <p><i>Calves may not be taken</i></p> <p><i>Bulls may be harvested</i> <i>July 1–Oct. 14</i> <i>Feb. 1–June 30</i></p> <p><i>Cows may be harvested.</i> <i>July 15–Apr. 30</i> <i>However, cows accompanied by calves may not be taken July 15–Oct. 14.</i></p>	<i>Unit 23, remainder</i>	<p><i>5 caribou per day as follows:</i></p> <p><i>Calves may not be taken</i> <i>July 1–Oct. 31</i> <i>Feb. 1–June 30</i></p> <p><i>Cows may be harvested.</i> <i>July 31–March 31</i> <i>However, cows accompanied by calves may not be taken July 31–Oct. 14.</i></p> <p><i>Federal public lands within a 10 mile wide corridor (5 miles either side) along the Noatak River from the western boundary of Noatak National Preserve upstream to</i></p>
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WP18–46/47 Executive Summary

	<p><i>the confluence with the Cutler River; north of the Noatak River between, and including, the Kelly and Nimiuktuk River drainages; within the northern and southern boundaries of the Eli and Agashashok River drainages, respectively; and within the Squirrel River drainage are closed to caribou hunting except by Federally qualified subsistence users hunting under these regulations.</i></p>
Southeast Alaska Subsistence Regional Advisory Council Recommendation	
Southcentral Alaska Subsistence Regional Advisory Council Recommendation	
Kodiak/Aleutians Subsistence Regional Advisory Council Recommendation	
Bristol Bay Subsistence Regional Advisory Council Recommendation	
Yukon-Kuskokwim Delta Subsistence Regional Advisory Council Recommendation	
Western Interior Alaska Subsistence Regional Advisory Council Recommendation	

WP18-46/47 Executive Summary	
Seward Peninsula Subsistence Regional Advisory Council Recommendation	
Northwest Arctic Subsistence Regional Advisory Council Recommendation	
Eastern Interior Alaska Subsistence Regional Advisory Council Recommendation	
North Slope Subsistence Regional Advisory Council Recommendation	
Interagency Staff Committee Comments	
ADF&G Comments	
Written Public Comments	None

**DRAFT STAFF ANALYSIS
WP18-46/47**

ISSUES

Proposal WP18-46, submitted by the Western Arctic Caribou Herd Working Group (WACH Working Group), and Proposal WP18-47, submitted by Enoch Mitchell of Noatak, request that Federal public lands in Unit 23 be closed to caribou hunting except by Federally qualified subsistence users. Proposal WP18-47 specifically requests that the closure extend from 2018/19 to 2020/21 only.

DISCUSSION

The proponent for WP18-46 is concerned about the decline of the WACH population. Working group members noted that the 2016/17 Federal public lands closure to caribou hunting by non-Federally qualified users (NFQU) in Unit 23 helped local hunters meet their subsistence needs by reducing user conflicts and hunting activity from nonlocal hunters. Members also commented that caribou migrated closer to villages (i.e. Noatak) and spoke to the cultural and nutritional importance of caribou to Unit 23 residents.

The proponent for WP18-47 states that the proposed closure will promote conservation of the WACH and food security for Federally qualified subsistence users (FQSU) and that it is consistent with Title VIII of the Alaska National Interest Lands Conservation Act (ANILCA) and the WACH Working Group's management plan as the WACH population is on the brink of preservative management. The proponent emphasizes that caribou are a vital subsistence resource to FQSU in Unit 23 and that store-bought food and fuel prices in the unit are very high. The proponent also states that the proposed change will minimize user conflicts by improving the ability of FQSU to harvest caribou and meet their subsistence needs. He notes that FQSU have reported changes in caribou migration patterns whereby caribou are traveling further from villages, which burdens local communities by increasing the time and fuel costs of caribou hunting. He also states that FQSU have reported that noise from aircraft used by transporters and guides can disrupt caribou migration and that this issue has been a longstanding source of user conflict. Noatak residents reported positive effects from the 2016/17 closure, including improved hunter success and reduced user conflicts. The Native Village of Noatak, the Cape Krusenstern National Monument Subsistence Resource Commission, the Kobuk Valley National Park Subsistence Resource Commission, and the Noatak/Kivalina Fish and Game Advisory Committee are co-sponsors of this proposal and submitted letters of support.

The applicable statutory guidance is found in the Alaska National Interest Lands Conservation Act (ANILCA) Title VIII §815.3, which states that:

Nothing in this title shall be construed as . . . authorizing a restriction on the taking of fish and wildlife for nonsubsistence uses on the public lands (other than national parks and park monuments) unless necessary for the conservation of healthy populations of fish and wildlife, for the reasons set forth in §816, to continue subsistence uses of such populations, or pursuant to other applicable law;

Existing Federal Regulations

Unit 23—Caribou

<i>Unit 23—that portion which includes all drainages north and west of, and including, the Singoalik River drainage</i>	<i>5 caribou per day as follows:</i>	
	<i>Calves may not be taken</i>	
	<i>Bulls may be harvested</i>	<i>July 1–Oct. 14 Feb. 1–June 30</i>
	<i>Cows may be harvested. However, cows accompanied by calves may not be taken</i>	<i>July 15–Apr. 30</i>
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	<i>Calves may not be taken</i>	
	<i>Bulls may be harvested</i>	<i>July 1–Oct. 31 Feb. 1–June 30</i>
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	<i>July 31–Oct. 14.</i>	

Proposed Federal Regulations

WP18-46

Unit 23—Caribou

<i>Unit 23—that portion which includes all drainages north and west of, and including, the Singoalik River drainage</i>	<i>5 caribou per day as follows:</i>	
	<i>Calves may not be taken</i>	
	<i>Bulls may be harvested</i>	<i>July 1–Oct. 14 Feb. 1–June 30</i>
	<i>Cows may be harvested. However, cows accompanied by calves may not be taken</i>	<i>July 15–Apr. 30</i>
	<i>July 15–Oct. 14.</i>	

Federal public lands in Unit 23 are closed to caribou hunting except by Federally qualified subsistence users.

Existing State Regulations

Unit 23—Caribou

23, north of and including Singoalik River drainage	Residents—Five caribou per day; however, calves may not be taken.	Bulls	RC907	July 1-Oct. 14 Feb. 1-June 30
		Cows	RC907	Jul. 15-Apr. 30
	Nonresidents—One bull; however, calves may not be taken		HT	Aug. 1-Sept. 30
23 remainder	Residents—Five caribou per day; however, calves may not be taken.	Bulls	RC907	July 1-Oct. 14 Feb. 1-June 30
		Cows	RC907	Sept. 1-Mar. 31
	Nonresidents—One bull; however, calves may not be taken		HT	Aug. 1-Sept. 30

Extent of Federal Public Lands

Federal public lands comprise approximately 71% of Unit 23 and consist of 40% National Park Service (NPS) managed lands, 22% Bureau of Land Management (BLM) managed lands, and 9% U.S. Fish and Wildlife Service (USFWS) managed lands.

Customary and Traditional Use Determinations

Residents of Unit 21D west of the Koyukuk and Yukon Rivers, Galena, 22, 23, 24 including residents of Wiseman but not including other residents of the Dalton Highway Corridor Management Area, and 26A have a customary and traditional use determination for caribou in Unit 23 (**Map 1**).

Regulatory History

In 1990, the caribou hunting season in Unit 23 was open year round with a 5 caribou per day harvest limit and a restriction on the take of cows May 16-June 30.

In 1995, the Federal Subsistence Board (Board) adopted Proposal P95-51 to increase the caribou harvest limit from 5 to 15 caribou per day so that subsistence hunters could maximize their hunting efforts when caribou were available (FWS 1995a).

In 1997, the Board adopted Proposal P97-66 with modification to provide a customary and traditional use determination for caribou in Unit 23 for rural residents of Unit 21D west of the Koyukuk and Yukon rivers,

Galena, Units 22, 23, 24 including residents of Wiseman, but not other residents of the Dalton Highway Corridor Management Area and Unit 26A (**Map 1**, FWS 1995b, 1997).

In 2000, the Board adopted Proposal WP00-53 with modification, allowing the use of snowmachines to position a hunter to select individual caribou for harvest in Units 22 and 23. This was done to recognize a customary and traditional practice in the region (FWS 2000a).

In 2013, an aerial photocensus indicated significant declines in the Teshekpuk Caribou herd (TCH), WACH, and possibly the Central Arctic Caribou Herd (CACH) populations (Caribou Trails 2014). In response, the Alaska Board of Game (BOG) adopted modified Proposal 202 (RC76) in March 2015 to reduce harvest opportunities for both Alaska residents and nonresidents within the range of the WACH and the TCH. These regulation changes – which included lowering harvest limits for nonresidents from two caribou to one bull, reductions in bull and cow season lengths, the establishment of new hunt areas, and prohibiting calf harvest – were adopted to slow or reverse the population decline. The regulatory changes took effect on July 1, 2015.

In 2015, four temporary special actions, WSA15-03/04/05/06, requesting changes to caribou regulations in Units 23, 24, and 26, were submitted by the North Slope Subsistence Regional Advisory Council (North Slope Council) and approved with modification by the Board, effective July 1, 2015. Temporary Special Action WSA15-03 requested designation of a new hunt area for caribou in the northwest corner of Unit 23 where the harvest limit would be reduced from 15 to 5 caribou per day, the harvest season would be shortened for bulls and cows, and the take of calves would be prohibited. The Board did not establish a new hunt area, applying the restrictions to all of Unit 23 and also prohibited the take of cows with calves. These State and Federal regulatory changes were the first time that harvest restrictions had been implemented for the WACH in over 30 years.

Five proposals (WP16-37, WP16-48, WP16-49/52, and WP16-61) concerning caribou regulations in Unit 23 were submitted to the Board for the 2016-2018 wildlife regulatory cycle. The Board adopted WP16-48 with modification to allow the positioning of a caribou, wolf, or wolverine for harvest on BLM lands only. Proposal WP16-37 requested that Federal caribou regulations mirror the new State regulations across the ranges of the WACH and TCH (Units 21D, 22, 23, 24, 26A, and 26B). The Board adopted Proposal WP16-37 with modification to reduce the harvest limit to 5 caribou per day, restrict bull season during rut and cow season around calving, prohibit the harvest of calves and the harvest of cows with calves before weaning (mid-Oct.), and to create a new hunt area in the northwest corner of Unit 23. The Board took no action on the remaining proposals (WP16-49/52, and WP16-61) because of action taken on WP16-37.

In 2015, the Northwest Arctic Subsistence Regional Advisory Council (Northwest Arctic Council) submitted a temporary special action request (WSA16-01) to close caribou hunting on Federal public lands in Unit 23 to NFQU for the 2016/17 regulatory year. The Council stated that their request was necessary for conservation purposes but also needed because nonlocal hunting activities were negatively affecting subsistence harvests. In April 2016, the Board approved WSA16-01, basing its decision on the strong support of the Northwest Arctic and North Slope Councils, public testimony in favor of the request, as well as concerns over conservation and continuation of subsistence uses (FSB 2016).

In June 2016, the State submitted a special action request (WSA16-03) to reopen caribou hunting on Federal public lands in Unit 23 to NFQU, providing new biological information (e.g. calf recruitment, weight, body

condition) on the WACH. The State specified that there was no biological reason for the closure and that it could increase user conflicts. In January 2017, the Board rejected WSA16-03 due to the position of all four affected Councils (Northwest Arctic, North Slope, Seward Peninsula, and Western Interior) as well as public testimony and Tribal consultation comments opposing the request. Additionally, the Board found the new information provided by the State to be insufficient to rescind the closure.

In November 2016, the Northwest Arctic Council voted to submit a special action request (WSA17-02) to close Federal public lands in Unit 23 to moose hunting by NFQU. The Council submitted the request due to a declining moose population in Unit 23 and because more local people are depending on moose to meet their subsistence needs in light of the current WACH population decline. In April 2017, the Board rejected WSA17-02 because moose harvest by FQSU has remained stable over the past decade, indicating these users' needs are still being met; NFQU harvest accounted for the minority of Unit 23 moose harvest, so eliminating them would have limited impact on the moose population; NFQU hunting activity could become concentrated on State lands, increasing user conflicts; and recent changes to State regulations (i.e. elimination of antlerless and nonresident hunts) already addressed the issue and time is needed to evaluate their effectiveness.

In January 2017, the BOG adopted Proposal 2, requiring registration permits for residents hunting caribou within the range of the Western Arctic and Teshekpuk herds in Units 23 and 26A (a similar proposal was passed for Unit 22 in 2016). The Alaska Department of Fish and Game (ADF&G) submitted the proposal in order to better monitor harvest and improve management flexibility. Also in January 2017, the BOG rejected Proposal 45, which proposed requiring big game hunting camps to be spaced at least three miles apart along the Noatak, Agashashok, Eli, and Squirrel Rivers. The Noatak/Kivalina & Kotzebue Fish and Game Advisory Committee (AC) submitted the proposal to allow caribou to migrate through those areas with less disruption and barriers. The proposal failed as it would be difficult to enforce.

In March 2017, the Northwest Arctic and North Slope Councils submitted temporary special action requests (WSA17-03 and -04, respectively) to close caribou hunting on Federal public lands in Unit 23 and in Units 26A and 26B, respectively to NFQU for the 2017/18 regulatory year. Both Councils stated that the intent of the proposed closures was to ensure subsistence use in the 2017/18 regulatory year, to protect declining caribou populations, and to reduce user conflicts. The Board approved WSA17-03 with modification to close all Federal public lands within a 10 mile wide corridor (5 miles either side) along the Noatak River from the western boundary of Noatak National Preserve upstream to the confluence with the Cutler River; within the northern and southern boundaries of the Eli and Agashashok River drainages, respectively; and within the Squirrel River drainage to caribou hunting except by FQSU for the 2017/18 regulatory year. The Board considered the modification a reasonable compromise for all users and that closure of the specified area was warranted in order to continue subsistence uses. The Board rejected WSA17-04 stating that recent changes to State regulations aimed at reducing caribou harvest should be given time to determine if they are effective before additional restrictions are enacted.

Controlled Use Areas

In 1988, the Traditional Council of Noatak submitted a proposal to the BOG to create the Noatak Controlled Use Area (CUA) in order to restrict the use of aircraft in any manner for big game hunting Aug. 15 - Sept. 20 due to user conflicts (Fall 1990:86). The proposed CUA extended five miles on either side of the

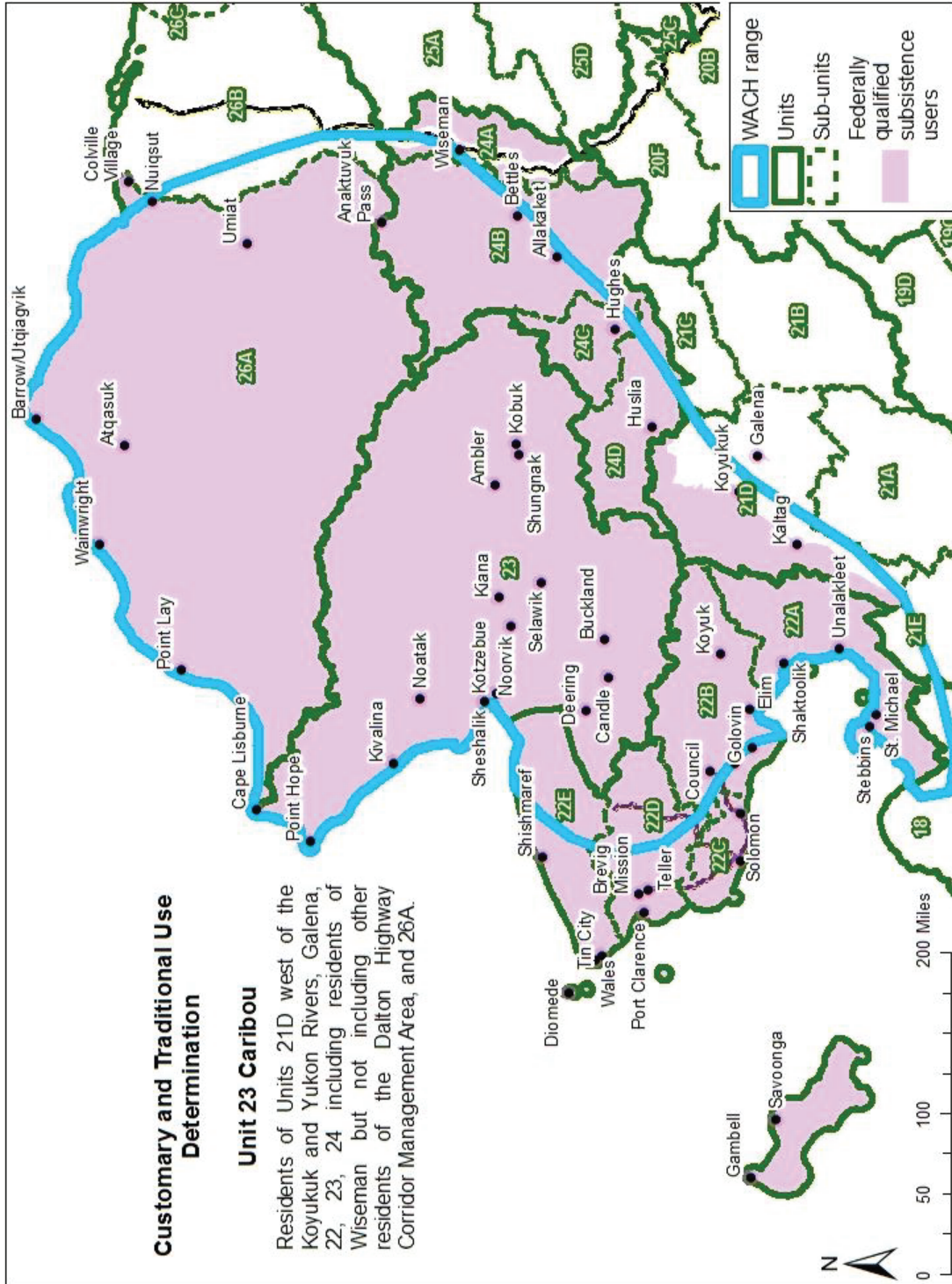
Noatak River, from the mouth of the Eli River upstream to the mouth of the Nimiuktuk River, including the north side of Kivivik Creek (ADF&G 1988:47). The BOG adopted the proposal with modification to close a much smaller area extending from the Kugururok River to Sapun Creek from Aug. 20-Sept. 20.

The CUA was expanded in 1994 and modified in 2017 (Betchkal 2015, Halas 2015, ADF&G 2017a). From 1994-2016, the Noatak CUA consisted of a 10-mile wide corridor (5 miles either side) along the Noatak River from its mouth to Sapun Creek with approximately 80 miles of the CUA within Noatak National Preserve (NP) (**Map 2**, Betchkal 2015). The closure dates from 1994-2009 were Aug. 25-Sept. 15. In 2009 (effective 2010), the BOG adopted Proposal 22 to expand the closure dates to Aug. 15-Sept. 30 in response to the timing of caribou migration becoming less predictable (ADF&G 2009). During the 2016/17 BOG regulatory cycle, the Noatak/Kivalina & Kotzebue AC proposed (Proposal 44) extending the upriver boundary of the Noatak CUA to the Cutler River, citing increased user conflicts as their rationale (ADF&G 2017b). In January 2017, the BOG approved amended Proposal 44 to shift the boundaries of the Noatak CUA to start at the mouth of the Agashashok River and end at the mouth of the Nimiuktuk River with approximately 105 miles within Noatak NP (**Map 2**, ADF&G 2017a).

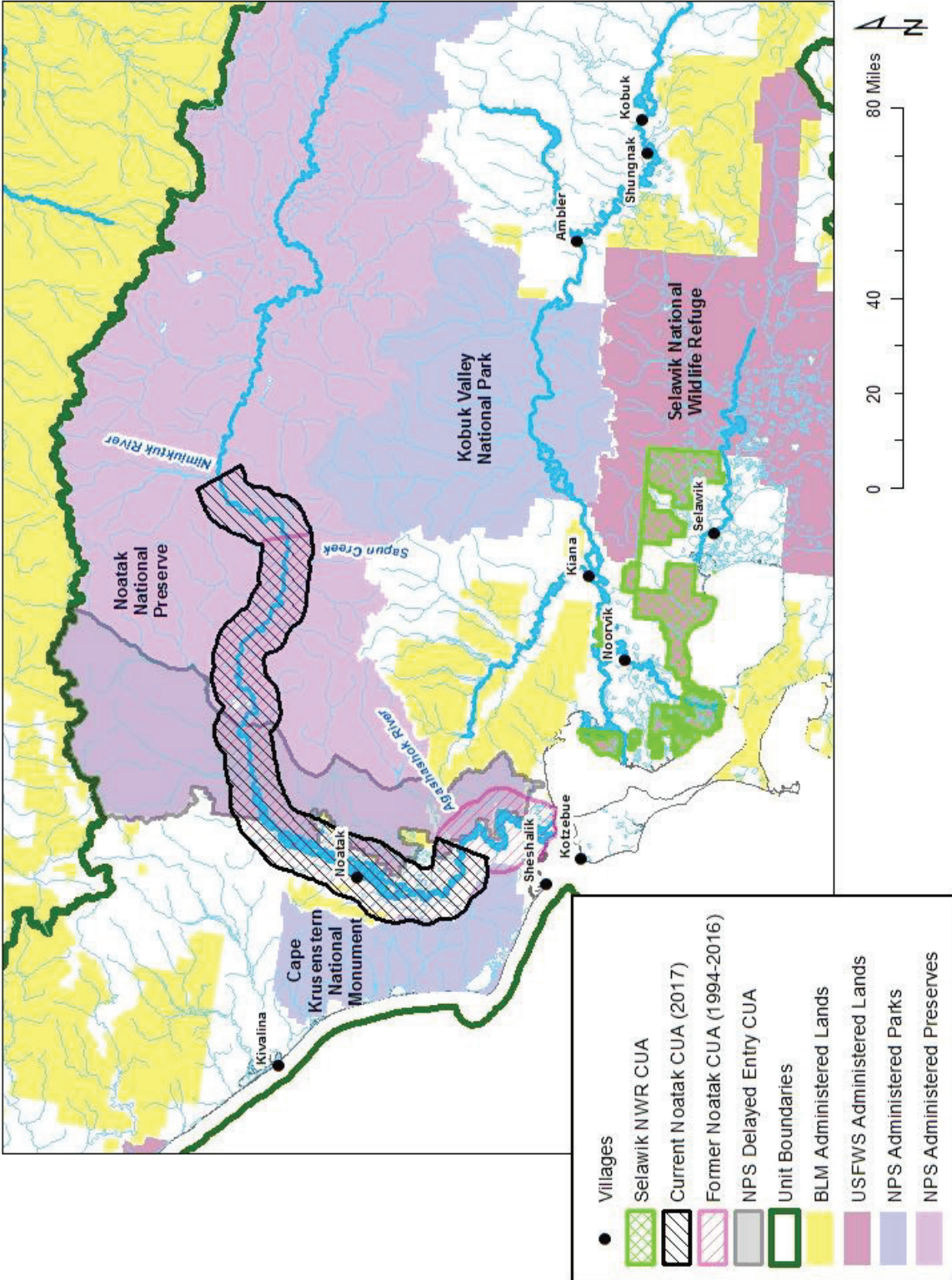
In 1990, the Noatak CUA was adopted under Federal regulations. In 1995, the Board adopted Proposal P95-50 to expand the time period and area of the CUA to Aug. 25-Sept. 15 and the mouth of the Noatak River upstream to the mouth of Sapun Creek, respectively, which aligned with current State regulations. In 2008, Proposals WP08-50 and 51 requested modifications to the Noatak CUA dates. These proposals were submitted in response to caribou migration occurring later in the season, to improve caribou harvest for subsistence users, and to decrease conflicts between local and nonlocal hunters. The Board deferred these proposals to the next regulatory cycle. In 2010, Proposals WP10-82, 83, and 85 requested similar date changes. The Board adopted WP10-85 to expand the time period during which aircraft are restricted in the Noatak CUA to Aug. 15-Sept. 30, which aligned with the current State regulations.

In 2011, Selawik National Wildlife Refuge (NWR) designated refuge lands in the northwest portion of the refuge as closed to big game hunting by commercial guides and transporters through their comprehensive conservation plan (FWS 2011, 2014). These refuge lands are intermingled with private lands near the villages of Noorvik and Selawik (**Map 2**). The purpose of this closure was to minimize trespass on private lands and to reduce user conflicts (FWS 2011).

In 2012, the NPS established a Special Commercial Use Area or “delayed entry zone” in the western portion of the Noatak NP (Halas 2015, Fix and Ackerman 2015). Within this zone, transporters can only transport nonlocal caribou hunters after September 15 unless otherwise specified by the Western Arctic Parklands superintendent in consultation with commercial operators, other agencies and local villages (Halas 2015). The purpose of this zone is to allow a sufficient number of caribou to cross the Noatak River and establish migration routes, to limit interactions between local and nonlocal hunters, and to allow local hunters the first opportunity to harvest caribou in that area (**Map 2**, FWS 2014, Halas 2015). To date, the Superintendent has not used his/her authority to alter the closure dates in response to changes in caribou herd migration or to meet the needs of local hunters (Halas 2015).



Map 1. Customary and Traditional (C&T) Use Determination for caribou in Unit 23. C&T Determinations indicate which Alaska rural residents are Federally qualified subsistence users. The WACH range indicates which residents are considered local in State management reports.



Map 2. Federal and State Hunting Management Areas in Unit 23.

Current Events

In January 2017, the Board directed the Office of Subsistence Management (OSM) to form an interagency group to discuss possible solutions to user conflict issues in Unit 23 such as targeted closures (FSB 2017). This group, consisting of representatives from OSM, BLM, NPS, USFWS, and ADF&G, met for the first time in April 2017 to discuss user conflicts in Unit 23 and develop suggestions to mitigate them. The group suggested closing Federal public lands within a 10 mile wide corridor (5 miles either side) along the Noatak River from the western boundary of Noatak National Preserve upstream to the confluence with the Cutler River; north of the Noatak River between, and including, the Kelly and Nimiuktuk River drainages; within the northern and southern boundaries of the Eli and Agashashok River drainages, respectively; and within the Squirrel River drainage to caribou hunting except by FQSU.

Several other proposals concerning Federal caribou harvest regulations in Unit 23 and the WACH were submitted for the 2018-2020 wildlife regulatory cycle (WP18-32, 45, 48/49, and 57). At the WACH Working Group meeting in December 2016, the group voted to submit two wildlife proposals. The group also voted to submit this proposal (WP18-46) as well as Proposal WP18-48 to require registration permits for caribou hunting in Units 22, 23, and 26A in order to align with State permitting requirements and better monitor harvest. Louis Cusack also submitted Proposal WP18-49 to require registration permits in these units.

At the Western Interior Council meeting in February 2017, the Council voted to submit Proposal WP18-32 to align Federal caribou seasons across the ranges of the WACH, TCH, and CACH. The intent of this proposal is to protect cows during migration. The Council expressed its intentions to submit a similar proposal to the BOG so that State and Federal seasons could be aligned.

At the Northwest Arctic Council meeting in March 2017, the Council voted to submit Proposal WP18-45 to decrease the harvest limit for caribou in Unit 23 from 5/day to 3/day. The Council also considered submitting a proposal to close Federal public lands to caribou hunting to NFQU (same as the WACH working group proposal), but the motion failed due to concerns about making the closure permanent and for family and tribal members currently living in urban areas who would be restricted by the closure.

At the North Slope Council meeting in March 2017, the Council voted to submit Proposal WP18-57 to close Federal public lands to caribou hunting by NFQU in Units 26A and 26B (similar to WSA17-04). This is in response to declines in the WACH, TCH, and CACH, which are seasonally present in the area.

Biological Background

Caribou abundance naturally fluctuates over decades (Gunn 2001, WACH Working Group 2011). Gunn (2001) reports the mean doubling rate for Alaskan caribou as 10 ± 2.3 years. Although the underlying mechanisms causing these fluctuations are uncertain, climatic oscillations (i.e. Arctic and Pacific Decadal Oscillations) may play an important role (Gunn 2001, Joly et al. 2011). Climatic oscillations can influence factors such as snow depth, icing, forage quality and growth, wildfire occurrence, insect levels, and predation, which all contribute to caribou population dynamics (Joly et al. 2011). Density-dependent

reduction in forage availability, resulting in poorer body condition may exacerbate caribou population fluctuations (Gunn 2001).

Caribou calving generally occurs from late May to mid-June (Dau 2013). Weaning generally occurs in late October and early November before the breeding season (Taillon et al. 2011). Calves stay with their mothers through their first winter, which improves calves' access to food and body condition (Holand et al. 2012). Calves orphaned after weaning (October) have greater chances of survival than calves orphaned before weaning (Holand et al. 2012, Joly 2000, Russell et al. 1991, Rughetti and Fest-Bianchet 2014).

The TCH, WACH, and CACH have ranges that overlap in Unit 26A (**Map 3**), and there can be considerable mixing of herds during the fall and winter. During the 1970s, there was little overlap between these herds, but the degree of mixing seems to be increasing. Currently, the WACH, TCH, and CACH populations are all declining (Dau 2011, 2015a, Lenart 2011, Parrett 2011, 2015c, 2015d).

The WACH has historically been the largest caribou herd in Alaska and has a home range of approximately 157,000 square miles in northwestern Alaska. In the spring, most mature cows move north to calving grounds in the Utukok Hills, while bulls and immature cows lag behind and move toward summer range in the Wulik Peaks and Lisburne Hills (**Map 4**, Dau 2011, WACH Working Group 2011).

Dau (2013) determined the calving dates for the WACH to be June 9–13. This is based upon long-term movement and distribution data obtained from radio-collared caribou (these are the dates cows ceased movements). After the calving period, cows and calves move west toward the Lisburne Hills where they mix with the bulls and non-maternal cows. During the summer, the herd moves rapidly to the Brooks Range.

In the fall, the herd moves south toward wintering grounds in the northern portion of the Nulato Hills. Rut occurs during fall migration (Dau 2011, WACH Working Group 2011). Dau (2013) determined the WACH rut dates to be October 22–26. This is based on back-calculations from calving dates using a 230 day gestation period. Since about 2000, the timing of fall migration has been less predictable, often occurring later than in previous decades (Dau 2015a). From 2010-2015, the average date that GPS collared caribou crossed the Noatak River ranged from Sep. 30 – Oct. 23 (Joly and Cameron 2017). The proportion of caribou using certain migration paths varies each year (**Figure 1**, Joly and Cameron 2017). Changes in migration paths are likely influenced by multiple factors including food availability, snow depth, rugged terrain, and dense vegetation (Fullman et al. 2017, Nicholson et al. 2016). If caribou travelled the same migration routes every year, their food resources would likely be depleted (NWARAC 2016). In recent years (2012-2014), the path of fall migration has shifted east (Dau 2015a).

The WACH Working Group developed a WACH Cooperative Management Plan in 2003, and revised it in 2011 (WACH Working Group 2011). The plan identifies seven plan elements: cooperation, population management, habitat, regulations, reindeer, knowledge, and education as well as associated goals, strategies, and management actions. As part of the population management element, the WACH Working Group developed a guide to herd management determined by population size, population trend, and harvest rate. Population sizes guiding management level determinations were based on recent (since 1970) historical data for the WACH (WACH Working Group 2011). Revisions to recommended harvest levels

under liberal and conservative management (+/- 100 to 2,850 caribou) were made in December 2015 (WACH Working Group 2015, **Table 1**). The State of Alaska manages the WACH to protect the population and its habitat, provide for subsistence and other hunting opportunities on a sustained yield basis, and provide for viewing and other uses of caribou (Dau 2011). State management objectives for the WACH are the same as the goals specified in the WACH Management Plan (Dau 2011, WACH Working Group 2011) and include:

- Encourage cooperative management of the WACH among State, Federal, local entities, and all users of the herd.
- Manage for healthy populations using management strategies adapted to fluctuating population levels and trends.
- Assess and protect important habitats.
- Promote consistent and effective State and Federal regulations for the conservation of the WACH.
- Seek to minimize conflict between reindeer herders and the WACH.
- Integrate scientific information, traditional ecological knowledge of Alaska Native users, and knowledge of all users into management of the herd.
- Increase understanding and appreciation of the WACH through the use of scientific information, traditional ecological knowledge of the Alaska Native users, and knowledge of all other users.

The WACH population declined rapidly in the early 1970s, bottoming out at about 75,000 animals in 1976. Aerial photocensuses have been used since 1986 to estimate population size. The WACH population increased throughout the 1980s and 1990s, peaking at 490,000 animals in 2003 (**Figure 2**). Since 2003, the herd has declined at an average annual rate of 7.1% from approximately 490,000 caribou to 200,928 caribou in 2016 (Caribou Trails 2014; Dau 2011, 2014, Parrett 2016a).

Between 1982 and 2011, the WACH population was within the liberal management level prescribed by the WACH Working Group (**Figure 2, Table 1**). In 2013, the herd population estimate fell below the population threshold for liberal management of a decreasing population (265,000), slipping into the conservative management level. In July 2015, ADF&G attempted an aerial photocensus of the herd. However, the photos taken could not be used due to poor light conditions that obscured unknown portions of the herd (Dau 2015b). ADF&G conducted a successful photocensus of the WACH on July 1, 2016. This census resulted in a minimum count of 194,863 caribou with a point estimate of 200,928 (Standard Error = 4,295), suggesting the WACH is still within the conservative management level, although close to the threshold for preservative management (**Figure 2, Table 1**). Results of this census indicate an average annual decline of 5% per year since 2013, a much lower rate than the 15% annual decline between 2011 and 2013. The large cohorts of 2015 and 2016 (calves born in these years), which currently comprise a substantial proportion of the herd, contributed to the recent decreased rate of decline, but remain vulnerable to difficult winter conditions due to their young age (Parrett 2016a). ADF&G plans to conduct another photocensus in the summer of 2017 and also transition from film to digital cameras, which will enhance their ability to complete successful and timely censuses (Parrett 2016a, Parrett 2017, pers. comm.).

Between 1970 and 2016, the bull:cow ratio exceeded critical management levels (40 bulls:100 cows) in all years except 1975, 2001, and 2014 (**Figure 3**). Reduced sampling intensity in 2001 likely biased the 2001

bull:cow ratio low (Dau 2013). Since 1992, the bull:cow ratios has trended downward (Dau 2015a). The average annual number of bulls:100 cows was greater during the period of population growth (54:100 between 1976–2001) than during the recent period of decline (44:100 between 2004–2016). Additionally, Dau (2015a) states that while trends in bull:cow ratios are accurate, actual values should be interpreted with caution due to sexual segregation during sampling and the inability to sample the entire population, which likely account for more annual variability than actual changes in composition.

Although factors contributing to the population decline are not known with certainty, fall and winter icing events likely initiated the decline (Dau 2015a). Increased adult cow mortality, and decreased calf recruitment and survival played a role (Dau 2011). Since the mid-1980s, adult mortality has slowly increased while recruitment has slowly decreased (Dau 2013, **Figure 4**). In a population model developed specifically for the WACH, Prichard (2009) found adult survival to have the largest impact on population size.

Calf production has likely had little influence on the population trajectory (Dau 2013, 2015a). Between 1990 and 2003, the June calf:cow ratio averaged 66 calves:100 cows/year. Between 2004 and 2016, the June calf:cow ratio averaged 71 calves:100 cows/year (**Figure 5**). In June 2016, 85 calves:100 cows were observed, which approximates the highest parturition level ever recorded for the herd (86 calves:100 cows in 1992) (Dau 2016a).

Decreased calf survival through summer and fall and recruitment into the herd are likely contributing to the current population decline (Dau 2013, 2015a). Fall calf:cow ratios indicate calf survival over summer. Between 1976 and 2016, the fall calf:cow ratio ranged from 35 to 59 calves:100 cows/year, averaging 46 calves:100 cows/year (**Figure 5**). Fall calf:cow ratios declined from an average of 46 calves:100 cows/year between 1990-2003 to an average of 42 calves:100 cows/year between 2004-2016 (Dau 2015a, **Figure 5**). Since 2008, ADF&G has recorded calf weights at Onion Portage as an index of herd nutritional status. In September 2015, calf weights averaged 100 lbs., the highest average ever recorded (Parrett 2015b).

Similarly, the ratio of short yearlings (SY, 10-11 months old caribou) to adults provides a measure of overwintering calf survival and recruitment. Between 1990 and 2003, SY:adult ratios averaged 20 SY:100 adults/year. Since the decline began in 2003, SY:adult ratios have averaged 16 SY:100 adults/year (2004-2016, **Figure 5**). However, 23 SY:100 adults were observed during spring 2016 surveys, the highest ratio recorded since 2007 (Dau 2016b). The overwinter calf survival for the 2015 cohort (Oct. 2015-Jun. 2016) was 84% (Parrett 2016b). While 2016 indices suggest improvements in recruitment, the overall trend since the early 1980s has been downward (Dau 2015a, 2016b).

Increased cow mortality is likely affecting the trajectory of the herd as well (Dau 2011, 2013). The annual mortality rate of radio-collared adult cows increased from an average of 15% between 1987 and 2003 to 23% from 2004–2014 (Dau 2011, 2013, 2014, 2015a, **Figure 4**). Estimated mortality includes all causes of death including hunting (Dau 2011). Dau (2015a) states that cow mortality estimates are conservative due to exclusion of unhealthy (i.e. diseased) and yearling cows. Dau (2013) attributed the high mortality rate for 2011–2012 (33%, **Figure 4**) to a winter with deep snows, which weakened caribou and enabled

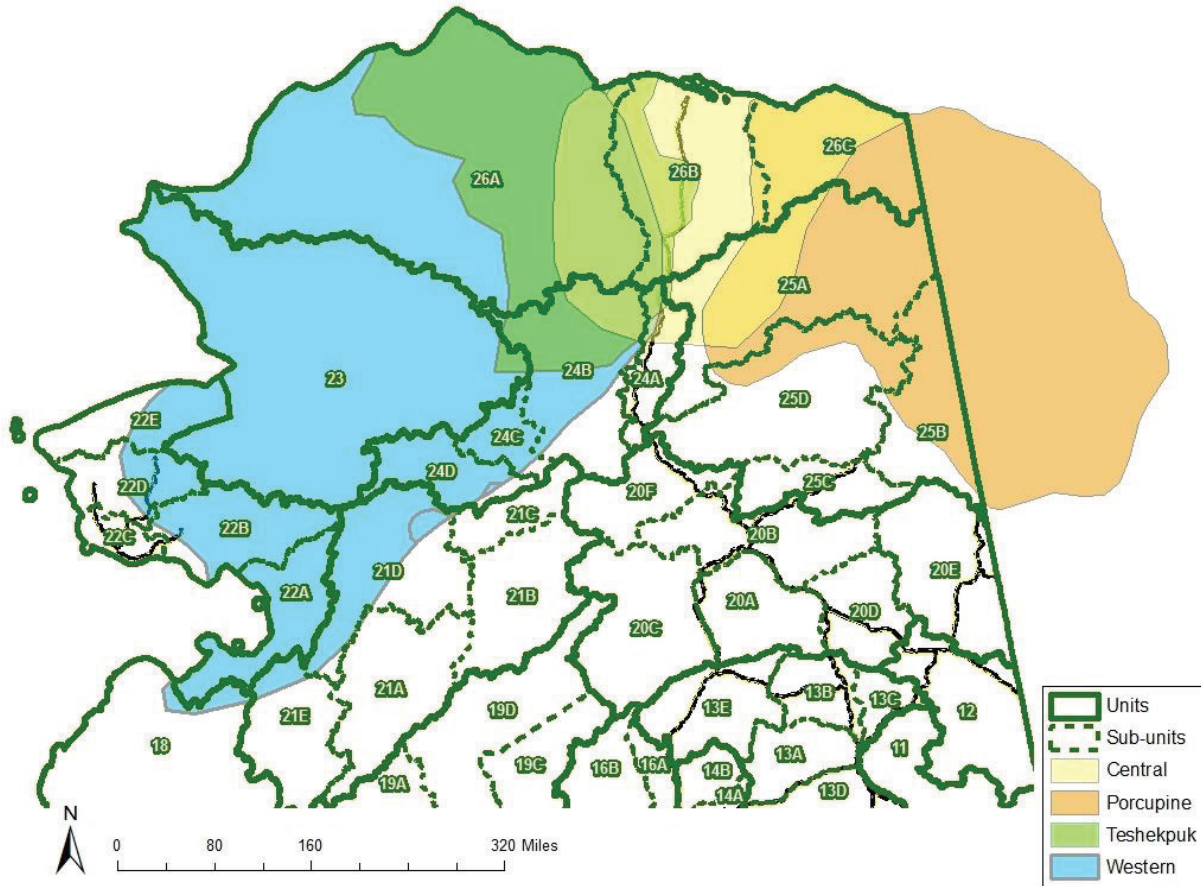
wolves to prey on them more easily. Prior to 2004, estimated adult cow mortality only exceeded 20% twice, but has exceeded 20% in 7 out of 9 regulatory years between 2004 and 2012 (**Figure 4**). The annual mortality rate was 8% as of April 2016 (Dau 2016b). This may fluctuate substantially throughout the year based on changing local conditions and harvest levels. Dau (2015a) indicates that mortality rates may also change in subsequent management reports as the fate of collared animals is determined, and that these inconsistencies are most pronounced for the previous 1–3 years.

Far more caribou died from natural causes than from hunting between 1992 and 2012 (Dau 2013). Cow mortality remained constant throughout the year, but natural and harvest mortality for bulls spiked during the fall. Predation, particularly by wolves, accounted for the majority of natural mortality (Dau 2013). However as the WACH has declined and estimated harvest has remained relatively stable, the percentage of mortality due to hunting has increased relative to natural mortality. For example, during the period October 1, 2013 to September 30, 2014, estimated hunting mortality was approximately 42% and estimated natural mortality about 56% (Dau 2014). In previous years (1983–2013), the estimated hunting mortality exceeded 30% only once in 1997-1998 (Dau 2013). Additionally, Prichard (2009) and Dau (2015a) suggest that harvest levels and rates of cows can greatly impact population trajectory. If bull:cow ratios continue to decline, harvest of cows may increase, exacerbating the current population decline.

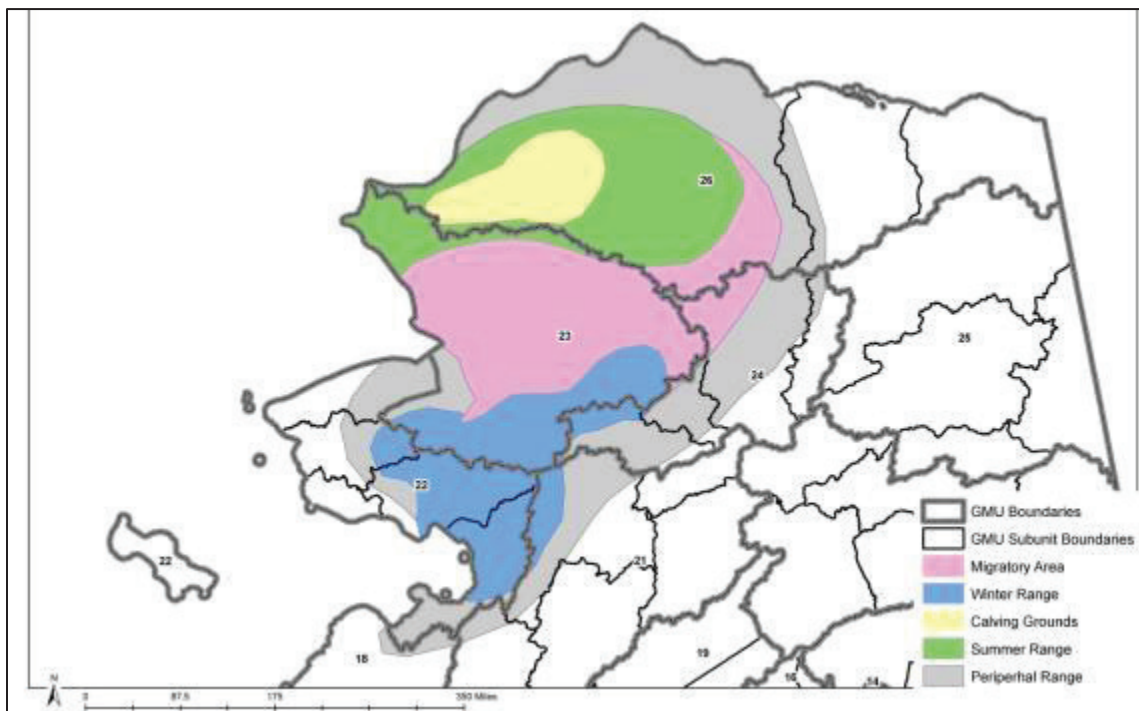
Although icing events likely precipitated the population decline, increased predation, hunting pressure, deteriorating range condition (including habitat loss and fragmentation), climate change, and disease may also be contributing factors (Dau 2015a, 2014). Joly et al. (2007) documented a decline in lichen cover in portions of the wintering areas of the WACH. Dau (2011, 2014) reported that degradation in range condition is not thought to be a primary factor in the decline of the herd because animals have generally maintained good body condition since the decline began. Body condition is assessed on a subjective scale from 1-5. The fall body condition of adult females in 2015 was characterized as “fat” (mean=3.9/5) with no caribou being rated as skinny or very skinny (Parrett 2015b). However, the body condition of the WACH in the spring may be a better indicator of the effects of range condition versus the fall when the body condition of the herd is routinely assessed and when caribou are in prime condition (Joly 2015, pers. comm.).

Habitat

Caribou feed on a wide variety of plants including lichens, fungi, sedges, grasses, forbs, and twigs of woody plants. Arctic caribou depend primarily on lichens during the fall and winter, but during summer they feed on leaves, grasses and sedges (Miller 2003).



Map 3. Herd overlap and ranges of the WACH, TCH, CACH, and PCH.



Map 4. Range of the WACH.

Table 1. Western Arctic Caribou Herd management levels using herd size, population trend, and harvest rate (WACH Working Group 2011, 2015).

Management and Harvest Level	Population Trend			Harvest Recommendations May Include:
	Declining Low: 6%	Stable Med: 7%	Increasing High: 8%	
Liberal	Pop: 265,000+	Pop: 230,000+	Pop: 200,000+	<ul style="list-style-type: none"> • Reduce harvest of bulls by nonresidents to maintain at least 40 bulls: 100 cows • No restriction of bull harvest by resident hunters unless bull:cow ratios fall below 40 bulls:100 cows
	Harvest: 16,000-22,000	Harvest: 16,000-22,000	Harvest: 16,000-22,000	
Conservative	Pop: 200,000-265,000	Pop: 170,000-230,000	Pop: 150,000-200,000	<ul style="list-style-type: none"> • No harvest of calves • No cow harvest by nonresidents • Restriction of bull harvest by nonresidents • Limit the subsistence harvest of bulls only when necessary to maintain a minimum 40:100 bull:cow ratio
	Harvest: 12,000-16,000	Harvest: 12,000-16,000	Harvest: 12,000-16,000	
Preservative	Pop: 130,000-200,000	Pop: 115,000-170,000	Pop: 100,000-150,000	<ul style="list-style-type: none"> • No harvest of calves • Limit harvest of cows by resident hunters through permit hunts and/or village quotas • Limit the subsistence harvest of bulls to maintain at least 40 bulls:100 cows • Harvest restricted to residents only, according to state and federal law. Closure of some federal public lands to nonqualified users may be necessary
	Harvest: 8,000-12,000	Harvest: 8,000-12,000	Harvest: 8,000-12,000	
Critical Keep Bull: Cow ratio ≥ 40 Bulls:100 Cows	Pop: < 130,000	Pop: < 115,000	Pop: < 100,000	<ul style="list-style-type: none"> • No harvest of calves • Highly restrict the harvest of cows through permit hunts and/or village quotas • Limit the subsistence harvest of bulls to maintain at least 40 bulls:100 cows • Harvest restricted to residents only, according to state and federal law. Closure of some federal public lands to nonqualified users may be necessary
	Harvest: 6,000-8,000	Harvest: 6,000-8,000	Harvest: 6,000-8,000	

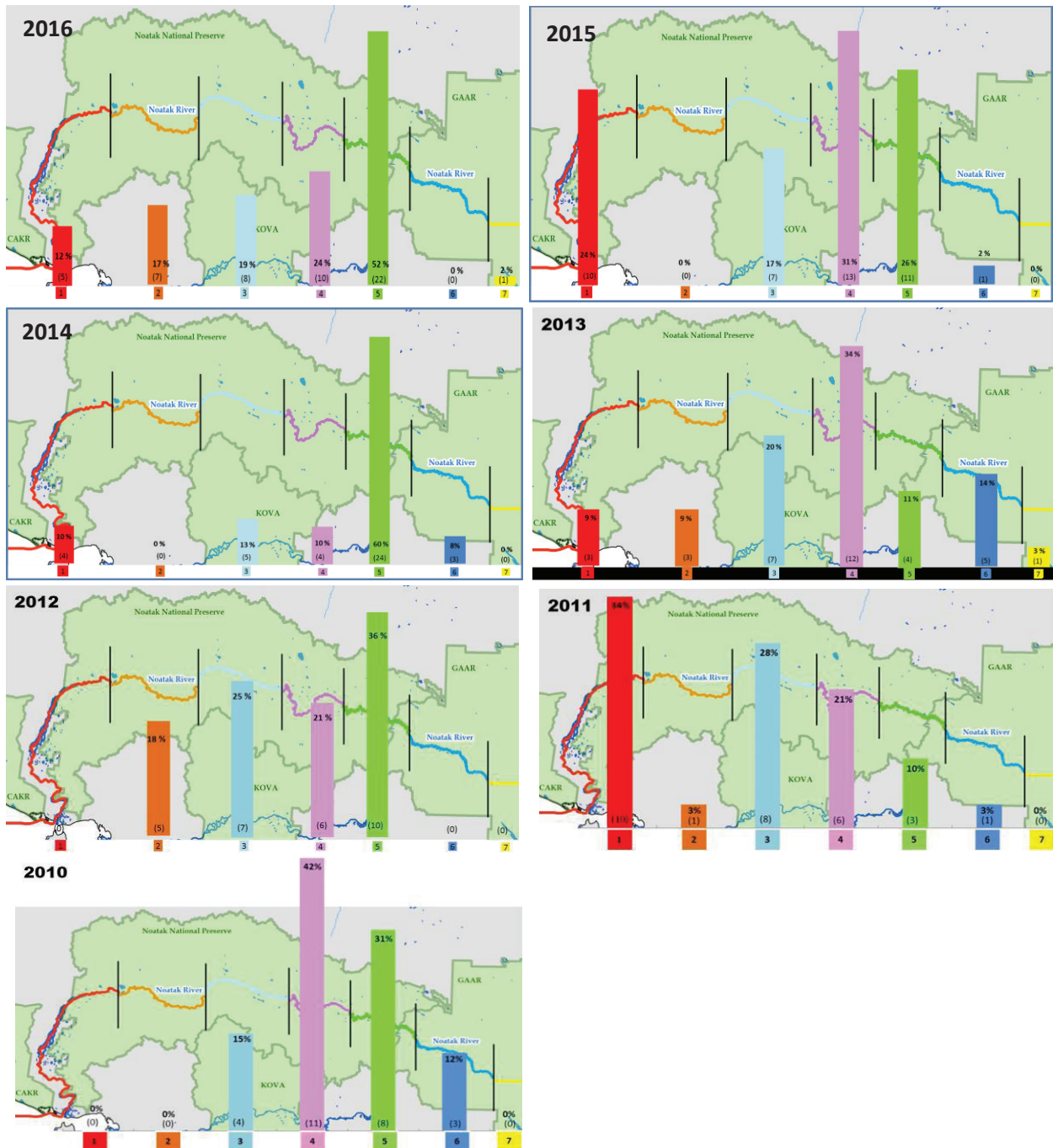


Figure 1. Distribution of caribou crossing the Noatak River during fall. Histograms depict where collared female caribou crossed the Noatak River, generally from north to south, on their fall migration. Relative percentages (top number) and the absolute number (middle number) of caribou are provided. The river is divided into seven (lowest number) color-coded segments which are displayed in the background. The middle five segments are 100 river kilometers long, while the westernmost segment (red) is 200 km (before extending into the Chukchi Sea) and the easternmost (yellow) runs as far east as WACH caribou are known to migrate. The number of caribou with GPS collars ranged from 39-79 caribou/year with later years having more collared caribou than earlier years (Joly and Cameron 2017).

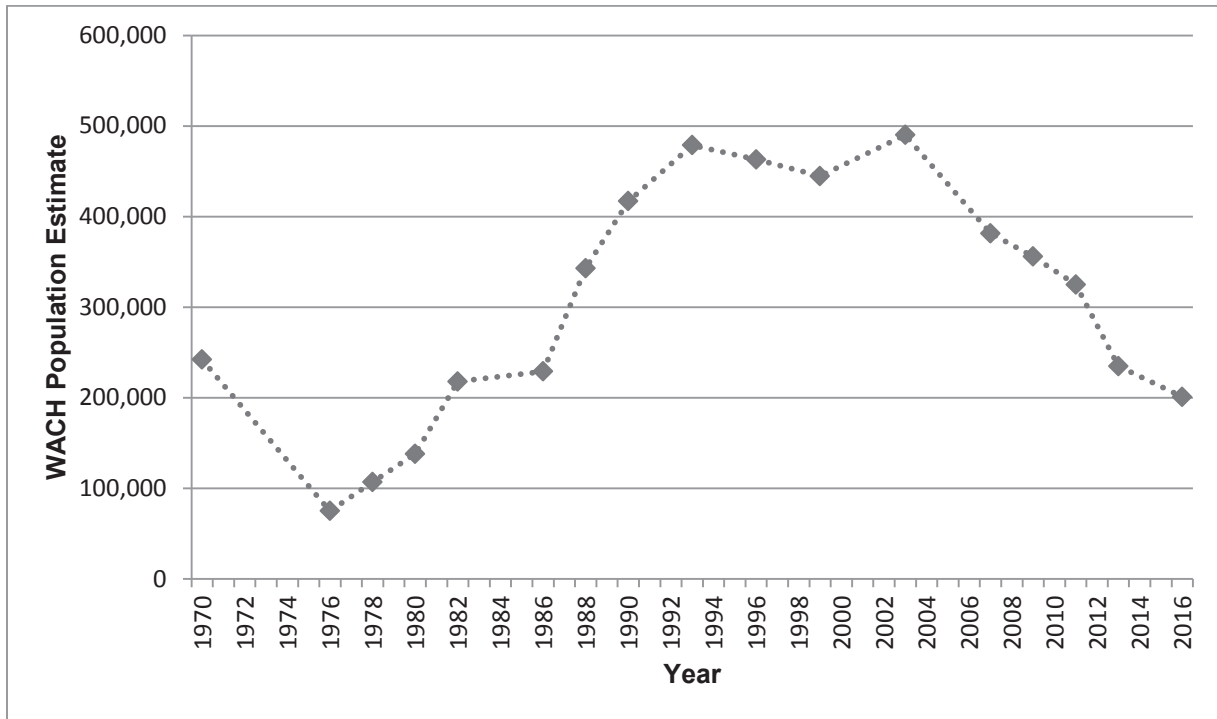


Figure 2. The WACH population estimates from 1970–2015. Population estimates from 1986–2016 are based on aerial photographs of groups of caribou that contained radio-collared animals (Dau 2011, 2013, 2014, Parrett 2016a).

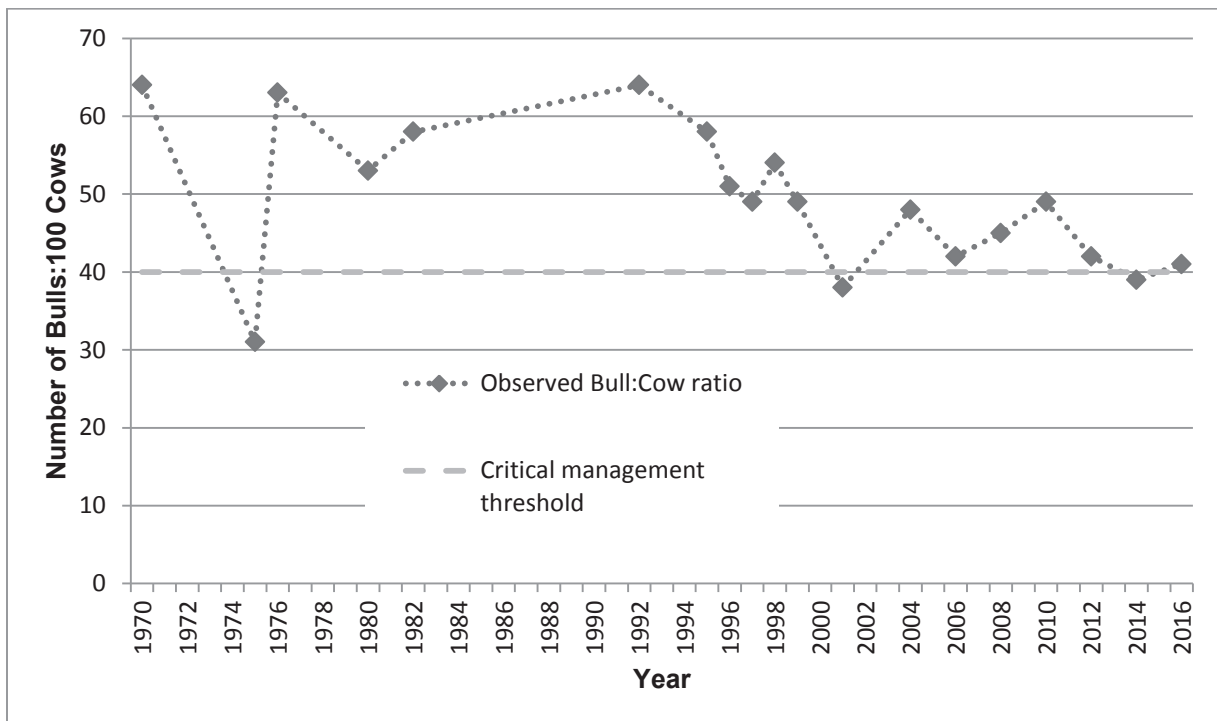


Figure 3. Bull: Cow ratios for the WACH (Dau 2015a, ADF&G 2017c).

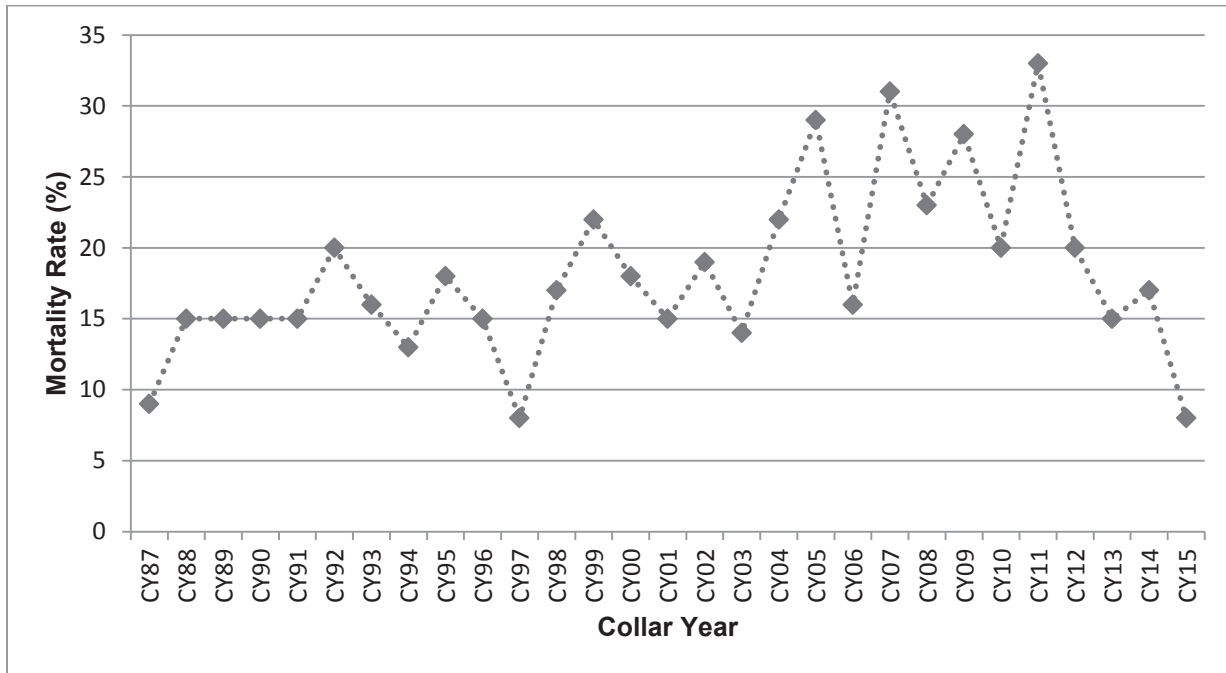


Figure 4. Mortality rate of radio-collared caribou in the Western Arctic caribou herd (Dau 2013, 2015a, 2016b). Collar Year (CY)= Oct. 1-Sept. 30. CY15 is Oct. 2015-Apr. 2016.

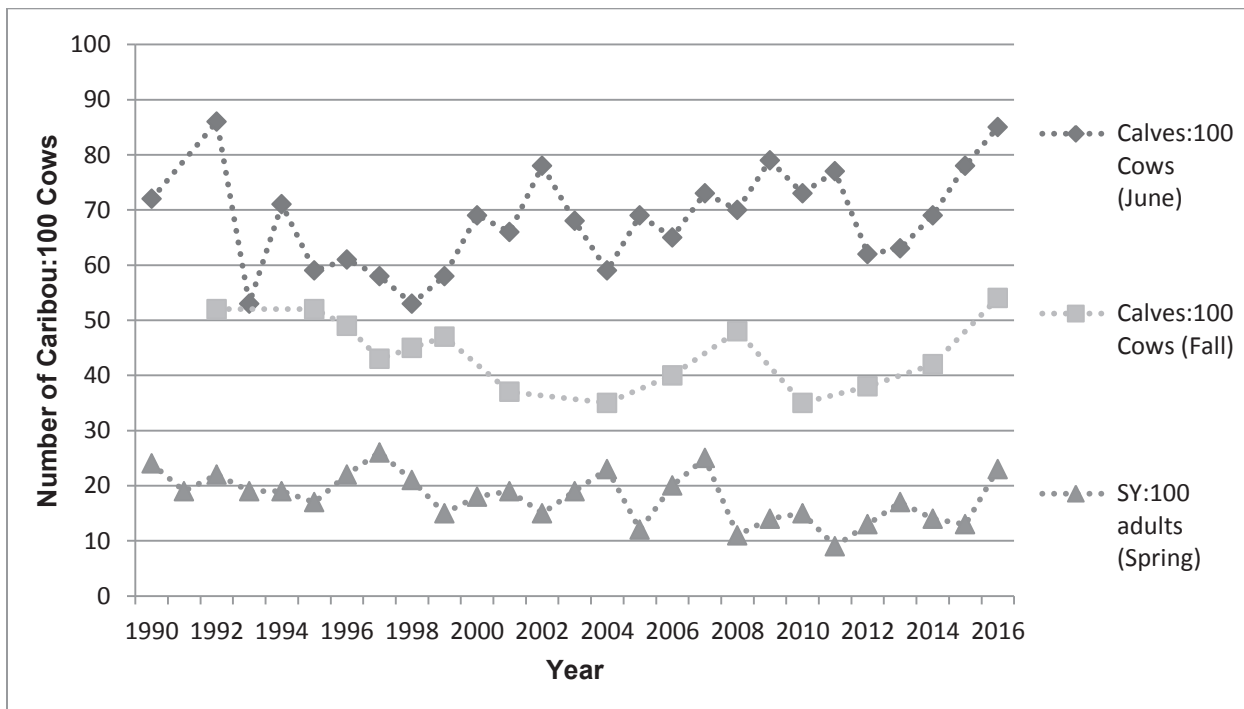


Figure 5. Calf:cow and short yearling (SY):adult ratios for the WACH (Dau 2013, 2015a, 2016a, ADF&G 2017c). Short yearlings are 10-11 months old caribou.

Cultural Knowledge and Traditional Practices

Meeting the nutritional and caloric needs of Arctic communities is vitally important and is the foundation of subsistence activities. Still, the meaning of subsistence extends far beyond human nutrition for Alaska's native peoples. Holthaus (2012) describes subsistence as the basis on which Alaska Native culture establishes its identity through "philosophy, ethics, religious belief and practice, art, ritual, ceremony, and celebration." Fienup-Riordan (1990) also describes subsistence in terms of the cultural cycles of birth and death representing the close human relationship and reciprocity between humans and the natural world. Concerning caribou specifically, Ms. Esther Hugo – a lifelong resident of Anaktuvuk Pass - describes the human-caribou relationship as a "way of life."

Caribou have been a primary resource for the Inupiat of the Northwest Arctic Region for thousands of years. Caribou bones dating from 8,000 to 10,000 years ago have been excavated from archeological sites on the Kobuk River (ADF&G 1992, Anderson 1988). Foote (1959, 1961) wrote about caribou hunting in the Noatak region forty years ago, noting that life would not be possible in Noatak without this source of meat. Caribou were traditionally a major source of both food and clothing and continues today to be the most important land animal consumed in this region (Burch 1984, 1994, 1998, ADF&G 1992). Uhl and Uhl (1979) documented the importance of caribou as a main source of red meat for Noatak residents as well as other communities in the region. Betcher (2016) also documents the critical contemporary importance of caribou to people residing throughout the Northwest Arctic.

Historically, during fall and spring caribou migrations, people built "drive fences" out of cairns, bundles of shrubs, or upright logs. These fences were sometimes several miles long and two to three miles wide. Ideally, the closed end of the fence crossed a river, and caribou were harvested while crossing the river and retrieved later; or the fence would end in a corral where caribou were snared and killed with spears (Burch 2012). Burch (2012:40) notes, "The landscape of Northwest Arctic, especially in hills and mountains, is littered with the remains of drive fences that were in every stage of construction when they were abandoned."

The WACH population declined rapidly in the Northwest Arctic beginning in the late 1800s. At its low point, its range had shrunk to less than half its former size. Famine ensued, primarily due to the absence of caribou. In the early 1900s, reindeer were introduced to fill the need for food and hides. The WACH began to rebound in the 1940s. Currently, among large terrestrial mammals, caribou are among the most abundant; however, the population in any specific area is subject to wide fluctuations from year to year as caribou migration routes change (Burch 2012).

Caribou were traditionally harvested any month of the year they were available in the Northwest Arctic Region. The objective of the summer hunt was to obtain the hides of adult caribou with their new summer coats. They provided the best clothing material available to the Inupiat. The fall hunt was to acquire large quantities of meat to freeze for winter (Burch 1994). The timing and routing of migration determined caribou hunting. Hunting seasons change from year to year according to the availability of caribou (ADF&G 1991). The numbers of animals and the duration of their stays varies from one year to the next (Burch 1994) and harvest varies from community to community depending on the availability of caribou.

Generally, communities in the southern portion of Unit 23 (Buckland, Deering) take caribou in the winter and spring, while the other communities in the unit take caribou in the fall, winter, and spring. Kivalina and Point Hope also take caribou in the summer in July (ADF&G 1992) and Selawik residents regularly hunt in the fall (Georgette 2016, pers. comm.).

Currently, caribou hunting by FQSU in Unit 23 is most intensive from September through November. Caribou can be harvested in large numbers, when available, and can be transported back to villages by boat before freeze-up. Hunters search for caribou and attempt to intercept them at known river crossings. Ideally, caribou harvesting occurs when the weather is cool enough to prevent spoilage of meat. If not, meat is frozen for later use. Prior to freeze-up, bulls are preferred because they are fatter than cows (Braem et al. 2015, Georgette and Loon 1993).

Small groups of caribou that have over-wintered may be harvested by hunters in areas that are accessible by snowmachine. Braem et al. (2015:141) explain, “Hunters harvest cows during the winter because they are fatter than bulls Caribou harvested during the winter can be aged completely without removing the skin or viscera Then in the spring, the caribou is thawed. Community members cut it into strips to make dried meat, or they package and freeze it.” In spring, caribou start their northward migration. The caribou that are harvested are “lean and good for making dried meat (*paniqtuq*) during the warm, sunny days of late spring” (Georgette and Loon 1993:80).

Today, the human population in Unit 23 is comprised primarily of 11 regional Inupiaq groups (Burch 1998). Kotzebue is the regional hub of transportation and commerce and is home to the majority of non-Natives in the region. The population of Unit 23 was approximately 7,500 in 2010, according to the U.S. Census (ADOLWD 2016). Caribou dominate the subsistence harvest of the region. In household harvest surveys conducted between 1964 and 2012, caribou were often the most harvested species, more than any other wild resource, in pounds of edible weight (**Appendix 1**, ADF&G 2016a). Based on these surveys, in a typical study year, the harvest of caribou was, on average, between 100 and 200 lbs. per person in northwest Alaska (**Appendix 1**, ADF&G 2016a).

User Conflicts

Throughout most of this analysis, local and nonlocal hunters are defined as those residing within and outside the range of the WACH, respectively. However, some authors cited in this section use the terms “local” and “nonlocal” without defining them. When definitions were provided they were included in this section. Otherwise, the terms are used in quotations.

User conflicts are likely to intensify when resources are scarce and when food security is threatened (Homer-Dixon 1994, Cohen and Pinstrup-Andersen 1999, Pomeroy et al. 2016). Such conflicts between local and nonlocal hunters have been well documented in Unit 23, specifically in the Noatak NP, the Squirrel River area, and along the upper Kobuk River (Georgette and Loon 1988, Jacobson 2008, Harrington and Fix 2009 in Fix and Ackerman 2015, Halas 2015, NWARAC 2015, Braem et al. 2015), even during times of high caribou abundance. Local hunters have expressed concerns over aircraft and “non-local” hunters disrupting caribou migration by “scaring” caribou away from river crossings, landing and

camping along migration routes, and shooting lead caribou (Halas 2015, Fix and Ackerman 2015, NWARAC 2015).

Halas (2015; **Map 5**), in a case study of Noatak caribou hunters and their interactions with transported hunters, examined the links between caribou behavior and migration, user group interactions, and changes to subsistence caribou hunting. In describing observations by Noatak hunters in 2012 and 2014 Halas (2015:81) explained,

Observations of caribou behavior (“spooked” caribou, deflected caribou groups from river crossings) due to aircraft are likely witnessed as a dramatic event not easily forgotten by a waiting Noatak hunter. Whether the aircraft intentionally or unintentionally may be “influencing” caribou movement, observing “scared” caribou can be a powerful experience for hunters.

In 1988 a proposal was submitted to the BOG to create the Noatak CUA (see regulatory history). Included within the proposal was the following justification from the Traditional Council of Noatak (Fall 1990:86, ADF&G 1988:47):

In the Noatak valley, aircraft supported hunters are directly competing with, and displacing subsistence hunters from traditional hunting sites along the Noatak River. The village most affected is Noatak, although families from Kotzebue are also affected. These families are having a great deal of difficulty obtaining their fall meat supply due to heavy aircraft traffic, rude aircraft operators, and displacement from traditional camping and hunting sites.

Aircraft operators have the opportunity to use many other areas than the main Noatak valley, in the vicinity of traditional hunting areas. Good management practices indicate that the two groups of users should be separated.

Experienced hunters from the village of Noatak point out that heavy aircraft traffic in the Noatak valley causes disruption of the fall caribou migration. The caribou are particularly sensitive near river crossings, which is stressful for the animals. Experience and good judgment is required to avoid disruption of the caribou migration. The village hunters’ experience with aircraft supported hunters has been poor. The aircraft supported hunter; lack of experience and commercial interests has led to abuse of the resource. Noatak hunters point out that the normal migration routes of caribou through the Noatak valley in the fall have changed over the last several years of heavy aircraft use. Village hunters have noticed increased levels of waste of caribou and moose by aircraft supported hunters.

In response to the proposal, the State Division of Subsistence interviewed 21 caribou hunting households in Noatak, 22 private pilots from Kotzebue, 10 Kotzebue-based air taxi services, two hunting guides, and the Federal Aviation Administration in Kotzebue (Fall 1990:86). This study found that fall caribou hunting in the proposed area was a traditional and meaningful activity for Noatak residents, that the major source of air

traffic in 1987 was from commercial air taxi operators, and that respondents tended to agree that air traffic significantly increased in the 1980s (Fall 1990, Georgette and Loon 1988).

BOG members indicated that they were not convinced that aircraft were disrupting subsistence caribou hunting but acknowledged an increase in outfitter operations along the Noatak River (Fall 1990:87). Fall (1990:87) suggests that because the BOG failed to support two similar proposals from Noatak previously, and because the current proposal had the support of both the Kotzebue Fish and Game Advisory Committee and the Arctic Fish and Game Regional Council (now Committee), there was pressure on the BOG to be responsive to the issue. The BOG unanimously adopted the proposal with modification to include approximately one third of the proposed land area (Fall 1990:87). The adopted boundaries of the CUA extended from Kugururok River to Sapun Creek and reflected the areas of greatest caribou hunting intensity and treeless habitats where caribou are most susceptible to noise (Wolfe 1988). Since 1988, the BOG has modified the dates and extent of the Noatak CUA several times in response to local concerns and user conflicts (see regulatory history, **Map 2**).

The BOG actions in 1988 and 1994 did not fully alleviate user conflicts along the Noatak River as local users continued to report similar observations in subsequent decades. In a 2014 survey of 19 Noatak hunters, 78% and 92% of respondents perceived “nonlocals” and planes to impact caribou migration, respectively. Similarly, 63% and 81% of respondents reported that “nonlocal” hunters and planes reduced hunting success, respectively (Halas 2015). Noatak respondents did differentiate between commercial transporter operators and “nonlocal” hunters, attributing a decrease in harvest success primarily to aircraft associated with commercial transporters (Halas 2015). Negative encounters between local and nonlocal hunters identified by respondents primarily focused on river crossings of migrating caribou (**Map 5**, Halas 2015).

A survey of 372 hunters identified as transporter clients in Noatak NP hunting between 2010 and 2013 indicated perceptions of conflict among this group differed from those expressed by “local” hunters (Fix and Ackerman 2015). Less than half of the transporter clients surveyed reported receiving information about issues of concern to “local” hunters. They did indicate that wilderness characteristics were important to them and that the quality of their experience was sensitive to encounters with others. Among encounter types in which the frequency exceeded hunter expectations were propeller planes (30% of respondents), other nonlocal hunters (27%), and hunting camps visible while hunting (25%, Fix and Ackerman 2015). Sixty percent of the groups who encountered caribou reported observing low flying aircraft near caribou.

Concerns regarding the lack of recent caribou population data (due to the failure of the 2015 photocensus), ongoing user conflicts and potential herd deflection by aircraft were discussed at length during the Northwest Arctic Council meeting in October 2015. While some Council members reported caribou harvest success for the year, many also reported ongoing concerns for herd deflection near the Squirrel and Agashashok Rivers in Unit 23, as well as concern for residents of Anaktuvuk Pass in Unit 24 who have been reporting an absence of animals from both the WACH and the TCH.

Repeated observations of airplanes affecting individual or group caribou behavior have been documented, and cumulative observations of this over time could lead an observer to conclusions about herd deflection (Halas 2015). Some studies and local observations of WACH caribou response to aircraft have suggested that animal response is limited in temporal and spatial scale (Fullman et al. 2017, BHA Alaska 2017) and that many factors contribute to larger scale shifts in migration. Fullman et al. (2017) studied the effects of environmental features and sport hunting on caribou migration in northwestern Alaska. These authors found that caribou tended to avoid rugged terrain and that the migration of caribou through Noatak NP does not appear to be hindered by sport hunting activity. They indicated that their results do not preclude the possibility of short-term effects (< 8 hours) altering the availability of caribou for individual hunters, and that the lack of observed influence of hunting activity could be related to limitations in the telemetry and sport hunter datasets used in the study (i.e. caribou locations were only recorded every 8 hours, not every sport hunter camp was included, and only landings events from transporter aircraft were considered).

Several studies have documented negative caribou responses and avoidance behavior toward aircraft, motorized equipment, and development (e.g., Valkenburg and Davis 1985, Wolfe et al. 2000, Vistnes and Nelleman 2008, Calef et al. 1976, Maier et al. 1998). Calef et al. (1976) observed panic reactions and strong escape responses in a high percentage of caribou, particularly when aircraft flew at altitudes of less than 60 meters (197 feet). Calef et al. (1976) also found that caribou response to small fixed-wing and helicopter overflights was strongest during early calving (late May to early June), post-calving (early June to late June), and winter.

Valkenburg and Davis (1983) specifically studied the reaction of the WACH to aircraft and compared this with their observations of the Delta Caribou Herd (DCH). They observed that WACH caribou ran from 82% of aircraft passes (compared to 35% of passes for DCH animals), and that escaping WACH caribou were more likely to continue running after the aircraft had passed as compared to DCH animals. They speculated that the higher intensity of WACH response to aircraft was due to insufficient exposure to non-detrimental aircraft activity (those not resulting in immediate hunting activities), the perception of aircraft as a threat, and the association of snowmachine noise with pursuit and a lack of differentiation with the noise of aircraft (Valkenburg and Davis 1983). These authors hypothesized that a greater number of benign or nonthreatening overflights may be necessary to habituate WACH animals and that same-day airborne hunting had exacerbated the situation (Valkenburg and Davis 1983). In comparison, DCH caribou occurred in areas where much of the aircraft and ground vehicle activity was nonthreatening (Valkenburg and Davis 1983). However, as these data are over 30 years old and same-day airborne is no longer permitted, WACH caribou may have become more habituated to aircraft traffic (i.e. Fullman et al. 2017). While empirical documentation is sparse, local observations (e.g. by residents, biologists, law enforcement officers) of caribou responses to aircraft have been variable. Variability in caribou responses is likely due to multiple factors such as past experiences of individual caribou, season, weather, type of plane and altitude, etc.

Incomplete camp location information has prevented a quantitative assessment of caribou deflection or displacement associated with commercial operators and their hunting clients (Dau 2015a). However, substantial transporter traffic in the Anisak drainage, which is within the Noatak NP, has not diverted migrating WACH caribou (Dau 2015a). A long-held cultural practice in the region requires that lead adult

female caribou be allowed to establish migratory paths unhindered by human activity. Dau (2015a) suggests that once lead caribou establish migration routes, the caribou behind them will follow regardless of hunting or other disturbances such as aircraft. In response to complaints from Anaktuvuk Pass residents about caribou migration being affected by non-subsistence hunter activity, ADF&G attempted to document such effects from 1991-93, but none were found (OSM 1995).

Avoidance behavior of caribou to human activity and development has also been documented to have other behavioral and physiological impacts. Some studies have shown that energy costs associated with repeated disturbance (including overflights) may decrease caribou reproduction rates (Luick et al. 1996, Bradshaw et al. 1997, Maier et al. 1998) and calf survival rates (Harrington and Veitch 1991). Studies have also reported reduction in the use of areas within 5 km from infrastructure and human activity (including aircraft) by 50–95% for weeks, months, or years (Vistnes and Nelleman 2008, Flydal et al. 2002).

Since the early 1980s, perceptions surrounding guides and transporters placing large numbers of nonlocal hunters (living outside of the range of the WACH) in fall caribou migration corridors and deflecting the herds from traditional hunting areas has been an issue of concern for local hunters (living within the range of the WACH) (Braem et al. 2015, Dau 2015a:34, Unit 23 Working Group 2016). In addition, the timing of hunting has caused conflicts between user groups because 85–95% of all caribou taken by nonlocal hunters are harvested between August 25 and October 7, the same period as intense subsistence hunting (Dau 2015a:31). While hunt timing often aligns among these user groups, methods of access do not. Most local hunters harvest caribou with snowmachines, boats, and 4-wheelers, and few use aircraft. In contrast, 76% of nonlocal hunters accessed hunt areas by plane in regulatory years 2012 and 2013 (Dau 2015a:31). This mode of access can provide nonlocal users with a greater range of access and speed in reaching ideal hunting locations, and also place them in front of a migrating herd.

Local hunters have stated that aircraft noise affects hunting success and migrating caribou. During the 2014 hunting season, average propeller aircraft noise events along the Noatak River ranged from 3.7 events per day at Kugururok River to 7.8 events per day at Sapun Creek. It is unknown whether the difference in propeller aircraft noise events is due to management areas (i.e. the NPS delayed entry zone and ADF&G controlled use area) or the recent easterly trend of primary caribou migration routes (Betchkal 2015). However, the recent propeller aircraft noise levels appear comparable to aircraft noise levels documented in Noatak NP in 1987 (Georgette and Loon 1988) and 1995-1996 (NPS) (Fix and Ackerman 2015). However, comparisons should be interpreted with caution due to different methodologies (i.e. human observations vs. continuous acoustic recordings and the establishment of the ‘delayed entry zone’ in 2012 (Fix and Ackerman 2015).

In 2008, the Unit 23 Working Group was established to address fall hunting related issues and to develop solutions to cooperatively solve hunting conflicts and to preserve traditional Inupiaq values, while also allowing for reasonable opportunities for non-local hunters (ADF&G 2016b). It is made up of 20 members, including representatives of regional and tribal governments and organizations, land and wildlife management agencies, the Big Game Commercial Services Boards, the Alaska Professional Hunters Association (including representatives from hunting guide and transport industries), Fish and Game

Advisory Committees, the Northwest Arctic Council, the BOG, and the Federal Subsistence Board (ADF&G 2016b). In 2010, the group proposed a mandatory orientation session for all pilots transporting big game in Unit 23. ADF&G implemented this, developed and distributed outreach materials, and established conflict planning processes (**Map 2**, Dau 2015a). The orientation suggests maintaining a minimum altitude of 2000 feet in the vicinity of camps (Betchkal 2015). Flight restrictions were also implemented by both State and Federal agencies (see Regulatory History).

The NPS Special Commercial Use Area in Noatak NP may have limited effect on the number and distribution of transported hunters because fewer caribou have been migrating through the affected area since 2011 and transporters generally already dropped clients east of the delayed entry zone (Dau 2015a). Additionally, the rule applies only to transporters with caribou hunting clients and not to those transporting other hunters, fishers, and recreational users. The rule also does not apply to personal aircraft that are commonly used for transportation by NFQU to and from the region. Furthermore, the timing of the delayed entry zone has not shifted in response to annual fluctuation in caribou migration, which has been less predictable in recent years.

Another area of intense user conflict was identified in the eastern portion of Unit 23 along a 25-mile long Kobuk River corridor located upstream of Kobuk, Ambler, and Shungnak, from the Mauneluk River to the Selby River (Braem et al. 2015). Much of this area is managed by the State and is relatively accessible for nonlocal hunters (**Map 6**; Braem et al. 2015). In 2001 and 2002, proposals were submitted to the BOG to create a controlled use corridor in this area, but they were not adopted (Braem et al. 2015). This area may be of particular importance in considering potential shifts in the distribution and density of nonlocal caribou hunters due to the 2016/17 closure of Federal public lands to caribou hunting by NFQU.

Shifts in caribou migration paths have created difficulty for Noatak, Kivalina, and Kotzebue hunters (Dau 2015a). Local WACH harvest has been relatively stable in Unit 23 since the 1990s, but residents of some communities have had to “greatly increase their expenditure of money and effort to maintain these harvest levels” (Dau 2015a:14-30). This is due in part to having to travel farther, more frequently, and for longer durations to find caribou (Halas 2015). Some communities such as Unalakleet and Noatak have “not met their subsistence needs in many recent years” (Dau 2015a:14-30). This was also expressed by Northwest Arctic Council members during meetings in October 2015 and March 2016 (NWARAC 2015, NWARAC and NSRAC 2016).

Northwest Arctic Council members reported ongoing concerns about extensive user conflicts in Unit 23 prior to the closure of Federal public lands (NWARAC 2015). Council members have testified that these conflicts have confounded their ability to successfully harvest caribou for subsistence purposes in some areas, and that these conflicts have caused degradation to their subsistence lifestyle through landscape modifications (e.g. abandoned structures and trash; landing strips; ATV trails), herd diversion and positioning (e.g. pushing or scaring caribou with low-flying aircraft for hunting, sightseeing, photography and other purposes; creating camp structures along migratory paths), and hunting of lead caribou. Aircraft activity was of particular concern and includes operations by transporters, guides, “nonlocal” hunters utilizing personal aircraft, and recreational users. Specifically, aircraft in the vicinity of the Squirrel River was cited as particularly problematic (NWARAC 2015).

Concerning nonlocal hunting and herd diversion near the Squirrel River, one Northwest Arctic Council member described the situation as follows (NWARAC 2015:217):

We're getting more and more sport hunters. There's 80 percent of sport hunters—pretty much close to 80 percent of all sport hunters goes into Noatak and Squirrel Rivers. That Squirrel River is like a corridor connected to Aggie [Agashashok River] and there's Kiana and the caribou come right through there. Come through the flats, then through the Noatak River. That's when we get in close to the village. We don't have to buy two, three drums of gas, which is worth 10 gallons, 15 gallons gas. That really helps us.

That's what we've been doing for decades, years, centuries. This problem is not natural. Natural probably we can do nothing about, like the weather, climate change, but this problem is manmade. It's on our land. We're hurting. Our subsistence is in jeopardy. Well, I want to depend on these caribou very much. Very much. Too high a density of non-local hunters. That's the problem. That's not natural problem. That's manmade that can be fixed and that's what we're trying to fix. It seems to go right through from ear to ear. What I say here is going to go right out the door again? No. We want something done. We ask that down from the Aggie River and the Eli River to protect our subsistence, to protect our traditional culture.

Another Council member indicated that the Squirrel River area experiences high user conflict and requested that the BLM take additional action to address the issue. The Squirrel River Management Plan Scoping Report issued in September of 2011 includes public commentary specifically in reference to “the impacts of transporters, transported hunters, and commercially-guided hunters on subsistence and general hunting.” (BLM 2011:18). Meetings held in urban areas (Anchorage and Fairbanks) elicited mixed responses to this question while meetings held in rural areas elicited primarily negative views of “nonlocal” hunter influence on caribou. Commentary between subsistence users and commercial operators were largely conflicting, whereby the former group tended to prefer greater regulatory restrictions on the latter group (BLM 2011). The efforts to develop the management plan were stopped when institutional boundaries shifted staff assignments from Fairbanks to Anchorage in 2013 (NWARAC 2017). Due to a multitude of ecological, sociological, and regulatory changes since plan development was initiated, BLM will likely reinstate the planning process from the beginning (NWARAC 2017).

While commercial aircraft may contribute to the perceived modifications in herd movement, private planes are also thought to exacerbate the problem. According to Chairman Shiedt of the Northwest Arctic Council (NWARAC 2015:210):

I think the majority of the problem now is happening these smaller planes, private-owned planes, are coming to Buckland and Noatak and Kiana and we're all blaming the transporters and outfitters. I'm not favoring them, but the other year too when I was at Kelly they were there from Interior. There were four planes when I was there. So maybe that's the problem we're having here.

Concerns were expressed by residents of Ambler, Shungnak, Noatak and Kobuk, as well as by members of the Northwest Arctic Council, that many nonlocal hunter practices clash with local hunting traditions such as shooting caribou for trophies or sport instead of food and wasting meat by letting it spoil in the field (Braem et al. 2015, NWARAC 2015, Halas 2015).

Concerns by residents of communities within Unit 23 were also recorded in the recent documentary “Counting on Caribou: Inupiaq Way of Life in Northwest Alaska” (Betcher 2016). Respondents from several communities expressed concern regarding food security as it pertains to caribou herd diversion and changes in migration routes. Several indicated that both small and large scale changes to migration routes are linked to “nonlocal” hunting activities, particularly low-flying aircraft. According to Lucy Nordlum of Kotzebue (Betcher 2016):

We have many influences that play into us not getting certain subsistence foods. Hunters from outside to get their trophy caribou or whatever, that has impacted our area of hunting a lot. I would say in the past ten years we don’t have the big migrations that we used to have. They are chased further back into the backcountry. That makes it hard for those of us that don’t have airplanes or can’t afford the gas. The costs are a lot for fuel now and that influences a lot of people getting out there and doing their hunting. A lot of the people go up to Onion Portage from Kotzebue to get their caribou. That’s 500 miles or so away. It is hard with the caribou because that is about the only staple I really have besides fish.

Some of these concerns were somewhat substantiated by a mailed survey of 372 “nonlocal” hunters that were transporter clients on the Noatak National Preserve (Fix and Ackerman 2015). Eighteen percent of respondents reported that someone in their group shot at the first caribou they saw and less than half reported receiving information regarding “traditional local subsistence use,” “subsistence areas to avoid,” and “local traditional hunting.” Most nonresidents reported that hunting for trophies was more important than hunting for meat while most Alaska residents reported hunting for meat as more important than hunting for trophies. Additionally, 58% of respondents reported they were not sure if they salvaged all edible meat. Similar to local hunters, nonlocal hunters reported encounters with other nonlocal hunters and airplanes as the two biggest factors detracting from their trip (Fix and Ackerman 2015).

Noatak hunters suggested allowing 1,000 caribou to pass before shooting, closing the Agashashok River corridor to nonlocal hunters, and appropriately spacing nonlocal camps (Halas 2015). Many of these suggestions cannot be enacted through the Board given the limits of its authority. However, more can be done by other Federal agencies and the State (i.e. establish a CUA along the Agashashok River, flexible caribou season opening date in response to annual migration timing) to address user conflicts and local concerns.

The Northwest Arctic Council considered submitting WSA16-01 as a first step in protecting the WACH. The Council indicated that they would revisit the success of the closure after one year and, if new population numbers continue to indicate declines, a request for closures on State lands would be a potential next step.

At the Northwest Arctic Council meeting in October 2016, many Council members and attendees expressed their perceptions of improved hunting conditions and success, although some expressed concern about the ability of urban-dwelling family members to hunt in the area (NWARAC 2016). One member of the Council shared his observations of the perceived effects of the closure (NWARAC 2016:70):

But to hear a lot of these villages start to be success [sic] and that the time of peace has arrived and hopefully has stayed. You know, I've seen so many people, local people, who harvested caribou are so much at ease, comfort, to be able to fill their freezers, especially in Noatak, Kivalina. Kiana's now starting to harvest a bunch of them, Noorvik, you know, people from Kotzebue. It's the time of peace.

At the Board meeting in January 2017, several members of the Northwest Arctic Council expressed their gratitude for the closure and observations pertaining to it (FSB 2017). They perceived the closure as effective, indicating that people were happy – it saved them money on gas, it put food on the table, and it eased the user conflicts. The Council Chair explained that there would likely be a new closure request for the following regulatory year and asked the Board to support the Council's efforts, adding that “if we don't do something today or tomorrow, this herd will be gone.” Another Council member expressed his concerns for food security in the region, noting “Our Dall Sheep dropped off the radar ... Now our moose is on the decline, our caribou is on the decline, once those are gone, I don't know what else we're going to have.” (FSB 2017:293).

At the Northwest Arctic Council meeting in March 2017, Council members continued to express contentment with the closure, increased hunting success for some communities, and decreased user conflict (NWARAC 2017). Two Council members expressed concern for communities in the Kobuk River area that seemingly experienced decreased harvest success due to caribou migration routes during the 2016/17 season. Another Council member expressed his concern that law enforcement was believed to only patrol Federal public lands and enforce the caribou closure during the fall migration but not during the winter.

There was also discussion on targeted closures or only closing portions of Unit 23 to caribou hunting by NFQU. One Council member stated that the closure was instituted to deal with conflicts in one drainage: “90 percent of the conflicts are on the Noatak River” (NWARAC 2017:105). Although not supported by the entire Northwest Arctic Council, the Council chair suggested only closing portions of Noatak NP, stating (NWARAC 2017:123):

That way our relatives that live in Anchorage could go hunt toward Kiana or towards Selawik in the State and Federal lands. That way they won't be against the regulation that's out there. What I'm trying to say is only do that Noatak. That way we won't have any problems because the main problem is Noatak and Kivalina, is where the conflict is at.

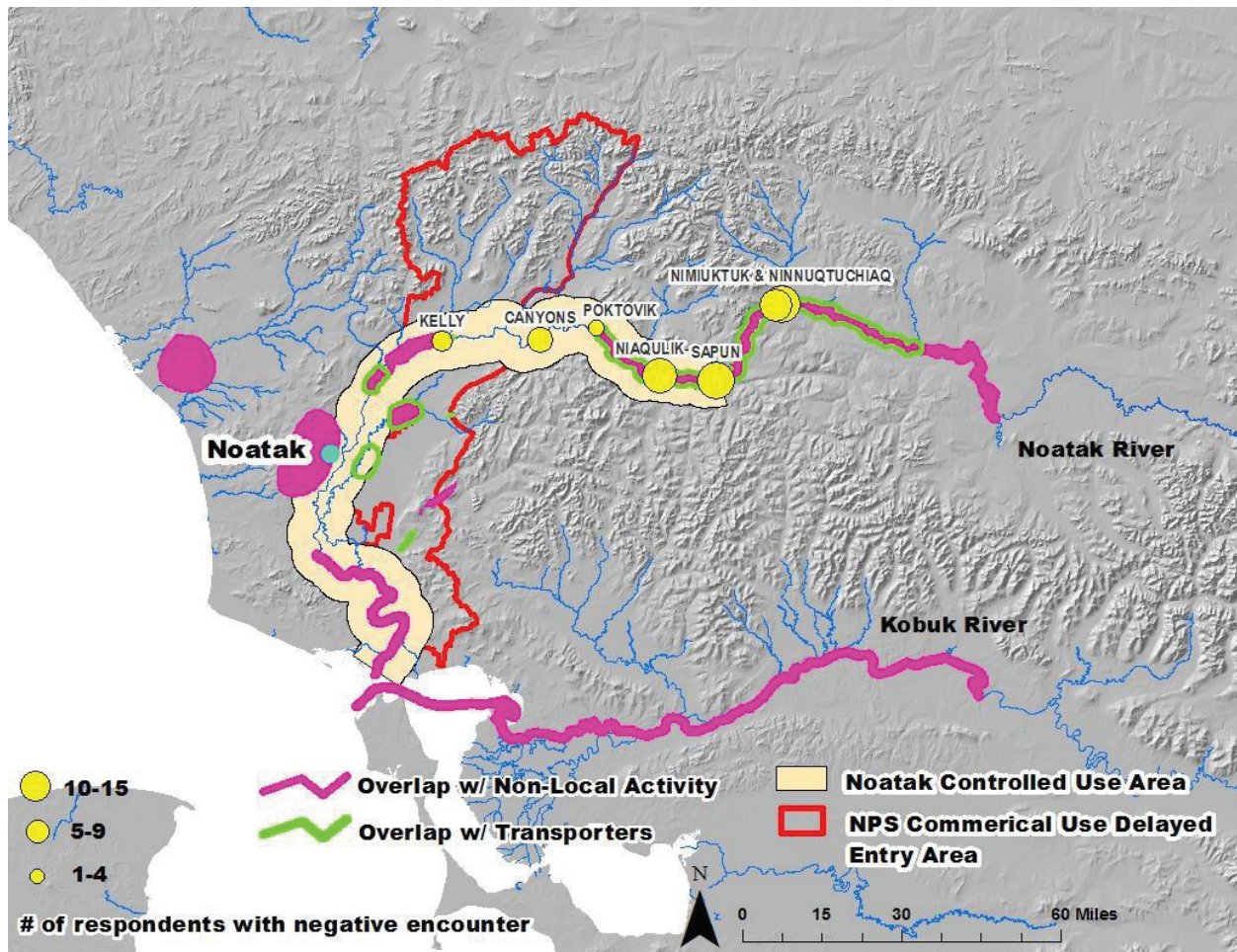
There is a long history of documented discussion on several important transmontane river corridors that are said to be crucial to supporting caribou migration along the western corridors of Unit 23. These drainages include the Noatak River, the Agashashok River, the Eli River, and the Squirrel River (NWARAC 2017). At the winter 2017 Northwest Arctic Council meeting, a motion was made to specifically close the passages through Agashashok, Eli, and Squirrel River drainages to NFQU since the current closure did not fully

close these drainages because of the checkerboard land status in these areas (**Map 6**, NWARAC 2017). The motion was later retracted because Federal public lands in these areas would be closed anyway under a unit-wide closure, and because the Board does not have authority to close hunting on State lands (NWARAC 2017). After retracting the motion, a Council member urged the Council to work with the BLM, NANA Regional Corporation, and the State to find a way to close these corridors to NFQU to ensure the successful migration of caribou (NWARAC 2017).

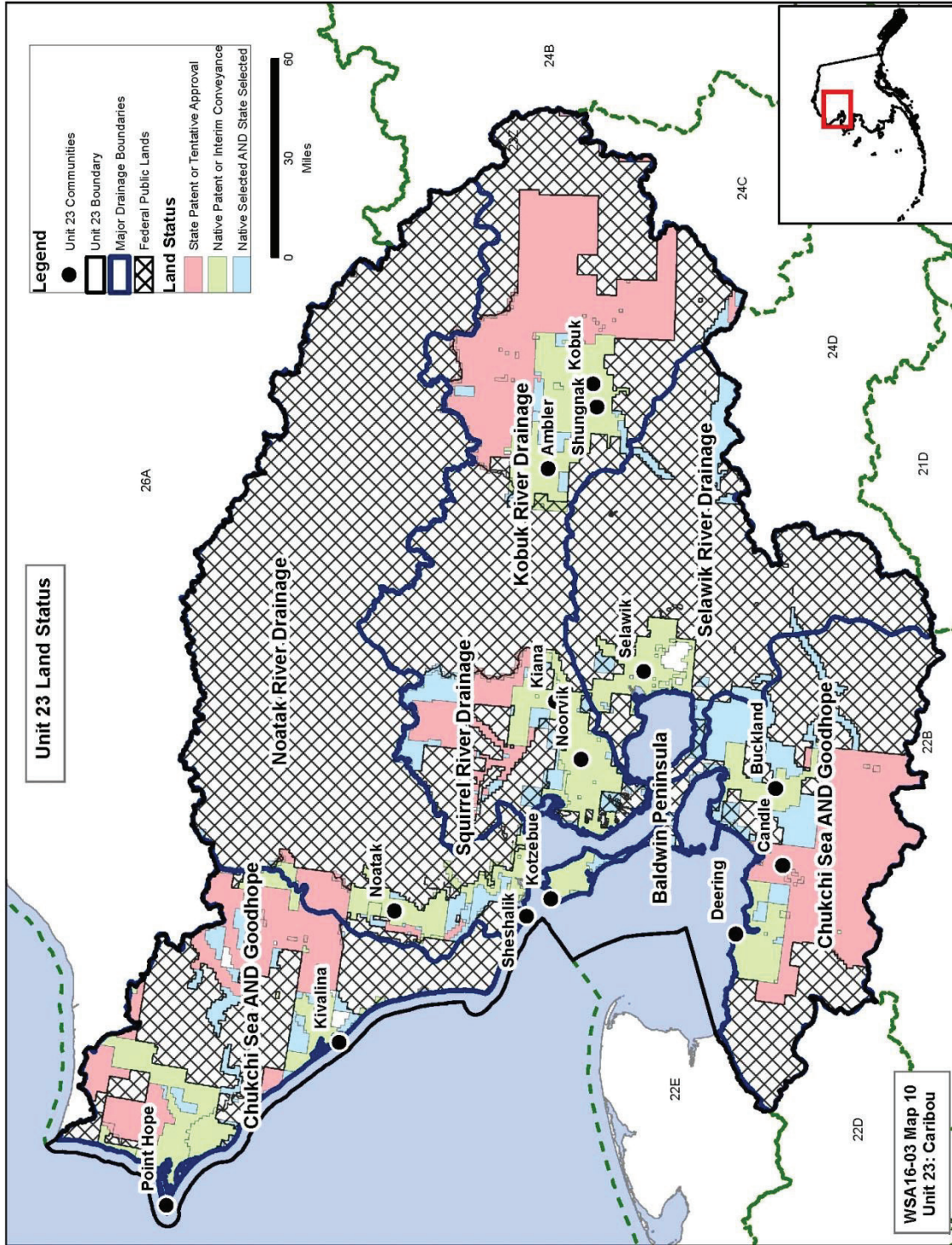
In response to WSA16-01, the Backcountry Hunters of Alaska created a video about nonlocal caribou hunting in Unit 23. In the video, Larry Bartlett (Chair of the Alaska Chapter) states that 90% of the caribou he has harvested in Unit 23 have been on gravel bars below the mean high water mark. The Federal lands closure does not apply to these areas, which are considered State lands. Bartlett observes several propeller planes fly near caribou and states that he is convinced airplanes do not disturb caribou. He also demonstrated the extreme amount of time and effort necessary to preserve harvested meat in a remote area for several days in warm weather (BHA Alaska 2017). Because some hunters may not have the skills necessary to preserve meat for extended periods in remote areas, this may have led to local resident observations of meat spoilage among some NFQU. The observations, hunting practices, and experiences contained within the video are those of a single user and do not represent all NFQU.

In response to WSA17-03, members of the public offered several observations, comments and concerns regarding the proposed closure at the public meetings held in Nome, Kotzebue, and Barrow (OSM 2017). Many Unit 23 residents testified in support of the closure while many people residing outside of the unit testified in opposition. Many comments in support of the request emphasized how vital caribou is for people's survival in the Northwest Arctic and how people cannot afford the extreme cost of store bought meat and fuel. Comments in opposition emphasized a lack of biological reason for closing to NFQU and that special actions are not the appropriate process for closures.

While the Board's endorsement of the WACH Management Plan is not legally binding, the Plan provides guidelines and recommendations for herd management that were developed and supported by a wide variety of stakeholders. Two of the WACH Management Plan's recommendations under preservative management are possible closure of some Federal public lands to NFQU and restricting harvest to Alaska residents only. However, the WACH population is currently on the line between conservative and preservative management (**Table 1**). Additionally, the Plan suggests closure of some Federal public lands, not all of them. However, the WACH Working Group voted to submit WP18-46, which seems to contradict its own plan. Currently, nonresidents may harvest caribou under State regulations. As the Board does not have authority to restrict only NFQU residing outside Alaska, any restrictions to only nonresident caribou hunting must be enacted by the BOG.



Map 5. Areas of overlap use between 19 Noatak interview respondents and “nonlocal users.” Green lines and polygons delineate overlap areas with observed transporters. Notes: Pink lines and polygons are “nonlocal” users observed in the area that overlapped with local hunters. Yellow circles represent the number of respondents who had a negative encounter with “nonlocals” in specified locations. Respondents could identify more than one location. Respondents were asked to report encounters over the last five years (Halas 2015).



Map 6. Land status within Unit 23 as per data obtained from the Bureau of Land Management on July 27, 2016.

Harvest History

The State manages the WACH on a sustained yield basis (i.e. managing current harvests to ensure future harvests). The harvestable surplus when the WACH population is declining is calculated as 6% of the estimated population (WACH working group 2011, Parrett 2017, pers. comm.). In recent years, as the WACH population has declined, the total harvestable surplus for the WACH has also declined (Dau 2011, Parrett 2015a). In 2016, the WACH harvestable surplus was 12,056 caribou (6% of 200,928 caribou). This is down from a harvestable surplus 14,085 caribou in 2013 when the WACH numbered approximately 234,757 caribou. While there is substantial uncertainty in harvestable surplus estimates, it is likely that sustainable harvest will soon be exceeded (Parrett 2015a, Dau 2015a). Of particular concern is the overharvest of cows, which has probably occurred since 2010/11 (Dau 2015a). Dau (2015a:14-29) states, “even modest increases in the cow harvest above sustainable levels could have a significant effect on the population trajectory of the WACH.”

Harvest from the WACH, which has remained fairly consistent since 1990, now represents a larger proportion of the annual mortality. This is one of the factors that prompted the BOG and the Board to enact restrictions on WACH harvest in March 2015 and April 2016, respectively. These regulatory restrictions addressed recommendations in the WACH working group’s management plan under conservative management (i.e. prohibiting the take of calves, shortening seasons, decreasing harvest limits) (**Table 1**). The recommendation most germane to this analysis is under preservative management and is to restrict harvest “to residents only, according to state and federal law. Closure of some federal lands to nonqualified users may be necessary,” which is under preservative and critical management levels (WACH Working Group 2011: 46-47).

Caribou harvest by local hunters is estimated from community harvest surveys, if available, and from models developed by A. Craig with ADF&G’s Division of Wildlife Conservation Region V. These models incorporate factors such as community size, availability of caribou, and per capita harvests for each community (Dau 2015a). In 2015, Craig’s models replaced models developed by Sutherland (2005), resulting in changes to local caribou harvest estimates from past years. While Craig’s models accurately reflect harvest trends, they do not accurately reflect actual harvest numbers (Dau 2015a). (Note: no model accurately reflects harvest numbers). This analysis only considers the updated harvest estimates using Craig’s new model as cited in Dau (2015a). Caribou harvest by nonlocal residents and nonresidents are based on harvest ticket reports (Dau 2015a).

Local and nonlocal hunters are defined in ADF&G management reports as living within and outside the range of the WACH, respectively. FQSU and NFQU are close, but not identical, to local and nonlocal hunters, respectively. Residents of Galena, Wiseman, and several communities on the western Seward Peninsula are FQSU, but are not considered local hunters by ADF&G as they are outside the range of the WACH by definition (**Map 1**).

From 2000–2014, the average estimated total harvest from the WACH was 11,984 caribou/year, ranging from 10,666–13,537 caribou/year (Dau 2015a, **Figure 6**). These harvest levels are within or below the

conservative harvest level specified in the WACH Management Plan (**Table 1**). However, harvest estimates do not include wounding loss, which may be hundreds of caribou (Dau 2015a).

Local hunters account for approximately 95% of the total WACH harvest and residents of Unit 23 account for approximately 58% on average (**Figure 7**, ADF&G 2017c). Comparison of caribou harvest by community from household survey data (**Appendix 1**) with **Figure 1** demonstrates that local community harvests parallel WACH availability rather than population trends. For example, Ambler only harvested 325 caribou when the WACH population peaked in 2003, but harvested 685 caribou in 2012 when most of the WACH migrated through eastern Unit 23. Similarly, Noatak only harvested 66 caribou in 2010 when no GPS-collared caribou migrated through western Unit 23. Harvest increased substantially (360 caribou) the following year when 37% of the GPS-collared caribou (and thus, a greater proportion of the WACH) migrated through western Unit 23.

On average, 76% of WACH caribou harvested by nonlocals are taken in Unit 23. From 2001-2013, total and Unit 23 nonlocal WACH harvest averaged 598 caribou/year and 456 caribou/year, respectively (**Figure 8**). In recent regulatory years (2012/13–2013/14), numbers of nonlocal hunters are slightly lower, partially because transporters have had to travel further to find caribou and thus, could not book as many clients (Dau 2015a).

Between 1998 and 2014, the number of NFQU hunting caribou and the number of caribou harvested by NFQU in Unit 23 averaged 487 hunters (range: 404-662) and 511 caribou (range: 248-669), respectively (**Figure 9**, ADF&G 2016c, FWS 2016). In 2015, after the BOG enacted restrictions, the number of NFQU and caribou harvested by NFQU decreased appreciably (340 hunters and 230 caribou). In 2016, during the closure of Federal lands to NFQU, the number of NFQU and caribou harvested by NFQU decreased even further (149 hunters and 111 caribou), although there may still be some outstanding 2016 harvest reports from nonlocal residents (**Figure 9**, WINFONET 2017). Based on patterns in submission rates and timing of harvest reports, the State estimates a 50% reduction in the number of and harvest by nonlocal caribou hunters in Unit 23 during 2016/17 as a result of the closure (Parrett 2016b, ADF&G 2017d).

The major river drainages in which NFQU people hunt and harvest caribou are included in most (~90%) harvest reports (WINFONET 2017). This data can be used to compare caribou harvest and hunting intensity (measured as the number of hunters) by NFQU across Unit 23 at coarse (major river drainage) scales. At the coarse scale, cumulative caribou harvest and hunting intensity by NFQU from 2005-2014 was highest in the Noatak River drainage (**Maps 7, 8**). While the total number of nonlocal hunters and harvest decreased in 2016 due to the Federal lands closure, the Noatak River Drainage still experienced the highest relative hunting intensity (WINFONET 2017, **Map 9**).

From 1999-2013, 72% of nonlocal hunters on average accessed hunting locations for the WACH by plane (~435 hunters/year). Most nonlocal harvest (85-90%) occurs between Aug. 25 and Oct. 7. In contrast, most local, subsistence hunters harvest WACH caribou whenever they are available using boats, 4-wheelers, and snowmachines (Dau 2015a, Fix and Ackerman 2015). In Unit 23, caribou are generally

available during fall migration. The temporal concentration of nonlocal hunters during times of intensive subsistence hunting is responsible for user conflicts in Unit 23 (Dau 2015a).

In 2015, approximately 60% of nonlocal hunters in Unit 23 used a transporter service, 10% used a guide, and 30% used no commercial services (Unit 23 Working Group 2016). In the Noatak NP, nonlocal transporter clients primarily consist of nonresidents and Alaska residents from urban areas such as Anchorage, Fairbanks, and communities on the Kenai Peninsula (Fix and Ackerman 2015, ADF&G 2016c).

The number of transported hunters within Selawik NWR has decreased since 2000 (**Figure 10**, FWS 2017). Since 1993 the highest harvests of caribou by transported hunters occurred from 1997-2000 when an average of 118 caribou were taken each year. In the past 10 years (2007-2016), the number of caribou harvested by transported hunters has decreased to an average of 12 caribou per year (**Figure 11**, FWS 2017). According to the Refuge Manager, the decline in caribou harvest is “mainly the result of caribou no longer being reliably available on the Refuge in September due to delayed migration” (Georgette 2016, pers. comm.).

Conversely, the number of transported hunters in the Noatak NP increased from about 70 in 2004 to over 400 in 2014 (**Figure 12**, Ackerman 2015, Fix and Ackerman 2015). In 2015, approximately 319 hunters were transported into Noatak NP (Braem 2017, pers. comm.). From 2004-2014, transported hunters comprised 68% of all air arrivals in Noatak NP on average. If private planes are included, hunters comprise 78% of the Preserve’s annual visitors on average. Additionally, hunters generally access the Preserve over a 70 day period (Aug 1-Oct. 10), compressing peak visitation to a few months (Ackerman 2015). In a survey of 372 sport hunters in the Noatak NP from 2010-2013, 62% of groups harvested caribou with the average harvest being 1.8 caribou per group member (Fix and Ackerman 2015).

In 2016, five guides and four transporters were permitted to operate on BLM lands in Unit 23 (Seppi 2017, pers. comm.) One guide transported moose and brown bear clients only. Two of the transporters did not operate in Unit 23 during 2016, and the remaining permit holders did not report any 2016 operations, likely because they did not operate on BLM lands in 2016 (Seppi 2017, pers. comm.). In 2015, eight guides and four transporters received permits. For the Squirrel River area, six guides and five transporters were permitted. Only five post-use reports were received and harvest totals included a single caribou (Seppi 2016, pers. comm.). In 2014, guides and outfitters brought in 22 clients and none harvested caribou; transporters brought in five clients who harvested 13 caribou (NWARAC 2015:207).

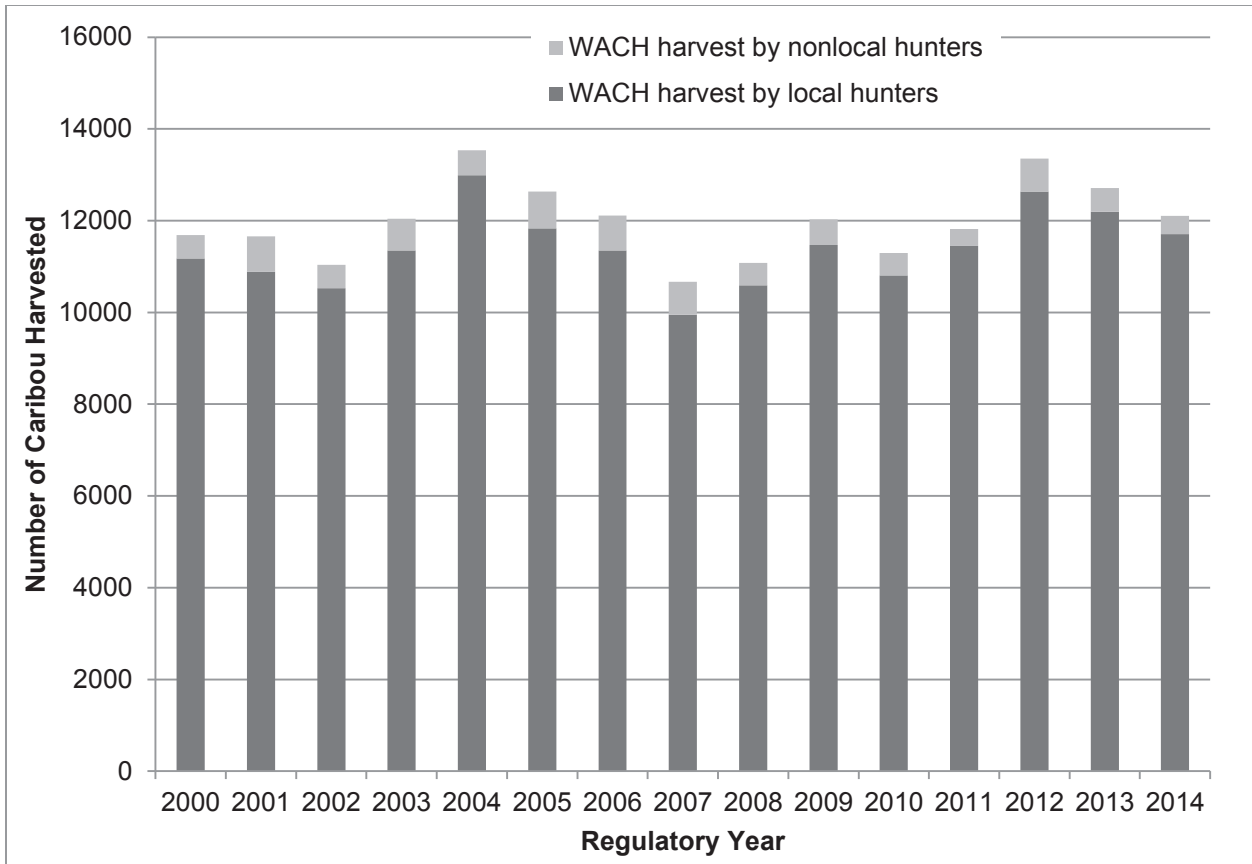


Figure 6. Estimated number of caribou harvested from the WACH by residency (Dau 2015a).

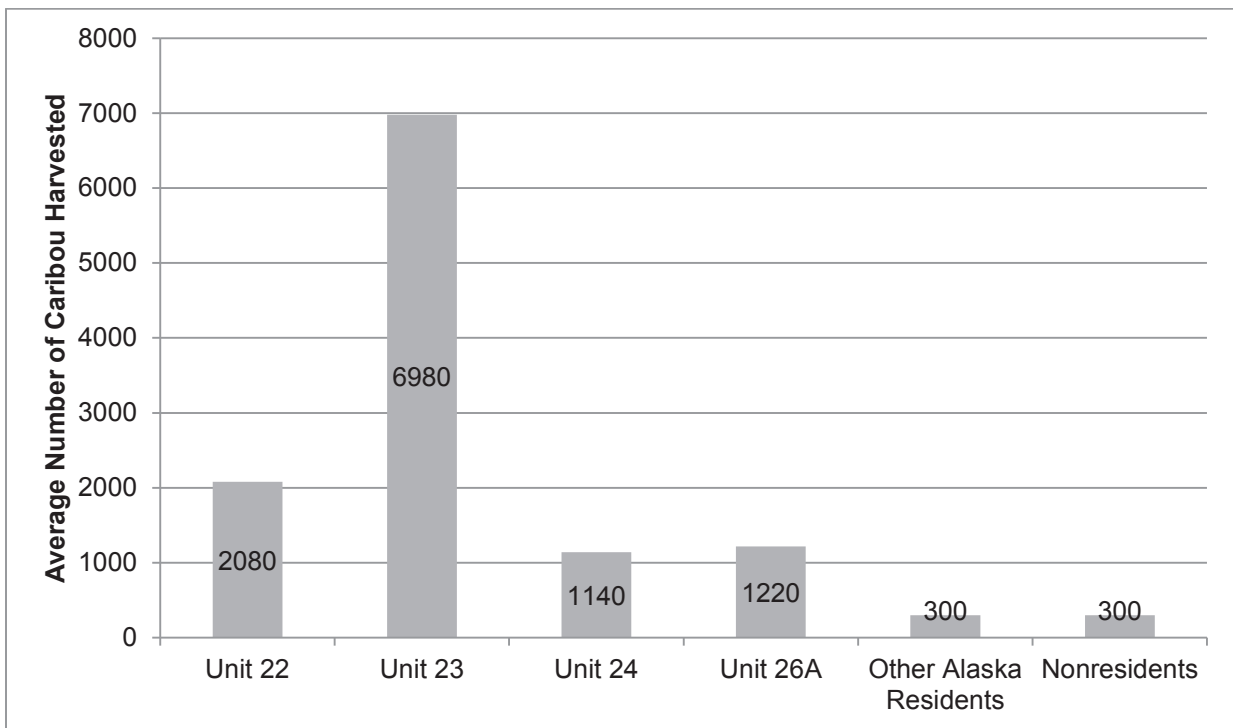


Figure 7. Average number of caribou harvested by unit and residency from 1998-2015 (ADF&G 2017c).

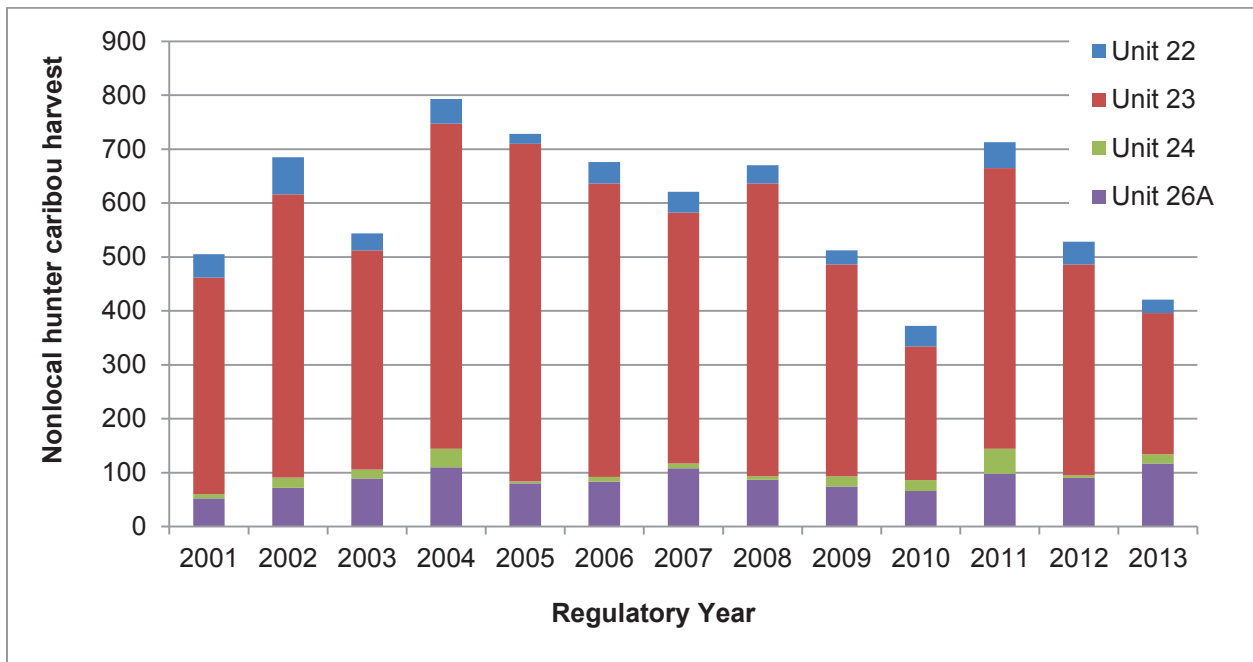


Figure 8. Nonlocal WACH harvest by unit (Dau 2015a, Dau 2013). Unit 21D was not included as only 0-2 caribou have been harvested from this unit each year.

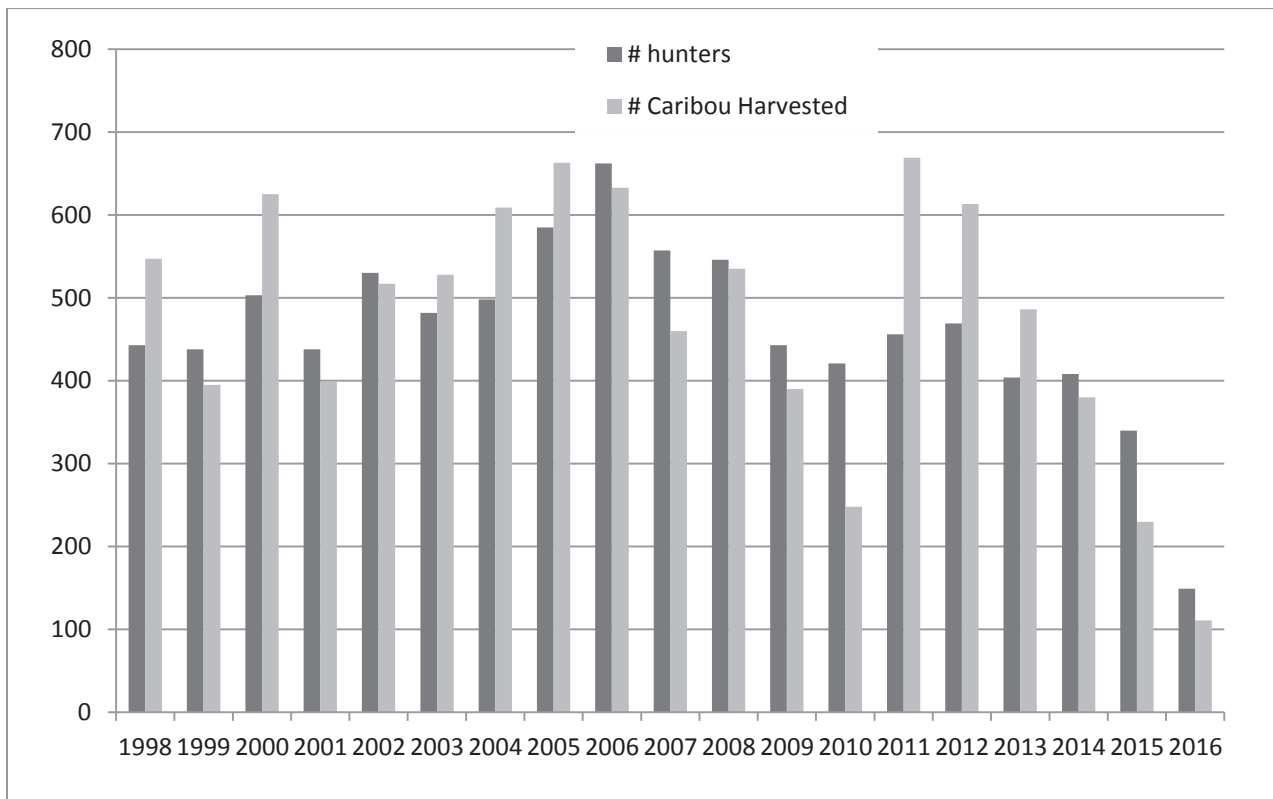


Figure 9. Number of non-Federally qualified users (NFQU) and number of caribou harvested by NFQU in Unit 23 (ADF&G 2016c, FWS 2016, WINFONET 2017).

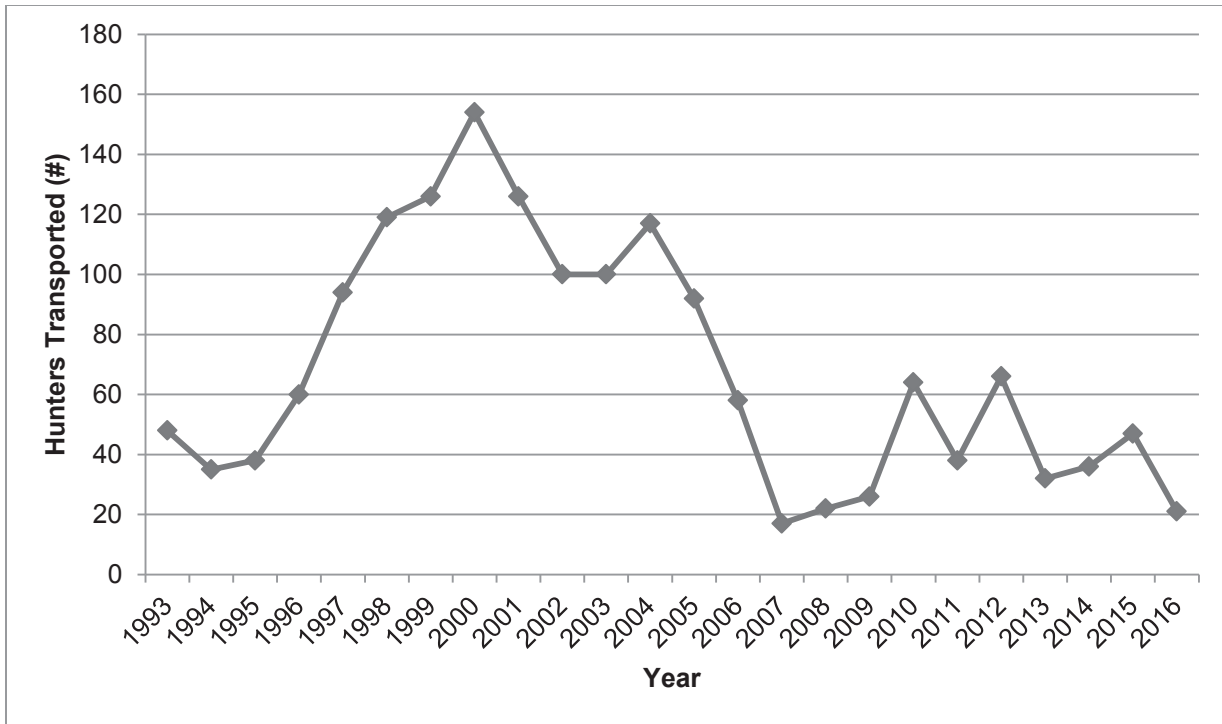


Figure 10. Number of hunters transported by aircraft transporters on Selawik National Wildlife Refuge (FWS 2017)

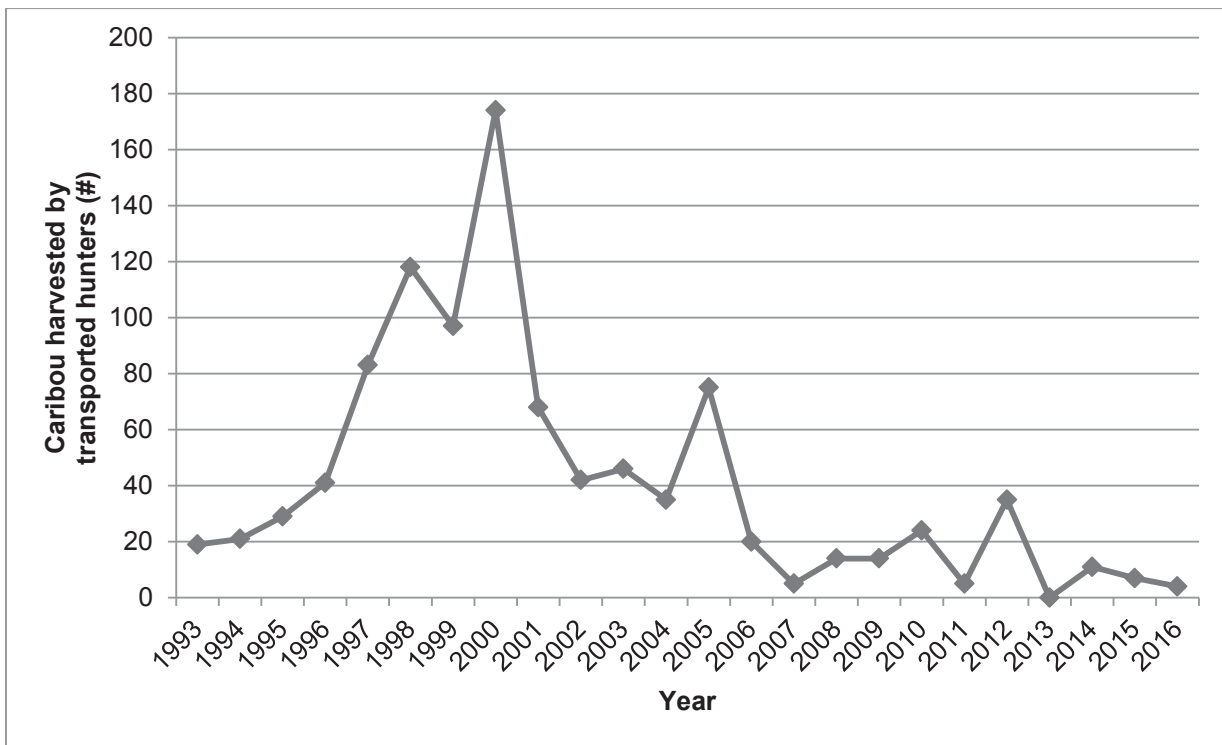


Figure 11. Number of caribou harvested by hunters transported by aircraft transporters on the Selawik National Wildlife Refuge (FWS 2017).

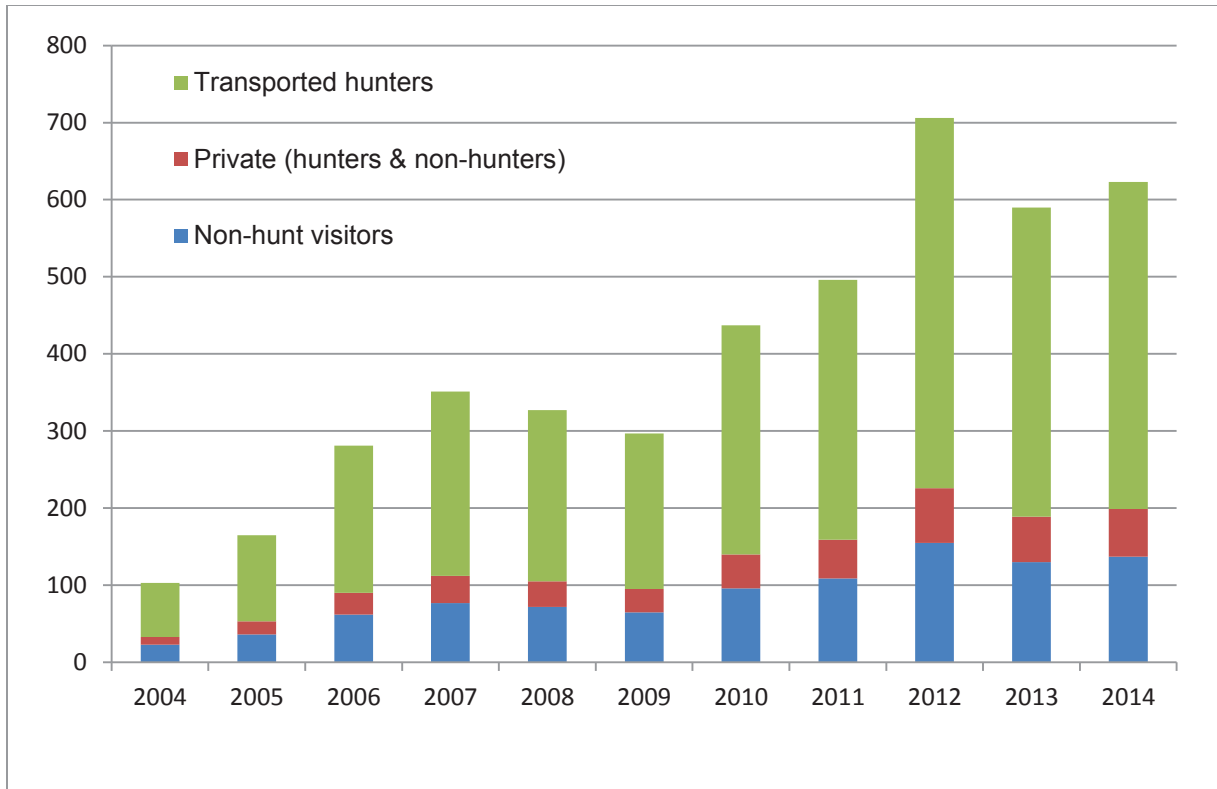
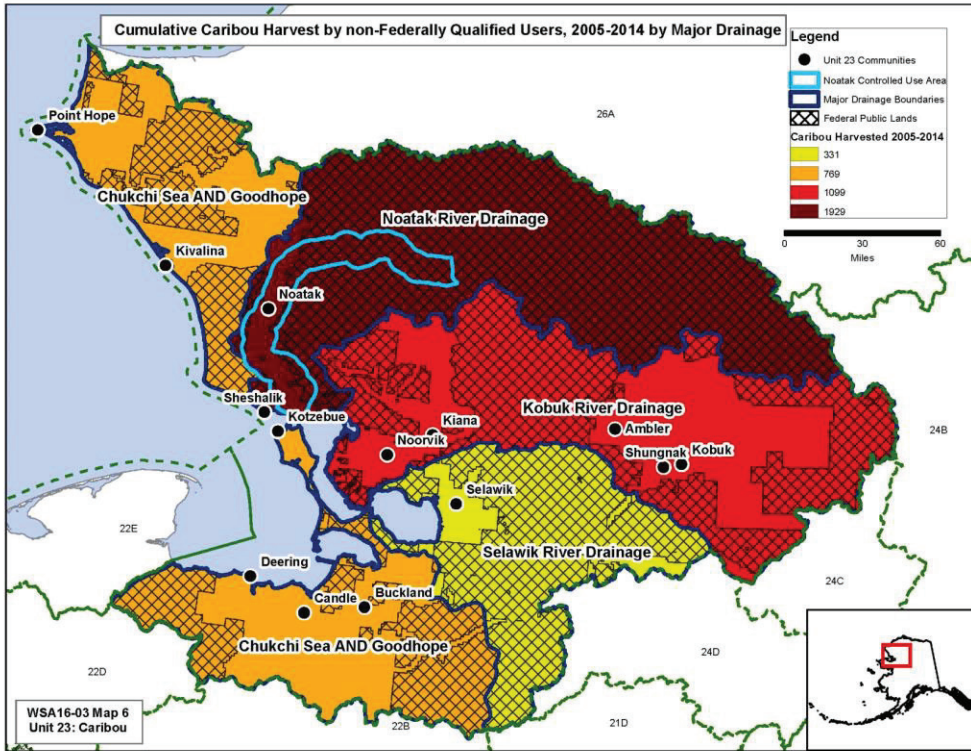
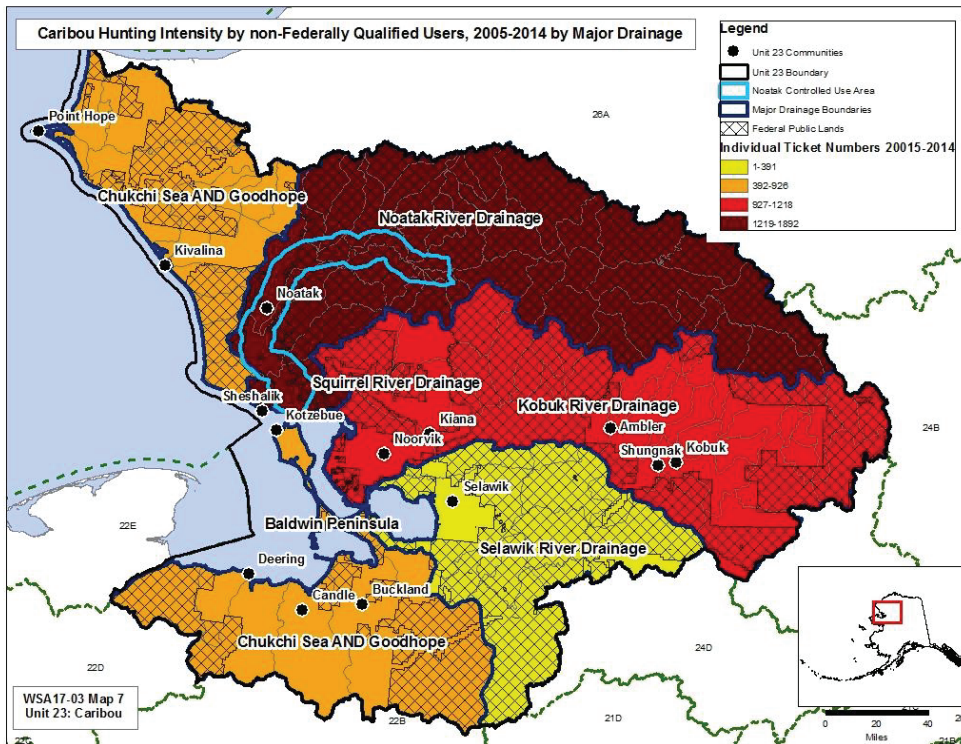


Figure 12. Noatak National Preserve recreation visitors arriving by air (Ackerman 2015). The number of visitors accessing Noatak NP by private planes is extrapolated.



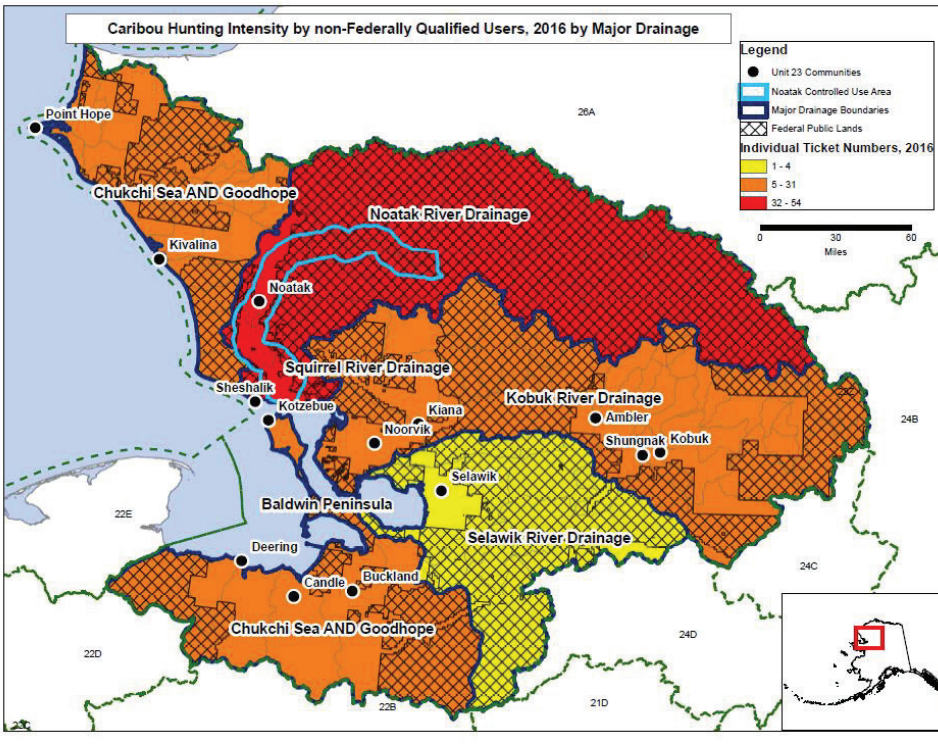
a.

Map 7. Cumulative caribou harvest by non-Federally qualified users in Unit 23 by major (n=4,128) river drainage from 2005-2014 (WINFONET 2017).



a.

Map 8. Cumulative caribou hunting intensity (number of hunters) of non-Federally qualified users by major (n=4,427) river drainage from 2005-2014 (WINFONET 2017).



Map 9. 2016 cumulative caribou hunting intensity (number of hunters) of non-Federally qualified users by major (n=117) river drainage (WINFONET 2017).

Other Alternatives Considered

User conflicts and related concerns over possible effects of NFQU hunting activity on caribou migration in Unit 23 occur more frequently in some areas than in others. The Noatak River corridor upstream from Noatak to the confluence of the Cutler River has repeatedly been identified as a high user conflict zone (**Map 5**, ADF&G 2017b, Halas 2015, Fix and Ackerman 2015, NWARAC 2015, 2016, 2017, FSB 2017). Other areas within Unit 23 such as the Squirrel River drainage, along the Upper Kobuk River, and other areas within Noatak NP such as the Eli and Agashashok (Aggie) Rivers have also been identified as areas experiencing user conflicts (Fix and Ackerman 2015, NWARAC 2015, 2017). Conversely, user conflicts are rarely identified on Selawik NWR, Gates of the Arctic National Preserve, Bering Land Bridge National Preserve, and BLM lands outside of the Squirrel River Drainage. Due to this discrepancy in user conflict, a partial Federal public lands closure may be more appropriate and more effective than a unit-wide Federal lands closure. The areas discussed below are the same ones recommended for closure by the Unit 23 Interagency Group.

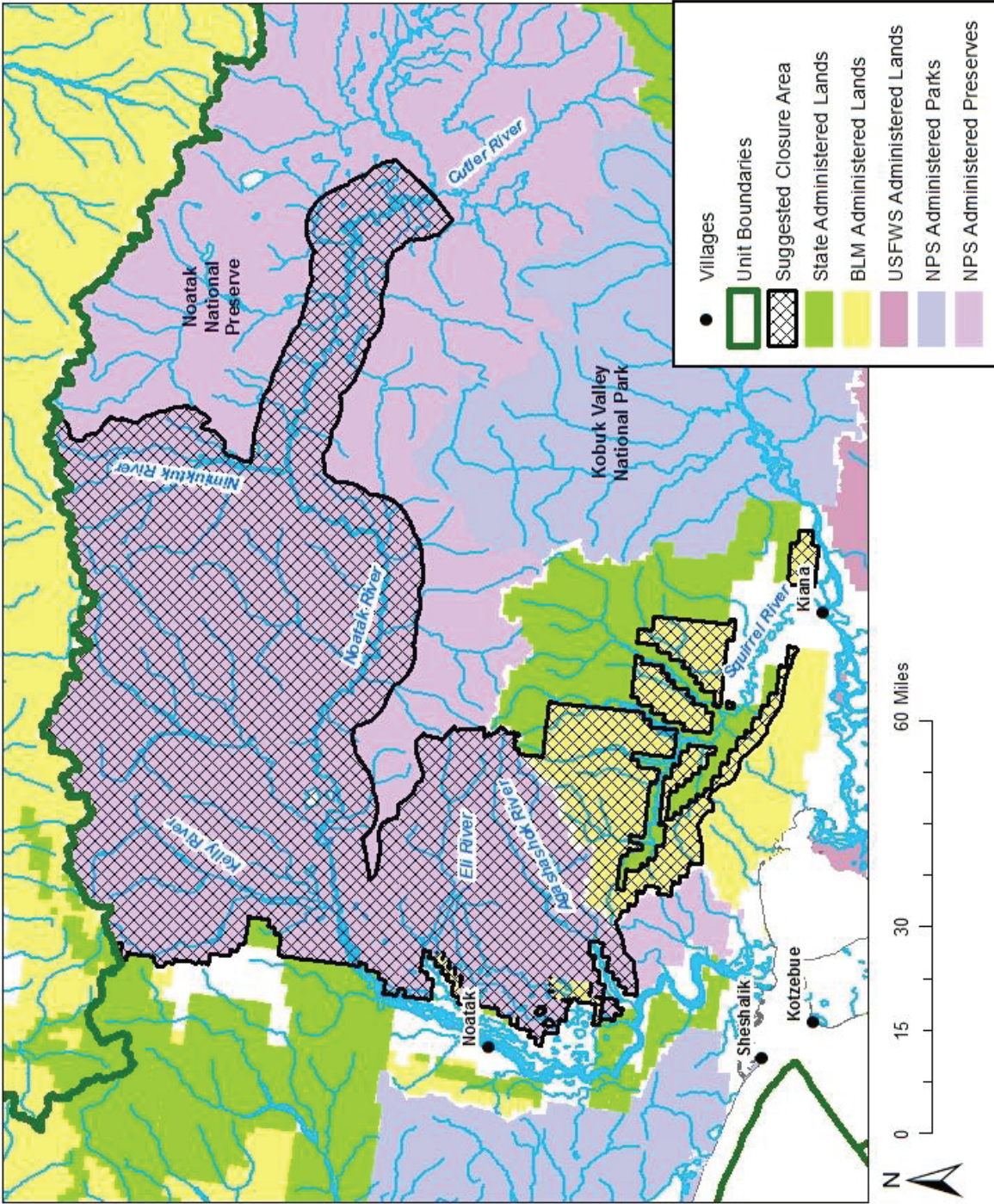
One alternative considered is to close Federal public lands within a 10-mile corridor along the Noatak River from the western boundary of Noatak NP upstream to its confluence with the Cutler River (**Map 10**). A ten mile corridor (5 miles either side) was selected since that is the width of the Noatak CUA. The Cutler River was selected because that is the extent of overlap between local and nonlocal hunters identified by Halas (2015, **Map 5**) as well as the upstream boundary of the Noatak CUA extension proposed by the Noatak/Kivalina and Kotzebue AC's in Proposal 44 (ADF&G 2017b). Additionally, the possibility of

only closing Federal public lands along the Noatak River downstream from its confluence with Sapun Creek was suggested by the Northwest Arctic Council Chair in order to provide urban-dwelling relatives greater hunting opportunity and because the main user conflict issues surround Noatak and Kivalina (NWARAC 2017:123-124). Furthermore, the Northwest Arctic Council stated in its 2016 annual report that the 2016 Federal lands closure to caribou hunting by NFQU reduced user conflicts and improved caribou harvest by FQSU in the vicinity of Noatak. Public testimony at the WSA17-03 public hearings also indicated that the majority of user conflicts occur in the Noatak area.

Closing Federal public lands along the Aggie and Eli rivers was also considered (**Map 10**). The retracted motion at the winter 2017 Northwest Arctic Council meeting which specifically requested closing the mountain passages in these areas to facilitate caribou migration and reduce user conflicts, highlights the importance of this area to local hunters.

Closing Federal public lands north of the Noatak River between (and including) the Kelly and Nimiuktuk River drainages was also considered as most user conflicts occur near Noatak (**Map 10**). These drainages provide migratory corridors that funnel caribou to the Noatak River where they are intercepted by local hunters. A concern commonly repeated by local hunters, particularly from Noatak (i.e. Halas 2015) is the effect of airplanes and nonlocal hunters on caribou migration. The long-held Inupiaq tradition of letting lead caribou pass unmolested in order to establish migration routes also suggests that once migration routes are established, other caribou will follow regardless of hunting or other disturbances such as airplanes (Dau 2015a). Perhaps a more appropriate response in this area would be to establish another CUA or delayed entry zone where NFQU would not be able to hunt until migration routes are clearly established. As caribou migration has become less predictable in recent years, often occurring later in the season (Dau 2015a), the dates for the new CUA would need to be flexible. However, temporal closures are beyond the scope of this request and may be more effectively implemented by NPS. Therefore, complete closure of this area may be warranted. However, closing the western portion of Noatak NP may have the unintended consequence of concentrating nonlocal caribou hunters in the eastern portion of the preserve.

Closing Federal public lands within the Squirrel River drainage was also considered. As there are no Federal public lands along the lower Squirrel River near Kiana, only the middle and upper reaches of the Squirrel River were considered. Along these sections, the vast majority of lands immediately along the Squirrel River (~0.5-1 mile either side) are State lands (**Map 6**). Therefore, it is uncertain whether closure of Federal lands in this area would discourage nonlocal hunters or just concentrate them in the narrow State-owned corridor, adding to user conflicts. The Northwest Arctic Council discussed making a motion to close only the Squirrel River area at its fall 2015 meeting, indicating the severity of the user conflicts in this area (NWARAC 2015). Closure of Federal public lands in the Squirrel River drainage would demonstrate the Board's responsiveness to FQSU concerns and may provoke action by other agencies (i.e. State).



Map 10. Suggested targeted closure of Federal public lands to caribou hunting by NFQU.

Effects of the Proposal

If WP18-46 or WP18-47 is adopted, caribou hunting on Federal public lands in Unit 23 would be closed to NFQU under Federal regulations indefinitely or for two regulatory years, respectively. Regulatory year 2018/19 would be the third consecutive year of a closure. In 2016/17, all Federal lands were closed by WSA16-01 while in 2017/18, only lands along the Noatak, Agashakok, Eli, and Squirrel Rivers were closed via WSA17-03.

In 2015, the State shortened bull and cow seasons for residents, prohibited the take of calves, and reduced the nonresident harvest limit. These recent regulation restrictions were enacted to reduce the impact of both resident and nonresident hunters on the WACH. In 2015, both the number of NFQU and number of caribou harvest by these users decreased appreciably, suggesting the regulatory changes were effective (**Figure 9**). However, the 2016/17 Federal closure to NFQU confounded further evaluation of these changes. Considering the substantial reduction in NFQU density and harvest in 2016/17, adoption of these proposals is expected to result in similar numbers of NFQU and harvest that are well below long-term averages (**Figure 9**). Preliminary data from harvest reports in 2016 indicate that the 2016/17 closure may have reduced nonlocal caribou harvest by 50% or more (Parrett 2016b, WINFONET 2017). While the overall number of nonlocal hunters and caribou harvest decreased in 2016/17, the relative distribution remained similar with the highest use in the Noatak (**Maps 7-9**).

While the sustainable harvest of WACH caribou may soon be (or has already been) exceeded, the overharvest of cows is of particular concern (Dau 2015a). As nonresidents may only harvest one bull, their impact on the herd's population trajectory is negligible. Total nonlocal harvest from Unit 23 accounts for only about 4% of the total WACH estimated harvest (456 caribou out of an estimated total harvest of 11,984 caribou on average) or 0.2% of the 2016 population estimate (200,928 caribou). From a biological perspective, reducing harvest by <4% (nonlocal harvest will still occur on State lands within Unit 23) will not have a meaningful impact on WACH conservation or population recovery. Indeed, wounding loss may account for more caribou mortalities than nonlocal harvest.

Concerns over the impact of sport hunting activities on caribou migration have also been expressed. Aircraft can affect caribou behavior in the short-term (< 8 hours), which can impact hunting success. However, aircraft are unlikely to have long-term impacts on caribou migration through the Noatak NP (Fullman et al. 2017, Halas 2015, Dau 2015a). The WACH have migrated through Unit 23 for thousands of years, although specific migration routes change annually (**Figure 1**). The long-held Inupiaq tradition of letting lead caribou pass unmolested in order to establish migration routes also suggests that once migration routes are established, other caribou will follow regardless of hunting or other disturbances such as airplanes (Dau 2015a). Adoption of these proposals would reduce airplane traffic within Noatak NP and may allow lead caribou to establish migration routes unmolested, precluding any potential migratory diversions.

Adoption of these proposals may also concentrate nonlocal hunters onto State lands, which only comprise 19% of Unit 23 (**Map 6**). Consequently, user conflicts may increase on State lands, particularly along the

Squirrel and upper Kobuk Rivers. However, there were no reports of concentrated nonlocal hunting activity on State lands affecting local harvest during the 2016/17 closure (ADF&G 2017d). Additionally, NFQU would need to distinguish between State and Federal lands. Due to the checkerboard pattern of land ownership in some areas of Unit 23 (i.e. Squirrel River area, **Map 6**), distinguishing land status is difficult and may increase law enforcement concerns. NFQU may also be displaced onto Federal public lands in adjacent units (i.e. Unit 26A), which could impact hunting and harvest in those units. During the 2016/17 Federal lands closure in Unit 23, nonlocal caribou harvest in Unit 26A increased 40%, although the average number of nonlocal hunters in Unit 23 is five times greater than in Unit 26A (ADF&G 2017d). However, NANA shareholders residing in urban areas would still be able to hunt on NANA lands under State regulations.

While the number of people and planes on Federal public lands would likely decrease substantially, user conflicts would not be fully eliminated since other users (i.e. moose hunters, photographers, recreational boaters, private planes) would still be able to fly over and access Federal public lands. Additionally, NFQU would still be able to access and harvest caribou on gravel bars below the mean high water mark within Federal public lands as these areas are considered State land. Reports from law enforcement and nonlocal hunters indicate caribou are commonly harvested on such gravel bars, which may suggest limited impacts of the closure as river crossings are where conflicts most often occur (**Map 5**, Stevenson 2017, pers. comm., BHA Alaska 2017). Attempts to mitigate user conflicts in Unit 23 have already been implemented by the NPS (delayed entry zone in Noatak NP), ADF&G (Noatak CUA), and Selawik NWR (closure of certain areas to commercial use). However, more can be done by individual agencies to further address user conflict (e.g. establishing new CUAs in high conflict areas, modifying the dates and extent of the NPS delayed entry zone, further restricting the number and activities of permitted transporters and guides, additional education and outreach, etc.).

Adopting these proposals may result in increased subsistence opportunity for FQSU. Reducing competition with and potential disturbance from nonlocal hunters may increase their hunting success and efficiency. Local residents recognized positive effects from the 2016/17 closure to caribou hunting by NFQU in Unit 23. The Noatak Native Village Council as well as students at the Noatak school submitted letters to the Board expressing their appreciation of the closure, citing higher harvest success. Public testimony from local residents in support of the closure was received during public meetings for WSA16-03 and WSA17-03 as well as the Board's deliberation on WSA16-03 (FSB 2017). Reports from regional law enforcement indicated that during the fall 2016 hunting season, nonlocal hunter density decreased along the Noatak River, but increased along the Wulik and Kivalina Rivers, suggesting nonlocal hunters shifted their activities in response to the Federal closure (Stevenson 2017, pers. comm., ADF&G 2017d). The favorable reports from Noatak residents likely reflected this shift in nonlocal hunter activity. However, it is possible that increases in nonlocal hunter activity in the vicinity of Kivalina could increase user conflicts in that area.

OSM PRELIMINARY CONCLUSION

Support Proposal WP18-46 **with modification** to close all Federal public lands within a 10 mile wide corridor (5 miles either side) along the Noatak River from the western boundary of Noatak National Preserve upstream to the confluence with the Cutler River; north of the Noatak River between, and including, the Kelly and Nimiuktuk River drainages; within the northern and southern boundaries of the Eli and Agashashok River drainages, respectively; and within the Squirrel River drainage to caribou hunting except by Federally qualified subsistence users and **Take No Action** on Proposal WP18-47.

The modified regulation should read:

Unit 23—Caribou

<i>Unit 23—that portion which includes all drainages north and west of, and including, the Singoalik River drainage</i>	<i>5 caribou per day as follows:</i>	
	<i>Calves may not be taken</i>	
	<i>Bulls may be harvested</i>	<i>July 1–Oct. 14 Feb. 1–June 30</i>
	<i>Cows may be harvested. However, cows accompanied by calves may not be taken</i>	<i>July 15–Apr. 30 July 15–Oct. 14.</i>
<i>Unit 23, remainder</i>	<i>5 caribou per day as follows:</i>	
	<i>Calves may not be taken</i>	<i>July 1–Oct. 31 Feb. 1–June 30</i>
	<i>Cows may be harvested. However, cows accompanied by calves may not be taken</i>	<i>July 31–March 31 July 31–Oct. 14.</i>
<i>Federal public lands within a 10 mile wide corridor (5 miles either side) along the Noatak River from the western boundary of Noatak National Preserve upstream to the confluence with the Cutler River; north of the Noatak River between, and including, the Kelly and Nimiuktuk River drainages; within the northern and southern boundaries of the Eli and Agashashok River drainages, respectively; and within the Squirrel River drainage are closed to caribou hunting except by Federally qualified subsistence users hunting under these regulations.</i>		

Justification

Closure of all Federal public lands in Unit 23 to NFQU is not warranted at this time. The Unit 23 Interagency Group recommended this targeted closure at its April 2017 meeting. Additionally, the WACH working group's management plan recommends closure of some, not all, Federal public lands if the WACH population drops below 200,000. Currently, the WACH population is on that management threshold. While user conflicts have been well documented in some portions of Unit 23 (i.e. along the Noatak and Squirrel Rivers), they have not been documented in other areas of Unit 23 (i.e. Bering Land Bridge National Preserve). Furthermore, while the 2016/17 closure seemed to have reduced nonlocal hunting activity and user conflicts in some areas, it increased the number of nonlocal hunters in other areas, which may lead to increased user conflicts in those areas.

Two criteria for a closure under ANILCA §815.3 and the Board's closure policy are conservation of healthy wildlife populations and continuation of subsistence uses of wildlife populations. Closure of Federal public lands for conservation of the WACH is not warranted. The number of caribou harvested by NFQU is not biologically meaningful. Additionally, caribou harvest by NFQU is already somewhat reduced due to the 2015 changes to State regulations (e.g. reduction in nonresident harvest limit, **Figure 9**). While NFQU activities may affect caribou behavior in the short-term, they likely do not affect long-term migration patterns through Noatak NP.

Closure of some Federal public lands for the continuation of subsistence uses, however, is warranted. Continued complaints about conflicts surrounding the Noatak and Squirrel River drainage and the apparent benefit of the 2016/17 Federal closure to Noatak residents evidenced by letters and public testimony support the closure of Federal public lands along the Noatak, Eli, Agashashok and Squirrel Rivers. Additionally, the short-term effects of aircraft on caribou behavior can negatively affect hunting success and harvest.

While NFQU will still be able to hunt caribou on gravel bars below the mean high water mark and on State lands in the Squirrel River drainage, these issues are beyond the Board's authority. Federal and State land managers could also be more proactive in enacting management strategies that respond to changing caribou migration and nonlocal use patterns over time.

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Appendix 1

Estimated total caribou harvest by community, per capita caribou harvest by community, and data sources for Unit 23: Western Arctic caribou herd (ADF&G 2015).

Unit 23				
Community	Year/Period	Est Caribou Harv.	# caribou per capita	Source
Ambler	2003	325	1.12	Georgette et al. 2005, unpublished data
	2009	456	1.75	Braem 2012
	2012	685	2.54	Braem et al. 2015
Buckland	2003	637	1.56	Magdanz et al. 2011
	2009	561	1.30	Braem 2012
Deering	1994	142	0.96	Magdanz et al. 2002
	2007-2008	182	1.37	Braem 2011
	2011-2012	237	1.91	Braem 2011
	2013	393	2.85	ADF&G unpublished data
Kiana	1999	488	1.23	ADF&G unpublished data
	2006	306	0.77	Magdanz et al. 2011
	2009	440	1.18	Braem 2012
Kivalina	1982	346	0.48	CSIS
	1983	564	0.78	CSIS
	1992	351	0.49	CSIS
	2007	268	0.67	Magdanz et al. 2010
	2010-2011	86	0.23	Braem et al. 2014
Kobuk	2004-2005	134	1.06	ADF&G unpublished data
	2009	210	1.72	Braem 2012
	2012	119	0.84	Braem et al. 2015
Kotzebue	1986	1917	0.71	Georgette and Loon 1993
	1991	3782	1.04	CSIS
	2001	2376	0.77	Whiting 2003
	2002	1719	0.56	Whiting 2003
	2003	1915	0.61	Whiting 2003
	2012-2013	1804	0.56	CSIS
2013-2014	1629	0.51	ADF&G unpublished data	
Noatak	1994	615	1.62	Magdanz et al. 2002
	1999	683	1.61	Georgette et al 2000., unpubd data
	2002	410	0.90	Georgette et al. 2004, unpubd data
	2007	441	0.90	Magdanz et al. 2010
	2010	66	0.13	Braem et al. 2014
	2011	360	0.66	Mikow et al. 2014
Noorvik	2002	988	1.46	Georgette et al. 2004, unpubd data
	2008	767	1.19	Braem et al. 2012
	2012	851	1.36	CSIS

-continued-

Unit 23, continued

Community	Year/Period	Est Caribou Harv.	# caribou per capita	Source
Point Hope	1994-1995	355	0.49	Bacon et al. 2009, rev. 2011
	2000-2001	219	0.31	Bacon et al. 2009, rev. 2011
Selawik	1999	1289	1.68	CSIS
	2006	934	1.11	CSIS
	2011	683	0.79	Braem et al. 2013
Shungnak	1998	561	2.17	Georgette 1999, unpubd data
	2002	403	1.62	Magdanz et al. 2004
	2008	416	1.53	Braem 2012
	2012	396	1.47	Braem et al. 2015

WP18–32 Executive Summary

General Description	<p>Proposal WP18-32 requests changes to the caribou season dates on Federal public lands in Units 21D, 22, 23, 24, 25A (West), 26A, and 26B. <i>Submitted by: Western Interior Alaska Subsistence Regional Advisory Council.</i></p>
Proposed Regulation	<p>Unit 21D—Caribou</p> <p><i>Unit 21D—north of the Yukon River and east of the Koyukuk River—caribou may be taken during a winter season to be announced</i> <i>Winter season to be announced</i></p> <p><i>Unit 21D, remainder—5 caribou per day, as follows: Calves may not be taken.</i></p> <p><i>Bulls may be harvested</i> <i>July 1-Oct. 14 10 Feb. 1-June 30</i></p> <p><i>Cows may be harvested</i> <i>Sep. 1-Mar. 31 Oct. 1 – Feb. 1</i></p> <p>Unit 22—Caribou</p> <p><i>Unit 22B—that portion west of Golovnin Bay and west of a line along the west bank of the Fish and Niukluk Rivers to the mouth of the Libby River, and excluding all portions of the Niukluk River drainage upstream from and including the Libby River drainage—5 caribou per day. Calves may not be taken</i></p> <p><i>Bulls may be harvested</i> <i>July 1 – Oct. 10 Feb. 1 – June 30</i></p> <p><i>Cows may be harvested</i> <i>Oct. 1 – Feb. 1</i></p> <p><i>Units 22A—that portion north of the Golsovia River drainage, 22B remainder, that portion of Unit 22D in the Kuzitrin River drainage (excluding the Pilgrim River drainage), and the Agiapuk River drainages, including the tributaries, and Unit 22E—that portion east of and including the Tin Creek drainage—5</i> <i>July 1-June 30</i></p>

WP18–32 Executive Summary	
<p><i>caribou per day. Calves may not be taken</i></p> <p><i>Bulls may be harvested</i></p> <p><i>Cows may be harvested</i></p> <p><i>Unit 22A, remainder—5 caribou per day. Calves may not be taken</i></p> <p><i>Bulls may be harvested</i></p> <p><i>Cows may be harvested</i></p> <p><i>Unit 22D, that portion in the Pilgrim River drainage—5 caribou per day. Calves may not be taken</i></p> <p><i>Bulls may be harvested</i></p> <p><i>Cows may be harvested</i></p> <p><i>Units 22C, 22D remainder, 22E remainder—5 caribou per day. Calves may not be taken</i></p> <p><i>Bulls may be harvested</i></p> <p><i>Cows may be harvested</i></p> <p>Unit 23—Caribou</p> <p><i>Unit 23—that portion which includes all drainages north and west of, and including, the Singoalik River drainage—5 caribou per day as follows: Calves may not be taken</i></p> <p><i>Bulls may be harvested</i></p> <p><i>Cows may be harvested. However, cows accompanied by calves may not be taken July</i></p>	<p><i>July 1 – Oct. 10</i> <i>Feb. 1 – June 30</i></p> <p><i>Oct. 1 – Feb. 1</i></p> <p><i>July 1–June 30, season may be announced</i></p> <p><i>July 1 – Oct. 10</i> <i>Feb. 1 – June 30</i></p> <p><i>Oct. 1 – Feb. 1</i></p> <p><i>Oct. 1–Apr. 30</i> <i>May 1–Sep. 30, season may be announced</i></p> <p><i>July 1 – Oct. 10</i> <i>Feb. 1 – June 30</i></p> <p><i>Oct. 1 – Feb. 1</i></p> <p><i>July 1–June 30, season may be announced</i></p> <p><i>July 1 – Oct. 10</i> <i>Feb. 1 – June 30</i></p> <p><i>Oct. 1 – Feb. 1</i></p> <p><i>July 1–Oct. 14 10</i> <i>Feb. 1–June 30</i></p> <p><i>July 15–Apr. 30</i> <i>Oct. 1 – Feb. 1</i></p>

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	<p>15 Oct. 14</p> <p>Unit 23, remainder—5 caribou per day, as follows: Calves may not be taken.</p> <p>Bulls may be harvested</p> <p style="text-align: right;">July 1-Oct. 10 Feb. 1-June 30</p> <p>Cows may be harvested. However, cows accompanied by calves may not be taken July 31-Oct. 14</p> <p style="text-align: right;">July 31-Mar. 31 Oct. 1 – Feb. 1</p> <p>Unit 24—Caribou</p> <p>Unit 24A—that portion south of the south bank of the Kanuti River—1 caribou</p> <p style="text-align: right;">Aug. 10-Mar. 31</p> <p>Unit 24B—that portion south of the south bank of the Kanuti River, upstream from and including that portion of the Kanuti-Kilolitna River drainage, bounded by the southeast bank of the Kodosin-Nolitna Creek, then downstream along the east bank of the Kanuti-Kilolitna River to its confluence with the Kanuti River—1 caribou</p> <p style="text-align: right;">Aug. 10-Mar. 31</p> <p>Units 24A remainder, 24B remainder—5 caribou per day as follows: Calves may not be taken.</p> <p>Bulls may be harvested</p> <p style="text-align: right;">July 1-Oct. 10 Feb. 1-June 30</p> <p>Cows may be harvested</p> <p style="text-align: right;">July 15-Apr. 30 Oct. 1 – Feb. 1</p> <p>Units 24C, 24D—5 caribou per day as follows: Calves may not be taken.</p> <p>Bulls may be harvested.</p> <p style="text-align: right;">July 1-Oct. 10 Feb. 1-June 30</p>
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	<p><i>Cows may be harvested</i> <i>Sep. 1 – Mar. 31</i> <i>Oct. 1 – Feb. 1</i></p>
	<p>Unit 25A—Caribou</p>
	<p><i>Unit 25A—in those portions west of the east bank of the East Fork of the Chandalar River extending from its confluence with the Teedrijik (Chandalar) River upstream to Guilbeau Pass and north of the south bank of the mainstem of the Teedrijik (Chandalar) River at its confluence with the East Fork Chandalar River west (and north of the south bank) along the West Fork Ch’idriinjik (Chandalar) River—10 caribou. However, only bulls may be taken May 16–June 30</i> <i>July 1–June 30</i></p>
	<p><i>Bulls may be harvested</i> <i>July 1 – Oct. 10</i> <i>Feb. 1 – June 30</i></p>
	<p><i>Cows may be harvested</i> <i>Oct. 1 – Feb. 1</i></p>
	<p><i>Unit 25A remainder, 25B, and Unit 25D, remainder—10 caribou</i> <i>July 1–Apr. 30</i></p>
	<p>Unit 26—Caribou</p>
	<p><i>Unit 26A—that portion of the Colville River drainage upstream from the Anaktuvuk River, and drainages of the Chukchi Sea south and west of, and including the Utukok River drainage—5 caribou per day as follows: Calves may not be taken.</i></p>
	<p><i>Bulls may be harvested</i> <i>July 1–Oct. 10</i> <i>Dec. 6</i> <i>Feb. 1–June 30</i></p>
	<p><i>Cows may be harvested; however, cows accompanied by calves may not be taken</i> <i>July 16–Mar. 15</i> <i>Oct. 1 – Feb. 1</i></p>
	<p><i>July 16–Oct. 15</i></p>

WP18–32 Executive Summary

	<p><i>Unit 26A remainder—5 caribou per day as follows: Calves may not be taken.</i></p> <p><i>Bulls may be harvested</i> July 1-Oct. 15 10 Dec. 6-Feb. 1-June 30</p> <p><i>Up to 3 cows per day may be harvested; however, cows accompanied by calves may not be taken July 16-Oct. 15</i> July 16-Mar. 15 Oct. 1 – Feb. 1</p> <p><i>Unit 26B, that portion south of 69°30' N. lat. and west of the Dalton Highway—5 caribou per day as follows:</i></p> <p><i>Bulls may be harvested</i> July 1-Oct. 14 10 Dec. 10-Feb. 1-June 30</p> <p><i>Cows may be harvested</i> July 1-Apr. 30 Oct. 1 – Feb. 1</p> <p><i>Unit 26B remainder—5 caribou per day as follows:</i></p> <p><i>Bulls may be harvested.</i> July 1-June 30 July 1 – Oct. 10 Feb. 1 – June 30</p> <p><i>Cows may be harvested.</i> July 1-May 15 Oct. 1 – Feb. 1</p> <p><i>You may not transport more than 5 caribou per regulatory year from Unit 26 except to the community of Anaktuvuk Pass</i></p>
OSM Preliminary Conclusion	Oppose
Southeast Alaska Subsistence Regional Advisory Council Recommendation	

WP18–32 Executive Summary	
Southcentral Alaska Subsistence Regional Advisory Council Recommendation	
Kodiak/Aleutians Subsistence Regional Advisory Council Recommendation	
Bristol Bay Subsistence Regional Advisory Council Recommendation	
Yukon-Kuskokwim Delta Subsistence Regional Advisory Council Recommendation	
Western Interior Alaska Subsistence Regional Advisory Council Recommendation	
Seward Peninsula Subsistence Regional Advisory Council Recommendation	
Northwest Arctic Subsistence Regional Advisory Council Recommendation	
Eastern Interior Alaska Subsistence Regional Advisory Council Recommendation	

WP18–32 Executive Summary	
North Slope Subsistence Regional Advisory Council Recommendation	
Interagency Staff Committee Comments	
ADF&G Comments	
Written Public Comments	None

**DRAFT STAFF ANALYSIS
WP18-32**

ISSUES

Proposal WP18-32, submitted by the Western Interior Alaska Subsistence Regional Advisory Council, requests changes to the caribou season dates on Federal public lands in Units 21D, 22, 23, 24, 25A (West), 26A, and 26B.

DISCUSSION

The proponent requests changes to Federal caribou regulations to protect cows from the Western Arctic Caribou Herd (WACH), Teshekpuk Caribou Herd (TCH), and the Central Arctic Caribou Herd (CACH) during the fall and spring migration. The proponent states that reducing the exposure of cows to hunting during migration will avoid migration deflections because cows lead migration. The proponent also requests changes to the bull seasons to prohibit bull harvest when they are not palatable during the rut. To align seasons between the State and Federal regulations, the proponent intends to submit an agenda change request to the Alaska Board of Game (BOG).

Existing Federal Regulation

Unit 21D—Caribou

Unit 21D—north of the Yukon River and east of the Koyukuk River—caribou may be taken during a winter season to be announced *Winter season to be announced*

Unit 21D, remainder—5 caribou per day, as follows: Calves may not be taken.

Bulls may be harvested

*July 1-Oct. 14
Feb. 1-June 30*

Cows may be harvested

Sep. 1-Mar. 31

Unit 22—Caribou

Unit 22B—that portion west of Golovnin Bay and west of a line along the west bank of the Fish and Niukluk Rivers to the mouth of the Libby River, and excluding all portions of the Niukluk River drainage upstream from and including the Libby River drainage—5 caribou per day. Calves may not be taken *Oct. 1-Apr. 30
May 1-Sep. 30, a season may be announced*

Units 22A—that portion north of the Golsovia River drainage, 22B *July 1-June 30*

remainder, that portion of Unit 22D in the Kuzitrin River drainage (excluding the Pilgrim River drainage), and the Agiapuk River drainages, including the tributaries, and Unit 22E—that portion east of and including the Tin Creek drainage—5 caribou per day. Calves may not be taken

Unit 22A, remainder—5 caribou per day. Calves may not be taken. July 1-June 30, season may be announced

Unit 22D, that portion in the Pilgrim River drainage—5 caribou per day. Calves may not be taken Oct. 1-Apr. 30
May 1-Sep. 30, season may be announced

Units 22C, 22D remainder, 22E remainder—5 caribou per day. Calves may not be taken July 1-June 30, season may be announced

Unit 23—Caribou

Unit 23—that portion which includes all drainages north and west of, and including, the Singoalik River drainage—5 caribou per day as follows: Calves may not be taken

Bulls may be harvested July 1-Oct. 14
Feb. 1-June 30

Cows may be harvested. However, cows accompanied by calves may not be taken July 15-Oct. 14

Unit 23, remainder—5 caribou per day, as follows: Calves may not be taken.

Bulls may be harvested July 1-Oct. 14
Feb. 1-June 30

Cows may be harvested. However, cows accompanied by calves may not be taken July 31-Oct. 14

Unit 24—Caribou

Unit 24A—that portion south of the south bank of the Kanuti River—1 caribou Aug. 10-Mar. 31

Unit 24B—that portion south of the south bank of the Kanuti River, upstream from and including that portion of the Kanuti-Kilolitna Aug. 10-Mar. 31

River drainage, bounded by the southeast bank of the Kodosin-Nolitna Creek, then downstream along the east bank of the Kanuti-Kilolitna River to its confluence with the Kanuti River—1 caribou

Units 24A remainder, 24B remainder—5 caribou per day as follows: Calves may not be taken

Bulls may be harvested

*July 1-Oct. 14.
Feb. 1-June 30*

Cows may be harvested

July 15-Apr. 30

Units 24C, 24D—5 caribou per day as follows: Calves may not be taken.

Bulls may be harvested

*July 1-Oct. 14
Feb. 1-June 30*

Cows may be harvested

Sep. 1-Mar. 31

Unit 25A—Caribou

*Unit 25A—in those portions west of the east bank of the East Fork of the Chandalar River extending from its confluence with the Chandalar River upstream to Guilbeau Pass and north of the south bank of the mainstem of the Chandalar River at its confluence with the East Fork Chandalar River west (and north of the south bank) along the West Fork Chandalar River—10 caribou. However, only bulls may be taken
May 16-June 30*

Unit 25A remainder, 25B, and Unit 25D, remainder—10 caribou *July 1-Apr. 30*

Unit 26—Caribou

Unit 26A—that portion of the Colville River drainage upstream from the Anaktuvuk River, and drainages of the Chukchi Sea south and west of, and including the Utukok River drainage—5 caribou per day as follows: Calves may not be taken

Bulls may be harvested

*July 1-Oct. 14
Dec. 6-June 30*

Cows may be harvested; however, cows accompanied by calves may not be taken July 16-Oct. 15 *July 16-Mar. 15*

Unit 26A remainder—5 caribou per day as follows: Calves may not be taken.

Bulls may be harvested *July 1-Oct. 15*
Dec. 6-June 30

Up to 3 cows per day may be harvested; however, cows accompanied by calves may not be taken July 16-Oct. 15 *July 16-Mar. 15*

Unit 26B, that portion south of 69°30' N. lat. and west of the Dalton Highway—5 caribou per day as follows:

Bulls may be harvested *July 1-Oct. 14*
Dec. 10-June 30

Cows may be harvested *July 1-Apr. 30*

*Unit 26B remainder—5 caribou per day as follows:
Bulls may be harvested.* *July 1-June 30*

Cows may be harvested *July 1-May 15*

You may not transport more than 5 caribou per regulatory year from Unit 26 except to the community of Anaktuvuk Pass

Proposed Federal Regulations

Unit 21D—Caribou

Unit 21D—north of the Yukon River and east of the Koyukuk River—caribou may be taken during a winter season to be announced *Winter season to be announced*

Unit 21D, remainder—5 caribou per day, as follows: Calves may not be taken.

Bulls may be harvested *July 1-Oct. 14 10*
Feb. 1-June 30

Cows may be harvested *~~Sep. 1-Mar. 31~~*
Oct. 1 – Feb. 1

Unit 22—Caribou

Unit 22B—that portion west of Golovnin Bay and west of a line along the west bank of the Fish and Niukluk Rivers to the mouth of the Libby River, and excluding all portions of the Niukluk River drainage upstream from and including the Libby River drainage—5 caribou per day. Calves may not be taken

~~Oct. 1–Apr. 30
May 1–Sep. 30, a
season may be
announced~~

Bulls may be harvested

***July 1 – Oct. 10
Feb. 1 – June 30***

Cows may be harvested

Oct. 1 – Feb. 1

Units 22A—that portion north of the Golsovia River drainage, 22B remainder, that portion of Unit 22D in the Kuzitrin River drainage (excluding the Pilgrim River drainage), and the Agiapuk River drainages, including the tributaries, and Unit 22E—that portion east of and including the Tin Creek drainage—5 caribou per day. Calves may not be taken

~~July 1–June 30~~

Bulls may be harvested

***July 1 – Oct. 10
Feb. 1 – June 30***

Cows may be harvested

Oct. 1 – Feb. 1

Unit 22A, remainder—5 caribou per day. Calves may not be taken

~~July 1–June 30, season
may be announced~~

Bulls may be harvested

***July 1 – Oct. 10
Feb. 1 – June 30***

Cows may be harvested

Oct. 1 – Feb. 1

Unit 22D, that portion in the Pilgrim River drainage—5 caribou per day. Calves may not be taken

~~Oct. 1–Apr. 30
May 1–Sep. 30, season
may be announced~~

Bulls may be harvested

***July 1 – Oct. 10
Feb. 1 – June 30***

Cows may be harvested

Oct. 1 – Feb. 1

Units 22C, 22D remainder, 22E remainder—5 caribou per day. Calves may not be taken

~~July 1–June 30, season
may be announced~~

Bulls may be harvested

July 1 – Oct. 10
Feb. 1 – June 30

Cows may be harvested

Oct. 1 – Feb. 1

Unit 23—Caribou

Unit 23—that portion which includes all drainages north and west of, and including, the Singoalik River drainage—5 caribou per day as follows: Calves may not be taken

Bulls may be harvested

July 1-Oct. 14 10
Feb. 1-June 30

Cows may be harvested. However, cows accompanied by calves may not be taken July 15-Oct. 14

July 15-Apr. 30
Oct. 1 – Feb. 1

Unit 23, remainder—5 caribou per day, as follows: Calves may not be taken.

Bulls may be harvested

July 1-Oct. 14 10
Feb. 1-June 30

Cows may be harvested. However, cows accompanied by calves may not be taken July 31-Oct. 14

July 31-Mar. 31
Oct. 1 – Feb. 1

Unit 24—Caribou

Unit 24A—that portion south of the south bank of the Kanuti River—1 caribou

Aug. 10-Mar. 31

Unit 24B—that portion south of the south bank of the Kanuti River, upstream from and including that portion of the Kanuti-Kilolitna River drainage, bounded by the southeast bank of the Kodosin-Nolitna Creek, then downstream along the east bank of the Kanuti-Kilolitna River to its confluence with the Kanuti River—1 caribou

Aug. 10-Mar. 31

Units 24A remainder, 24B remainder—5 caribou per day as follows: Calves may not be taken.

Bulls may be harvested ~~July 1-Oct. 14-~~
10
Feb. 1-June 30

Cows may be harvested ~~July 15-Apr. 30~~
Oct. 1 – Feb. 1

Units 24C, 24D—5 caribou per day as follows: Calves may not be taken.

Bulls may be harvested. ~~July 1-Oct. 14~~
10
Feb. 1-June 30

Cows may be harvested ~~Sep. 1-Mar. 31~~
Oct. 1 – Feb. 1

Unit 25A—Caribou

*Unit 25A—in those portions west of the east bank of the East Fork of the Chandalar River extending from its confluence with the **Teedriijik (Chandalar)** River upstream to Guilbeau Pass and north of the south bank of the mainstem of the **Teedriijik (Chandalar)** River at its confluence with the East Fork Chandalar River west (and north of the south bank) along the West Fork **Ch'idriinjik (Chandalar)** River—10 caribou. However, only bulls may be taken May 16-June 30* ~~July 1-June 30~~

Bulls may be harvested **July 1 – Oct. 10**
Feb. 1 – June 30

Cows may be harvested **Oct. 1 – Feb. 1**

Unit 25A remainder, 25B, and Unit 25D, remainder—10 caribou ~~July 1-Apr. 30~~

Unit 26—Caribou

Unit 26A—that portion of the Colville River drainage upstream from the Anaktuvuk River, and drainages of the Chukchi Sea south and west of, and including the Utukok River drainage—5 caribou per day as follows: Calves may not be taken.

Bulls may be harvested ~~July 1-Oct. 14~~**10**
~~Dec. 6~~ **Feb. 1-June 30**

Cows may be harvested; however, cows accompanied by calves may not be taken July 16-Oct. 15	July 16-Mar. 15 Oct. 1 – Feb. 1
Unit 26A remainder—5 caribou per day as follows: Calves may not be taken.	
Bulls may be harvested	July 1-Oct. 15 10 Dec. 6-Feb. 1 -June 30
Up to 3 cows per day may be harvested; however, cows accompanied by calves may not be taken July 16-Oct. 15	July 16-Mar. 15 Oct. 1 – Feb. 1
Unit 26B, that portion south of 69°30' N. lat. and west of the Dalton Highway—5 caribou per day as follows:	
Bulls may be harvested	July 1-Oct. 14 10 Dec. 10-Feb. 1 -June 30
Cows may be harvested	July 1-Apr. 30 Oct. 1 – Feb. 1
Unit 26B remainder—5 caribou per day as follows: Bulls may be harvested.	July 1-June 30 July 1 – Oct. 10 Feb. 1 – June 30
Cows may be harvested.	July 1-May 15 Oct. 1 – Feb. 1
You may not transport more than 5 caribou per regulatory year from Unit 26 except to the community of Anaktuvuk Pass	

Existing State Regulations

Unit 21D—Caribou

21A	Residents and Nonresidents: 1 bull	HT	Aug. 10 – June 30
21B, north of the Yukon River and downstream from Ukawutni Creek	Residents and Nonresidents		No open season

21B remainder	Residents and Nonresidents: 1 caribou	HT	Aug. 10 – Sept. 30
21C, Dulbi River drainage and Melozitna River drainages downstream from Big Creek	Residents and Nonresidents		No open season
21C remainder	Residents and Nonresidents: 1 caribou	HT	Aug. 10 – Sept. 30
21D, north of the Yukon River and east of the Koyukuk River	Residents: 2 caribou may be taken during the winter season	HT	may be announced
21D remainder	Residents: 5 caribou per day however, calves may not be taken		
	Bulls	HT	July 1 – Oct. 14 Feb. 1 – June 30
	Cows	HT	Sept. 1 – Mar. 31
	Nonresidents: 1 bull however calves may not be taken	HT	Aug. 1 – Sept. 30
21E	Residents and Nonresidents: 1 caribou	HT	Aug. 10 – Sept. 30

Unit 22—Caribou

22A, that portion
north of the Golsovia
River drainage

Residents— 5 caribou
per day, by registration
permit only, up to 20
caribou total; as follows:

	<i>Up to 5 bulls per day; however, calves may not be taken;</i>	RC800	<i>no closed season</i>
			<i>July 1-Mar. 31</i>
	<i>Up to 5 cows per day; however, calves may not be taken</i>	RC800	
			<i>Aug. 1-Sept. 30</i>
	<i>Nonresidents—1 bull; however, calves may not be taken</i>	HT	
<i>22A remainder</i>	<i>Residents—5 caribou per day, by registration permit only, up to 20 caribou total; as follows:</i>		
	<i>Up to 5 bulls per day; however calves may not be taken; bulls may not be taken Oct. 15-Jan. 31.</i>	RC800	<i>may be announced</i>
	<i>Nonresidents—1 bull; however, calves may not be taken</i>	HT	<i>may be announced</i>
<i>Unit 22B, that portion west of Golovnin Bay, and west of a line along the west bank of the Fish and Niukluk rivers to the mouth of the Libby river, and excluding all portions of the Niukluk River drainage upstream from and including the Libby River drainage</i>	<i>Residents—5 caribou per day, by registration permit only, up to 20 caribou total; as follows:</i>		
	<i>Up to 5 bulls per day; however, calves may not be taken;</i>	RC800	<i>Oct. 1-Apr. 30</i>
	<i>Up to 5 cows per day; however, calves may not be taken</i>	RC800	<i>Oct. 1-Mar. 31</i>
	<i>Up to 5 caribou per day; however, calves may not be taken; during the period May 1-Sept. 30, a season may be</i>	RC800	<i>may be announced</i>

	<p><i>announced by emergency order; however, cow caribou may not be taken April 1-Aug. 31</i></p>		<p><i>may be announced</i></p>
	<p><i>Nonresidents: 1 bull; however, calves may not be taken; during the period Aug. 1-Sept. 30, a season may be announced by emergency order</i></p>	<p><i>HT</i></p>	
<p><i>22B Remainder</i></p>	<p><i>Residents—5 caribou per day, by registration permit only, up to 20 caribou total; as follows:</i></p>		
	<p><i>Up to 5 bulls per day; however, calves may not be taken</i></p>	<p><i>RC800</i></p>	<p><i>no closed season</i></p>
	<p><i>Up to 5 cows per day; however, calves may not be taken</i></p>	<p><i>RC800</i></p>	<p><i>July. 1-Mar. 31</i></p>
	<p><i>Nonresidents—1 bull; however, calves may not be taken</i></p>	<p><i>HT</i></p>	<p><i>Aug. 1-Sept. 30</i></p>
<p><i>22C</i></p>	<p><i>Residents—5 caribou per day, by registration permit only, up to 20 caribou total; as follows:</i></p>		
	<p><i>Up to 5 bulls per day; however calves may not be taken; bulls may not be taken Oct. 15-Jan. 31.</i></p>	<p><i>RC800</i></p>	<p><i>may be announced</i></p>
	<p><i>Up to 5 cows per day; however calves may not be taken; cows may not</i></p>	<p><i>RC800</i></p>	<p><i>may be announced</i></p>

	<i>be taken Apr. 1-Aug. 31.</i>		
	<i>Nonresidents—1 bull; however, calves may not be taken</i>	<i>HT</i>	<i>may be announced</i>
<i>22D, that portion in the Pilgrim River drainage</i>	<i>Residents—5 caribou per day, by registration permit only, up to 20 caribou total; as follows:</i>		
	<i>Up to 5 bulls per day; however, calves may not be taken</i>	<i>RC800</i>	<i>Oct. 1-Apr. 30</i>
	<i>Up to 5 cows per day; however, calves may not be taken</i>	<i>RC800</i>	<i>Oct. 1-Mar. 31</i>
	<i>Up to 5 caribou per day; however, calves may not be taken; during the period May 1-Sept. 30, a season may be announced by emergency order; however, cow caribou may not be taken April 1-Aug. 31</i>	<i>RC800</i>	<i>may be announced</i>
	<i>Nonresidents: 1 bull; however, calves may not be taken; during the period Aug. 1-Sept. 30, a season may be announced by emergency order</i>	<i>HT</i>	<i>may be announced</i>
<i>22D, that portion in the Kuzitrin River drainage (excluding the Pilgrim River drainage) and the Agiapuk river</i>	<i>Residents—5 caribou per day, by registration permit only, up to 20 caribou total; as follows:</i>		
	<i>Up to 5 bulls per day;</i>	<i>RC800</i>	<i>no closed season</i>

<i>drainage, including tributaries</i>	<i>however, calves may not be taken</i>		
	<i>Up to 5 cows per day; however, calves may not be taken</i>	RC800	<i>July 1-Mar. 31</i>
	<i>Nonresidents—1 bull; however, calves may not be taken</i>	HT	<i>Aug. 1-Sept. 30</i>
<i>22E, that portion east of and including the Sanaguich River drainage</i>	<i>Residents—5 caribou per day, by registration permit only, up to 20 caribou total; as follows:</i>		
	<i>Up to 5 bulls per day; however, calves may not be taken</i>	RC800	<i>no closed season</i>
	<i>Up to 5 cows per day; however, calves may not be taken</i>	RC800	<i>July 1-Mar. 31</i>
	<i>Nonresidents—1 bull; however, calves may not be taken</i>	HT	<i>Aug. 1-Sept. 30</i>
<i>22E Remainder</i>	<i>Residents—5 caribou per day, by registration permit only; up to 20 caribou total; as follows:</i>	RC800	<i>may be announced</i>
	<i>Up to 5 bulls per day; however calves may not be taken; bulls may not be taken Oct. 15-Jan. 31.</i>	RC800	<i>may be announced</i>
	<i>Up to 5 cows per day; however calves may not be taken; cows may not be taken Apr. 1-Aug. 31.</i>	RC800	<i>may be announced</i>

*Nonresidents—1 bull; HT may be announced
however, calves may not
be taken;*

Unit 23—Caribou

*23, north of and
including the
Singoalik River
drainage*

*Residents—5 caribou
per day; however, calves
may not be taken.*

*Bulls RC907 July 1-Oct. 14
Feb. 1-June 30*

Cows RC907 Jul. 15-Apr. 30

*Nonresidents—1 bull; HT Aug. 1 – Sept. 30
however, calves may not
be taken*

23 remainder

*Residents—5 caribou
per day; however, calves
may not be taken.*

*Bulls RC907 July 1-Oct. 14
Feb. 1-June 30*

Cows RC907 Sept. 1-Mar. 31

*Nonresidents—1 bull; HT Aug. 1-Sept. 30
however, calves may not
be taken*

Unit 24—Caribou

*24A, south of the
south bank of the
Kanuti River*

*Resident Hunters: 1 HT Aug. 10 – Mar. 31
caribou*

*Nonresident Hunters: 1 HT Aug. 10 – Sept. 30
caribou*

24A, remainder	Resident Hunters: 2 caribou	HT	July 1 – Apr. 30
	Nonresident Hunters: 2 bulls	HT	Aug 1 – Sept. 30
24B, south of the south bank of the Kanuti River, upstream from and including that portion of the Kanuti-Kilolitna River drainage, bounded by the southeast bank of the Kodosin-Nolitna Creek, then downstream along the east bank of the Kanuti-Kilolitna River to its confluence with the Kanuti River	Resident Hunters: 1 caribou	HT	Aug. 10 – Mar. 31
	Nonresident Hunters: 1 caribou	HT	Aug. 10 – Sept. 30
24B remainder	Resident Hunters: 5 caribou per day however, calves may not be taken.		
	Bulls	HT	July 1 – Oct. 14 Feb 1 – June 30
	Cows	HT	July 15 – Apr. 30
	Nonresident Hunters: 1 bull	HT	Aug. 1 – Sept. 30
24C, 24D	Resident Hunters: 5 caribou per day however, calves may not be taken.		

			<i>July 1- Oct. 14</i>
<i>Bulls</i>		<i>HT</i>	<i>Feb 1 – June 30</i>
<i>Cows</i>		<i>HT</i>	<i>Sept. 1- Mar. 31</i>
<i>Nonresident Hunters: 1 bull however calves may not be taken</i>	<i>HT</i>		<i>Aug. 1 – Sept. 30</i>

Unit 25A—Caribou

<i>25A, 25B, 25D remainder</i>	<i>Resident Hunters: 10 caribou</i>	<i>HT</i>	<i>July 1-Apr. 30</i>
	<i>Nonresident Hunters: 2 bulls</i>	<i>HT</i>	<i>Aug. 1 – Sept. 30</i>

Unit 26—Caribou

<i>Unit 26A the Colville River drainage upstream from the Anaktuvuk River, and drainages of the Chukchi Sea south and west of, and including the Utukok River drainage</i>	<i>Resident Hunters: 5 caribou per day, however, calves may not be taken:</i>		
	<i>Bulls</i>	<i>RC907</i>	<i>July 1 – Oct. 14 Feb. 1 – June 30</i>
	<i>Cows</i>	<i>RC907</i>	<i>July 15 – Apr. 30</i>
	<i>Nonresident hunters: 1 bull; however, calves may not be taken</i>	<i>HT</i>	<i>July 15– Sept.30</i>
<i>Unit 26A remainder</i>	<i>Resident Hunters: 5 bulls per day; however, calves may not be taken</i>	<i>RC907</i>	<i>July 1 – July 15 Mar. 16-June 30</i>

5 caribou per day three RC907 July 16 – Oct. 15
of which may be cows:
calves may not be taken,
and cows with calves
may not be taken

3 cows per day however, RC907 Oct. 16 – Dec. 31
calves may not be taken

5 caribou per day three RC907 Jan. 1 – Mar. 15
of which may be cows;
calves may not be taken

Nonresident Hunters: 1 HT July 15 – Sept. 30
bull however, calves may
not be taken

Unit 26B—Caribou

Unit 26(B),
Northwest portion
north of the 69° 30'
N. lat. and west of the
east bank of the
Kuparuk River to a
point at 70° 10' N.
lat., 149° 04' W.
long., and west
approximately 22
miles to 70° 10' N. lat
and 149° 56' W. long,
then following the
east bank of the
Kalubik River to the
Arctic Ocean

Resident Hunters: 5
caribou per day

Bulls HT No closed season

Cows HT July 1- May 15

Nonresident Hunters: 1- HT Aug. 1-Sept 15
bull

26B remainder Resident Hunters: 2 HT Aug. 1-Apr. 30
bulls

Nonresident Hunters: 1 HT Aug. 1-Sept. 15
bull

Extent of Federal Public Lands

Federal public lands comprise approximately 56% of Unit 21D and consist of 53% U.S. Fish and Wildlife Service (USFWS) managed lands and 47% Bureau of Land Management (BLM) managed lands (see **Unit 21 Map**).

Federal public lands comprise approximately 43% of Unit 22 and consist of 65% BLM managed lands, 29% National Park Service (NPS) managed lands, and 7% USFWS managed lands (see **Unit 22 Map**).

Federal public lands comprise approximately 71% of Unit 23 and consist of 56% NPS managed lands, 31% BLM managed lands, and 13% USFWS managed lands (see **Unit 23 Map**).

Federal public lands comprise approximately 64% of Unit 24 and consist of 34% USFWS managed lands, 34% NPS managed lands, and 33% BLM managed lands (see **Unit 24 Map**).

Federal public lands comprise approximately 76% of Unit 25A and consist of 97% USFWS managed lands and 3% BLM managed lands (see **Unit 25 Map**).

Federal public lands comprise approximately 73% of Unit 26A and consist of 66.9% BLM managed lands, 6.6% National Park Service (NPS) managed lands, and 0.1% USFWS managed lands. Federal public lands comprise approximately 29% of Unit 26B and consist of 22.8% USFWS managed lands, 3.6% BLM managed lands, and 2.7% NPS managed lands (see **Unit 26 Map**).

Customary and Traditional Use Determinations

Residents that have a customary and traditional use determination for caribou in Units 21, 22, 23, 24, 25A, 26A and 26B are presented in **Table 1**.

Table 1. Unit specific customary and traditional use determinations

UNIT	CUSTOMARY AND TRADITIONAL DETERMINATION
21D	Residents of Units 21B, 21C, 21D, and Huslia
22A	Residents of Units 21D west of the Koyukuk and Yukon Rivers, 22 (except residents of St. Lawrence Island), 23, 24, Kotlik, Emmonak, Hooper Bay, Scammon Bay, Chevak, Marshall, Mountain Village, Pilot Station, Pitka's Point, Russian Mission, St. Marys, Nunam Iqua, and Alakanuk
22 Remainder	Residents of Units 21D west of the Koyukuk and Yukon Rivers, 22 (excluding residents of St. Lawrence Island), 23, and 24
23	Residents of Unit 21D west of the Koyukuk and Yukon Rivers, Galena, 22, 23, 24 including residents of Wiseman but no other residents of the Dalton Highway Corridor Management Area and 26A
24	Residents of Unit 24, Galena, Kobuk, Koyukuk, Stevens Village, and Tanana
25A	Residents of Units 24A and 25
26A and 26C	Residents of Unit 26 (except the Prudhoe Bay–Deadhorse Industrial Complex), Anaktuvuk Pass, and Point Hope
26B	Residents of Unit 26, Anaktuvuk Pass, Point Hope, and Unit 24 within the Dalton Highway Corridor Management Corridor Area (DHCMA)

Regulatory History

See **Appendix A** for a summary of the regulatory history.

Current Events

Several proposals concerning Federal caribou harvest regulations in Unit 23 and Unit 26 were submitted for the 2018-2020 wildlife regulatory cycle.

At the Northwest Arctic Subsistence Regional Advisory Council meeting in March 2017, the Council voted to submit a proposal to decrease the caribou harvest limit in Unit 23 from 5 to 3 caribou/day (WP18-45).

The North Slope Subsistence Regional Advisory Council submitted a proposal requesting that Federal public lands in Units 26A and 26B be closed to caribou hunting by non-Federally qualified users (NFQU) (WP18-57).

Two proposals, the first submitted by the Western Arctic Caribou Herd Working Group (WACH Working Group) (WP18-46), and the second by Enoch Mitchell of Noatak (WP18-47), request that Federal public lands in Unit 23 be closed to caribou hunting except by Federally qualified subsistence users. Proposal WP18-47 specifically requests that the closure extend from 2018/19-2020/21 only.

Two proposals, the first submitted by the WACH Working Group (WP18-48) and the second by Louis Cusack (WP18-49), request that Federal reporting requirements for caribou in Units 22, 23, and 26A be aligned with the State's registration permit requirements.

Biological Background

The TCH, WACH, and CACH have ranges that overlap in Unit 26A (**Map 1**) and there can be considerable mixing of herds during the fall and winter (Hemming 1971). During the early 2000s, the number of caribou from the WACH, TCH, CACH, and Porcupine Caribou Herd (PCH) peaked at over 700,000 animals, which may be the highest number since the 1970s (OSM 2017b). Currently, the WACH, TCH, and CACH populations are all declining (Dau 2011, Lenart 2011, Parrett 2011). After declining slowly during the 1990s and early 2000s, the PCH has been increasing and by 2016 was at 197,000, which is the highest population yet recorded for this herd (OSM 2017b). In some years, harvest on Federal public lands within the Arctic National Wildlife Refuge (Arctic NWR) in Unit 26B is primarily from the PCH (Arthur 2017 pers. comm.).

Caribou abundance naturally fluctuates over decades (Gunn 2001, WACH Working Group 2011) and this may result in proportional constrictions and expansions of migratory pathways that shift caribou near or away from communities. Other factors may influence migratory patterns such as human disturbance, industrial development, habitat suitability, and climactic conditions. The influence of NFQU hunting activities, especially the use of aircraft and motorized vehicles as well as the harvest of lead caribou adjacent to what are considered important migratory corridors, has been an ongoing and contentious topic in the northwestern Arctic, since at least the 1980s (Georgette and Loon 1988, Jacobson 2008, Harrington and Fix 2009, Fix and Ackerman 2015, Halas 2015, NWARAC 2015, Braem et al. 2015). In the Northwest Arctic, the Unit 23 Working Group was established to assist with some of these concerns among various user groups. These user conflicts were, in part, the impetus for the closure of Federal public lands to NFQU in Unit 23 for the 2016/2017 regulatory year. Gunn (2001) reports the mean doubling rate for Alaskan caribou as 10 ± 2.3 years. Although the underlying mechanisms causing these fluctuations are uncertain, Gunn (2001) suggests climatic oscillations (i.e. Arctic and Pacific Decadal Oscillations) as the primary factor, exacerbated by predation and density-dependent reduction in forage availability resulting in poorer body condition. During the 1970s, there was little overlap between these four herds, but the degree of mixing seemed to have increased as the herds grew in the early 2000s (Lenart 2011, Dau 2011, Parrett 2011).

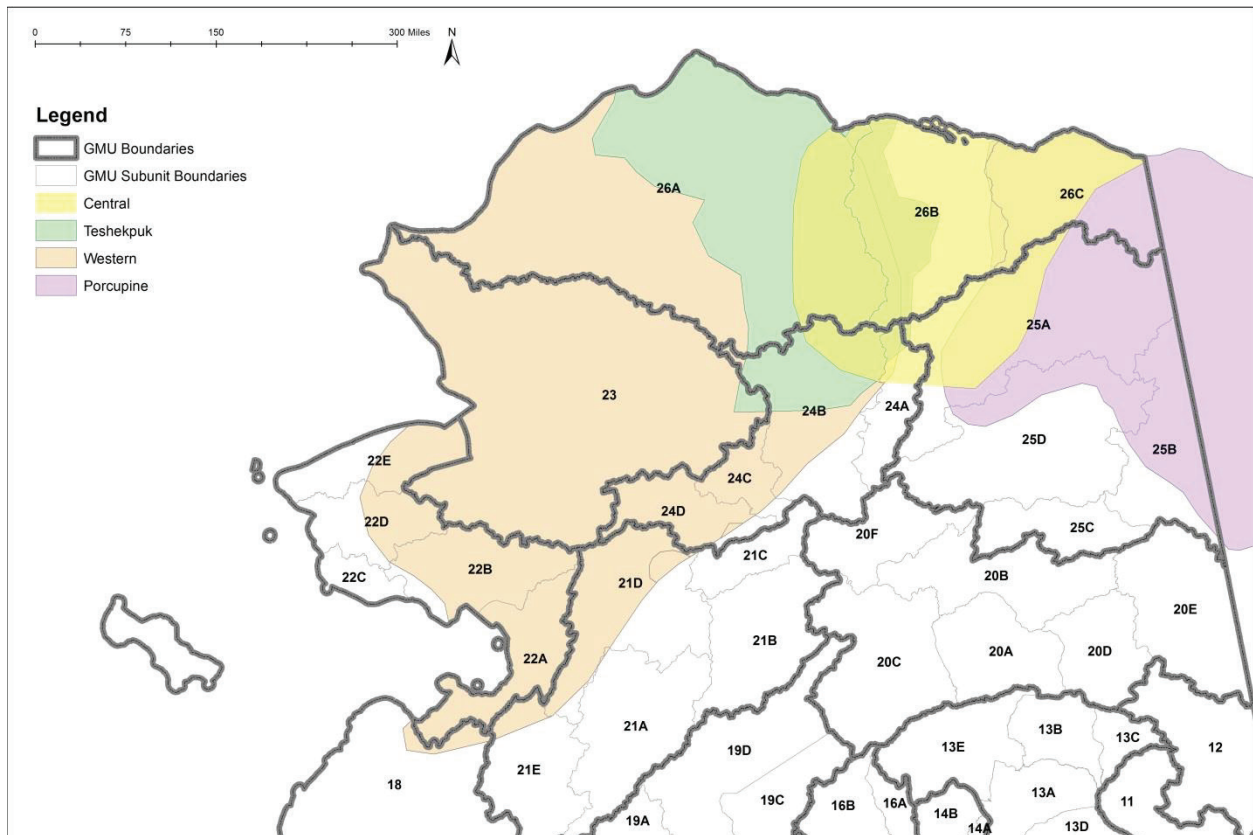
Caribou calving generally occurs during late May and early June. Weaning generally occurs in late October and early November before the breeding season (Taillon et al. 2011). Calves stay with their mothers through their first winter, which improves calves' access to food and body condition. Joly (2000) found that calves orphaned later in life have greater chances of surviving. Data from Russell et al. (1991)

suggests 50% and 75% of the calves orphaned in September and November, respectively, survived the winter (Joly 2000). Indeed, there is little evidence that calves orphaned after weaning experience strongly reduced overwintering survival rates than non-orphaned calves (Rughetti and Festa-Bianchet 2014, Joly 2000, Holand et al. 2012), although Holand et al. (2012) found orphaned calves to have greater losses of winter body mass than non-orphaned calves.

The WACH, TCH, and CACH migrate between seasonal summer and winter ranges and calving areas. Over many years, traditional migration routes have developed in response to spatial and temporal variability of environmental conditions encountered (Duquette 1988). Migration routes that were successful in previous years are likely learned by young caribou following older, more experienced animals (Pullainen 1974). Maintaining connectivity between the seasonal areas is important because restoring disturbed migration routes can be challenging (Wilcove and Wikelski 2008, Singh and Milner-Gulland 2011). Long-term climate changes may affect seasonal ranges and migratory patterns through changes in forage abundance, habitat quality, and weather (Joly et al. 2011). In addition, increased development along migration routes could increase energy costs, impede movements, or deflect caribou to less optimal areas. Understanding the importance of spatial and temporal variation of the seasonal habitat use and the migration routes are important considerations for management of caribou herds.

Central Arctic Caribou Herd

The CACH range includes the area from the eastern portion of the Arctic coastal plain of the North Slope to the Canadian border, the north side of the Brooks Range from the Itkillik River to the Canadian border, the south side of the Brooks Range from the North Fork of the Koyukuk River to the East Fork of the Teedriijik (Chandalar) River, and as far south as the Teedriijik (Chandalar) River valley (Lenart 2015). The traditional calving grounds of the CACH are between the Colville and Kuparuk rivers on the west side of the Sagavanirktok River and between the Sagavanirktok and Canning rivers on the east side. In response to oil and gas development and infrastructure in the 1990s caribou that calved in the western Unit 26B shifted their calving grounds to the southwest (Arthur and Del Vecchio 2009). The CACH summer range extends east from Fish Creek, just west of the Colville River, along the coast and inland about 30 miles to the Canadian border. Typically the CACH summer range extends from the Colville River to just east of the Katakaturuk River and from the coast inland to the foothills of the Brooks Range. The winter range of the CACH occurs in the northern and southern foothills of the Brooks Range. In most years the CACH begin migrating toward the foothills of the Brooks Range in August and by September most of the caribou are in the foothills around Toolik Lake, Galbraith Lake, Accomplishment Creek, Ivishak River and the upper Sagavanirktok River. Depending on the year, the rut, which typically occurs in mid-October, can occur on the north or south side of the Brooks Range (Lenart 2015). The range of the CACH often overlaps with the PCH on the summer and winter ranges to the east and with the WACH and TCH herds on the summer and winter ranges to the west (**Map 1**) (Lenart 2015).



Map 1. Herd overlap and ranges of the Western Arctic, Teshekpuk, Central Arctic and Porcupine Caribou herds (Caribou Trails 2014).

The seasonal movements and migratory patterns of CACH have been studied using radio telemetry for the past 30 years (Cameron et al. 1979, Whiten and Cameron 1983, Cameron et al. 1986, Carruthers et al. 1987, Cameron et al. 1995, Cameron et al. 2005). Migratory patterns of the CACH are oriented principally north-south, from the summer range and calving areas on the tundra-dominated Arctic coastal plain to the winter range in the foothills and mountains of the Brooks Range (Cameron et al. 1979, Carruthers et al. 1987, Fancy et al. 1989, Cameron et al. 2002, Nicholson et al. 2016). Spring migration to the calving areas, which is led by pregnant females, occurs during April and May (Duquette and Klein 1987). After calving, males and non-pregnant females form large groups in mid-June (Cameron and Whitten 1979). Similar to the TCH, CACH often moves to windy areas along the Beaufort Sea coast or to areas with persistent patches of snow to avoid harassment by flies and mosquitoes during the middle of the summer (White et al. 1979). During August, when the insect activity lessens, the caribou begin a slow and irregular movement toward the foothills of the Brooks Range. The fall migration to the wintering areas starts in September and continues through November (Cameron et al. 1986, Lenart 2015).

From 2003-2007, movements of 54 caribou from the CACH were monitored (Nicholson et al. 2016). The annual summer and winter home ranges of the CACH, using a 90% fixed kernel utilization distribution, were similar between summer (mean = 27,929 km²) and winter (mean = 26,585 km²). Overlap between consecutive summer ranges was 62.4% and between consecutive winter ranges was 42.8% (Nicholson et al.

2016). The CACH typically cross the Dalton Highway from the northwest to the southeast during the fall migration, which is away from Anaktuvuk Pass (Nicholson et al. 2016). The CACH used multiple migration routes, or a network of corridors versus a single migration route. Although caribou migratory patterns varied each year, some areas were consistently used each year. The migration paths that consistently had high caribou concentrations during spring and fall migrations each year were along the Dalton Highway between Galbraith Lake and the Ribdon River (Nicholson et al. 2016, Jack Reakoff 2017 pers. comm.).

The State manages the CACH to provide for subsistence and other hunting opportunities on a sustained yield basis. State management objectives for the CACH are as follows (Lenart 2015):

- Maintain a population of at least 28,000-32,000 caribou
- Maintain accessibility of seasonal ranges for CACH caribou
- Maintain a harvest of at least 1,400 caribou if the population is \geq 28,000 caribou
- Maintain a ratio of at least 40 bulls:100 cows
- Reduce conflicts between consumptive and nonconsumptive uses of caribou along the Dalton Highway

When the CACH was recognized as a distinct herd in 1975, the population was estimated to be 5,000 caribou (Cameron and Whitten 1979). The population increased to approximately 23,000 in 1992 (Valkenburg 1993), decreased to 18,000 in 1995, and then increased rapidly from 27,000 in 2000 to 70,034 in 2010 (Lenart 2015). Low cow mortality, high parturition rates, and high calf survival and recruitment contributed to the population increase of approximately 12% per year from 1998-2008 (Lenart 2015). In 2013, the population dropped to approximately 50,000 and by 2016 the population decreased to 22,360 caribou, which is below State management objectives (Lenart 2011, 2013, 2017a, b). The recent decline from 2010 to 2016 represented a decline of approximately 17% per year. The late spring of 2013, which killed many adult and yearling females, likely contributed to the population decline from 2010 to 2013. Two major factors influencing the population decline from 2013 to 2016 were the high mortality of adult females and emigration (Lenart 2017b). From 2013-2016 54% of the collared females ($n = 54$ in 2013) died and 19% switched from the CACH to other caribou herds (Lenart 2017b). Previous research indicates that predation has not played a major role in calf mortality and it is not thought to be a major factor in the decline (Lenart 2017b). Disease is also not implicated as a major factor for the decline of the CACH (Lenart 2017b). The State attributes the decline between 2013 and 2016 censuses to a large proportion of older females that died of old age, the late spring of 2013, and herd switching (Lenart 2017a).

Composition surveys are usually conducted during the fall near the peak of the rut to take advantage of the mixing of the bulls, cows, and calves. Composition counts were conducted in 2009-2012, 2014, and 2016 (Lenart 2015, 2017a). Composition surveys were not done in 2013 because the CACH was mixed with the PCH (**Table 2**) (Lenart 2015). The calf:cow ratio did not decline until after 2012 (**Table 2**). From 2009-2012 calf:cow ratios averaged 49 calves:100 cows (**Table 2**) (Lenart 2015). The calf:cow ratio was 48 calves: 100 cows when the population dropped to 22,360 caribou in 2016 (Lenart 2017a). Calf:cow ratios for calves \leq 4 years old, were above 70 calves:100 cows during the period when the herd was growing between 2000 and 2010 (Lenart 2017a). From 2010-2016, when the herd was declining, the calf:cow ratio

for older calves dropped below the 70 calves:100 cows. Although the bull:cow ratio had declined to 39 bulls:100 cows in 2016, it was still close to the State recommended objective of 40 (Lenart 2015, 2017b) between 2000 and 2010 (Lenart 2017a).

Table 2. CACH sex and age composition information collected during fall composition surveys, 2009-2014 (Lenart 2015)^a.

Date	Bulls:100 cows	Calves:100 cows	Percent Calves (n)	Percent Cows (n)	Percent Bulls (n)	Sample Size	Groups
13-14 Oct. 2009	50	33	18 (1,193)	55 (3,641)	27 (1,814)	6,648	19
23 Oct. 2010	50	46	23 (889)	51 (1,930)	26 (968)	3,787	12
13 Oct. 2011	69	56	25 (1303)	44 (2,306)	31 (1,590)	5,199	22
14 Oct. 2012	56	61	23 (1,132)	55 (1,845)	22 (1,039)	4,016	15
13-14 Oct. 2014 ^b	41	42	23 (462)	55 (1,097)	22 (445)	2,004	18
2016	39	48					

^a 2016 data is incomplete (Lenart 2017b)

^b Data may not be comparable with previous years due to small sample size.

Teshkepuk Caribou Herd

The TCH calving and summering areas overlap with the eastern portion of the National Petroleum Reserve–Alaska (NPR–A). Most of the TCH moves toward Teshkepuk Lake in May to calve in early June. The primary calving grounds of the TCH (approximately 1.8 million acres) occur to the east, southeast and northeast of Teshkepuk Lake (Person et al. 2007, Wilson et al. 2012). From late June through July cows and bulls move to the Beaufort Sea coast from Dease Inlet to the mouth of the Kogru River (Utqiagvik (Barrow) to the Colville River Delta), around the north and south side of the Teshkepuk Lake, and the sand dunes along the Ikpikpuk River to seek relief from insects (Carroll 2007, Parrett 2007). The narrow corridors of land to the east and northwest of the Teshkepuk Lake are important migratory corridors to insect relief areas as well (Yokel et al. 2009). River corridors are also used more during periods of insect harassment. Fall and winter movements are more variable, although most of the TCH winters on the coastal plain around Atqasuk, south of Teshkepuk Lake. However, the TCH has wintered as far south as the Seward Peninsula, as far east as the Arctic NWR, and in the foothills and mountains of the Brooks Range (Carroll 2007). In 2008/2009, the TCH used many of these widely disparate areas in a single year (Parrett 2011, 2015a). From 2007-2011, the TCH wintered in four relatively distinct areas: the coastal plain between Atqasuk and Wainwright; the coastal plain west of Nuiqsut; the central Brooks Range; and the shared winter ranges with the WACH in the Noatak, Kobuk, and Selawik drainages. During the winters of 2012-2013 and 2013-2014, the TCH wintered primarily near Atqasuk and Wainwright and east of Anaktuvuk Pass (Parrett 2015a).

The State manages the TCH to provide for subsistence and other hunting opportunities on a sustained yield basis, to ensure that adequate habitat exists, and provide for viewing and other uses of caribou (Parrett 2011). Specific State management objectives for the TCH are as follows (Parrett 2011):

Attempt to maintain a minimum population of 15,000 caribou, recognizing that caribou numbers naturally fluctuate.

- Maintain a harvest level of 900–2,800 caribou using strategies adapted to population levels and trends.
- Maintain a population composed of least 30 bulls per 100 cows.
- Monitor herd characteristics and population parameters (on an annual or regular basis).
- Develop a better understanding of the relationships and interactions among North Slope caribou herds.
- Encourage cooperative management of the herd and its habitat among State, Federal, and local entities and all users of the herd.
- Seek to minimize conflicts between resource development and the TCH.

Since 1984, the minimum population of the TCH has been estimated from aerial photocensuses and radio-telemetry data. Population estimates are determined by methods described by Rivest et al. (1998), which account for caribou in groups that do not have a collared animal and for missing collars. Based on these methods the TCH population increased from an estimated 18,292 caribou (minimum estimate 11,822) in 1982 to 68,932 caribou (minimum estimate 64,106) in 2008. The minimum estimates are derived from the visual estimate in 1982 and from the aerial photocensus minimum after 1982. From 2008 to 2014, the population declined by almost half to 39,000 caribou (**Figure 1**) (Parrett 2015a). Interpretation of population estimates is difficult due to movements and range overlap among caribou herds, which results in both temporary and permanent immigration and emigration (Person et al. 2007). For example, the minimum count in 2013 contained an unknown number of CACH caribou (Parrett 2015a). Following the 2013 census, Alaska Department of Fish and Game (ADF&G) made the decision to manage the TCH based on the minimum count because the bulk of the animals that were estimated rather than counted were with the WACH at the time of the photocensus (Parrett 2015b, pers. comm.). In 2015, the minimum count was 35,181 with a population estimate of 41,542 (SE = 3,486) (Parrett 2017a, pers. comm.).

In 2013 and 2016 the number of bulls:100 cows was 39 bulls:100 cows and 28 bulls:100 cows in 2016, respectively (**Figure 2**) (Parrett 2011, 2013, 2015a, Parrett 2017a, pers. comm.). Comparison of bull:cow and calf:cow ratios from 1991-2000 and later years is not possible due to changes in methodology. From 2009-2013 the calf:cow ratio increased from 18 calves:100 cows to 48 calves: 100 cows in 2016 (Parrett 2013, 2015a, Parrett 2017a, pers. comm.). In addition, the number of short-yearlings:adults, which is a measure of recruitment, declined from an average of 20 short-yearlings:100 adults between 1999 and 2008 to an average of 14 short-yearlings:100 adults from 2009-2014 (**Figure 3**) (Parrett 2013) and increased in 2016 to 29 short-yearlings:100 adults (Parrett 2017a, pers. comm.).

The annual mortality of adult radio collared females from the TCH has remained close to the long term (1991-2012) average of 14.5% (range 8–25%) (Parrett 2011, 2015a, Caribou Trails 2014). As the TCH

has declined, calf weights declined, indicating that poor nutrition may be having a significant effect on this herd (Carroll 2015, pers. comm., Parrett 2015b, pers. comm.). In 2016 increased calf weights, high adult female survival (92%), high yearling recruitment (29 yearlings:100 adults), and high calf production (81%), and a high calf:cow ratio (48 calves:100 cows) suggest that the population may be stable or declining at a slower rate (Parrett 2017a, pers. comm.) In contrast, the body condition of individuals from the WACH, which also declined dramatically, has remained relatively good, indicating that caribou are still finding enough food within their range (Caribou Trails 2014, Dau 2014). A recent study found that calf production was low, calf survival on calving grounds was high, 40% of the concentrated wintering range was on NPS land, and that starvation was a significant mortality factor on non-NPS lands (Parrett 2017a, pers. comm.). The late spring in 2013 likely contributed to the decline in winter survival in 2014.

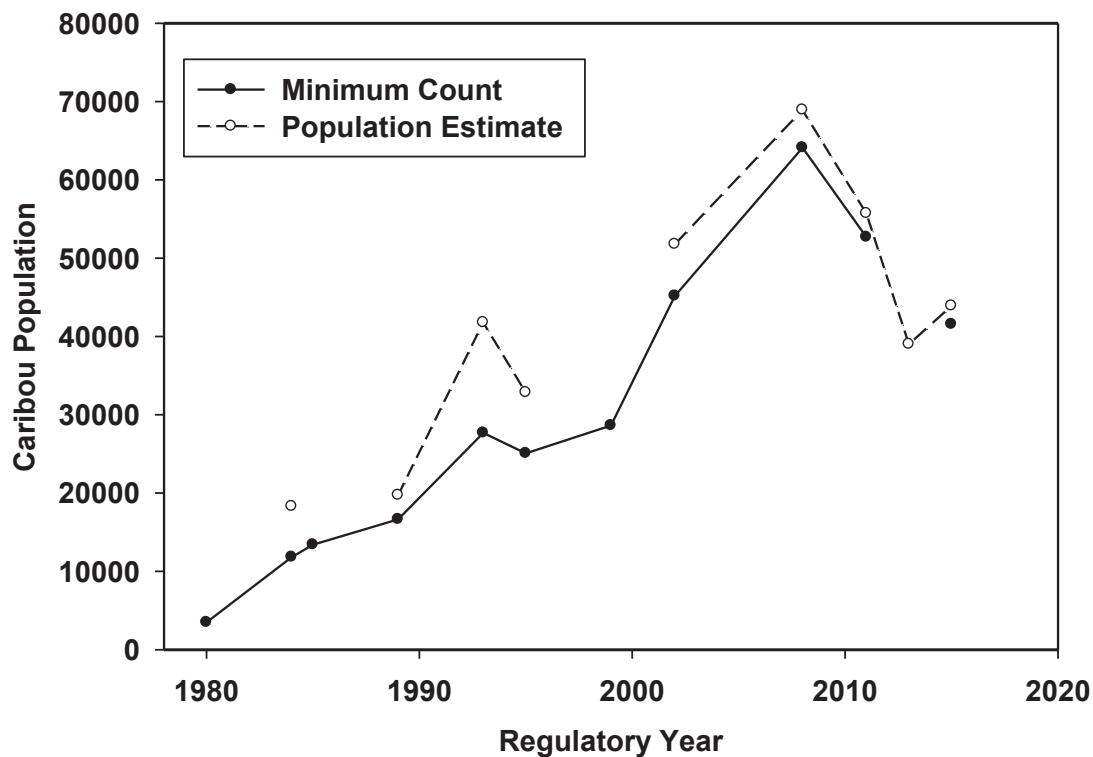


Figure 1. Minimum counts and population estimates of the Teshekpuk Caribou Herd from 1980-2014. Population estimates from 1984-2013 are based on aerial photographs of groups of caribou that contained radio-collared animals (Parrett 2011, 2013, Parrett 2015a).

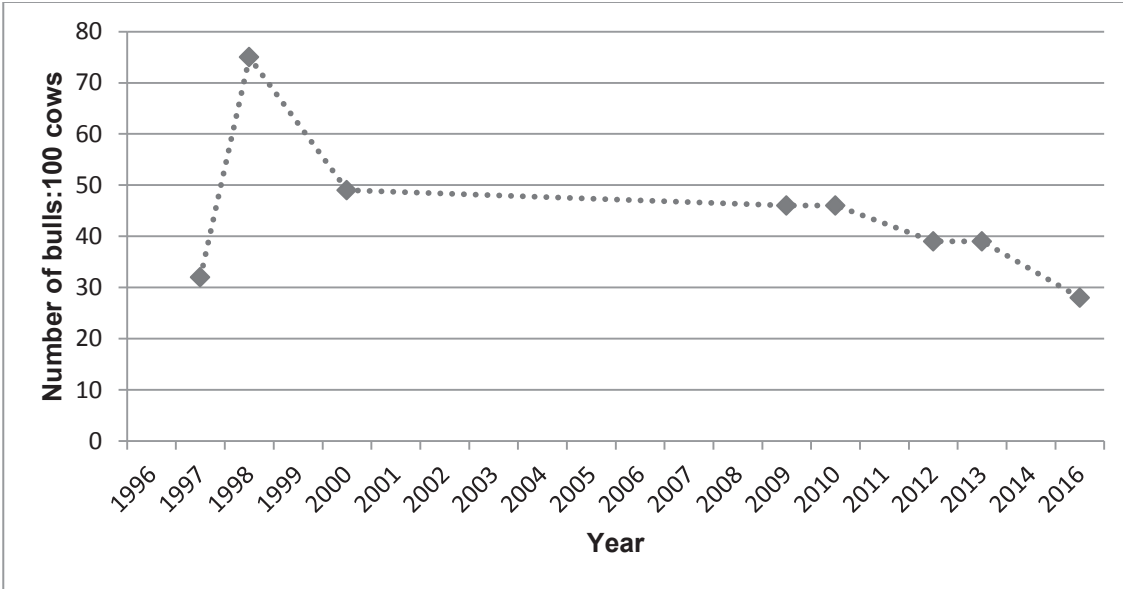


Figure 2. Bull:cow ratios of the Teshekpuk Caribou Herd (Parrett 2013).

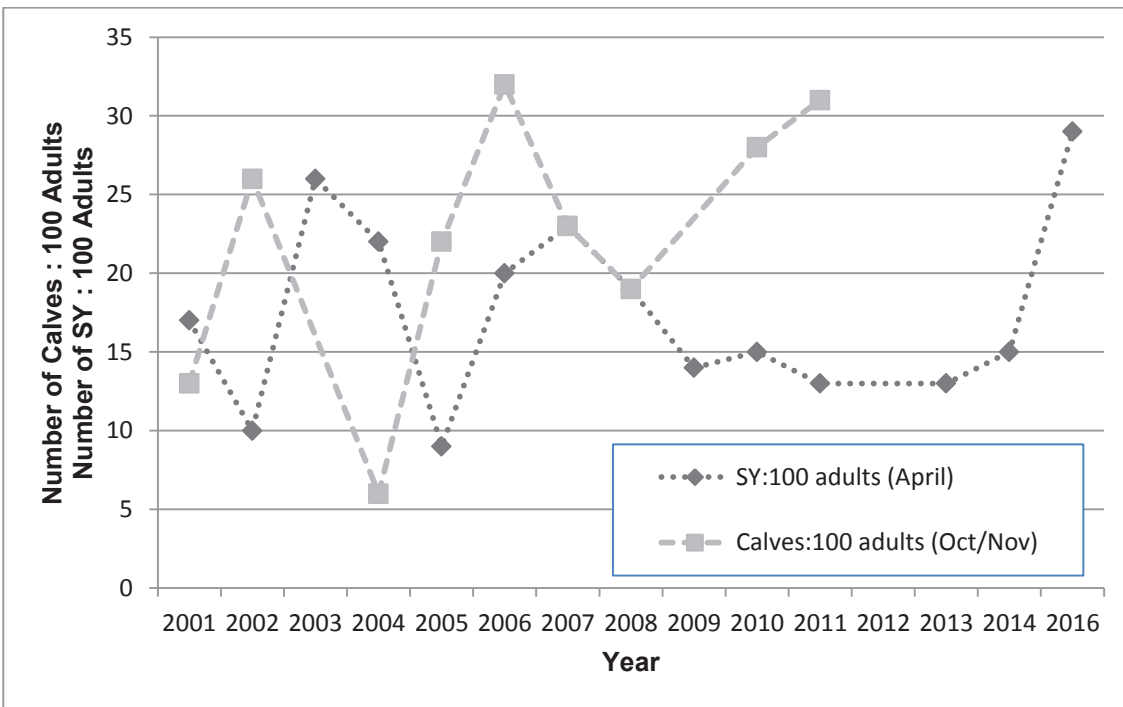


Figure 3. Calf:adult and short-yearling (SY):adult ratios for the Teshekpuk Caribou Herd (Parrett 2015a). Short-yearlings are 10-11 months old caribou.

Western Arctic Caribou Herd

The WACH, the largest herd in Alaska, has a home range of approximately 157,000 mi² in northwestern Alaska (**Map 2**). In the spring, most mature cows move north to calving grounds in the Utukok Hills, while bulls and immature cows lag behind and move toward summer range in the Wulik Peaks and Lisburne Hills area (Dau 2011, WACH Working Group 2011). Spring migration for the WACH usually begins around April 1 (July 2017). Dau (2013) determined the calving dates for the WACH to be June 9–13. This is based upon long-term movement and distribution data obtained from radio-collared caribou (these are the dates cows ceased movements and were assumed to be calving). After calving, cows and calves move west toward the Lisburne Hills where they mix with the remaining bulls and non-maternal cows. During the summer the herd moves rapidly to the Brooks Range.

In the fall the herd moves south toward their wintering grounds in the northern portion of the Nulato Hills. Rut occurs during fall migration (Dau 2011, WACH Working Group 2011). Dau (2013) determined the WACH rut dates to be October 22–26 based on back-calculations from calving dates using a 230-day gestation period. Since about 2000, the timing of fall migration has been less predictable, often occurring later than in previous decades (Dau 2015a). Approximately 99% of the WACH migrate through the Noatak National Preserve and the Gates of the Arctic National Park (July 2017). From 2010-2015, the average date that GPS collared caribou crossed the Noatak River ranged from Sep. 30 – Oct. 23 (**Figure 4**) (July and Cameron 2017). The proportion of caribou using certain migration paths varies each year (July and Cameron 2017). Changes in migration paths are likely influenced by multiple factors including food availability, snow depth, rugged terrain, and dense vegetation (Fullman et al. 2017, Nicholson et al. 2016). If caribou travelled the same migration routes every year, their food resources would likely be depleted (NWARAC 2016). In recent years (2012-2014), the path of fall migration has shifted east (Dau 2015a). The caribou migrated early in 2016 and the mean distance travelled was 1932 miles which is about average. More of the herd crossed the eastern portion of the Noatak River compared to 2015 when a greater proportion crossed the western Noatak River near the coast (July 2017). The start of the cow fall migration can vary by a month and by October 1 many of the cows will have passed through the northern portion of Unit 23 while the bulk of the WACH will still be migrating through the southern half of Unit 23. On average, collared cows cross the Selawik River during fall migration around Oct. 15 and are still migrating on Oct. 1 (July 2017), the proposed opening cow season for Unit 22. In Units 26A and 26B most of the cow caribou will have migrated through.

In part, due to the collapse of the WACH in the 1970s, the WACH Working Group was formed. In 2003 it developed a WACH Cooperative Management Plan, and revised it in 2011 (WACH Working Group 2011). The WACH Management Plan identifies seven plan elements: cooperation, population management, habitat, regulations, reindeer, scientific and traditional ecological knowledge, and education as well as associated goals, strategies, and management actions. As part of the population management element, the WACH Working Group developed a guide to herd management determined by population size, population trend, and harvest rate. Revisions to recommended harvest levels under liberal and conservative management (+/- 100 - 2,850 caribou) were made in December 2015 (WACH Working Group 2015, **Table 3**). Potential management actions and harvest recommendations for each management level can be found

in Appendix 2 of the Western Arctic Caribou herd Cooperative Management Plan (WACH Working Group 2011).

The State manages the WACH to protect the population and its habitat, provide for subsistence and other hunting opportunities on a sustained yield basis, and provide for viewing and other uses of caribou (Dau 2011). State management objectives for the WACH are listed in the 2011 Western Arctic Caribou Cooperative Management Plan (WACH Working Group 2011, Dau 2011) and include:

- Encourage cooperative management of the WACH among State, Federal, local entities, and all users of the herd.
- Manage for healthy populations using management strategies adapted to fluctuating population levels and trends.
- Assess and protect important habitats.
- Promote consistent and effective State and Federal regulations for the conservation of the WACH.
- Seek to minimize conflict between reindeer herders and the WACH.
- Integrate scientific information, traditional ecological knowledge of Alaska Native users, and knowledge of all users into management of the herd.
- Increase understanding and appreciation of the WACH through the use of scientific information, traditional ecological knowledge of the Alaska Native users, and knowledge of all other users.

The WACH population declined rapidly in the early 1970s bottoming out at about 75,000 animals in 1976. Aerial photocensuses have been used since 1986 to estimate population size. The WACH declined at an average annual rate of 7.1% from approximately 490,000 animals in 2003 to 235,000 in 2013 (Dau 2011, 2013, 2014, 2015a; Caribou Trails 2014) (**Figure 4**).

Between 1982 and 2011, the WACH was within the liberal management level prescribed by the WACH Working Group (**Table 3**). In 2013, the WACH population estimate fell below the threshold for liberal management of a decreasing population (265,000), slipping into the conservative management level. In July 2015, ADF&G attempted an aerial photocensus of the herd. However, the photos taken could not be used due to poor light conditions that obscured unknown portions of the herd (Dau 2015b). ADF&G conducted a successful photocensus of the WACH on July 1, 2016. This census resulted in a minimum count of 194,863 caribou with a point estimate of 200,928 (Standard Error = 4,295), suggesting the WACH is still within the conservative management level, although close to the threshold for preservative management (**Figure 5, Table 3**)(Parrett 2016a). Results of this census indicate an average annual decline of 5% per year since 2013, representing a much lower rate than the 15% annual decline between 2011 and 2013. The large cohorts of 2015 and 2016, which currently comprise a substantial proportion of the herd, contributed to the recent decreased rate of decline, but remain vulnerable to difficult winter conditions due to their young age (Parrett 2016a). The data from the 2017 photo census is currently being analyzed by ADF&G (Parrett 2017b, pers. comm.).

Between 1970 and 2016, the bull:cow ratio exceeded critical management levels in all years except 1975, 2001, and 2014 (**Table 4**). Reduced sampling intensity in 2001 likely biased the 2001 bull:cow ratio low (Dau 2013). Since 1992, the bull:cow ratio has trended downward (Dau 2015a). The average annual

number of bulls:100 cows was greater during the period of population growth (54:100 between 1976–2001) than during the recent period of decline (44:100 between 2004–2016). Additionally, Dau (2015a) states that while trends in bull:cow ratios are accurate, actual values should be interpreted with caution due to sexual segregation during sampling and the inability to sample the entire population, which likely account for more annual variability than actual changes in composition.

Although factors contributing to the decline are not known with certainty, increased adult cow mortality and decreased calf recruitment and survival played a role (Dau 2011). Since the mid-1980s, adult mortality has slowly increased while recruitment has slowly decreased (Dau 2013). Increased survival and recruitment is important to slow or reverse the current decline. In a population model developed specifically for the WACH, Prichard (2009) found adult survival to have the largest impact on population size. Calf production has likely had little influence on the population trajectory (Dau 2013, 2015a). Between 1990 and 2003, the June calf:cow ratio averaged 66 calves:100 cows/year. Between 2004 and 2016, the June calf:cow ratio averaged 71 calves:100 cows/year (**Table 4, Figure 6**). In June 2016, 85 calves:100 cows were observed, which approximates the highest parturition level ever recorded for the herd (86 calves:100 cows in 1992) (Dau 2016a).

Decreased calf survival through summer and fall and recruitment into the herd are likely contributing to the current population decline (Dau 2013, 2015a). Fall calf:cow ratios indicate calf survival over summer. Between 1976 and 2016, the fall calf:cow ratio ranged from 35 to 59 calves:100 cows/year, averaging 46 calves:100 cows/year (**Figure 6**). Fall calf:cow ratios declined from an average of 46 calves:100 cows/year between 1990-2003 to an average of 42 calves:100 cows/year between 2004-2016 (Dau 2015a, **Figure 6**). Since 2008, ADF&G has recorded calf weights at Onion Portage as an index of herd nutritional status. In September 2015, calf weights averaged 100 lbs., the highest average ever recorded (Parrett 2015c).

Similarly, the ratio of short-yearlings (SY, 10-11 months old caribou) to adults provides a measure of overwintering calf survival and recruitment. Between 1990 and 2003, SY:adult ratios averaged 20 SY:100 adults/year. Since the decline began in 2003, SY:adult ratios have averaged 16 SY:100 adults/year (2004-2016, **Figure 6**). However, 23 SY:100 adults were observed during spring 2016 surveys, the highest ratio recorded since 2007 (Dau 2016b). The overwinter calf survival for the 2015 cohort (Oct. 2015-June 2016) was 84% (Parrett 2016b). While 2016 measures suggest improvements in recruitment, the overall trend since the early 1980s has been downward (Dau 2015a).

Increased cow mortality is likely affecting the trajectory of the herd (Dau 2011, 2013). The annual mortality rate of radio-collared adult cows increased, from an average of 15% between 1987 and 2003, to 23% from 2004–2014 (Dau 2011, 2013, 2014, 2015a). Estimated mortality includes all causes of death including hunting (Dau 2011). Dau (2015a) states that cow mortality estimates are conservative due to exclusion of unhealthy (i.e. diseased) and yearling cows. Dau (2009, 2013) reported that rain-on-snow events, deep snow and winter thaws may have contributed to the relatively high estimated mortality rates of 23% during 2008-2009, 27% during 2009-2010 and 33% in 2011-2012. Prior to 2004, estimated adult cow mortality only exceeded 20% twice, but has exceeded 20% in 7 out of 9 regulatory years between 2004 and 2012. The annual mortality rate was 8% as of April 2016 (Dau 2016b). This may fluctuate

substantially throughout the year based on changing local conditions and harvest levels. Dau (2015a) suggests that mortality rates may also change in subsequent management reports as the fate of collared animals is determined, and that these inconsistencies are most pronounced for the previous 1–3 years.

Far more caribou died from natural causes than from hunting between 1992 and 2012. Cow mortality remained constant throughout the year. However, natural and harvest mortality for bulls spiked during the fall. Predation, particularly by wolves, accounted for the majority of the natural mortality (Dau 2013). However, as the WACH has declined and estimated harvest has remained relatively stable, the percentage of mortality due to hunting has increased relative to natural mortality. For example, during the period October 1, 2013 to September 30, 2014, estimated hunting mortality was approximately 42% and estimated natural mortality about 56% (Dau 2014). In previous years (1983–2013), the estimated hunting mortality exceeded 30% only once in 1997-1998 (Dau 2013). Additionally, Prichard (2009) and Dau (2015a) suggest that harvest levels and rates of cow harvest can greatly impact population trajectory. If bull:cow ratios continue to decline, harvest of cows may increase, exacerbating the current population decline.

Dau (2015a) cites fall and winter icing events as the primary factor initiating the population decline in 2003. Increased predation, hunting pressure, deteriorating range condition (including habitat loss and fragmentation), climate change, and disease may also be contributing factors (Gunn 2001, Joly et al. 2007, Dau 2013, 2014, 2015a). Changing climatic conditions can affect snow depth, icing, forage quality and growth, frequency, location, and intensity of wildfires, insect abundance, and predation which can affect migration and have long-term population level effects (Joly et al. 2011). Joly et al. (2007) documented a decline in lichen cover in portions of the wintering areas of the WACH. Dau (2011, 2014) reported that degradation in range condition is not thought to be a primary factor in the decline of the WACH because animals in the WACH, unlike the TCH, have generally maintained good body condition since the decline began. Body condition is assessed on a subjective scale from 1-5. The body condition of adult females in 2015 were characterized as “fat” (mean = 3.9/5) with no caribou being rated as skinny or very skinny (Parrett 2015c). However, the body condition of the WACH in spring may be a better indicator of the effects of winter range condition versus the fall when the body condition of the WACH is routinely assessed and when caribou are in prime condition, and weights may be more reflective of summer range conditions (Joly 2015, pers. comm.). Fall condition is also the best indicator of whether or not caribou are likely to become pregnant (Parrett 2017a, pers. comm.).

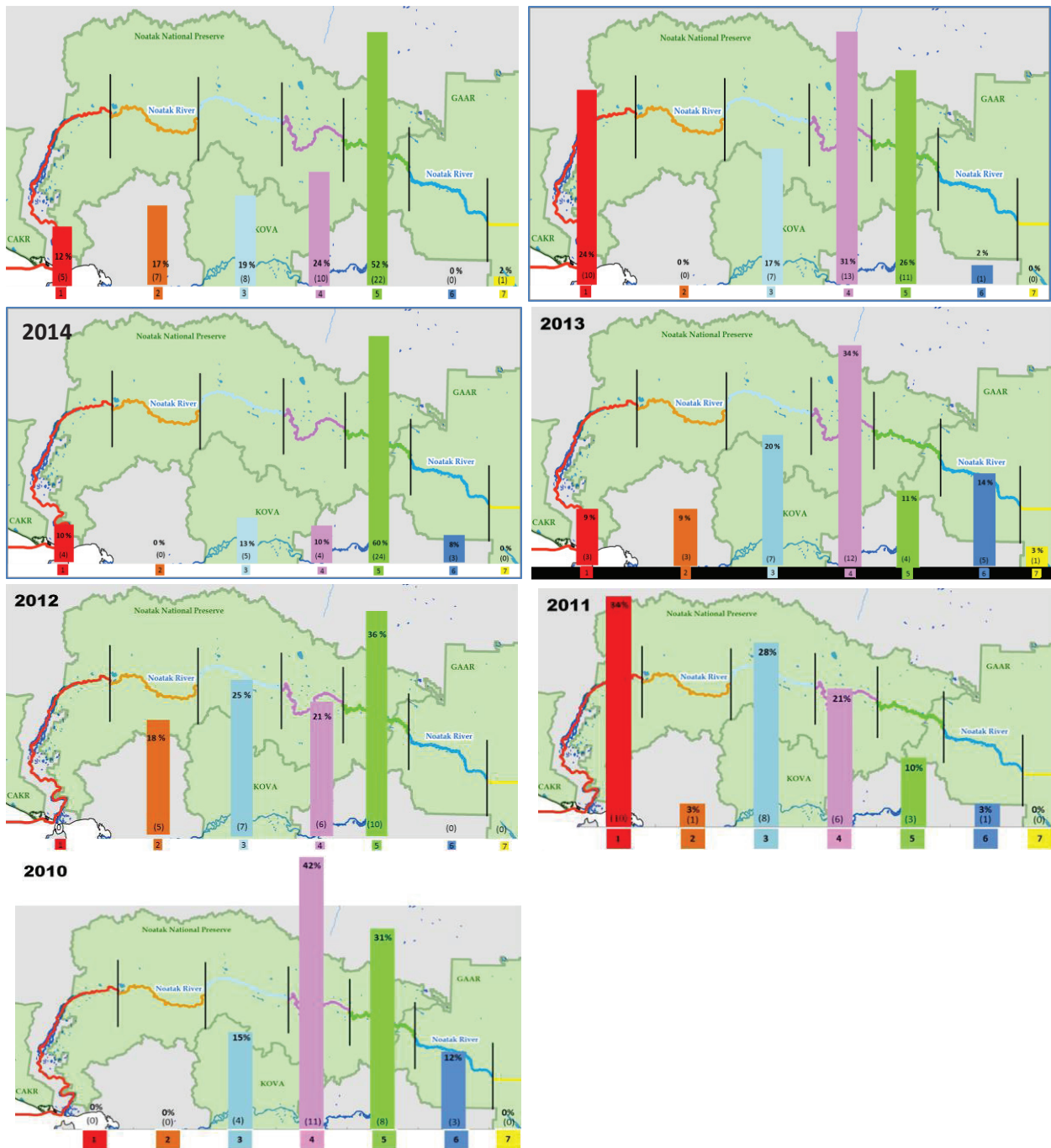
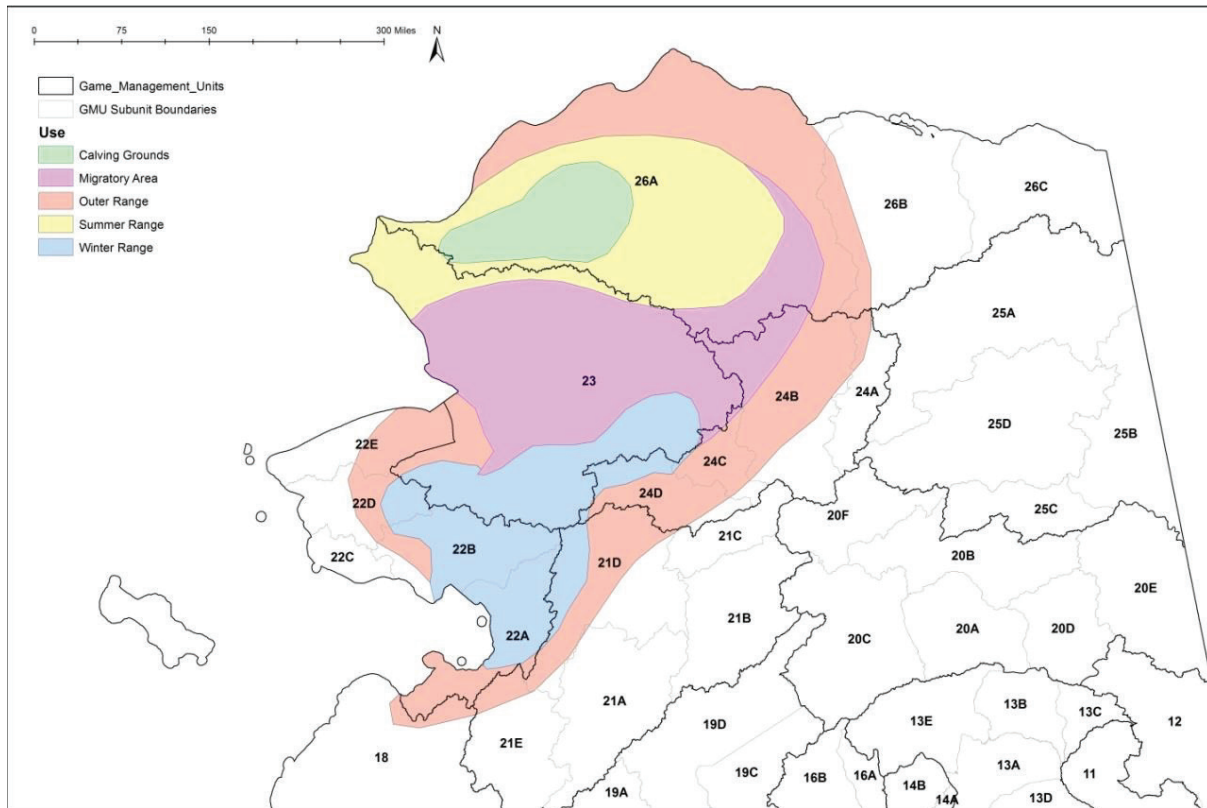


Figure 4. Distribution of caribou crossing the Noatak River during fall. Histograms depict where collared female caribou crossed the Noatak River, generally from north to south, on their fall migration. Relative percentages (top number) and the absolute number (middle number) of caribou are provided. The river is divided into seven (lowest number) color-coded segments, which are displayed in the background. The middle five segments are 100 river kilometers long, while the westernmost segment (red) is 200 km (before extending into the Chukchi Sea) and the easternmost (yellow) runs as far east as WACH caribou are known to migrate. The number of caribou with GPS collars ranged from 39-79 caribou/year with later years having more collared caribou than earlier years (Joly and Cameron 2017).



Map 2. Calving grounds, wintering range, summering range, migratory areas, and home range extent of the Western Arctic Caribou Herd (WACH Working Group 2011)

Table 3. Western Arctic Caribou Herd management levels using herd size, population trend, and harvest rate (WACH Working Group 2011, 2015).

Management and Harvest Level	Population Trend			Harvest Recommendations May Include:
	Declining Low: 6%	Stable Med: 7%	Increasing High: 8%	
Liberal	Pop: 265,000+	Pop: 230,000+	Pop: 200,000+	<ul style="list-style-type: none"> • Reduce harvest of bulls by nonresidents to maintain at least 40 bulls: 100 cows • No restriction of bull harvest by resident hunters unless bull:cow ratios fall below 40 bulls:100 cows
	Harvest: 16,000-22,000	Harvest: 16,000-22,000	Harvest: 16,000-22,000	
Conservative	Pop: 200,000-265,000	Pop: 170,000-230,000	Pop: 150,000-200,000	<ul style="list-style-type: none"> • No harvest of calves • No cow harvest by nonresidents • Restriction of bull harvest by nonresidents • Limit the subsistence harvest of bulls only when necessary to maintain a minimum 40:100 bull:cow ratio
	Harvest: 12,000-16,000	Harvest: 12,000-16,000	Harvest: 12,000-16,000	
Preservative	Pop: 130,000-200,000	Pop: 115,000-170,000	Pop: 100,000-150,000	<ul style="list-style-type: none"> • No harvest of calves • Limit harvest of cows by resident hunters through permit hunts and/or village quotas • Limit the subsistence harvest of bulls to maintain at least 40 bulls:100 cows • Harvest restricted to residents only, according to state and federal law. Closure of some federal public lands to nonqualified users may be necessary
	Harvest: 8,000-12,000	Harvest: 8,000-12,000	Harvest: 8,000-12,000	
Critical Keep Bull:Cow ratio ≥ 40 Bulls:100 Cows	Pop: < 130,000	Pop: < 115,000	Pop: < 100,000	<ul style="list-style-type: none"> • No harvest of calves • Highly restrict the harvest of cows through permit hunts and/or village quotas • Limit the subsistence harvest of bulls to maintain at least 40 bulls:100 cows • Harvest restricted to residents only, according to state and federal law. Closure of some federal public lands to nonqualified users may be necessary
	Harvest: 6,000-8,000	Harvest: 6,000-8,000	Harvest: 6,000-8,000	

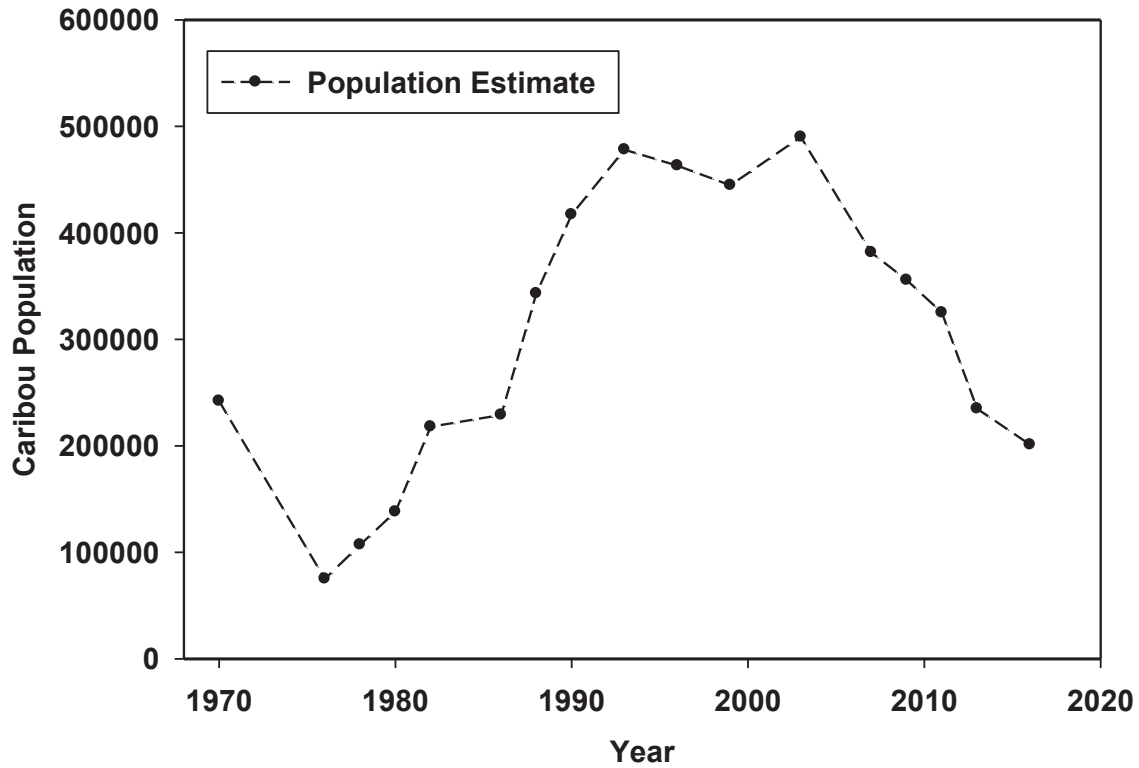


Figure 5. Maximum population estimates of the Western Arctic Caribou Herd from 1970-2016. Population estimates from 1986-2016 are based on aerial photographs of groups of caribou that contained radio-collared animals (Dau 2011, 2013, 2014, 2015a, Parrett 2017a, pers. comm.).

Table 4. Western Arctic Caribou Herd fall composition 1976 – 2014 (Dau 2011, 2013, 2014, 2015a, 2016b).

Regulatory Year	Total bulls: 100 cows ^a	Calves: 100 cows	Calves: 100 adults	Bulls	Cows	Calves	Total
1976/1977	63	52	32	273	431	222	926
1980/1981	53	53	34	715	1,354	711	2,780
1982/1983	58	59	37	1,896	3,285	1,923	7,104
1992/1993	64	52	32	1,600	2,498	1,299	5,397
1995/1996	58	52	33	1,176	2,029	1,057	4,262
1996/1997	51	49	33	2,621	5,119	2,525	10,265
1997/1998	49	43	29	2,588	5,229	2,255	10,072
1998/1999	54	45	29	2,298	4,231	1,909	8,438
1999/2000	49	47	31	2,059	4,191	1,960	8,210
2001/2002	38	37	27	1,117	2,943	1,095	5,155
2004/2005	48	35	24	2,916	6,087	2,154	11,157
2006/2007	42	40	28	1,900	4,501	1,811	8,212
2008/2009	45	48	33	2,981	6,618	3,156	12,755
2010/2011	49	35	23	2,419	4,973	1,735	9,127
2012/2013	42	38	27	2,119	5,082	1,919	9,120
2014/2015	39	b	b	b	b	b	b
2015/2016	41 ^c	54	b	b	b	b	b

^a 40 bulls:100 cows is the minimum level recommended in the WACH Cooperative Management Plan (WACH Working Group 2011)

^b Data not available

^c Estimated from power point presentation presented at the WACH Working Group Meeting December 13, 2016 (Parrett 2016a)

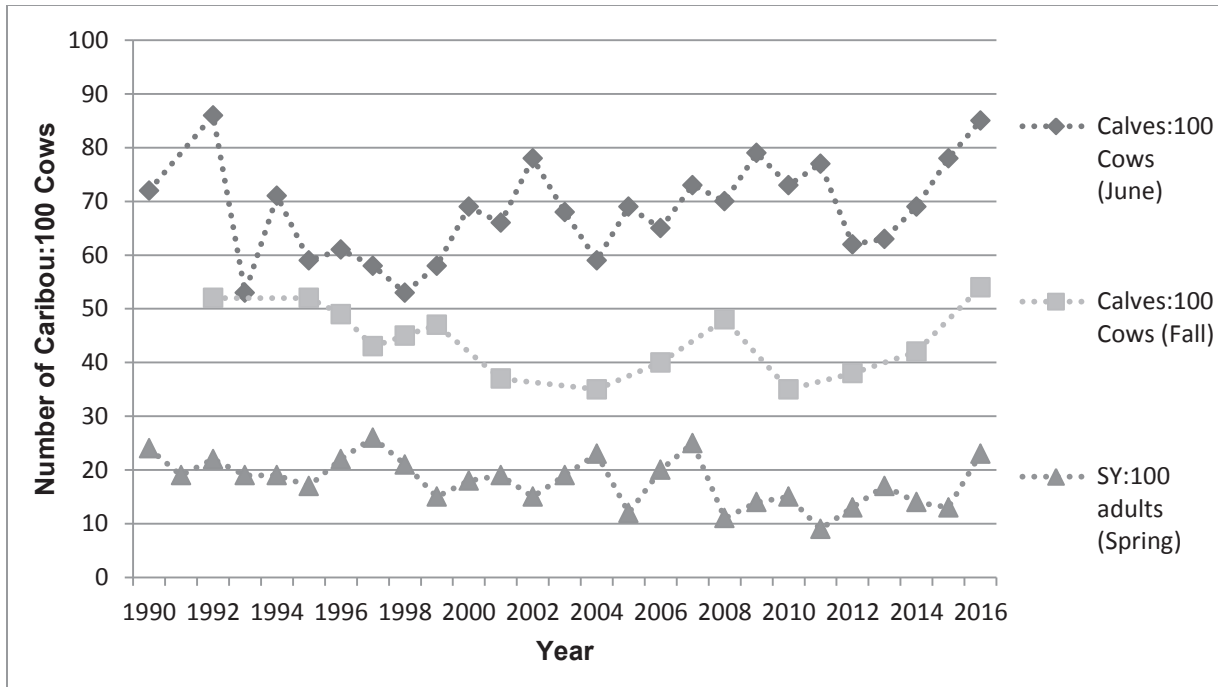


Figure 6. Calf:cow and short-yearling (SY):adult ratios for the WACH (Dau 2013, 2015a, 2016a, ADF&G 2017c). Short -yearlings are 10-11 months old caribou.

Habitat

Caribou feed on a wide variety of plants including lichens, fungi, sedges, grasses, forbs, and twigs of woody plants. Arctic caribou depend primarily on lichens during the fall and winter, but during summer they feed on leaves, grasses and sedges (Miller 2003). The importance of high use areas for the TCH at Teshekpuk Lake during the summer has been well documented (Person et al. 2007, Carroll 2007, Parrett 2011, Wilson et al. 2012, Smith et al. 2015). Presumably the importance of areas to the north, south, and east of Teshekpuk Lake during calving is due to the high concentration of sedge-grass meadows (Wilson et al. 2012) and extremely low predator densities (Parrett 2017, pers. comm.). In 2013 BLM closed 3.1 million acres around Teshekpuk Lake in the NPR–A to oil and gas development in recognition of the importance of these areas for caribou, waterfowl and shorebirds (BLM 1998, 2008, 2013; Cameron et al. 2005, Arthur and Del Vecchio 2009).

Harvest History

Reliance on caribou from a particular herd varies by community. Weather, distance of caribou from the community, terrain, and high fuel costs are some of the factors that can affect the availability and accessibility of caribou (Parrett 2015a). Local residents in Units 21D, 23, 24, 25A, 26A and 26B are defined as those having customary and traditional use in these units (**Table 1**). Generally, in State harvest monitoring efforts, local residents are those that reside within the range of the WACH, TCH, or CACH. Point Hope, which is located in Unit 23, and Anaktuvuk Pass, which is located in Unit 24B near the border with Unit 26A, have a customary and traditional use determination for caribou in Units 26A and 26B.

Documentation of harvest for Alaska residents has varied depending on whether they live north or south of the Yukon River. Prior to 2017/2018, Alaska residents who lived north of the Yukon River were not required to obtain harvest tickets although they were required to register with ADF&G or an authorized vendor. Compliance with registration requirement was low and not enforced (Braem 2017a, pers. comm.). Harvest by Alaska residents who live south of the Yukon River and nonresidents was monitored using harvest reports (Lenart 2015, Dau 2015a).

Understanding the overlap between caribou hunting by local users and nonlocal users is complicated by the lack of annual information on the exact location, harvest numbers, and caribou herd used by local hunters. Recently enacted State regulations requiring registration permits for residents hunting caribou within the range of the Western Arctic and Teshekpuk herds in Units 21, 23, 24, and 26 seek to improve harvest monitoring and allow for more detailed analysis of harvest trends and distribution.

Central Arctic Caribou Herd

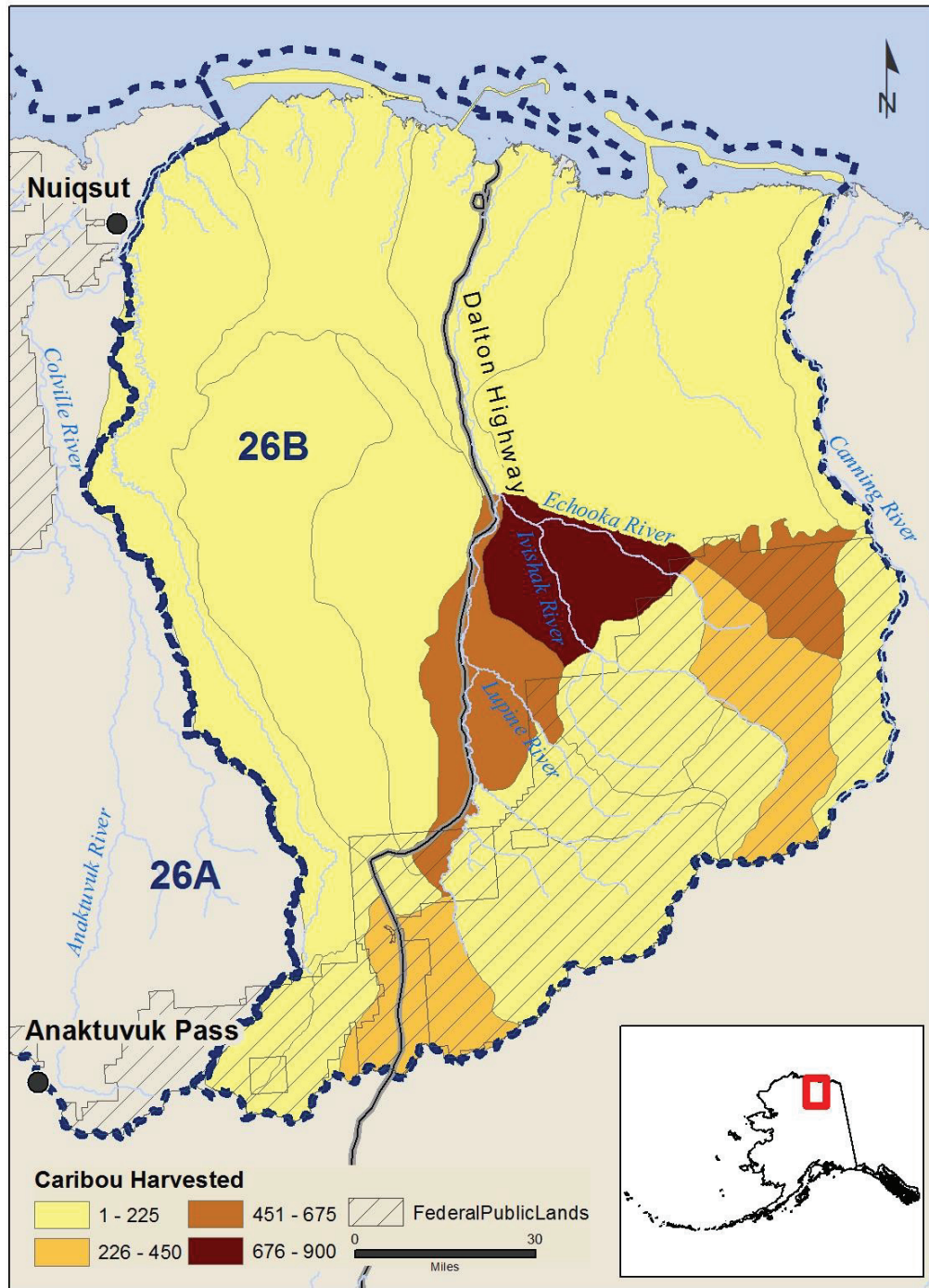
Although most of the harvest from the CACH comes from Unit 26B, some occurs in Units 24A, 24B, 25A, 26A, and 26C. Less than 10% of the harvest in Unit 25A (range 250-400) is estimated to come from the CACH (Caikoski 2015). Harvests in summer and early fall that occur in Units 24A, 24B, 25A, and 26C are primarily from other herds such as the PCH, TCH, or WACH. Additional harvest from the CACH may occur when the CACH is located near Kaktovik (Unit 26C) in the summer, near Wiseman and Coldfoot (Unit 24A) in the fall and winter, and near Arctic Village (Unit 25A) in the fall and winter.. During the fall and winter some caribou from the TCH and WACH occasionally mix with the CACH. For the purposes of documenting the annual harvest from the CACH, Lenart (2017a) used an estimate of 100 caribou (Lenart 2017b) based on community harvest surveys by local residents outside of Unit 26B (**Table 5**). Harvest information presented for the CACH will refer to Unit 26B unless noted otherwise.

Harvest by local hunters from Nuiqsut occurs in the summer and fall, from July through September, and during the spring, from March through April (Braem et al. 2011, Brown et al. 2016). A little more than 50% of the caribou harvest taken by Nuiqsut hunters occurs during the summer and fall and is from both the TCH and CACH (Lenart 2015). Nuiqsut hunters, who usually hunt west of the community, represent most of the local harvest from the CACH. Based on the distribution of caribou and the timing and location, Braem et al. (2011) estimated that 13% of the total harvest between 2002 and 2007 by Nuiqsut residents, was in Unit 26B, just west across the border with Unit 26A where the community is located. Braem et al. (2011) estimated that Nuiqsut hunters averaged approximately 61 caribou from the CACH annually from 2002 and 2007. The average total annual caribou harvest by Nuiqsut hunters, which includes TCH and CACH, from 2000-2007 was 469 caribou. In 2014, 774 caribou were estimated to have been harvested by Nuiqsut residents (Braem 2015). Nuiqsut residents harvested approximately 317 caribou (41%) from the CACH in 2014 (Braem 2017b). In 2014, Nuiqsut residents harvested caribou in all months except May. The most productive months were June (114), July (189), and August (215). Harvest declined sharply after August, only 73 caribou were harvested in September. The fewest caribou were taken in April (2) and November (4). There were 43 caribou harvested for which the date of harvest was not known. Of the caribou harvested in 2014, 72% were bulls. An estimated 166 cows were harvested in 2014 with 45% being harvested in January and February (Brown et al. 2016).

The average annual CACH harvest by nonlocal hunters from 2013/14 to 2015/16 in Unit 26B was approximately 937 caribou. (**Table 5**) (Lenart 2017a, WinfoNet 2017). Bow hunters took approximately 21% of the total harvest during this time. The average number of bulls harvested annually from the CACH from 2012-2015 was 699 and the average number of cows harvested was 234 (**Table 5**). A majority of the reported caribou harvest from the CACH occurs in August and September (Lenart 2015).

The proportion of resident and nonlocal harvest has fluctuated with CACH population trends (WinfoNet 2017) (**Figure 7, Table 6**). In general resident harvest has decreased with the recent population decline and the nonresident harvest has increased slightly (**Figure 7, Table 6**). Nonlocal residents accounted for 89% of the total caribou harvest from 2013-2015, which is approximately 827 caribou annually (Lenart 2017a). The location and total caribou harvest by NFQU hunters from the CACH during the population decline from 2011-2016 is shown in **Map 3**. It should be noted that the displayed spatial data is reflective of reported harvest records with locational data at fine scales; records lacking spatial specificity are not represented. Assuming unreported data is proportional to available data, **Maps 3, 5, and 6** represent general spatial harvest patterns. Between 2011 and 2016, a total of 5,049 caribou were harvested by NFQU in Unit 26B. Among those, 3,433 (68%) were from nonlocal Alaska residents and 1,616 (32%) and from nonresidents (WinfoNet 2017). The annual cow harvest by NFQU in Unit 26B increased from 47 in 2006-2009 to 234 in 2010-2016 (**Figure 8**). This increase coincided with the change in the harvest limits from two to five caribou and harvest season for cows from Oct. 1-Apr. 30 to July 1-Apr. 30 in the 2010 State regulations.

Although a harvest rate of 5% of the population has been used as a guideline by ADF&G since 1991 to determine the allowable harvest, the reported harvest has been well below the harvestable surplus, averaging less than 2% since 2000/01 (Lenart 2015). However, with the recent population decline, Lenart (2017a) recommended a harvest level of 3% of the population. ADF&G adopted new caribou regulations for Unit 26B for 2017/2018 with the intended goal of reducing the annual harvest from an average of 937 caribou from 2013-2015 to 680 (3% of 22,360) and reducing the cow harvest from approximately 200 to 75 (Lenart 2017a).



Map 3. Reported caribou harvest in Unit 26B from the CACH by NFQU during the population decline 2011-2016 (WinfoNet 2017).

Table 5. Reported harvest from the Central Arctic Caribou Herd by sex and method of take in Alaska, 2006-2015 (Lenart 2013, 2015, 2017a; ADF&G 2017b).

Regulatory Year^a	Male	Female	Unit 26A Residents^a	Total Harvest (# harvested by bow)^b	Total Hunters
2006/07	795	32	100	927 (301)	1,331
2007/08	596	65	100	761 (183)	1,380
2008/09	658	47	100	805 (180)	1,362
2009/10	750	45	100	895 (224)	1,317
2010/11	976	234	100	1,310 (296)	1,622
2011/12	808	344	100	1,252 (330)	1,401
2012/13	727	276	100	1,103 (285)	1,430
2013/14	721	134	100	955 (190)	1,423
2014/15	717	195	100	1,012 (198)	na ^c
2015/16	522	222	100	844 (92)	na ^c
Mean	699	234	100	1,033 (219)	–

^a Estimated yearly average from Unit 26A residents from community harvest surveys, Kaktovik and Nuiqsut

^b Total includes bow harvest and harvest from Unit 26A residents

^c Not available

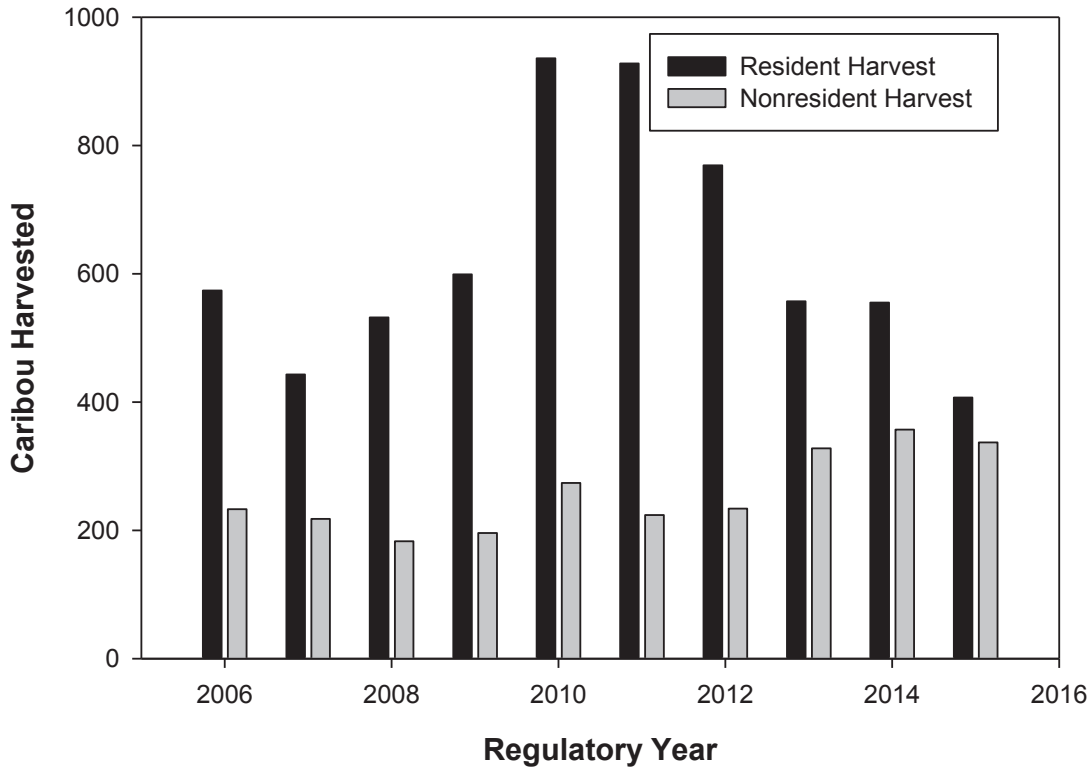


Figure 7. Reported CACH harvest by residency, 2006-2015 (Lenart 2017a).

Table 6. Characteristics of the Central Arctic Caribou Herd average annual harvest in Unit 26B by residency, 2013-2015. The proportion of the total Unit 26B caribou harvest by residency for 2006-2015 is included for comparison (Lenart 2017a).

Residency	Total CACH Harvest	Female CACH Harvest	Proportion of the Harvest (%) 2013-2015	Proportion of the Harvest (%) 2006-2015	Hunters	Success Rate (%)
Unit 26A Residents	100	20	11%	10%	na	na
Other Alaskan Residents	490	158	53%	64%	910	38%
Nonresident	340	24	36%	26%	430	62%
Total	930	202	-	-	-	-

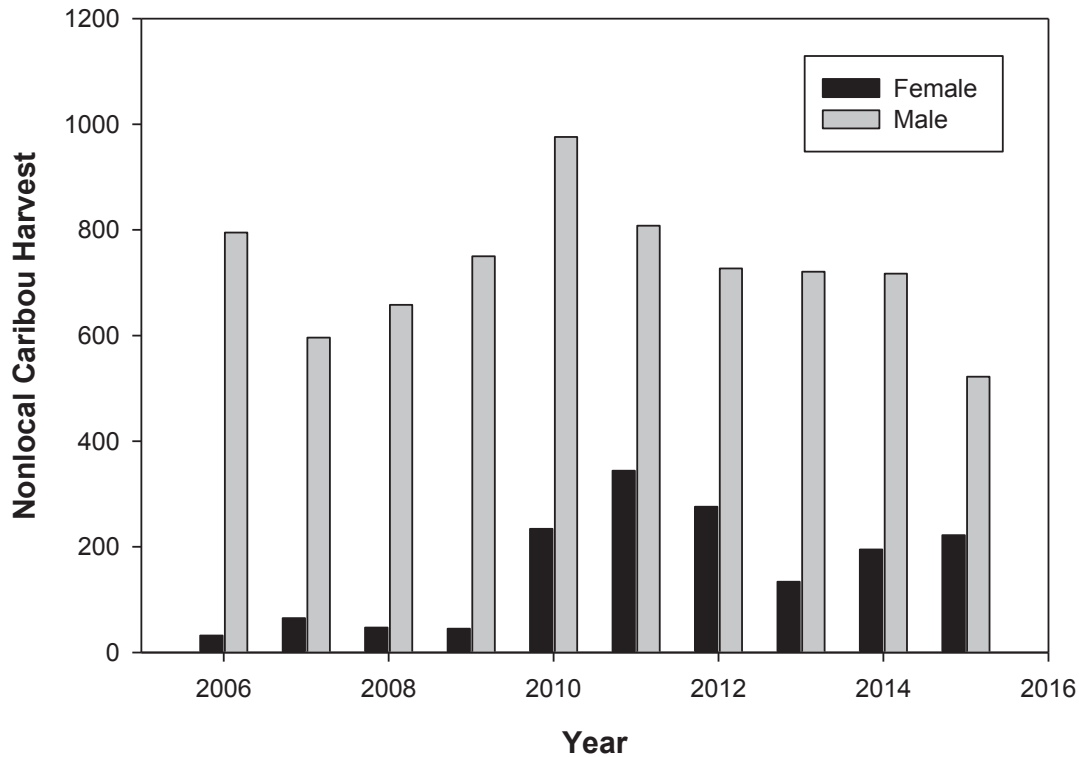
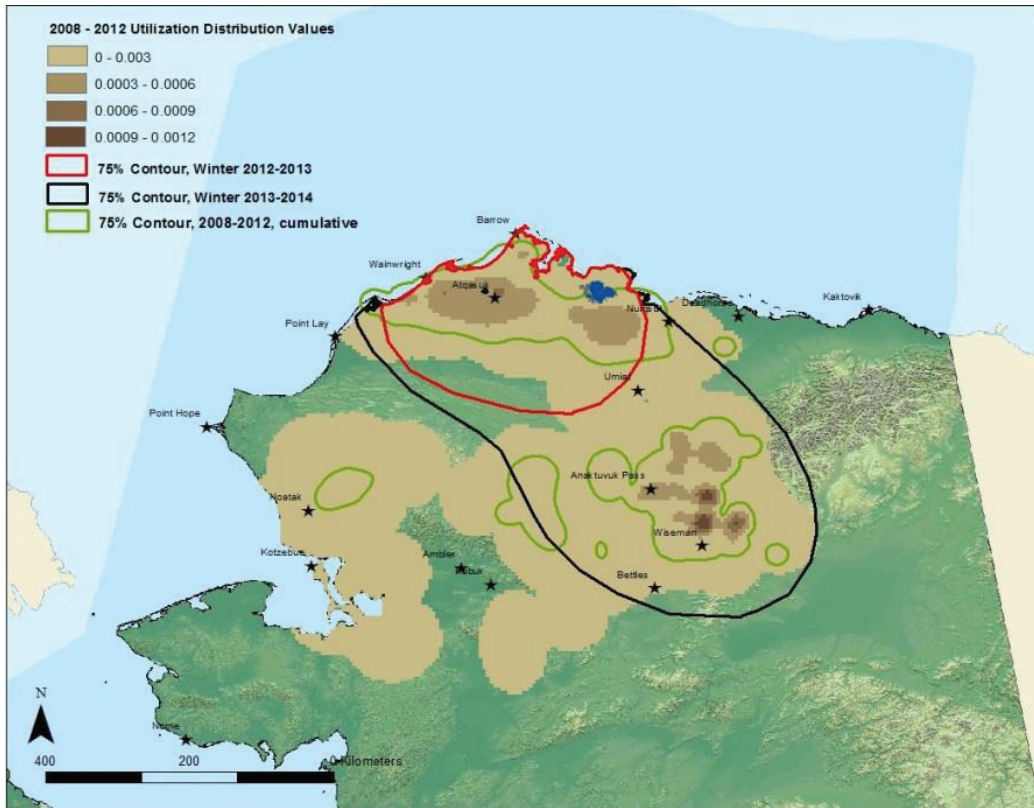


Figure 8. Central Arctic caribou herd harvest by sex by nonlocals in Unit 26B, 2006-2016 (Lenart 2017a)

Teshkepuk Caribou Herd

The TCH annual harvest is 4,000-5,000 (Parrett 2015a). Most of the harvest is by local Federally qualified subsistence users (FQSU). Less than 1% of the TCH harvest is by nonlocal residents in Alaska and nonresidents (Parrett 2011, Parrett 2015a). Residents of Atqasuk, Utqiagvik, Nuiqsut, and Wainwright harvest caribou primarily from the TCH while residents from Anaktuvuk Pass, Point Lay, and Point Hope harvest caribou primarily from the WACH (**Table 7**) (Dau 2011, Parrett 2011). For example the TCH winter range did not overlap Anaktuvuk Pass in 2012/2013 but did in 2013/2014 (**Map 4**). Residents of Nuiqsut, which is on the northeast corner of Unit 26A, harvest approximately 77% and 86% of their caribou from the TCH between 2002 and 2007 and 2010 and 2010, respectively (Parrett 2013). A little more than 50% of the caribou harvest taken by Nuiqsut hunters occurs in the summer and fall and is from both the TCH and CACH (Lenart 2015). Although some harvest from the TCH occurs outside of Unit 26A in Units 23, 24, and 26B, it is unlikely that the overall harvest is significant when the TCH is mixed with other caribou herds (Parrett 2013, 2015a).



Map 4. Cumulative Teshekpuk caribou herd winter range, Alaska, 2008-2012, with utilization distribution values depicted in shades of brown, 75% kernel contour from the 2008-2012 in green. The 75% contours from the two individual winters from 2012-2014 are depicted by the red and black outlines (Parrett 2015a).

Range overlap between the three caribou herds, frequent changes in the wintering distribution of the TCH and WACH, and annual variation in the community harvest survey effort and location make it difficult to determine the proportion of the TCH, WACH and CACH in the harvest. Knowledge of caribou distribution at the time of the reported harvest is often used to estimate the proportion of the harvest from each herd.

The use of harvest tickets, required by nonlocal hunters, provides time and location of the harvest and, together with knowledge of the caribou distribution and allows for a more accurate assessment of the proportion of caribou harvested from each herd by nonlocals. For harvests by FQSU, analysis of the proportional harvest from different herds has been difficult due to poor or non-existent reporting, variation in the timing and effort of community harvest surveys, changes in the distribution and timing of TCH migration, and overlapping distribution with adjacent herds. However, previous efforts from 2002-2007 determined that Utqiagvik residents harvest primarily from the TCH (Parrett 2013, Braem 2017b). If used throughout the range, harvest tickets would allow for better tracking of the FQSU harvest with respect to the overlapping caribou herds. Community harvest surveys continue to be the preferred method to estimate

harvest by FQSU, since previous attempts to conduct registration hunts were not effective (Georgette 1994, Parrett 2015a).

For communities where harvest surveys have not been conducted or the estimates are unreliable, the Division of Wildlife Conservation estimated annual harvests based on the current community population, previous per capita harvest estimates and yearly caribou availability. A general overview of the relative utilization of caribou herds by community from 2008/09 to 2009/10 is presented in **Table 7** (Parrett 2011, Dau 2011, and Lenart 2011). These years were chosen because there was good separation between the herds during this period. The total estimated annual harvest from the TCH during 2008/09 (3,219 caribou) (Parrett 2011) was similar to 2012/13 and 2013/14 (3387 caribou) (Parrett 2015a) (**Table 7**). Most of the caribou harvest in 2012/2013 and 2013/2014 occurred in August and September (Parrett 2015a). The estimated annual harvest during 2012/13 and 2013/14 using this method was approximately 3,387 (Parrett 2015a).

Table 7. Estimated caribou harvest of the Teshekpuk, Western Arctic and Central Arctic caribou herds during the 2008/2009 regulatory years by FQSU in Unit 26A (Parrett 2011, Dau 2011, Lenart 2011, Sutherland 2005). Note: Due to the mixing of the herds, annual variation in the community harvest surveys and missing data, the percentages for each community do not add up to 100%.

Community	Human population ^a	Per capita caribou harvest ^{bc}	Approximate total community harvest	Estimated annual TCH harvest (%) ^d	Estimated annual WACH harvest (%) ^d	Estimated annual CACH harvest (%) ^d
Anaktuvuk Pass	298	1.8	524	157 (30)	431 (82)	
Atqasuk	218	0.9	201	197 (98)	6 (2)	
Barrow (Utqiagvik)	4,127	0.5	2,063	2,002 (97)	62 (3)	
Nuiqsut	396	1.1	451	388 (86)	3 (1)	58 (13)
Point Lay	226	1.3	292	58 (20)	210 (72)	
Point Hope	689	0.3	220	0	220 (100)	
Wainwright	547	1.3	695	417 (60)	48 (15)	
Total Harvest				3,219	980	58

^a Community population size based on 2007 census estimates

^b Citations associated with per-capita caribou harvest assessment by community can be found in **Table 6** (Parrett 2011).

^c Sutherland (2005)

^d Percent of the total community harvest

The harvest estimate for Utqiagvik, from household surveys conducted by ADF&G in 2014/15 was 4,231 caribou (Braem 2015). Based on data collected by the North Slope Borough Wildlife Department and others, the average annual harvest estimate for Utqiagvik from 1992-2003 was 2096 caribou (Braem 2015).

Currently the harvestable surplus for the TCH is estimated to be approximately 2,500 at a 6% harvest rate. A conservative estimated harvest rate for the period between 2012/13 to 2013/14 is approximately 10% of the 2013 (3,917 caribou) population estimate of 39,172 (range 32,000-45,000) (Parrett 2015a). However, due to the mixing of TCH with the WACH and CACH, the lack of annual harvest data for FQSU and the lack of spatial data, it is difficult to determine the actual TCH harvest. The conservative TCH harvest rate of 10% is almost double the harvest rate estimates for the WACH and CACH (Parrett 2015a) and a conservation concern. If the TCH population declines to below 35,000 the harvest rate may be reduced to 4-5%, assuming that the harvest composition remains consistent at approximately 15% bulls and 2% cows (Parrett 2017a, pers. comm.).

Due to the remoteness and inaccessibility of much of the area, most of the TCH harvest is by local hunters (Parrett 2015a). TCH harvest by local hunters in recent years has occurred primarily from July to October (Braem et al. 2011, 2015; Parrett 2011) whereas nonresidents and nonlocal residents typically harvest most of their caribou from the WACH, along the Colville River drainage, in August and September (Parrett 2015a). For example, greater than 95% of the caribou harvested by nonresidents and nonlocal residents in 2012/13 and 2013/14 occurred in August and September (Parrett 2015a). The nonresident and nonlocal resident harvest from the TCH, which averages about 100 caribou a year, or 3% of the total TCH harvest, is split evenly between the nonlocal and nonresidents (Parrett 2013).

Western Arctic Caribou Herd

Annual caribou harvest by local residents is estimated from community harvest surveys, when available. In 2015 the linear model (Sutherland 2005) used to estimate caribou harvests by hunters who live within the range of the WACH was replaced by a new analysis of covariance developed by Adam Craig, a biometrician with ADF&G's Division of Wildlife Conservation Region V (Arctic and Western Alaska). These models incorporate factors such as community size and availability of caribou (Dau 2015a). In 2015, changes to the methods developed by Sutherland (2005) by Craig to analyze the harvest data, resulted in changes to local caribou harvest estimates from past years. While Craig's model accurately reflects long-term trends in annual local harvests, it is too insensitive to detect short-term changes in harvest levels useful to real time management decisions to regulate harvests and does not accurately reflect actual harvest levels or harvest levels by Unit (Dau 2015a). This analysis only considers the updated harvest estimates using the new model (Dau (2015a). The accuracy of harvest reporting by locals may improve with the requirement for registration permits for those that live north of the Yukon River. Caribou harvest by NFQU is based on harvest ticket reports (Dau 2015a).

From 2000–2014, the estimated harvest from the WACH averaged 11,984 caribou/year, ranging from 10,666-13,537 caribou/year (**Figure 9**) (Dau 2015a). The total harvest during 2012/13 and 2013/14 was 13,352 and 12,713 caribou, respectively. These harvest estimates assumed that 95% of all caribou harvested by nonlocal hunters in Unit 26A were from the WACH and the remainder from the TCH. Using the 2011 and 2013 population estimates, the total annual harvest during 2012/13 and 2013/14 was approximately 4-5% of the population (Dau 2015a). These harvest levels are within or below the conservative harvest level specified in the WACH Management Plan (**Table 3**). However, harvest estimates do not include wounding loss or caribou killed but not salvaged, which may be hundreds of

caribou (Dau 2015a). Subsistence hunters throughout the range of the WACH take caribou whenever they are available. Thus the seasonal harvest patterns among communities are dependent upon the seasonal movements of the caribou. Despite year-round seasons prior to 2015, most of the caribou taken by FQSU and NFQU has been between Aug. 25 and Oct. 7 (Dau 2015a). Local residents, defined as living within the range of the WACH, account for approximately 95% of the WACH harvest, with residents of Unit 23 accounting for approximately 58% (**Figure 10**) (Parrett 2017a, pers. comm.). Approximately 37% of the total annual WACH harvest is taken by local residents in Units 22, 24B, 26A, and 26B (**Figure 10**).

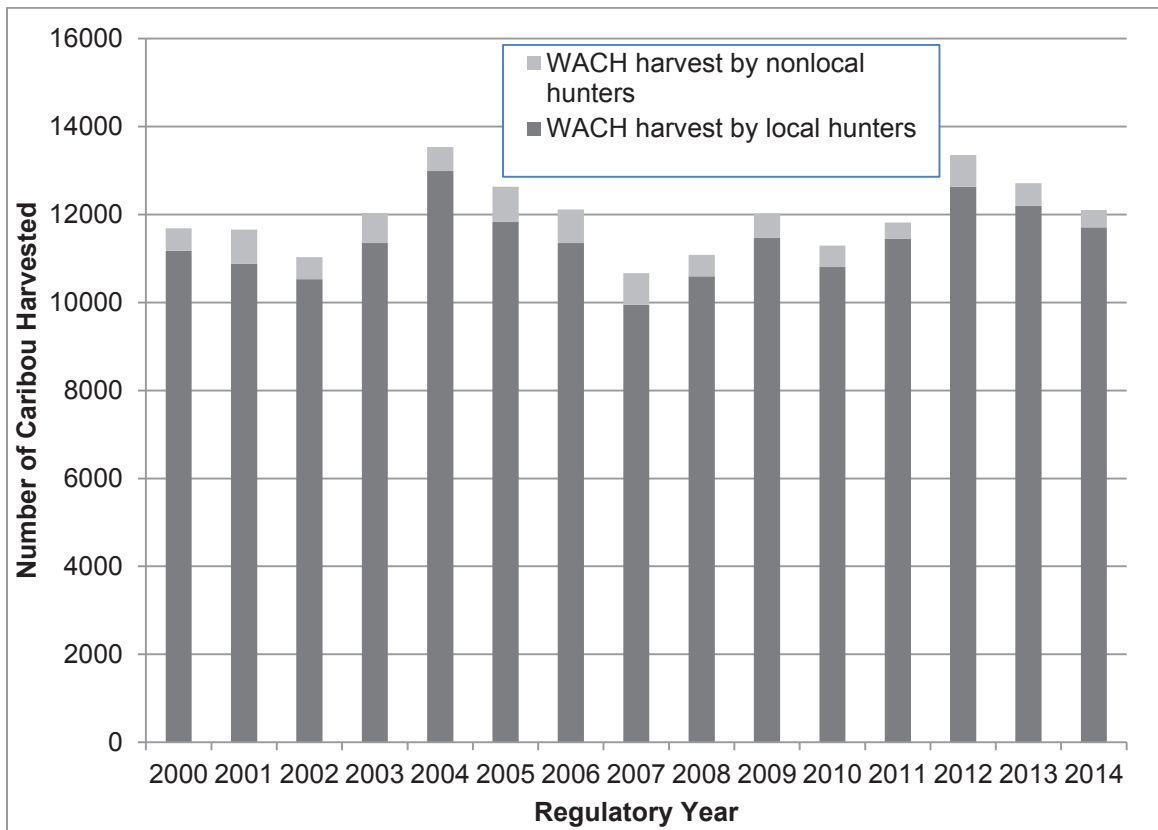


Figure 9. Estimated number of caribou harvested from the WACH by residency (Dau 2015a).

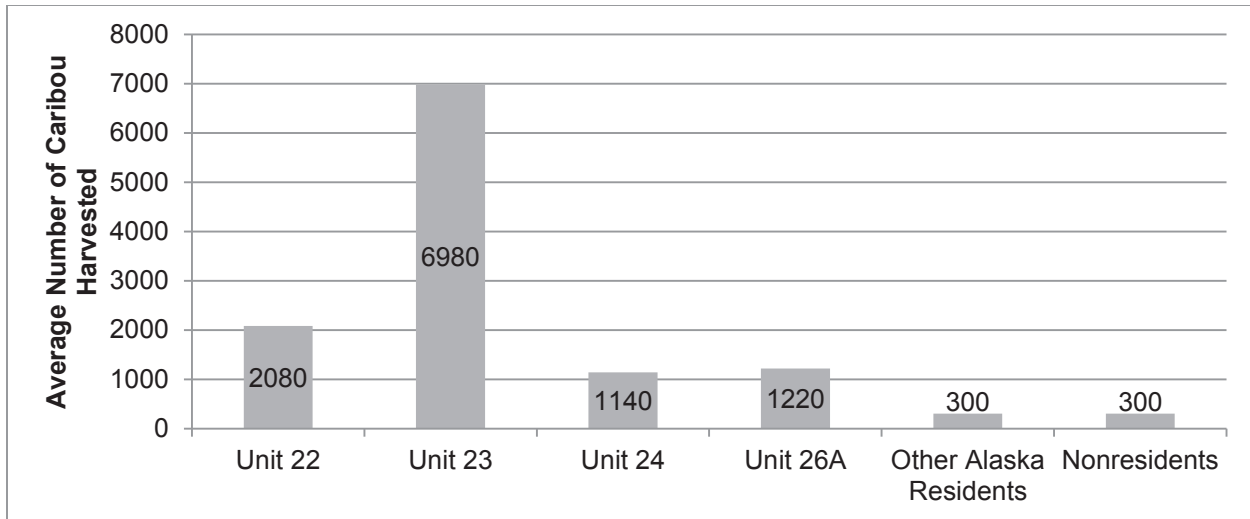


Figure 10. Average WACH annual caribou harvest by unit and residency from 1998-2015 (Parrett 2017a, pers. comm.).

The WACH are on their periphery of their winter range when on the Seward Peninsula (Unit 22). Consequently movements and locations are much less predictable than the core part of the range. Due to the lack of established migratory patterns, local subsistence users need flexibility with respect to the hunting season for bulls and cows so that they can take advantage when the caribou are present. Hunters in the northern areas get access to bulls earlier than in more southern wintering areas of the WACH in Unit 22. Hunters in the more southern locations also consider bulls palatable much later in the fall than hunters up north (July 2015).

From 2001-2013, total average annual nonlocal WACH harvest was 598 caribou (range 421-793) (WinfoNet 2017) (**Figure 11**). Over the same time period, nonlocal WACH harvest from Units 26A, 26B, and 24B averaged 102 caribou/year (range 60-144) (**Figure 11**). Nonlocal WACH harvest from Unit 23 and Units 26A, 26B, and 24B combined accounts for 76% and 14% of the total nonlocal WACH harvest on average, respectively.

Between 1998 and 2014, the number of NFQU hunting caribou and the number of caribou harvested by NFQU in Unit 23 averaged 487 hunters (range: 404-662) and 511 caribou (range: 248-669), respectively (**Figure 12**, USFWS 2017). In 2015, after the BOG enacted restrictions, the number of NFQU and caribou harvested by NFQU decreased appreciably (340 hunters and 230 caribou). In 2016, during the closure of Federal lands to NFQU, the number of NFQU and caribou harvested by NFQU decreased even further (149 hunters and 111 caribou), although there may still be some outstanding 2016 harvest reports from nonlocal residents (**Figure 12**, WinfoNet 2017). Based on patterns in submission rates and timing of harvest reports, the State estimates a 50% reduction in the number of and harvest by nonlocal caribou hunters in Unit 23 during 2016/17 as a result of the closure (Parrett 2016b, ADF&G 2017d).

Based on those hunters that provided harvest ticket reports for Unit 26A, the number of nonresidents compared to Alaska residents outside the WACH range that harvested caribou from the WACH increased from 2011-2015 (**Figure 13**). Approximately 95% of the total Unit 26A caribou harvest was from the

WACH and by residents within the WACH range (Dau 2013). The annual harvest by NFQU is a very small percentage ($\approx 1\%$) of the total WACH harvest (Figures 11 and 14). Female harvest by NFQU in Unit 26A averaged 10% (range 2-19) from 2006-2016.

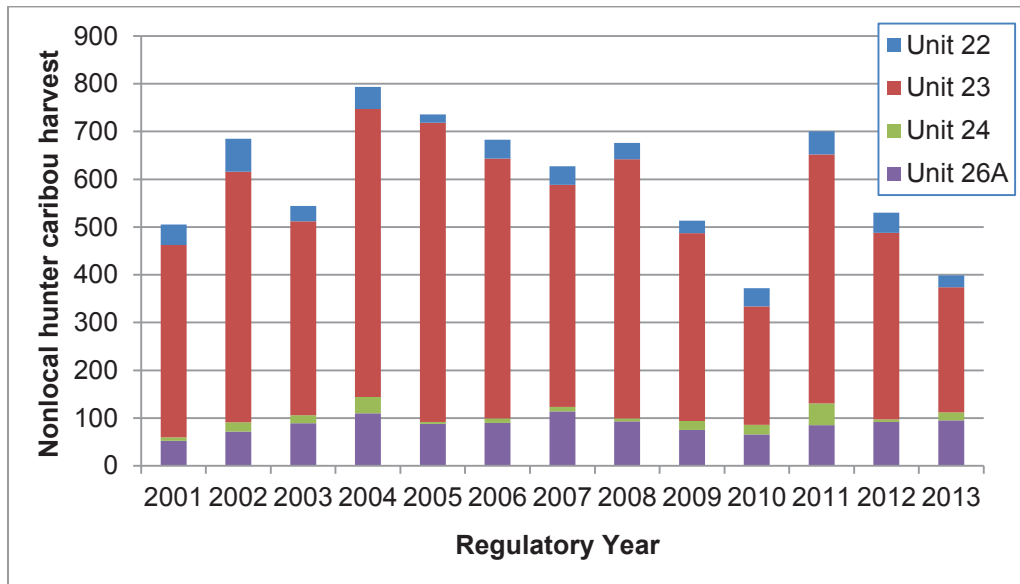


Figure 11. Nonlocal WACH harvest by unit (Dau 2013, 2015a, WinfoNet 2017). Unit 21D was not included as only 0-2 caribou have been harvested from this unit each year.

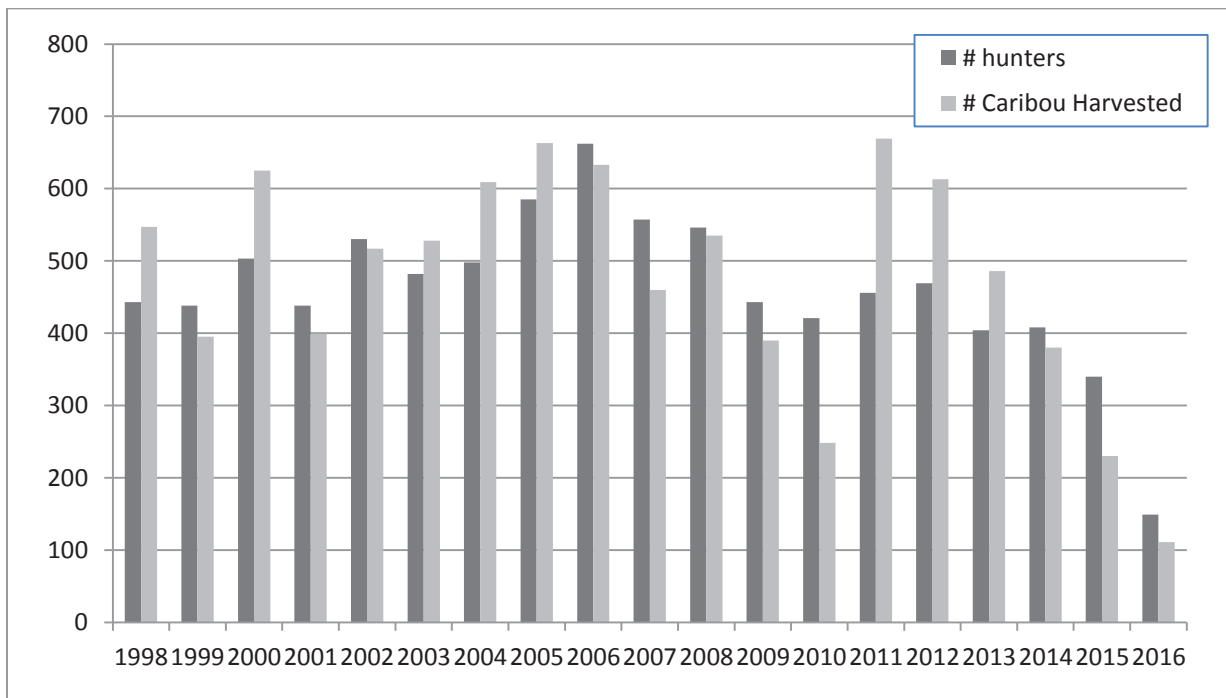


Figure 12. Number of non-Federally qualified users (NFQU) and number of caribou harvested by NFQU in Unit 23 (ADF&G 2016c, USFWS 2016, WinfoNet 2017).

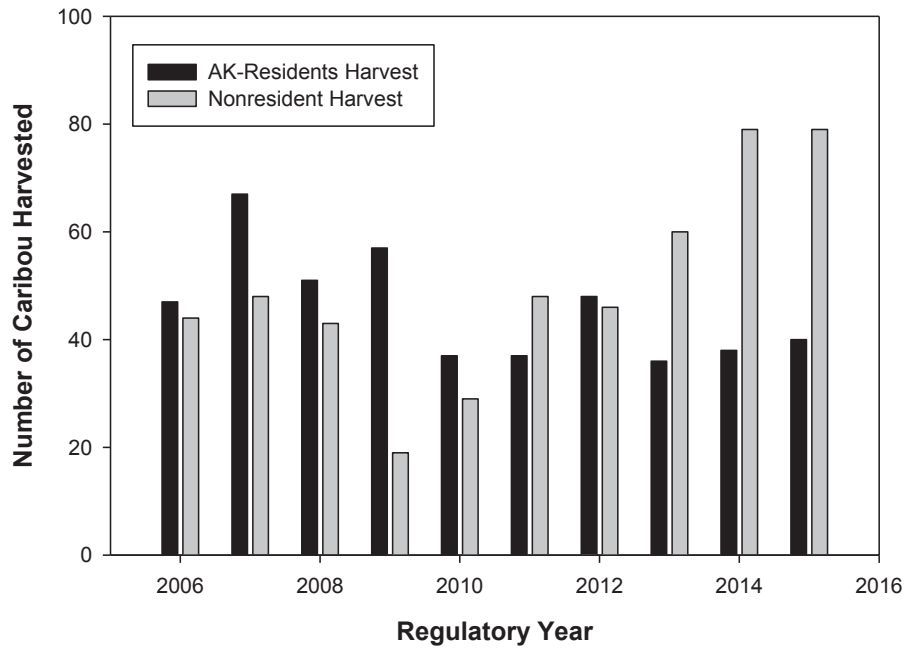


Figure 13. Residency of successful nonlocal caribou hunters from the WACH in Unit 26A, 2006-2015 (Dau 2013, 2015a).

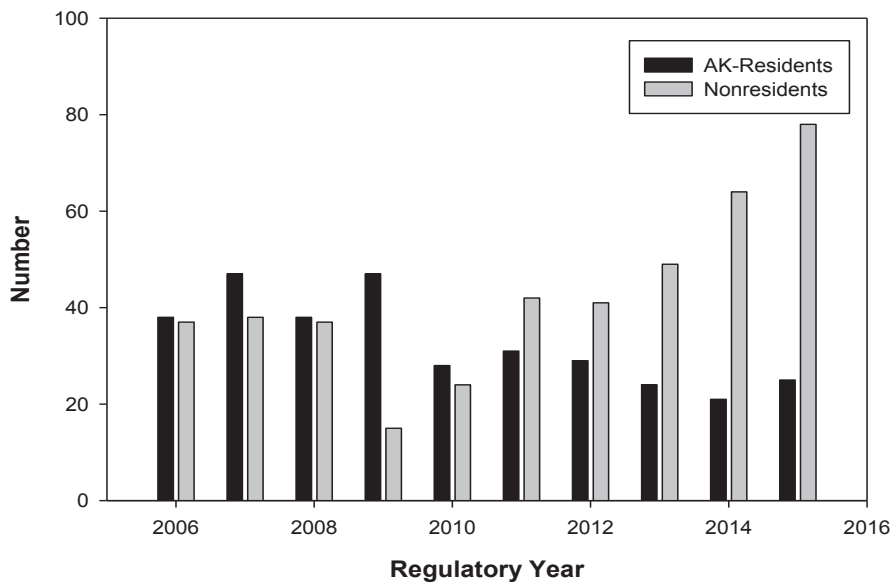
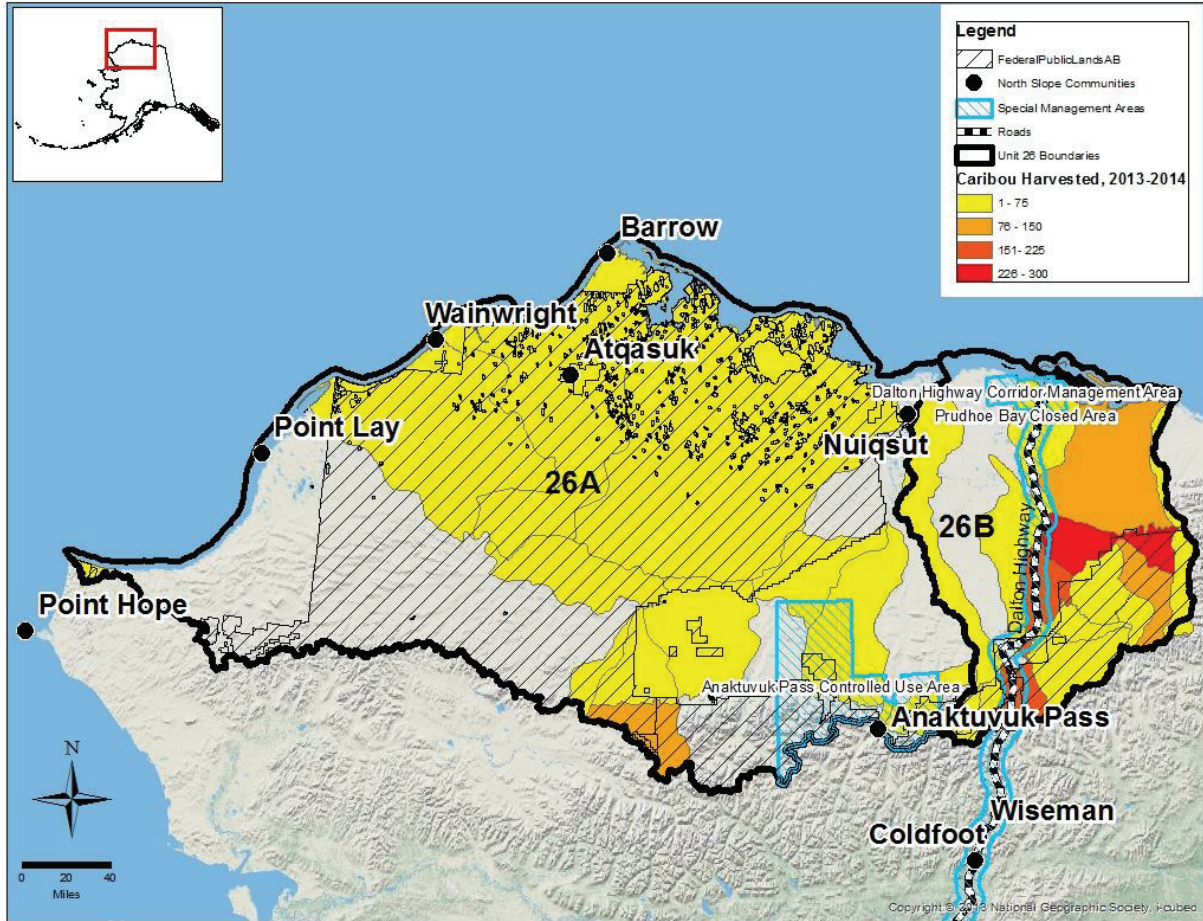


Figure 14. Nonlocal WACH harvest in Unit 26A, 2006-2015 (Dau 2013, ADF&G 2017b).

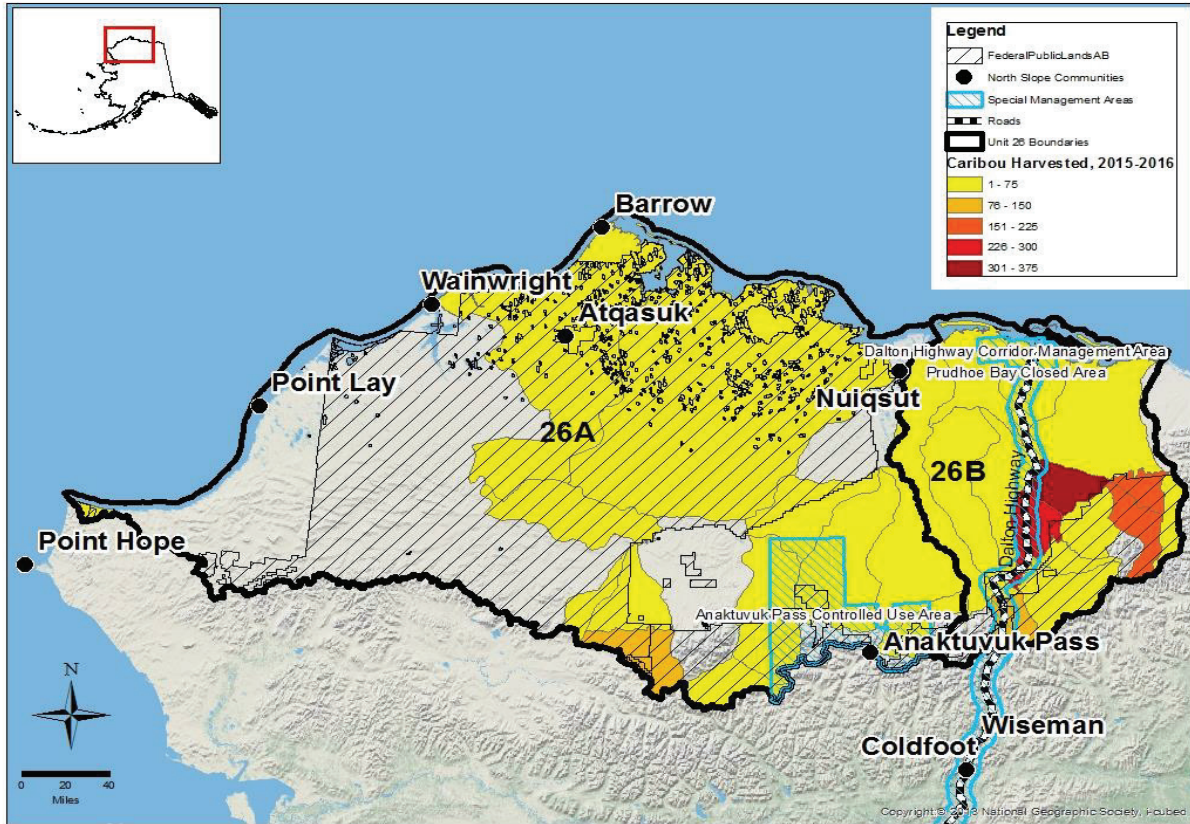
Harvestable surplus for the WACH is calculated as 6% of the population (Braem 2017a, pers. comm.) and when evaluated separately by sex is approximately 15% bulls and 2% cows (Dau 2015a). In recent years, as the WACH population has declined, the total harvestable surplus has also declined (Dau 2011, Parrett 2015a). In 2015/16, the combined TCH/WACH harvestable surplus declined from an estimated 13,250 caribou in 2014/15 to an estimated 12,400 caribou. While there is substantial uncertainty in the harvestable surplus estimates, the overall trend is decreasing and it is likely that sustainable harvest will soon be exceeded if the decline continues (Parrett 2015a, Dau 2015a). Of particular concern is the overharvest of cows, which has probably occurred since 2010/11 (Dau 2015a). Dau (2015a) states, “Even modest increases in the cow harvest above sustainable levels could have a significant effect on the population trajectory of the WACH. Harvest from the WACH, which has remained fairly consistent, is one of the factors that prompted the BOG to enact restrictions to WACH and TCH caribou harvest in March 2015.

Using the percentage of harvest reported by community from the WACH in 2008/09 (**Table 7**) and the 2014 community harvest estimates for Utqiagvik, Anaktuvuk Pass, Nuiqsut, and Point Hope (Braem 2015) and the 2014 total nonlocal harvest (117 caribou) (ADFG 2017a), the total WACH caribou harvest for Unit 26A in 2014 was approximately 1,185 caribou. Adding another 120 caribou from Point Lay and Atqasuk (Parrett 2011) would bring the total to approximately 1,305 caribou harvested from the WACH in 2014 in Unit 26A. This year was chosen because it was the most recent community harvest records for the North Slope (Braem 2015).

Comparison of the two year period from 2013-2014 (**Map 5**) with 2015-2016 (**Map 6**) shows an increase in 2015-2016 of the harvest within the vicinity of Anaktuvuk Pass in Unit 26A. These changes in harvest patterns may be due in part to hunters shifting hunting areas and intensity to areas within Unit 26A and 26B in response to changes in the movement of the caribou herds as a result of the closure of Federal public lands to caribou hunting by NFQU in Unit 23 in 2016/2017.



Map 5. Reported caribou harvest in Units 26A and 26B from the WACH, TCH, and CACH by NFQU, 2013-2014 (WinfoNet 2017).



Map 6. Reported caribou harvest in Units 26A and 26B from the WACH, TCH, and CACH by NFQU , 2015-2016 (WinfoNet 2017).

Cultural Knowledge and Traditional Practices

Meeting the nutritional and caloric needs of Arctic and Subarctic communities is important and is the foundation of subsistence activities. Still, the meaning of subsistence extends far beyond human nutrition for Alaska’s Native peoples. Holthaus (2012) describes subsistence as the base on which Alaska Native culture establishes its identity though “philosophy, ethics, religious belief and practice, art, ritual, ceremony, and celebration.” Fienup-Riordan (1990) also describes subsistence in terms of the cultural cycles of birth and death representing the close human relationship and reciprocity between humans and the natural world. Concerning caribou specifically, Ms. Esther Hugo, a lifelong resident of Anaktuvuk Pass, describes the human-caribou relationship as a “way of life” (NWARAC 2017).

The effects of this proposal span the range of several caribou herds and the traditional territories of several cultural groups (**Map 7**). These cultural groups include the Inupiat of the North Slope, Northwest Arctic and the Seward Peninsula, the Koyukon Athabascans of the Western Interior, and the Gwich’in Athabascans of the Eastern interior. The range of the PCH also includes a small portion of traditional Han Athabaskan territory within Alaska, while the range of the WACH includes a small portion of Holikachuk

began to rebound in the 1940s. Currently, among large terrestrial mammals, caribou are among the most abundant; however, the population in any specific area is subject to wide fluctuations from year to year as caribou migration routes change (Burch 2012).

The availability of WACH, TCH, CACH, and PCH herds within the traditional territories of the interior Athabascans is more variable and depends on annual migratory patterns. Harvest of caribou in these communities depends on the proximity of the migration to each village (Brown et al 2004). Within Koyukon Athabaskan territory, Allakaket, Alatna and Huslia have been documented as the largest communities that harvest caribou, although several hunters from Galena have been documented traveling long distances to harvest this species (Brown et al 2004). Communities from this region are thought to primarily harvest WACH caribou (Brown et al 2004). In terms of the use of caribou (which includes caribou received from other households) within Koyukon territory, a 2002-2003 study documented 0% use among households in Kaltag and Ruby, 96% in Allakaket, and 100% in Alatna (Brown et al 2004).

Within traditional Gwich'in Athabaskan territory, particularly those villages located in proximity to the Upper Yukon and Porcupine Rivers, residents primarily harvest from the PCH, although Central Arctic and Fortymile Herd animals are occasionally harvested (Caulfield 1983). Residents of other areas in this region have also been documented as traveling north to obtain caribou meat, including residents of Beaver traveling along the Yukon River to the vicinity of Charley Creek [Kandik River] (Schneider 1976) and residents of Fort Yukon traveling above Circle for caribou (Caulfield 1983). Caribou in this region are usually first seen in mid-August while migrating south from the coastal plain along alpine ridges. Caribou meat is generally stored by freezing or drying and is typically prepared by boiling but may also be baked or fried (Caulfield 1983).

Historically the North Slope Inupiat hunted caribou year-round (Braem 2013). Traditionally, coastal groups tended to store caribou frozen in ice cellars while inland groups more commonly stripped and dried the meat (Braem 2013). Today, caribou is frozen, dried, and eaten fresh (Braem 2013). As a food resource, caribou remain important to meeting the subsistence needs of Inupiaq families on the North Slope. In 1989 the coastal community of Wainwright harvested approximately 83,187 lb. of caribou (178 lb. per capita), representing 24% of the community's harvest in that year (ADF&G 2017c). Comparatively, Wainwright harvested approximately 243,594 lbs. of marine mammals (521 lb. per capita), representing 69% of the community's harvest (Brown et al. 2016). Utqiagvik, the largest community in the region, harvested 4,231 caribou in 2014, representing 103 lb. per capita of edible weight.

Historically, during fall and spring caribou migrations, people built "drive fences" out of cairns, bundles of shrubs, or upright logs. These fences were sometimes several miles long and two to three miles wide. Ideally, the closed end of the fence crossed a river, and caribou were harvested while crossing the river and retrieved later; or the fence would end in a corral where caribou were snared and killed with spears (Burch 2012, Caulfield 1983). Caribou drives allowed a large number of caribou to be harvested in a short time (Burch 2012, Spencer 1959, Murdoch 1988). These methods were replaced with firearms in the 19th century.

Caribou were traditionally harvested any month of the year they were available in the Northwest Arctic Region. The objective of the summer hunt was to obtain the hides of adult caribou with their new summer coats. They provided the best clothing material available to the Inupiat. The fall hunt was to acquire large quantities of meat to freeze for winter (Burch 1994). The timing and routing of migration determined caribou hunting. Hunting seasons change from year to year according to the availability of caribou (ADF&G 1991). The numbers of animals and the duration of their stays varies from one year to the next (Burch 1994) and harvest varies from community to community depending on the availability of caribou. Generally, communities in the southern portion of Unit 23 (Buckland, Deering) take a majority of their caribou in the winter and spring, while the other communities in Unit 23 take caribou in the fall, winter, and spring. Kivalina and Point Hope also take caribou in the summer in July (ADF&G 1992) and Selawik residents regularly hunt in the fall (Georgette 2016, pers. comm.). In Gwich'in Athabaskan territory, caribou were typically harvested in the fall, winter and spring (Caulfield 1983). Caribou typically only remain available to Arctic Village and Venetie residents through winter and spring (Caulfield 1983).

Currently, caribou hunting by FQSU in Unit 23 is most intensive from September through November. Caribou can be harvested in large numbers, when available, and can be transported back to villages by boat before freeze-up. Hunters often search for caribou and attempt to intercept them at known river crossings. Ideally, caribou harvest occurs when the weather is cool enough to prevent spoilage of meat. If not, meat is frozen for later use. Prior to freeze-up in Inupiaq regions, bulls are preferred because they are fatter than cows (Braem et al. 2015, Georgette and Loon 1993). In Athabaskan regions, hunters often select cows between October and February when they are fatter and better tasting than bulls (Caulfield 1983). At other times, bulls or cows may be taken (Caulfield 1983).

Small groups of caribou that have over-wintered may be taken by hunters in areas that are accessible by snowmachine. Braem et al. (2015:141) explain,

“Hunters harvest cows during the winter because they are fatter than bulls Caribou harvested during the winter can be aged completely without removing the skin or viscera Then in the spring, the caribou is thawed. Community members cut it into strips to make dried meat, or they package and freeze it.”

In spring, caribou start their northward migration. The Inupiat consider caribou taken at this time to be “lean and good for making dried meat (*paniqtuq*) during the warm, sunny days of late spring” (Georgette and Loon 1993:80).

Caribou are especially important for inland communities such as Atqasuk and Anaktuvuk Pass for which marine mammals are not available. While whaling communities tended to be more permanent, inland peoples traditionally tended toward annual and seasonal movements to reflect caribou migrations (Spencer 1984). The abandonment of this more mobile lifestyle has probably had significant consequences for the adaptability of hunters and their ability to meet subsistence needs. The two dominant modes of subsistence were intertwined by trading relationships between inland and coastal communities that sometimes helped to supplement dietary needs (Spencer 1984).

In 2014, the inland community of Anaktuvuk Pass harvested approximately 104,664 lbs. of caribou (330 lbs. per capita), representing 84% of the community harvest in that year (Brown et al. 2016). Among the harvested animals, 51% were bulls, 39% were cows, and 10% were of unknown sex (Brown et al. 2016). Cows were primarily harvested between November and April while bulls were primarily harvested throughout the rest of the year (Braem 2015). In 2011 approximately 85% of the bulls were taken during the months of August and September (Holen et al. 2012). Approximately 89% of Anaktuvuk Pass households reported using caribou in 2014, with 47% of households giving caribou away and 68% of households receiving caribou (ADF&G 2017c); use and sharing of caribou in this community remains high and has led to food security concerns in recent years when caribou migration patterns shifted away from the community.

User conflict concerns have been voiced in the North Slope region over time, especially regarding the effect of non-local hunting activity on caribou migration patterns (NWARAC and NSRAC 2016, WIRAC 2016, NSRAC 2015, 2016, 2017). Despite documented concerns through repeated public testimony, information is lacking on the degree of impact that these hunting activities have on both short and long-term caribou migration patterns. User conflict on the North Slope has centered primarily on the caribou migration patterns in the vicinity of Anaktuvuk Pass. A long-held cultural practice in the region requires that lead adult female caribou be allowed to establish migratory paths unhindered by human activity. Dau (2015a) suggests that once lead caribou establish migration routes, the caribou behind them will follow regardless of hunting or other disturbances such as aircraft. In response to complaints from Anaktuvuk Pass residents about caribou migration being affected by non-subsistence hunter activity, ADF&G attempted to document such effects from 1991-93, but none were found (OSM 1995).

In 1995 the Board adopted a proposal from the City of Anaktuvuk Pass to close Federal public lands in Unit 26A, south of the Colville River, upstream from and including the Anaktuvuk River drainage, to NFQU from August 1st through September 30th. The justification was to allow for caribou migrations to take their normal route into Anaktuvuk Pass. Concerns have frequently been expressed about activities that disturb caribou migrations by guides and transporters north of Anaktuvuk Pass, especially in light of severe food security concerns for that community in recent years (NWARAC and NSRAC 2016, WIRAC 2016). The BOG established the Anaktuvuk Controlled Use Area in 2005, to reduce the user conflict during the caribou hunting season and to provide more opportunity for Anaktuvuk Pass residents to harvest caribou. The current regulations close the area to the use of aircraft for hunting caribou, including the transportation of caribou hunters, their hunting gear, or parts of caribou from August 15 through October 15; however, this provision does not apply to the transportation of caribou hunters, their hunting gear, or parts of caribou by aircraft between publicly owned airports. Residents of Anaktuvuk Pass stated that the closure of Federal public lands to non-Federally qualified users for caribou hunting in Unit 23 during the 2016-2017 regulatory year was perceived as having improved the situation, allowing for the resumption of historical migration patterns and harvest activities (OSM 2017a, 2017b).

User conflicts between local and nonlocal hunters have been well documented in Unit 23, specifically in the Noatak NP, the Squirrel River area, and along the upper Kobuk River (Georgette and Loon 1988, Jacobson 2008, Harrington and Fix 2009 in Fix and Ackerman 2015, Halas 2015, NWARAC 2015, Braem et al. 2015), even during times of high caribou abundance. Local hunters have expressed concerns over aircraft

and “nonlocal” hunters disrupting caribou migration by “scaring” caribou away from river crossings, landing and camping along migration routes, and shooting lead caribou (Halas 2015, Fix and Ackerman 2015, NWARAC 2015).

Halas (2015; **Map 5**), in a case study of Noatak caribou hunters and their interactions with transported hunters, examined the links between caribou behavior and migration, user group interactions, and changes to subsistence caribou hunting. In describing observations by Noatak hunters in 2012 and 2014 Halas (2015:81) explained,

Observations of caribou behavior (“spooked” caribou, deflected caribou groups from river crossings) due to aircraft are likely witnessed as a dramatic event not easily forgotten by a waiting Noatak hunter. Whether the aircraft intentionally or unintentionally may be “influencing” caribou movement, observing “scared” caribou can be a powerful experience for hunters.

Some studies and local observations of WACH caribou response to aircraft have suggested that animal response is limited in temporal and spatial scale (Fullman et al. 2017) and that many factors contribute to larger scale shifts in migration. Dau (2015a) noted that despite substantial transporter traffic in the Anisak drainage, which is within the Noatak NP, has not diverted migrating WACH caribou. Fullman et al. (2017) studied the effects of environmental features and sport hunting on caribou migration in northwestern Alaska. These authors found that caribou tended to avoid rugged terrain and that the migration of caribou through Noatak NP does not appear to be hindered by sport hunting activity. They indicated that their results do not preclude the possibility of short-term effects (< 8 hours) altering the availability of caribou for individual hunters, and that the lack of observed influence of hunting activity could be related to limitations in the telemetry and sport hunter datasets used in the study (i.e. caribou locations were only recorded every 8 hours, not every sport hunter camp was included, and only landings events from transporter aircraft were considered).

Concerns over the impact of sport hunting activities on caribou migration have also been expressed. Aircraft can affect caribou behavior in the short-term (< 8 hours), which can impact hunting success. However, aircraft are unlikely to have long-term impacts on caribou migration through the Noatak NP (Fullman et al. 2017, Halas 2015, Dau 2015a). The WACH have migrated through Unit 23 for thousands of years, although specific migration routes change annually (Figure 4). The long-held Inupiaq tradition of letting lead caribou pass unmolested in order to establish migration routes also suggests that once migration routes are established, other caribou will follow regardless of hunting or other disturbances such as airplanes (Dau 2015a).

Shifts in caribou migration paths have created difficulty for Noatak, Kivalina, and Kotzebue hunters (Dau 2015a). Local WACH harvest has been relatively stable in Unit 23 since the 1990s, but residents of some communities have had to “greatly increase their expenditure of money and effort to maintain these harvest levels” (Dau 2015a:14-30). This is due in part to having to travel farther, more frequently, and for longer durations to find caribou (Halas 2015). Some communities such as Unalakleet and Noatak have “not met their subsistence needs in many recent years” (Dau 2015a:14-30). This was also expressed by Northwest

Arctic Council members during meetings in October 2015 and March 2016 (NWARAC 2015, NWARAC and NSRAC 2016).

Northwest Arctic Council members reported ongoing concerns about extensive user conflicts in Unit 23 prior to the closure of Federal public lands (NWARAC 2015). Council members have testified that these conflicts have confounded their ability to successfully harvest caribou for subsistence purposes in some areas, and that these conflicts have caused degradation to their subsistence lifestyle through landscape modifications (e.g. abandoned structures and trash; landing strips; ATV trails), herd diversion and positioning (e.g. pushing or scaring caribou with low-flying aircraft for hunting, sightseeing, photography and other purposes; creating camp structures along migratory paths), and hunting of lead caribou. Aircraft activity was of particular concern and includes operations by transporters, guides, “nonlocal” hunters utilizing personal aircraft, and recreational users. Specifically, aircraft in the vicinity of the Squirrel River was cited as particularly problematic (NWARAC 2015).

Effects of the Proposal

If this proposal is adopted, Federally qualified subsistence users would have less opportunity to harvest cow and bull caribou from the WACH, TCH, and CACH due to shorter harvest seasons on Federal public lands in Units 21, 22, 23, 24, 25A, 26A, and 26B. The peak of the caribou harvest from these populations in Units 23, 24, 25A, 26A and 26B occurs during late summer and fall from mid-August to early October. Starting the cow season on October 1 would eliminate September, which has traditionally been a heavily used month by Federally qualified subsistence users (FQSU). Limiting the bull hunt in Unit 22 from July 1 to Oct. 10 will limit the hunt to primarily those caribou that reside there year-round and would reduce flexibility to hunt caribou when they are present. The North Slope Subsistence Regional Advisory Council (NSRAC) discussed the start date following the rut, when changes were made to the caribou regulations in 2016, and they were adamant that bull caribou are edible by early December versus Feb. 1 as proposed by the proponent.

There are some potential benefits to delaying the start of the cow season until October 1 as the more restrictive cow harvest season would allow calves to stay with cows longer in the fall, thus increasing their survival. Also, delaying the hunting season may give cows from the WACH, TCH, and CACH more time to establish their preferred migration routes prior to disturbance from hunters if this is occurring given the current level of hunting activity. This may benefit local subsistence hunters if the caribou establish routes closer to the communities and traditional hunting corridors. However, it should be noted that many caribou will still be in migration, and thus, the possibility of deflecting the herds still exists.

OSM PRELIMINARY CONCLUSION

Oppose Proposal WP18-32.

Justification

Modifying the cow seasons as suggested by the proponent would likely reduce the overall cow harvest and increase calf survival which may lessen the population decline and aid in recovery. However, the changes

proposed for cow and bull seasons would have little effect in reducing deflections of the caribou herds. This is due to the variability of the timing and location of migration patterns between calving, summer, and winter areas of the WACH, TCH, and CACH, the location of communities and their dependence on these caribou, traditional hunting patterns of local subsistence users, and current Federal and State regulations already in place to protect caribou in each unit. In addition to human disturbance, population expansion and contraction, long-term effects of habitat fragmentation, climate change, habitat loss, and industrial development also affect variation in the migratory patterns and seasonal habitat use by the WACH, TCH, and CACH.

Ending the cow caribou season on Feb. 1, which is approximately 2 months before the start of the spring migration, is an unnecessary conservation measure for the protection of migrating caribou although it may help reduce the overall cow harvest. Shortening the start of the bull season is likely to have little impact as most subsistence hunters will not hunt bull caribou in the rut and those that do, for example in Unit 22, would oppose this change (WACH 2016).

For the proposed changes to the cow and bull caribou seasons to be fully effective, similar changes would need to be made to State regulations by the BOG. Rather than seasonal changes to minimize caribou migration deflections over the range of the three herds in seven Game Management Units as suggested by the proponent a more effective approach may be to have local Federal and State land managers in each unit enact short term seasonal hunting restrictions when needed to allow the lead animals to migrate through undisturbed. In response to the declines in the WACH and TCH populations, the BOG and the Board adopted caribou hunting restrictions regulations in 2015 and 2016 to reduce the cow harvest and overall harvest. Recently enacted conservation actions for the WACH, TCH, and CACH need to be given time, to determine if they are effective in reducing the caribou harvest in slowing down or reversing the population declines in the WACH, TCH, and CACH, before additional changes are made to the caribou regulations and to see what effect, if any, they have on the migratory patterns of caribou. Reasons for the OSM Justification are discussed on a unit-specific basis below.

Unit 26B

The primary caribou herd in Unit 26B is the CACH. NFQU are responsible for a majority (89%) of the caribou harvest in Unit 26B. Under State regulations, Unit 26B is divided up into two hunt areas, one in the northwest corner of Unit 26B and Unit 26B remainder. State caribou regulations for the northwestern corner have liberal seasons and harvest limits to support local subsistence users, primarily from Nuiqsut. In response to the recent decline in the CACH population, the State adopted new caribou hunting regulations which eliminated the cow harvest, reduced the harvest from 5 caribou per day to 2 bull caribou for residents, and 1 bull caribou for nonresidents in Unit 26B remainder for 2017/2018. The combination of variable migratory patterns of the CACH from year to year, hunting pressure that is distributed across the landscape, the relatively small percentage of Federal lands, and high use of State lands by NFQU suggest the restricted cow season would have little effect on reducing disturbance to the fall CACH migration across the DHCMA. The newly enacted State regulations for Unit 26B, which will likely reduce the overall CACH caribou harvest and have the greatest effect on reducing harvest pressure and impact to migrating caribou across the DHCMA, need to be given time to determine if they are effective.

The start for the bull season following the rut was discussed extensively by the NSRAC for the previous caribou regulations enacted in 2015 and 2016. The Dec. 10 start date versus the proposed Feb. 1 start date provides more opportunity for FQSU.

Unit 26A

The availability of caribou to local communities in Units 26A is dependent on the seasonal movements of the TCH and WACH. Utqiagvik, Wainwright, and Atkasuk harvest primarily from the TCH and Point Hope, Point Lay, and Anaktuvuk Pass harvest primarily from the WACH. Most of the caribou migration through Unit 26A occurs prior to Oct. 1, the proposed start date for the cow season, and thus would have the desired effect of allowing the caribou to migrate on Federal public lands undisturbed. However, it would also eliminate the prime caribou hunting season for cows from the WACH and TCH, which occurs during the months of August and September. Federally qualified subsistence users would also have less opportunity to harvest caribou if they were restricted to a bull only harvest during August and September. The potential benefit of a later cow season to allow unrestricted migration of the cows from the WACH and TCH does not outweigh the need for FQSU to harvest caribou when they are available.

The start for the bull season following the rut was discussed extensively by the NSRAC for the previous caribou regulations enacted in 2015 and 2016. The Dec. 6 start date following the rut versus the proposed Feb. 1 start date provides more opportunity for FQSU.

Unit 25A (West)

Although caribou in Unit 25A are harvested from three herds (PCH, Forty Mile Herd, and the CACH), the PCH is the primary herd for subsistence users. Arctic Village is the primary subsistence community in Unit 25A. Overlap with the PCH and CACH on the wintering grounds makes it difficult to determine the percentage of harvest from each herd. Although there is lack of data on the CACH harvest and migration in Unit 25A, it is estimated that <10% of the harvest is from the CACH. The PCH is at an all-time high, so sex-specific season restrictions to protect migration of the small proportion of wintering caribou from the CACH are not warranted.

Unit 24

Residents of Anaktuvuk Pass, who are highly dependent on caribou, have expressed concerns that NFQU have been responsible for deflecting WACH from their normal migration routes, thus causing hardship for local users. The closure of caribou hunting in Unit 23 to NFQU during the 2016-2017 regulatory year was perceived as having improved the situation, allowing for historical migration patterns and harvest activities in Anaktuvuk Pass in 2016. Changing the start date to Oct. 1 for the cow season would have the desired effect of allowing the caribou to migrate on Federal public lands undisturbed. However, to be fully effective similar regulations would have to be adopted by the Alaska Board of Game. However, it would also eliminate the prime caribou hunting season for cows from primarily the WACH, and to a lesser extent the TCH, which occurs during the months of August and September. Federally qualified subsistence users would also have less opportunity to harvest caribou if they were restricted to a bull only harvest during August and September. The potential benefit of a later cow season to allow unrestricted migration of the

cows from the WACH and TCH does not outweigh the need for FQSU to harvest caribou when they are available.

Unit 23

A majority of the harvest from the WACH occurs in Unit 23. The start of the cow migration can vary by a month, which adds to the complexity of trying to establish a cow season to protect the migration of the lead cows. Some of the caribou in the northern portion of the unit will have migrated through the Unit by Oct. 1 while many more will still be migrating through the southern portion of Unit 23. In addition, changing the cow season to Oct.1 - Feb.1 would eliminate the month of September which overlaps with the primary hunting period from the WACH of Aug. 25-Oct. 7 (Dau 2015a). Setting the end date for the caribou season as February is two months prior to the start of the spring migration so will have no effect to the migration but may help reduce the overall cow harvest. It also would reduce the opportunity of FQSU to harvest cows by two months compared to the current Federal regulations. Given the seasonal, yearly, and spatial variability during the WACH spring and fall migration, establishment of Oct. 1 as the start date for the cow season in Unit 23 does not meet the proponent's objectives in Unit 23. Additionally, caribou harvest by NFQU is already somewhat reduced due to the 2015 changes to State regulations (e.g. reduction in nonresident harvest limit) (**Figures 9 and 12**).

Unit 22

On average, cows cross the Selawik River during the fall migration around Oct. 15th, so cow caribou would still be migrating on Oct. 1, the proposed start date for the cow season. Restricting the bull season to July 1 - Oct. 10 and Feb. 1 to June 30 would limit the hunt to those caribou that reside year-round. In addition, many of the Federally qualified subsistence users have expressed the need for longer not shorter caribou hunting seasons because of the lack of established migration patterns in this unit and the need to be able to hunt caribou whenever they become available. For example, FQSU in the north typically have access to caribou much earlier than hunters in the southern areas.

Unit 21

The number of cows making it to this unit prior to Oct. 1 is negligible, so the proposed fall date does little to meet the proponent's goal. There is no spring season in Unit 21, so any deflection of lead cow caribou by NFQU is not an issue.

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Appendix A

Regulatory History

Unit 21D

In 1991, the Federal Subsistence Board (Board) adopted Proposal P91-132 with modification to designate new hunt areas in Unit 21D and establish a to-be-announced winter season with a harvest limit of two caribou (FWS 1991).

In 1992, the Board approved Temporary Special Action S92-06 to open a temporary winter season for caribou in Unit 21D north of the Yukon River and east of the Koyukuk River (FWS 1992).

In 2007, the Board adopted Proposal WP07-33, closing Unit 21D north of the Yukon River and east of the Koyukuk River to caribou hunting during the Federal fall season. This was done in order to conserve the declining Galena Mountain Caribou Herd (FWS 2007).

Unit 22

In 1994, the Board adopted Proposal P94-63A with modification to allow snowmachines to be used to take caribou and moose in Unit 22 (OSM 1994a).

In 1996, the Board adopted Proposal P96-049 with modification to provide a customary and traditional use determination for caribou in Unit 22 for rural residents of Unit 21D west of the Koyukuk and Yukon rivers, Units 22 (except St. Lawrence Island), 23, 24. The Proposal also provided a customary and traditional use determination for caribou in Unit 22A for residents of Kotlik, Emmonak, Marshall, Mountain Village, Pilot Station, Pitka's Point, Russian Mission, St. Mary's, Sheldon Point, and Alakanuk (OSM 1996).

In 1997, the Board adopted Proposal P97-54 with modification to add residents of Hooper Bay, Scammon Bay, and Chevak to the customary and traditional use determination for caribou in Unit 22A (OSM 1997).

In 2000, the Board adopted Proposal WP00-53 with modification allowing the use of snowmachines to position a hunter to select individual caribou for harvest in Units 22 and 23. This was done to recognize a customary and traditional practice in the region (OSM 2000a).

In 2002, the ADF&G issued two emergency orders addressing caribou/reindeer conflicts. The first, EO 05-03-02, closed the portion of Unit 22D within the Pilgrim River drainage south of the Pilgrim River bridge to caribou hunting between Aug. 31, 2002 and June 30, 2003. The purpose of this action was to prevent the harvest of reindeer, since no caribou were present in the area during this time. The second, EO 05-04-02, opened this same area to the harvest of caribou from Oct. 17, 2002 through Jun. 30, 2003. This emergency order provided harvest opportunity after caribou had moved into the area (Dau 2005).

In 2003, the Board adopted Proposal WP03-40 with modification to establish a harvest season of July 1-June 30 and a 5 caribou per day harvest limit in portions of Units 22D and 22E. This was done because caribou had expanded their range into these subunits and harvest was not expected to impact the caribou or

reindeer herds, to provide additional subsistence hunting opportunities, and to align State and Federal regulations (OSM 2003).

In 2005, the Alaska Board of Game (BOG) adopted a proposal creating two new hunt areas for caribou in Units 22B and 22D. This proposal also changed the season for these newly described areas to Oct. 1 – Apr. 15.

In 2006, the Board adopted Proposal WP06-37 with modification, which designated a new hunt area in Unit 22B with an open season of Oct. 1-Apr. 30 and a closed season from May 1-Sept. 30 unless opened by a Federal land manager. This was done to prevent incidental take of privately-owned reindeer and to reduce user conflicts (OSM 2006a).

In 2016, the BOG adopted Proposal 140 as amended to make the following changes to Unit 22 caribou regulations: establish a registration permit hunt (RC800), set an annual harvest limit of 20 caribou total, and lengthen cow and bull seasons in several hunt areas.

Unit 23

In 1995, the Board adopted Proposal P95-51 to increase the caribou harvest limit from 5 per day to 15 per day to increase opportunity for subsistence hunters to maximize their hunting when the caribou were available (FWS 1995a).

In 1997, the Board adopted Proposal P97-66 with modification to provide a positive customary and traditional use determination for caribou in Unit 23 for rural residents of Unit 21D west of the Koyukuk and Yukon rivers, Galena, Units 22, 23, 24 including residents of Wiseman, but not other residents of the Dalton Highway Corridor Management Area and Unit 26A (FWS 1995b, 1997b).

In 2000, Board adopted Proposal WP00-53 with modification allowing the use of snowmachines to position and select individual caribou for harvest in Units 22 and 23. This was done to recognize a customary and traditional practice in the region (FWS 2000a).

In 2013, an aerial photocensus indicated significant declines in the TCH (Caribou Trails 2014), WACH (Dau 2011), and the Central Arctic Caribou Herd (CACH) populations. In response, the BOG adopted modified Proposal 202 (RC76) in March 2015 to reduce harvest opportunities for both residents and nonresidents within the range of the WACH and the TCH. These regulation changes – which included lowering bag limits, changing harvest seasons, modifying the hunt area descriptors, and restricting bull and cow harvest and prohibiting calf harvest – were adopted to slow or reverse the population decline.

In 2015, The Board approved Temporary Special Action WSA15-03/04/05/06 with modification to simplify and clarify the regulatory language; maintain the current hunt areas in Units 23; decrease the harvest limit from 15 to 5 caribou per day, shorten the cow and bull seasons and prohibit the harvest of calves and cows with calves in Unit 23 (OSM 2015).

In 2015, the Northwest Arctic Subsistence Regional Advisory Council submitted Temporary Special Action Request WSA16-01 to close caribou hunting on Federal public lands in Unit 23 to non-Federally

qualified users (NFQU) for the 2016/17 regulatory year (OSM 2016a). The Council stated that their request was necessary for conservation purposes but were also needed because nonlocal hunting activities were negatively affecting subsistence harvests. In April 2016, the Board approved WSA16-01, basing its decision on the strong support of the Northwest Arctic and North Slope Councils, public testimony in favor of the request, as well as concerns over conservation and continuation of subsistence uses (FSB 2016).

In June 2016, the State submitted Temporary Special Action Request WSA16-03 to reopen caribou hunting on Federal public lands in Unit 23 to NFQU, providing new biological information (e.g. calf recruitment, weight, body condition) on the WACH. The State specified that there was no biological reason for the closure and that it could increase user conflicts. In January 2017, the Board rejected WSA16-03 due to the position of all four affected Councils (Northwest Arctic, North Slope, Seward Peninsula, and Western Interior Alaska Regional Advisory Councils), public testimony, and Tribal consultation comments opposing the request. Additionally, the Board found the new information provided by the State to be insufficient to rescind the closure (FSB 2017, OSM 2017a).

In January 2017, the BOG adopted Proposal 2, requiring registration permits for residents hunting caribou within the range of the Western Arctic and Teshekpuk herds in Units 22, 23, and 26 a similar proposal was passed for Unit 22 in 2016). ADF&G submitted the proposal in order to better monitor harvest and improve management flexibility (ADF&G 2017a).

Also in January 2017, the BOG rejected Proposal 45, which proposed requiring big game hunting camps to be spaced at least three miles apart along the Noatak, Agashashok, Eli, and Squirrel Rivers. The Noatak/Kivalina & Kotzebue Fish and Game Advisory Committee (AC) submitted the proposal to allow caribou to migrate through those areas with less disruption and barriers. The proposal failed as it would be difficult to enforce.

In March 2017, the Northwest Arctic Subsistence Regional Advisory Council submitted Temporary Special Action Request WSA17-03 to close caribou hunting on Federal public lands in Unit 23 to NFQU for the 2017/18 regulatory year. The Northwest Arctic Subsistence Regional Advisory Council stated that the intent of the proposed closure was to ensure subsistence use in the 2017/18 regulatory year, to protect declining caribou populations, and to reduce user conflicts. In June 2017, the Board approved Temporary Special Action WSA17-03 with modification to close Federal public lands to caribou hunting within a 10 mile wide corridor (5 miles on either side) along a portion of the Noatak River and within the Squirrel River drainage for the 2017/2018 regulatory year. While these closures may help reduce user conflicts along these high use areas, the Board concluded that closure of all Federal public lands to NFQU was not warranted.

Unit 24

In 2000, the Board adopted Proposal P00-44 to expand the hunting area north of the Kanuti River for caribou to allow Federally qualified subsistence users additional opportunities to harvest from the WACH (OSM 2000b). The harvest limit was set at 5 caribou per day with the restriction that cows may not be taken from May 16-June 30 (FWS 2000b). The Board, however, did not change the harvest limit of one

caribou in the southern section of Unit 24B and 24A which was enacted to protect the Ray Mountain Caribou Herd, a small population of about 1,000 animals, on their wintering range (Jandt 1998).

In 2015, The Board approved Temporary Special Action WSA15-03/04/05/06 with modification to shorten the cow and bull seasons and to prohibit the harvest of calves in Unit 24 remainder (OSM 2015).

Unit 25A

In 2010 the Board adopted Proposal WP10-94 with modification to increase the caribou hunting season to year-round and restricted the harvest season to bulls only from May 16- June 30. The increase to a year-round harvest season was in response to increasing trend of the CACH. Restricting the harvest to bulls only during May and June was implemented to protect calving females. The hunt occurs in the area where the CACH winter in Unit 25A (OSM 2010).

Unit 26A and 26B

The Board adopted Proposal P94-82 with modification to allow motor-driven boats and snowmachines to be used to take caribou in Unit 26A and to allow swimming caribou to be taken with a firearm in Unit 26A (OSM 1994b).

In 1995, the Federal Subsistence Board (Board) adopted Proposal P95-64 to increase the harvest limit from 5 caribou per day to 10 caribou per day in Unit 26 to increase opportunity for subsistence hunters (OSM 1995a). The Board also adopted Proposal P95-62 which closed the area east of the Killik River and south of the Colville River to NFQU (OSM 1995b). This closure was enacted to prevent NFQU from harvesting lead animals, which may have caused the migration to move away from the area that local subsistence users hunted in Unit 26A (OSM 1995b).

In 2005, the BOG established a Controlled Use Area for the Anaktuvuk River drainage that prohibited the use of aircraft for caribou hunting from Aug. 15–Oct. 15. The intent of this proposal was to limit access by nonlocal hunters, reduce user conflicts, and lessen the impact on caribou migration.

In 2006, the Board adopted Proposal WP06-65 which opened the area east of the Killik River and south of the Colville River to NFQU (OSM 2006b). The 1995 closure was lifted for several reasons. First, due to changes in land status, lands formerly managed by BLM were transferred to Alaska Native corporations or the State pursuant to the Alaska Native Claims Settlement Act or the Statehood Act, respectively. However, only the lands east of Anaktuvuk Pass were affected by the closure, making the closure less effective. Second, the WACH, TCH, and CACH populations, which traverse Unit 26A, were healthy and could support both subsistence and non–subsistence uses.

In 2013, an aerial photocensus indicated significant declines in the TCH (Caribou Trails 2014), WACH (Dau 2011), and possibly the CACH (Caribou Trails 2014). In response, the BOG adopted modified Proposal 202 (RC76) in March 2015 to reduce harvest opportunities for both residents and non-residents within the range of the WACH and the TCH. These regulation changes, which included lower bag limits, changes to harvest seasons, modification of hunt areas, restrictions on bull and cow harvest and a

prohibition on calf harvest, were adopted to slow or reverse the population decline. These regulatory changes, which were the result of extensive discussion and compromise among a variety of user groups, took effect on July 1, 2015.

In an effort to enact conservation measures the North Slope Subsistence Regional Advisory Council submitted four temporary wildlife special actions (WSA) for Units 23, 24, 26A, and 26B to change caribou harvest regulations on Federal public lands for the 2015/16 regulatory year. The Board approved Temporary Special Actions WSA15-03/04/05/06, which were similar to the changes made to State regulations in an attempt to reverse or slow the decline of the WACH and TCH. To address two primary factors contributing to the decline, low calf survival and high adult cow mortality, WSA15-03/04/05/06 prohibited the harvest of cows with calves, prohibited the harvest of calves, and reduced the harvest limit from 10 to 5 caribou per day, and shortened the cow and bull seasons in Unit 26A. Compared to the new State caribou regulations, it requested 3 additional weeks to the bull harvest season (Dec. 6- Dec. 31). In Unit 26B WSA15-03/04/05/06 reduced the harvest limit from 10 to 5 caribou and shortened the cow and bull seasons (OSM 2015).

Changes to caribou regulations in 2015 by the State Board of Game and the Federal Subsistence Board represented the first time in over 30 years that major changes to the harvest regulations were implemented for the WACH and TCH. These restrictions for the WACH were also supported by management recommendations outlined in the Western Arctic Herd Management Plan (WACH Working Group 2011). The intent of these regulations was to reduce the overall harvest and cow mortality to allow the WACH and TCH populations to recover. In 2015, three proposals were submitted for the 2016-2018 wildlife regulatory cycle concerning caribou regulations in Unit 26A and 26B, two from the North Slope Subsistence Regional Advisory Council (WP16-63 and WP16-64) and one from Jack Reakoff (WP16-37). The Board adopted WP16-37 with modification and took no action on WP16-63/64 based on action taken on WP16-37 (OSM 2016b). Changes to the 2016-2018 Federal regulations in Unit 26A included a reduction from ten to five caribou per day harvest limit, splitting Unit 26A into two hunt areas based on range and migration patterns of the WACH and TCH, selecting the opening date for bulls in the winter season as December 6, a prohibition on the take of calves, and protection of cows with calves from July 16-Oct. 15. Changes to caribou regulations in Unit 26B which include harvest from the CACH were: a reduced harvest limit from ten to five caribou per day; splitting Unit 26B into two hunt areas, one south of 69°30' N. lat. west of the Dalton Highway and 26B remainder; a restricted cow season from July to April/May; and a reduction in the cow and bull seasons.

In February 2017, in response to the decline in the CACH, the BOG adopted Proposal 105 (RC22) with amendments to reduce overall caribou harvest from 930 to 680 and the cow harvest from 202 to 75 in Unit 26B (Lenart 2017a).

In March 2017, the Norwest Arctic and North Slope Subsistence Regional Advisory Councils submitted Temporary Special Action Requests WSA17-03, and WSA-04, to close caribou hunting on Federal public lands in Unit 23 and in Units 26A and 26B, respectively to NFQU for the 2017/18 regulatory year. Both Councils stated that the intent of the proposed closures was to ensure continuation of subsistence uses in the 2017/18 regulatory year, to protect declining caribou populations, and to reduce user conflicts. In June

2017, the Board approved Temporary Special Action WSA17-03 with modification to close Federal public lands to caribou hunting within a 10 mile wide corridor (5 miles on either side) along a portion of the Noatak River; within the Squirrel River drainage; and within the northern and southern boundaries of the Eli and Agashashok River drainages; for the 2017/2018 regulatory year. While these closures may help reduce user conflicts along these high use areas, the Board concluded that closure of all Federal public lands to NFQU was not warranted at that time.

In June 2017, the Board rejected WSA17-04 for a variety of reasons including: 1) the relatively small cow harvest by NFQU in Unit 26A; 2) the need for adequate time to determine if the recently enacted conservation actions for WACH, TCH, and CACH are effective in reducing the caribou harvest and reversing or slowing down the population declines; 3) the closure of Federal public lands in Unit 26A would likely shift hunters to State lands around Anaktuvuk Pass; 4) closure of Federal public lands in Unit 26B, which makes up only about 30% of the unit, is not likely to have as much effect as recent BOG regulations to protect the CACH; and 5) a reduction in hunting pressure along the Dalton Highway Corridor Management Area (DHCMA), which is thought to affect the migration of the CACH, is unlikely to be effective, as most NFQU will use the DHCMA to access adjacent State lands.

WP18–48/49 Executive Summary	
General Description	<p>Proposal WP18-48/49 requests that Federal reporting requirements for caribou in Units 22, 23, and 26A be aligned with the State’s registration permit requirements. <i>Submitted by: Western Arctic Caribou Herd Working Group and Louis Cusack.</i></p>
Proposed Regulation	<p>Unit 22—Caribou</p> <p><i>Unit 22B—that portion west of Golovnin Bay and west of a line along the west bank of the Fish and Niukluk Rivers to the mouth of the Libby River, and excluding all portions of the Niukluk River drainage upstream from and including the Libby River drainage—5 caribou per day by State registration permit. Calves may not be taken</i> <i>Oct. 1-Apr. 30. May 1-Sep. 30, a season may be announced.</i></p> <p><i>Units 22A—that portion north of the Golsovia River drainage, 22B remainder, that portion of Unit 22D in the Kuzitrin River drainage (excluding the Pilgrim River drainage), and the Agiapuk River drainages, including the tributaries, and Unit 22E—that portion east of and including the Tin Creek drainage—5 caribou per day by State registration permit. Calves may not be taken</i> <i>July 1-June 30.</i></p> <p><i>Unit 22A, remainder—5 caribou per day by State registration permit. Calves may not be taken</i> <i>July 1-June 30, season may be announced.</i></p> <p><i>Unit 22D, that portion in the Pilgrim River drainage—5 caribou per day by State registration permit. Calves may not be taken</i> <i>Oct. 1-Apr. 30. May 1-Sep. 30, season may be announced.</i></p> <p><i>Units 22C, 22D remainder, 22E remainder—5 caribou per day by State registration permit. Calves may not be taken</i> <i>July 1-June 30, season may be announced</i></p>

WP18-48/49 Executive Summary

Unit 23—Caribou

*Unit 23—that portion which includes all drainages north and west of, and including, the Singoalik River drainage—5 caribou per day as follows **by State registration permit**: Calves may not be taken*

Bulls may be harvested

July 1-Oct. 14.

Feb. 1-June 30.

Cows may be harvested. However, cows accompanied by calves may not be taken July 15-Oct. 14

July 15-Apr. 30.

*Unit 23, remainder—5 caribou per day, as follows **by State registration permit**: Calves may not be taken.*

Bulls may be harvested

July 1-Oct. 14.

Feb. 1-June 30.

Cows may be harvested. However, cows accompanied by calves may not be taken July 31-Oct. 14

July 31-Mar. 31

Unit 26A—Caribou

*Unit 26A—that portion of the Colville River drainage upstream from the Anaktuvuk River, and drainages of the Chukchi Sea south and west of, and including the Utukok River drainage—5 caribou per day as follows **by State registration permit**: Calves may not be taken.*

Bulls may be harvested

July 1-Oct. 14.

Dec. 6-June 30.

Cows may be harvested; however, cows accompanied by calves may not be taken July 16-Oct. 15

July 16-Mar. 15.

*Unit 26A remainder—5 caribou per day as follows **by State registration permit**: Calves may*

WP18–48/49 Executive Summary	
	<p><i>not be taken.</i></p> <p><i>Bulls may be harvested</i> <i>July 1-Oct. 15.</i> <i>Dec. 6-June 30.</i></p> <p><i>Up to 3 cows per day may be harvested; however,</i> <i>July 16-Mar. 15.</i> <i>cows accompanied by calves may not be taken</i> <i>July 16-Oct. 15</i></p> <p><i>You may not transport more than 5 caribou per regulatory year from Unit 26 except to the community of Anaktuvuk Pass</i></p>
OSM Preliminary Conclusion	Support Proposal WP18-48; and Take No Action on Proposal WP18-49.
Southeast Alaska Subsistence Regional Advisory Council Recommendation	
Southcentral Alaska Subsistence Regional Advisory Council Recommendation	
Kodiak/Aleutians Subsistence Regional Advisory Council Recommendation	
Bristol Bay Subsistence Regional Advisory Council Recommendation	
Yukon-Kuskokwim Delta Subsistence Regional Advisory Council Recommendation	
Western Interior Alaska Subsistence Regional Advisory Council	

WP18–48/49 Executive Summary	
Recommendation	
Seward Peninsula Subsistence Regional Advisory Council Recommendation	
Northwest Arctic Subsistence Regional Advisory Council Recommendation	
Eastern Interior Alaska Subsistence Regional Advisory Council Recommendation	
North Slope Subsistence Regional Advisory Council Recommendation	
Interagency Staff Committee Comments	
ADF&G Comments	
Written Public Comments	None

**DRAFT STAFF ANALYSIS
WP18-48/49**

ISSUES

Proposal WP18-48, submitted by the Western Arctic Caribou Herd Working Group (WACH Working Group) and Proposal WP18-49, submitted by Louis Cusack, requests that Federal reporting requirements for caribou in Units 22, 23, and 26A be aligned with the State's registration permit requirements.

DISCUSSION

The WACH Working Group recognizes the registration permit hunt as a useful tool to monitor harvest and inform herd management, which is particularly important given the WACH population decline.

Mr. Cusack states that the intent of Proposal WP18-49 is to improve harvest data, herd management, and opportunity for all hunters. The proponent states that registration permits will help managers make sound decisions and determine the best means to curtail the current caribou population declines without taking more drastic measures. The proponent notes that given the current population decline, the impact of hunting on the WACH, and the inaccuracy of present harvest estimation methods for local harvest, more accurate reporting of both total harvest and composition of the harvest are needed. The proponent states that given the mix of Federal and non-Federal lands in these units, caribou hunting would be very cumbersome and confusing to manage under different Federal and State reporting requirements. The proponent references several reports to support the need for more accurate harvest reporting. He also notes that all users should be willing to work together in order to protect important natural resources.

Existing Federal Regulations

Unit 22—Caribou

Unit 22B—that portion west of Golovnin Bay and west of a line along the west bank of the Fish and Niukluk Rivers to the mouth of the Libby River, and excluding all portions of the Niukluk River drainage upstream from and including the Libby River drainage—5 caribou per day. Calves may not be taken Oct. 1-Apr. 30. May 1-Sep. 30, a season may be announced.

Units 22A—that portion north of the Golsovia River drainage, 22B remainder, that portion of Unit 22D in the Kuzitrin River drainage (excluding the Pilgrim River drainage), and the Agiapuk River drainages, including the tributaries, and Unit 22E—that portion east of and including the Tin Creek drainage—5 caribou per day. Calves may not be taken July 1-June 30.

Unit 22A, remainder—5 caribou per day. Calves may not be taken *July 1-June 30, season may be announced.*

Unit 22D, that portion in the Pilgrim River drainage—5 caribou per day. Calves may not be taken *Oct. 1-Apr. 30.
May 1-Sep. 30, season may be announced.*

Units 22C, 22D remainder, 22E remainder—5 caribou per day. Calves may not be taken *July 1-June 30, season may be announced*

Unit 23—Caribou

Unit 23—that portion which includes all drainages north and west of, and including, the Singoalik River drainage—5 caribou per day as follows: Calves may not be taken

Bulls may be harvested *July 1-Oct. 14.
Feb. 1-June 30.*

Cows may be harvested. However, cows accompanied by calves may not be taken July 15-Oct. 14 *July 15-Apr. 30.*

Unit 23, remainder—5 caribou per day, as follows: Calves may not be taken.

Bulls may be harvested *July 1-Oct. 14.
Feb. 1-June 30.*

Cows may be harvested. However, cows accompanied by calves may not be taken July 31-Oct. 14 *July 31-Mar. 31*

Unit 26A—Caribou

Unit 26A—that portion of the Colville River drainage upstream from the Anaktuvuk River, and drainages of the Chukchi Sea south and west of, and including the Utukok River drainage—5 caribou per day as follows: Calves may not be taken.

Bulls may be harvested *July 1-Oct. 14.
Dec. 6-June 30.*

Cows may be harvested; however, cows accompanied by calves may not be taken July 16-Oct. 15 *July 16-Mar. 15.*

Unit 26A remainder—5 caribou per day as follows: Calves may not be taken.

Bulls may be harvested July 1-Oct. 15.
Dec. 6-June 30.
Up to 3 cows per day may be harvested; however, cows accompanied by calves may not be taken July 16-Oct. 15

Proposed Federal Regulations

Unit 22—Caribou

Unit 22B—that portion west of Golovnin Bay and west of a line along the west bank of the Fish and Niukluk Rivers to the mouth of the Libby River, and excluding all portions of the Niukluk River drainage upstream from and including the Libby River drainage—5 caribou per day by State registration permit. Calves may not be taken Oct. 1-Apr. 30.
May 1-Sep. 30, a season may be announced.

Units 22A—that portion north of the Golsovia River drainage, 22B remainder, that portion of Unit 22D in the Kuzitrin River drainage (excluding the Pilgrim River drainage), and the Agiapuk River drainages, including the tributaries, and Unit 22E—that portion east of and including the Tin Creek drainage—5 caribou per day by State registration permit. Calves may not be taken July 1-June 30.

Unit 22A, remainder—5 caribou per day by State registration permit. Calves may not be taken July 1-June 30, season may be announced.

Unit 22D, that portion in the Pilgrim River drainage—5 caribou per day by State registration permit. Calves may not be taken Oct. 1-Apr. 30.
May 1-Sep. 30, season may be announced.

Units 22C, 22D remainder, 22E remainder—5 caribou per day by State registration permit. Calves may not be taken July 1-June 30, season may be announced

Unit 23—Caribou

Unit 23—that portion which includes all drainages north and west of, and including, the Singoalik River drainage—5 caribou per day as follows by State registration permit: Calves may not be taken

Bulls may be harvested July 1-Oct. 14.
Feb. 1-June 30.

Cows may be harvested. However, cows accompanied by calves may not be taken July 15-Apr. 30.
July 15-Oct. 14

Unit 23, remainder—5 caribou per day, as follows by State registration permit: Calves may not be taken.

Bulls may be harvested July 1-Oct. 14.
Feb. 1-June 30.

Cows may be harvested. However, cows accompanied by calves may not be taken July 31-Mar. 31
July 31-Oct. 14

Unit 26A—Caribou

Unit 26A—that portion of the Colville River drainage upstream from the Anaktuvuk River, and drainages of the Chukchi Sea south and west of, and including the Utukok River drainage—5 caribou per day as follows by State registration permit: Calves may not be taken.

Bulls may be harvested July 1-Oct. 14.
Dec. 6-June 30.

Cows may be harvested; however, cows accompanied by calves may not be taken July 16-Mar. 15.
July 16-Oct. 15

Unit 26A remainder—5 caribou per day as follows by State registration permit: Calves may not be taken.

Bulls may be harvested July 1-Oct. 15.
Dec. 6-June 30.

Up to 3 cows per day may be harvested; however, cows accompanied by calves may not be taken July 16-Mar. 15.
July 16-Oct. 15

You may not transport more than 5 caribou per regulatory year from Unit 26 except to the community of Anaktuvuk Pass

Existing State Regulations

Unit 22—Caribou

22A, north of the Golsovia River drainage	Residents—Twenty caribou total, up to 5 per day; however, calves may not be taken. Permit available online at http://hunt.alaska.gov or in person at Nome ADF&G, and license vendors within Unit 22 beginning June 15	Bulls	RC800	no closed season
		Cows	RC800	July 1-Mar. 31
	Nonresidents—one bull; however, calves may not be taken		HT	Aug. 1-Sept. 30
22A remainder	Residents—Twenty caribou total, up to 5 per day; however, calves may not be taken, bulls may not be taken Oct 15-Jan 31, and cows may not be taken Apr 1-Aug 31. Permit available online at http://hunt.alaska.gov or in person at Nome ADF&G, and license vendors within Unit 22 beginning June 15		RC800	May be announced
	Nonresidents—one bull; however, calves may not be taken		HT	May be announced
Unit 22B, west of Golovnin Bay, west of the west banks of Fish and Niukluk rivers below the Libby river (excluding the Libby River drainage and Niukluk River drainage above the mouth of the Libby River)	Residents—Twenty caribou total, up to 5 per day; however, calves may not be taken. Permit available online at http://hunt.alaska.gov or in person at Nome ADF&G, and license vendors within Unit 22 beginning June 15	Bulls	RC800	Oct. 1-Apr. 30
		Cows	RC800	Oct. 1-Mar. 31
	Residents- Twenty caribou total, up to 5 per day; however, calves may not be taken, and bulls may not be taken Oct 15-Jan 31, and cows may not be taken Apr 1-Aug 31. Permit available online at http://hunt.alaska.gov or in person at Nome ADF&G, and license vendors within Unit 22 beginning June 15		RC800	may be announced
	Nonresidents: one bull; however, calves may not be taken		HT	may be announced

22B remainder	Residents—Twenty caribou total, up to 5 per day; however, calves may not be taken. Permit available online at http://hunt.alaska.gov or in person at Nome ADF&G, and license vendors within Unit 22 beginning June 15	Bulls	RC800	no closed season
		Cows	RC800	July. 1-Mar. 31.
	Nonresidents—one bull; however, calves may not be taken		HT	Aug. 1-Sept. 30
22C	Residents—Twenty caribou total, up to 5 per day; however, calves may not be taken, bulls may not be taken Oct 15-Jan 31, and cows may not be taken Apr 1-Aug 31. Permit available online at http://hunt.alaska.gov or in person at Nome ADF&G, and license vendors within Unit 22 beginning June 15		RC800	May be announced
	Nonresidents—one bull; however, calves may not be taken		HT	May be announced
22D Pilgrim River drainage	Residents—Twenty caribou total, up to 5 per day; however, calves may not be taken. Permit available online at http://hunt.alaska.gov or in person at Nome ADF&G, and license vendors within Unit 22 beginning June 15	Bulls	RC800	Oct. 1-Apr. 30
		Cows	RC800	Oct. 1-Mar. 31
	Residents- Twenty caribou total, up to 5 per day; however, calves may not be taken, and bulls may not be taken Oct 15-Jan 31, and cows may not be taken Apr 1-Aug 31. Permit available online at http://hunt.alaska.gov or in person at Nome ADF&G, and license vendors within Unit 22 beginning June 15		RC800	may be announced
	Nonresidents: one bull; however, calves may not be taken		HT	may be announced

22D, in the Kuzitrin River drainage (excluding the Pilgrim River drainage) and the Agiapuk river drainage	Residents—Twenty caribou total, up to 5 per day; however, calves may not be taken. Permit available online at http://hunt.alaska.gov or in person at Nome ADF&G, and license vendors within Unit 22 beginning June 15	Bulls	RC800	no closed season
	Nonresidents—one bull; however, calves may not be taken		HT	Aug. 1-Sept. 30
22D remainder	Residents—Twenty caribou total, up to 5 per day; however, calves may not be taken, bulls may not be taken Oct 15-Jan 31, and cows may not be taken Apr 1-Aug 31. Permit available online at http://hunt.alaska.gov or in person at Nome ADF&G, and license vendors within Unit 22 beginning June 15		RC800	May be announced
	Nonresidents—one bull; however, calves may not be taken		HT	May be announced
22E, east of and including the Sanaguich River drainage	Residents—Twenty caribou total, up to 5 per day; however, calves may not be taken. Permit available online at http://hunt.alaska.gov or in person at Nome ADF&G, and license vendors within Unit 22 beginning June 15	Bulls	RC800	no closed season
	Nonresidents—one bull; however, calves may not be taken		HT	Aug. 1-Sept. 30
22E remainder	Residents—Twenty caribou total, up to 5 per day; however, calves may not be taken, bulls may not be taken Oct 15-Jan 31, and cows may not be taken Apr 1-Aug 31. Permit available online at http://hunt.alaska.gov or in person at Nome ADF&G, and license vendors within Unit 22 beginning June 15		RC800	May be announced
	Nonresidents—one bull; however, calves may not be taken		HT	May be announced

Unit 23—Caribou

<i>23, north of and including Singoalik River drainage</i>	<i>Residents—Five caribou per day; however, calves may not be taken.</i>	<i>Bulls</i>	<i>RC907</i>	<i>July 1-Oct. 14 Feb. 1-June 30</i>
		<i>Cows</i>	<i>RC907</i>	<i>Jul. 15-Apr. 30</i>
	<i>Nonresidents—One bull; however, calves may not be taken</i>		<i>HT</i>	<i>Aug. 1-Sept. 30</i>
<i>23 remainder</i>	<i>Residents—Five caribou per day; however, calves may not be taken.</i>	<i>Bulls</i>	<i>RC907</i>	<i>July 1-Oct. 14 Feb. 1-June 30</i>
		<i>Cows</i>	<i>RC907</i>	<i>Sept. 1-Mar. 31</i>
	<i>Nonresidents—One bull; however, calves may not be taken</i>		<i>HT</i>	<i>Aug. 1-Sept. 30</i>

Unit 26—Caribou

<i>26A, the Colville River drainage upstream from the Anaktuvuk River, and drainages of the Chukchi Sea south and west of, and including the Utukok River drainage</i>	<i>Residents—Five caribou per day; however, calves may not be taken.</i>	<i>Bulls</i>	<i>RC907</i>	<i>July 1-Oct. 14 Feb. 1-June 30</i>
		<i>Cows</i>	<i>RC907</i>	<i>Jul. 15-Apr. 30</i>
	<i>Nonresidents—One bull; however, calves may not be taken</i>		<i>HT</i>	<i>July 15-Sept. 30</i>
<i>26A, Remainder</i>	<i>Residents—Five bulls per day; however, calves may not be taken;</i>		<i>RC907</i>	<i>July 1-July 15 Mar. 16-June 30</i>
	<i>Five caribou per day three of which may be cows; calves may not be taken, and cows with calves may not be taken</i>		<i>RC907</i>	<i>July 16-Oct. 15</i>
	<i>Three cows per day however, calves may not be taken</i>		<i>RC907</i>	<i>Oct. 16-Dec. 31</i>
	<i>Five caribou per day three of which may be cows; calves may not be taken</i>		<i>RC907</i>	<i>Jan. 1-Mar. 15</i>

Nonresidents—One bull however, calves may not be taken HT July 15-Sept. 30

Extent of Federal Public Lands

Federal public lands comprise approximately 43% of Unit 22 and consist of 28% Bureau of Land Management (BLM) managed lands, 12% National Park Service (NPS) managed lands, and 3% U.S. Fish and Wildlife Service (USFWS) managed lands.

Federal public lands comprise approximately 71% of Unit 23 and consist of 40% NPS managed lands, 22% BLM managed lands, and 9% USFWS managed lands.

Federal public lands comprise approximately 73% of Unit 26A and consist of 66% BLM managed lands and 7% NPS managed lands.

Customary and Traditional Use Determinations

Residents of Units 21D west of the Koyukuk and Yukon Rivers, 22 (except residents of St. Lawrence Island), 23, 24, Kotlik, Emmonak, Hooper Bay, Scammon Bay, Chevak, Marshall, Mountain Village, Pilot Station, Pitka's Point, Russian Mission, St. Marys, Nunam Iqua, and Alakanuk have a customary and traditional use determination for caribou in Unit 22A.

Residents of Units 21D west of the Koyukuk and Yukon Rivers, 22 (excluding residents of St. Lawrence Island), 23, and 24 have a customary and traditional use determination for caribou in Unit 22 remainder.

Residents of Unit 21D west of the Koyukuk and Yukon Rivers, Galena, 22, 23, 24 including residents of Wiseman but not including other residents of the Dalton Highway Corridor Management Area, and 26A have a customary and traditional use determination for caribou in Unit 23.

Residents of Unit 26, Anaktuvuk Pass, and Point Hope have customary and traditional use determination for caribou in Unit 26A.

Regulatory History

In 1984, the Alaska Department of Fish and Game (ADF&G) changed harvest reporting requirements for individuals hunting caribou north of the Yukon River. Instead of a standard harvest ticket and report, individuals were required to register with ADF&G (at specified vendors) and then return a harvest report form that was mailed to them by ADF&G later in the season (Georgette 1994). In 1989, harvest tickets were once again required for individuals living south (but hunting caribou north) of the Yukon River while the hunter registration system was retained for individuals living and hunting caribou north of the Yukon River (Georgette 1994).

In 1990, the Federal caribou hunting seasons in Units 22A, 22B, 23, and 26A were open year round with a 5 caribou/day harvest limit and a restriction on the take of cows May 16-June 30. There was no open caribou season in Units 22C, 22D, and 22E.

In 1994, the Federal Subsistence Board (Board) adopted Proposal P94-63A with modification to allow snowmachines to be used to take caribou and moose in Unit 22. The Board also adopted Proposal P94-82 with modification to allow motor-driven boats and snowmachines to be used to take caribou in Unit 26 and to allow swimming caribou to be taken with a firearm using rimfire cartridges in Unit 26. (Swimming caribou could be taken with a firearm using rimfire cartridges in Unit 23 since 1990).

In 1995, the Board adopted Proposal P95-51 to increase the caribou harvest limit in Unit 23 from 5 to 15 caribou per day so that subsistence hunters could maximize their hunting efforts when caribou were available. The Board also adopted Proposal P95-64 to increase the harvest limit from 5 caribou per day to 10 caribou per day in Unit 26 to increase harvest opportunity for subsistence hunters. The Board also adopted Proposal P95-62 which closed the area east of the Killik River and south of the Colville River to caribou hunting by non-Federally qualified users from Aug. 1-Sept. 30. This closure was enacted to prevent non-Federally qualified users from harvesting lead animals, which may have caused the migration to move away from the area that local subsistence users hunted in Unit 26A.

In 1996, the Board adopted Proposal P96-049 with modification to provide a customary and traditional use determination for caribou in Unit 22 for rural residents of Unit 21D west of the Koyukuk and Yukon rivers, and Units 22 (except St. Lawrence Island), 23, and 24. The proposal also provided a customary and traditional use determination for caribou in Unit 22A for residents of Kotlik, Emmonak, Marshall, Mountain Village, Pilot Station, Pitka's Point, Russian Mission, St. Mary's, Sheldon Point, and Alakanuk.

In 1997, the Board adopted Proposal P97-54 with modification to add residents of Hooper Bay, Scammon Bay, and Chevak to the customary and traditional use determination for caribou in Unit 22A.

In 1997, the Board adopted Proposal P97-66 with modification to provide a customary and traditional use determination for caribou in Unit 23 for rural residents of Unit 21D west of the Koyukuk and Yukon rivers, Galena, Units 22, 23, 24 including residents of Wiseman, but not other residents of the Dalton Highway Corridor Management Area and Unit 26A.

In 2000, the Board adopted Proposal WP00-53 with modification allowing the use of snowmachines to position a hunter to select individual caribou for harvest in Units 22 and 23. This was done to recognize a customary and traditional practice in the region.

In 2003, the Board adopted Proposal WP03-40 with modification to establish a harvest season of July 1-June 30 and a 5 caribou per day harvest limit in portions of Units 22D and 22E. This was done because caribou had expanded their range into these subunits and harvest was not expected to impact the caribou or reindeer herds, to provide additional subsistence hunting opportunities, and to align State and Federal regulations.

In 2006, the Board adopted Proposal WP06-37 with modification, which designated a new hunt area in Unit 22B with an open season of Oct. 1-Apr. 30 and a closed season from May 1-Sept. 30 unless opened by a Federal land manager. This was done to prevent incidental take of privately-owned reindeer and to reduce user conflicts.

Also in 2006, the Board adopted Proposal WP06-65 which opened the area east of the Killik River and south of the Colville River to non-Federally qualified users. The 1995 closure was lifted for several reasons. First, due to changes in land status, lands formerly managed by BLM were transferred to Alaska Native corporations or the State pursuant to the Alaska Native Claims Settlement Act or the Statehood Act, respectively. After these land transfers, only lands east of Anaktuvuk Pass were affected by the closure, making the closure less effective. Second, the population was at a point where it could support both subsistence and non–subsistence uses.

In 2013, an aerial photo census indicated significant declines in the Teshekpuk Caribou Herd (TCH), WACH, and possibly the Central Arctic Caribou Herd (CACH) populations (Caribou Trails 2014). In response, the Alaska Board of Game (BOG) adopted modified Proposal 202 (RC76) in March 2015 to reduce harvest opportunities for both Alaska residents and nonresidents within the range of the WACH and the TCH, including Units 22, 23, and 26A. These regulation changes – which included lowering bag limits for nonresidents from two caribou to one bull, reductions in bull and cow season lengths, the establishment of new hunt areas, and prohibiting calf harvest – were adopted to slow or reverse the population decline.

In 2015, two special actions, WSA15-03/05, requesting changes to caribou regulations in Units 23 and 26A, were submitted by the North Slope Subsistence Regional Advisory Council (North Slope Council). Temporary Special Action WSA15-03 requested designation of a new hunt area for caribou in the northwest corner of Unit 23 where the harvest limit would be reduced from 15 to 5 caribou per day, the harvest season would be shortened for bulls and cows, and the take of calves would be prohibited. Temporary Special Action WSA15-05, requested that the bull caribou harvest limit in Unit 26A be reduced from 10 caribou per day to 5 caribou per day, the cow harvest limit be reduced to 3 per day, the harvest seasons for bulls and cows be reduced, and the take of calves and cows with calves be prohibited. Compared to the new State caribou regulations, it requested 3 additional weeks to the bull harvest season (Dec. 6- Dec. 31).

The Board approved Temporary Special Actions WSA15-03/04/05/06 with modification to simplify and clarify the regulatory language; maintain the current hunt areas in Units 23; decrease the harvest limit from 15 to 5 caribou per day and shorten the cow and bull seasons throughout Unit 23; prohibit the harvest of cows with calves throughout the affected units; and reduce the harvest limit in Unit 26B remainder from 10 to 5 caribou per day and shorten the season. These special actions took effect on July 1, 2015. These State and Federal regulatory changes in 2015 were the first time that harvest restrictions had been implemented for the WACH in over 30 years.

In 2015, the Northwest Arctic Subsistence Regional Advisory Council (Northwest Arctic Council) submitted a temporary special action request (WSA16-01) to close caribou hunting on Federal public lands in Unit 23 to non-Federally qualified users for the 2016/17 regulatory year. The Council stated that its request was necessary for conservation purposes but also needed because nonlocal hunting activities were negatively affecting subsistence harvests. In April 2016, the Board approved WSA16-01, basing its decision on the strong support of the Northwest Arctic and North Slope Councils, public testimony in favor of the request, as well as concerns over conservation and continuation of subsistence uses.

Six proposals (WP16-37, WP16-48, WP16-49/52, WP16-61, and WP16-63) concerning caribou regulations in Units 22, 23, and 26A were submitted to the Board for the 2016-2018 wildlife regulatory cycle. In April 2016, the Board adopted WP16-48 with modification to allow the positioning of a caribou, wolf, or wolverine for harvest in Unit 23 on BLM lands only. Proposal WP16-37 requested that Federal caribou regulations mirror the new State regulations across the ranges of the WACH and TCH (Units 21D, 22, 23, 24, 26A, and 26B). The Board adopted Proposal WP16-37 with modification to reduce the harvest limit to 5 caribou per day, restrict bull season during rut and cow season around calving, prohibit the harvest of calves and the harvest of cows with calves before weaning (mid-Oct.) in some areas, to create new hunt areas, and to establish new seasons in Unit 22. The Board took no action on the remaining proposals (WP16-49/52, WP16-61, and WP16-63) because of action taken on WP16-37.

In 2016, the BOG adopted Proposal 140 as amended to make the following changes to Unit 22 caribou regulations: establish a registration permit hunt (RC800), set an annual harvest limit of 20 caribou total, and lengthen cow and bull seasons in several hunt areas. The BOG also adopted a portion of Proposal 85, removing the caribou harvest ticket and report exception for residents living north of the Yukon River in Units 21, 24, 25, 26B, and 26C. The Board deferred Proposal 85 for the remaining units (Units 18, 22, 23, and 26A) to the Arctic/Western Region meeting in Jan. 2017.

In June 2016, the State submitted a special action request (WSA16-03) to reopen caribou hunting on Federal public lands in Unit 23 to non-Federally qualified users, providing new biological information (e.g. calf recruitment, weight, body condition) on the WACH. The State specified that there was no biological reason for the closure and that it could increase user conflicts. In January 2017, the Board rejected WSA16-03 due to the position of all four affected Councils (Northwest Arctic, North Slope, Seward Peninsula, and Western Interior) as well as public testimony and tribal consultation comments opposing the request. Additionally, the Board found the new information provided by the State to be insufficient to rescind the closure.

In January 2017, the BOG adopted Proposal 2, requiring registration permits for residents hunting caribou within the ranges of the WACH and TCH in Units 23 and 26. ADF&G submitted the proposal in order to better monitor harvest and improve management flexibility. The BOG rejected Proposal 3 (deferred Proposal 85 from 2016) due to action taken on Proposal 2.

In March 2017, the Northwest Arctic and North Slope Councils submitted temporary special action requests (WSA17-03 and -04, respectively) to close caribou hunting on Federal public lands in Unit 23 and in Units 26A and 26B, respectively, to non-Federally qualified users for the 2017/18 regulatory year. Both Councils stated that the intent of the proposed closures was to ensure subsistence use in the 2017/18 reg-

ulatory year, to protect declining caribou populations, and to reduce user conflicts. The Board voted to approve WSA17-03 with modification to close all Federal public lands within a 10 mile wide corridor (5 miles either side) along the Noatak River from the western boundary of Noatak National Preserve upstream to the confluence with the Cutler River; within the northern and southern boundaries of the Eli and Agashashok River drainages, respectively; and within the Squirrel River drainage, to caribou hunting except by Federally qualified subsistence users for the 2017/18 regulatory year. The Board considered the modification a reasonable compromise for all users and that closure of the specified area was warranted in order to continue subsistence use. The Board rejected WSA17-04 due to recent changes to State regulations that should reduce caribou harvest.

Current Events

Several proposals concerning Federal caribou harvest regulations in Units 23 and 26A were submitted for the 2018-2020 wildlife regulatory cycle (WP18-32, 45, 46/47, and 57). At the WACH Working Group meeting in December 2016, the group voted to submit two wildlife proposals. Proposal WP18-46 is to close Federal public lands in Unit 23 to caribou hunting by non-Federally qualified users. It also voted to submit this proposal (WP18-48).

At the Western Interior Council meeting in February 2017, the Council voted to submit Proposal WP18-32 to align caribou seasons across the ranges of the WACH, TCH, and CACH. The intent of this proposal is to protect cows during migration. The Council expressed its intent to submit a similar proposal to the BOG.

At the Northwest Arctic Council meeting in March 2017, the Council voted to submit Proposal WP18-45 to decrease the caribou harvest limit in Unit 23 from 5 to 3 caribou per day.

At the North Slope Council meeting in March 2017, the Council voted to submit Proposal WP18-57 to close Federal public lands to caribou hunting by non-Federally qualified users in Units 26A and 26B (similar to WSA17-04). This is in response to declines in the WACH, TCH, and CACH, which are seasonally present in the area.

Enoch Mitchell submitted Proposal WP18-47 to close Federal public lands in Unit 23 to caribou hunting by non-Federally qualified users for the 2018/19- 2020/21 regulatory years. The proposal was co-sponsored by the Native Village of Noatak, the Cape Krusenstern National Monument Subsistence Resource Commission (SRC), the Kobuk Valley National Park SRC, and the Noatak/Kivalina Fish and Game Advisory Committee.

Biological Background

Caribou abundance naturally fluctuates over decades (Gunn 2001, WACH Working Group 2011). Gunn (2001) reports the mean doubling rate for Alaskan caribou as 10 ± 2.3 years. Although the underlying mechanisms causing these fluctuations are uncertain, climatic oscillations (i.e. Arctic and Pacific Decadal Oscillations) may play an important role (Gunn 2001, Joly et al. 2011). Climatic oscillations can influence factors such as snow depth, icing, forage quality and growth, wildfire occurrence, insect levels, and

predation, which all contribute to caribou population dynamics (Joly et al. 2011). Density-dependent reduction in forage availability, resulting in poorer body condition may exacerbate caribou population fluctuations (Gunn 2001).

Caribou calving generally occurs from late May to mid-June (Dau 2013). Weaning generally occurs in late October and early November before the breeding season (Taillon et al. 2011). Calves stay with their mothers through their first winter, which improves calves' access to food and body condition (Holand et al. 2012). Calves orphaned after weaning (October) have greater chances of survival than calves orphaned before weaning (Holand et al. 2012, Joly 2000, Russell et al. 1991, Rughetti and Fest-Bianchet 2014).

The TCH, WACH, and CACH have ranges that overlap in Unit 26A (**Map 1**), and there can be considerable mixing of herds during the fall and winter. During the 1970s, there was little overlap between these herds, but the degree of mixing seems to be increasing. Thus, interpretation of population estimates is difficult due to both temporary and permanent immigration (Person et al. 2007).

The total number of caribou among the various herds wintering on the North Slope peaked at over 700,000 animals in the early 2000s (this includes the Porcupine Caribou Herd in northeast Alaska and Northwest Territories, Canada), which may have been the highest number since the 1970s. This number has declined substantially since the early 2000s. Currently, the WACH, TCH, and CACH populations are all declining (Dau 2011, 2015a, Lenart 2011, Parrett 2011, 2015c, 2015d).

Western Arctic Caribou Herd

The WACH has historically been the largest caribou herd in Alaska and has a home range of approximately 157,000 square miles in northwestern Alaska. In the spring, most mature cows move north to calving grounds in the Utukok Hills, while bulls and immature cows lag behind and move toward summer range in the Wulik Peaks and Lisburne Hills (**Map 2**, Dau 2011, WACH Working Group 2011).

Dau (2013) determined the calving dates for the WACH to be June 9–13. This is based upon long-term movement and distribution data obtained from radio-collared caribou (these are the dates cows ceased movements). After the calving period, cows and calves move west toward the Lisburne Hills where they mix with the bulls and non-maternal cows. During the summer, the herd moves rapidly to the Brooks Range.

In the fall, the herd moves south toward wintering grounds in the northern portion of the Nulato Hills. Rut occurs during fall migration (Dau 2011, WACH Working Group 2011). Dau (2013) determined the WACH rut dates to be October 22–26. This is based on back-calculations from calving dates using a 230-day gestation period. Since about 2000, the timing of fall migration has been less predictable, often occurring later than in previous decades (Dau 2015a). From 2010-2015, the average date that GPS collared caribou crossed the Noatak River ranged from Sep. 30 – Oct. 23 (Joly and Cameron 2017). The proportion of caribou using certain migration paths varies each year (**Figure 1**, Joly and Cameron 2017). In recent years (2012-2014), the path of fall migration has shifted east (Dau 2015a).

The WACH Working Group developed a WACH Cooperative Management Plan in 2003, and revised it in 2011 (WACH Working Group 2011). The WACH Management Plan identifies seven plan elements: cooperation, population management, habitat, regulations, reindeer, knowledge, and education as well as associated goals, strategies, and management actions. As part of the population management element, the WACH Working Group developed a guide to herd management determined by population size, population trend, and harvest rate. Population sizes guiding management level determinations were based on recent (since 1970) historical data for the WACH (WACH Working Group 2011). Revisions to recommended harvest levels under liberal and conservative management (+/- 100 - 2,850 caribou) were made in December 2015 (WACH Working Group 2015, **Table 1**). The State of Alaska manages the WACH to protect the population and its habitat, provide for subsistence and other hunting opportunities on a sustained yield basis, and provide for viewing and other uses of caribou (Dau 2011). State management objectives for the WACH are the same as the goals specified in the WACH Management Plan (Dau 2011, WACH Working Group 2011) and include:

- Encourage cooperative management of the WACH among State, Federal, local entities, and all users of the herd.
- Manage for healthy populations using management strategies adapted to fluctuating population levels and trends.
- Assess and protect important habitats.
- Promote consistent and effective State and Federal regulations for the conservation of the WACH.
- Seek to minimize conflict between reindeer herders and the WACH.
- Integrate scientific information, traditional ecological knowledge of Alaska Native users, and knowledge of all users into management of the herd.
- Increase understanding and appreciation of the WACH through the use of scientific information, traditional ecological knowledge of the Alaska Native users, and knowledge of all other users.

The WACH population declined rapidly in the early 1970s, bottoming out at about 75,000 animals in 1976. Aerial photo censuses have been used since 1986 to estimate population size. The WACH population increased throughout the 1980s and 1990s, peaking at 490,000 animals in 2003 (**Figure 2**). Since 2003, the herd has declined at an average annual rate of 7.1% from approximately 490,000 caribou to 200,928 caribou in 2016 (Caribou Trails 2014; Dau 2011, 2014, Parrett 2016a).

Between 1982 and 2011, the WACH population was within the liberal management level prescribed by the WACH Working Group (**Figure 2, Table 1**). In 2013, the herd population estimate fell below the population threshold for liberal management of a decreasing population (265,000), slipping into the conservative management level. In July 2015, ADF&G attempted an aerial photo census of the herd. However, the photos taken could not be used due to poor light conditions that obscured unknown portions of the herd (Dau 2015b). ADF&G conducted a successful photocensus of the WACH on July 1, 2016. This census resulted in a minimum count of 194,863 caribou with a point estimate of 200,928 (Standard Error = 4,295), suggesting the WACH was still within the conservative management level, although close to the threshold for preservative management (**Figure 2, Table 1**). Results of this census indicate an average annual decline of 5% per year since 2013, representing a much lower rate than the 15% annual

decline between 2011 and 2013. The large cohorts of 2015 and 2016, which currently comprise a substantial proportion of the herd, contributed to the recent decreased rate of decline, but remain vulnerable to difficult winter conditions due to their young age (Parrett 2016a). ADF&G is planning to conduct another photocensus in the summer of 2017 and is transitioning from film to digital cameras, which will enhance their ability to complete successful and timely censuses (Parrett 2016a, Parrett 2017, pers. comm.).

Between 1970 and 2016, the bull:cow ratio exceeded critical management levels (40 bulls:100 cows, **Table 1**) in all years except 1975, 2001, and 2014 (**Figure 3**). Reduced sampling intensity in 2001 likely biased the 2001 bull:cow ratio low (Dau 2013). Since 1992, the bull:cow ratios has trended downward (Dau 2015a). The average annual number of bulls:100 cows was greater during the period of population growth (54:100 between 1976–2001) than during the recent period of decline (44:100 between 2004–2016). Additionally, Dau (2015a) states that while trends in bull:cow ratios are accurate, actual values should be interpreted with caution due to sexual segregation during sampling and the inability to sample the entire population, which likely account for more annual variability than actual changes in composition.

Although factors contributing to the population decline are not known with certainty, fall and winter icing events likely initiated the decline (Dau 2015a). Increased adult cow mortality, and decreased calf recruitment and survival also played a role (Dau 2011). Since the mid-1980s, adult mortality has slowly increased while recruitment has slowly decreased (Dau 2013, **Figure 4**). In a population model developed specifically for the WACH, Prichard (2009) found adult survival to have the largest impact on population size.

Calf production has likely had little influence on the population trajectory (Dau 2013, 2015a). Between 1990 and 2003, the June calf:cow ratio averaged 66 calves:100 cows/year. Between 2004 and 2016, the June calf:cow ratio averaged 71 calves:100 cows/year (**Figure 5**). In June 2016, 85 calves:100 cows were observed, which approximates the highest parturition (calving) level ever recorded for the herd (86 calves:100 cows in 1992) (Dau 2016a).

Decreased calf survival through summer and fall and recruitment into the herd are likely contributing to the current population decline (Dau 2013, 2015a). Fall calf:cow ratios indicate calf survival over summer. Between 1976 and 2016, the fall calf:cow ratio ranged from 35 to 59 calves:100 cows/year, averaging 46 calves:100 cows/year (**Figure 5**). Fall calf:cow ratios declined from an average of 46 calves:100 cows/year between 1990-2003 to an average of 42 calves:100 cows/year between 2004-2016 (Dau 2015a, **Figure 5**). Since 2008, ADF&G has recorded calf weights at Onion Portage as an index of herd nutritional status. In September 2015, calf weights averaged 100 lbs., the highest average ever recorded (Parrett 2015b).

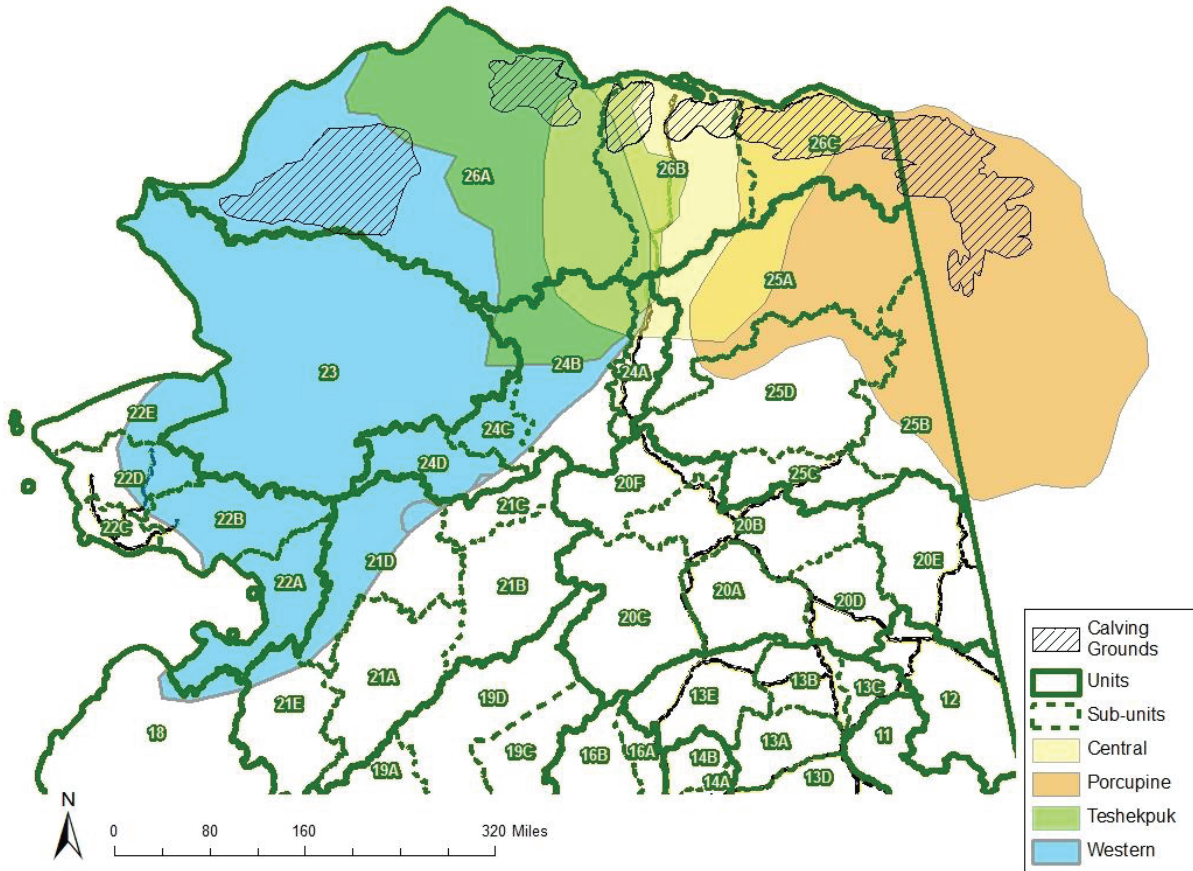
Similarly, the ratio of short yearlings (SY, 10-11 months old caribou) to adults provides a measure of overwintering calf survival and recruitment. Between 1990 and 2003, SY:adult ratios averaged 20 SY:100 adults/year. Since the decline began in 2003, SY:adult ratios have averaged 16 SY:100 adults/year (2004-2016, Dau 2013, 2015a, 2016b, **Figure 5**). However, 23 SY:100 adults were observed during spring 2016 surveys, the highest ratio recorded since 2007 (Dau 2016b). The overwinter calf survival for the 2015 cohort (Oct. 2015-Jun. 2016) was 84% (Parrett 2016b). While 2016 indices suggest

improvements in recruitment, the overall trend since the early 1980s has been downward (Dau 2015a, 2016b).

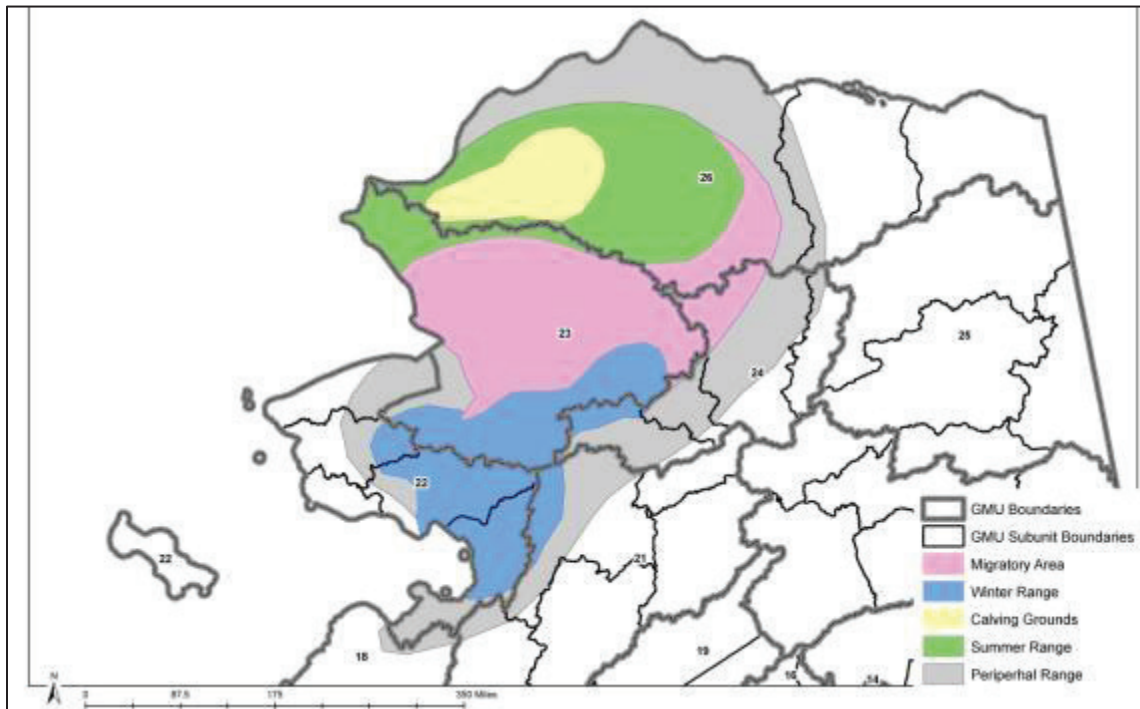
Increased cow mortality is likely affecting the trajectory of the herd as well (Dau 2011, 2013). The annual mortality rate of radio-collared adult cows increased from an average of 15% between 1987 and 2003 to 23% from 2004–2014 (Dau 2011, 2013, 2014, 2015a, **Figure 4**). Estimated mortality includes all causes of death including hunting (Dau 2011). Dau (2015a) states that cow mortality estimates are conservative due to exclusion of unhealthy (i.e. diseased) and yearling cows. Dau (2013) attributed the high mortality rate for 2011–2012 (33%, **Figure 4**) to a winter with deep snows, which weakened caribou and enabled wolves to prey on them more easily. Prior to 2004, estimated adult cow mortality only exceeded 20% twice, but has exceeded 20% in 7 out of 9 regulatory years between 2004 and 2012 (**Figure 4**). The annual mortality rate was 8% as of April 2016 (Dau 2016b). This may fluctuate substantially throughout the year based on changing local conditions and harvest levels. Dau (2015a) indicates that mortality rates may also change in subsequent management reports as the fate of collared animals is determined, and that these inconsistencies are most pronounced for the previous 1–3 years.

Far more caribou died from natural causes than from hunting between 1992 and 2012 (Dau 2013). Cow mortality remained constant throughout the year, but natural and harvest mortality for bulls spiked during the fall. Predation, particularly by wolves, accounted for the majority of natural mortality (Dau 2013). However as the WACH has declined and estimated harvest has remained relatively stable, the percentage of mortality due to hunting has increased relative to natural mortality. For example, during the period October 1, 2013 to September 30, 2014, estimated hunting mortality was approximately 42% and estimated natural mortality about 56% (Dau 2014). In previous years (1983–2013), the estimated hunting mortality exceeded 30% only once in 1997-1998 (Dau 2013). Additionally, Prichard (2009) and Dau (2015a) suggest that harvest levels and rates of cows can greatly impact population trajectory. If bull:cow ratios continue to decline, harvest of cows may increase, exacerbating the current population decline.

Although icing events likely precipitated the population decline, increased predation, hunting pressure, deteriorating range condition (including habitat loss and fragmentation), climate change, and disease may also be contributing factors (Dau 2015a, 2014). Joly et al. (2007) documented a decline in lichen cover in portions of the wintering areas of the WACH. Dau (2011, 2014) reported that degradation in range condition is not thought to be a primary factor in the decline of the herd because animals have generally maintained good body condition since the decline began. Body condition is assessed on a subjective scale from 1-5. The fall body condition of adult females in 2015 was characterized as “fat” (mean = 3.9/5) with no caribou being rated as skinny or very skinny (Parrett 2015b). However, the body condition of the WACH in the spring may be a better indicator of the effects of range condition versus the fall when the body condition of the herd is routinely assessed and when caribou are in prime condition (Joly 2015, pers. comm.).



Map 1. Herd overlap and ranges of the WACH, TCH, CACH, and PCH.



Map 2. Range of the WACH.

Table 1. Western Arctic Caribou Herd management levels using herd size, population trend, and harvest rate (WACH Working Group 2011, 2015).

Management and Harvest Level	Population Trend			Harvest Recommendations May Include:
	Declining Low: 6%	Stable Med: 7%	Increasing High: 8%	
Liberal	Pop: 265,000+	Pop: 230,000+	Pop: 200,000+	<ul style="list-style-type: none"> • Reduce harvest of bulls by nonresidents to maintain at least 40 bulls: 100 cows • No restriction of bull harvest by resident hunters unless bull:cow ratios fall below 40 bulls:100 cows
	Harvest: 16,000-22,000	Harvest: 16,000-22,000	Harvest: 16,000-22,000	
Conservative	Pop: 200,000-265,000	Pop: 170,000-230,000	Pop: 150,000-200,000	<ul style="list-style-type: none"> • No harvest of calves • No cow harvest by nonresidents • Restriction of bull harvest by nonresidents • Limit the subsistence harvest of bulls only when necessary to maintain a minimum 40:100 bull:cow ratio
	Harvest: 12,000-16,000	Harvest: 12,000-16,000	Harvest: 12,000-16,000	
Preservative	Pop: 130,000-200,000	Pop: 115,000-170,000	Pop: 100,000-150,000	<ul style="list-style-type: none"> • No harvest of calves • Limit harvest of cows by resident hunters through permit hunts and/or village quotas • Limit the subsistence harvest of bulls to maintain at least 40 bulls:100 cows • Harvest restricted to residents only, according to state and federal law. Closure of some federal public lands to nonqualified users may be necessary
	Harvest: 8,000-12,000	Harvest: 8,000-12,000	Harvest: 8,000-12,000	
Critical Keep Bull:Cow ratio ≥ 40 Bulls:100 Cows	Pop: < 130,000	Pop: < 115,000	Pop: < 100,000	<ul style="list-style-type: none"> • No harvest of calves • Highly restrict the harvest of cows through permit hunts and/or village quotas • Limit the subsistence harvest of bulls to maintain at least 40 bulls:100 cows • Harvest restricted to residents only, according to state and federal law. Closure of some federal public lands to nonqualified users may be necessary
	Harvest: 6,000-8,000	Harvest: 6,000-8,000	Harvest: 6,000-8,000	

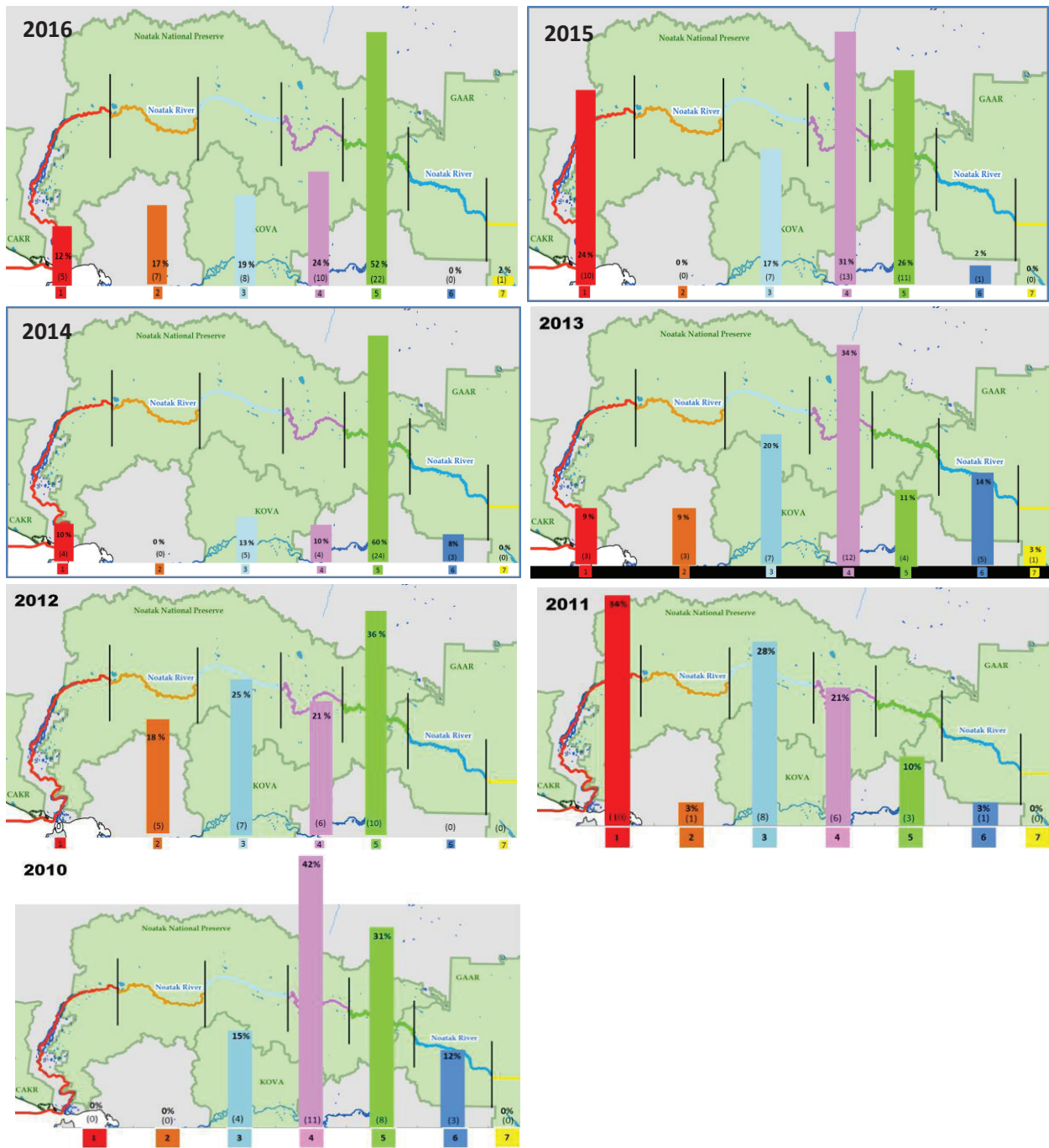


Figure 1. Distribution of caribou crossing the Noatak River during fall. Histograms depict where collared female caribou crossed the Noatak River, generally from north to south, on their fall migration. Relative percentages (top number) and the absolute number (middle number) of caribou are provided. The river is divided into seven (lowest number) color-coded segments which are displayed in the background. The middle five segments are 100 river kilometers long, while the westernmost segment (red) is 200 km (before extending into the Chukchi Sea) and the easternmost (yellow) runs as far east as WAH caribou are known to migrate. The number of caribou with GPS collars ranged from 39-79 caribou/year with later years having more collared caribou than earlier years (Joly and Cameron 2017).

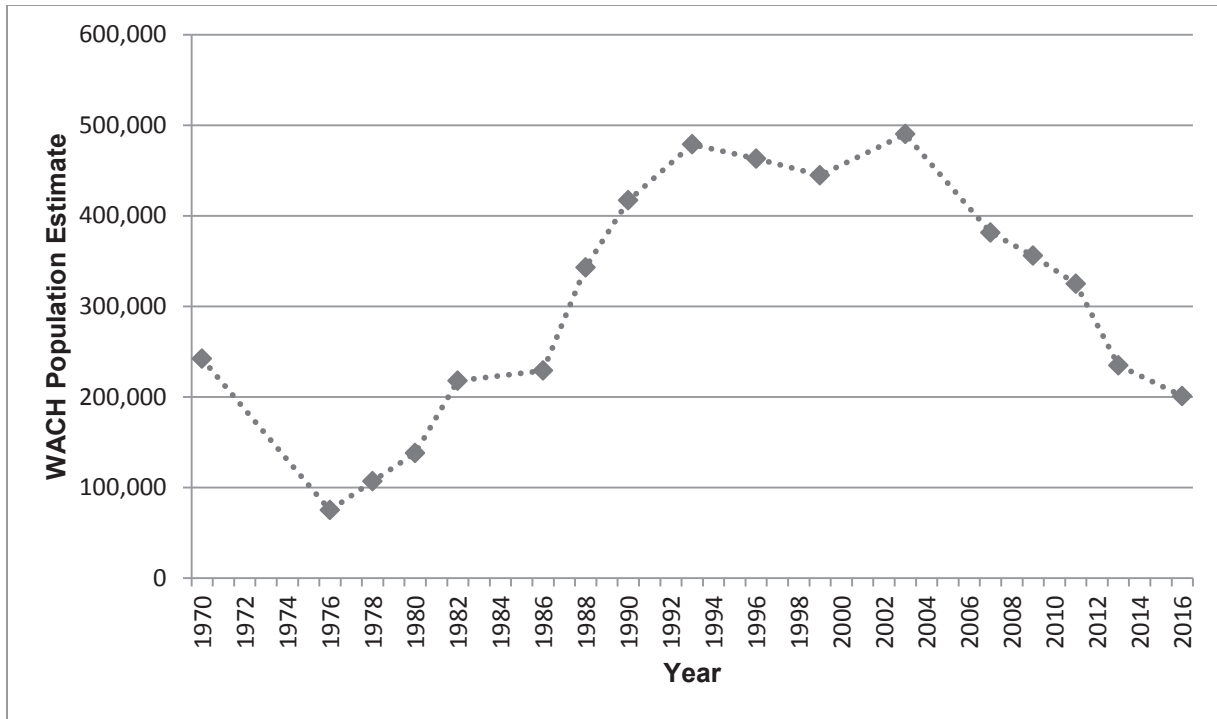


Figure 2. The WACH population estimates from 1970–2015. Population estimates from 1986–2016 are based on aerial photographs of groups of caribou that contained radio-collared animals (Dau 2011, 2013, 2014, Parrett 2016a).

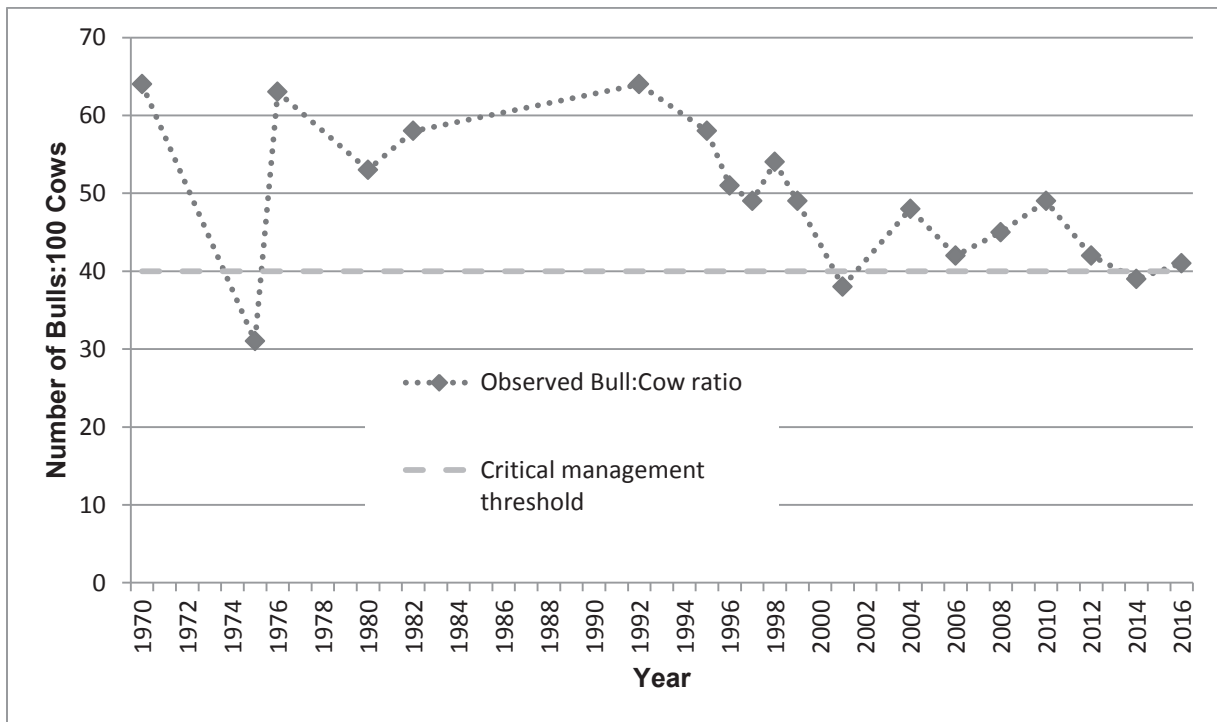


Figure 3. Bull: Cow ratios for the WACH (Dau 2015a, ADF&G 2017c).

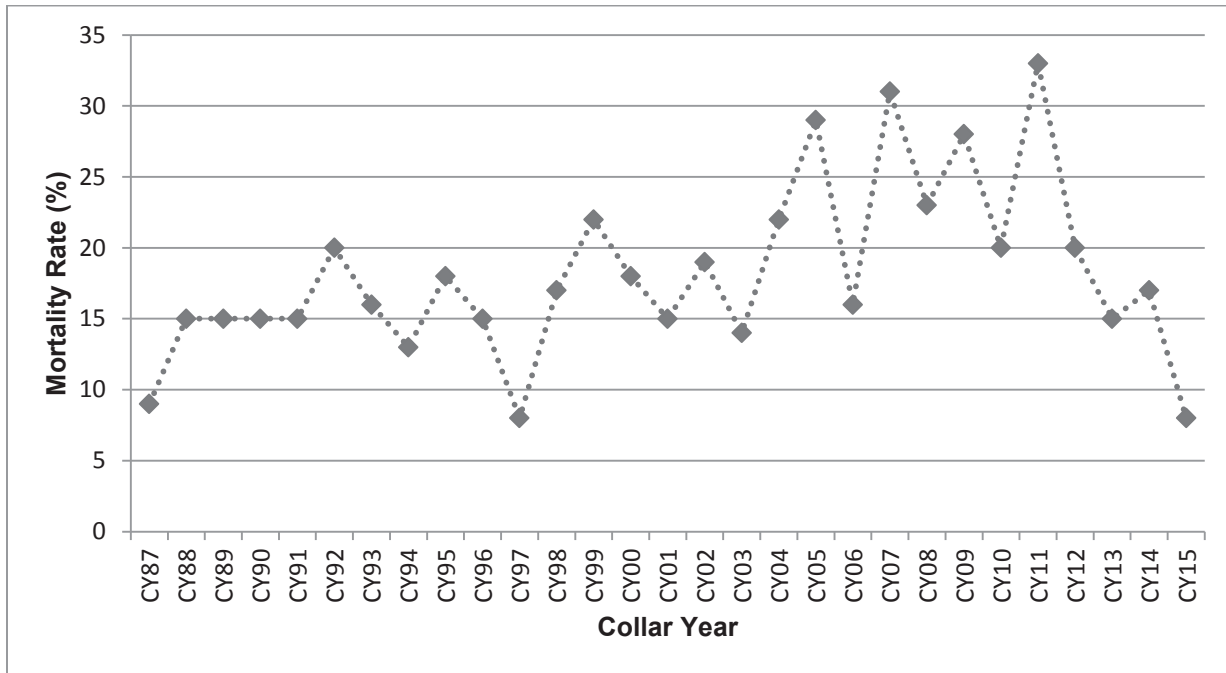


Figure 4. Mortality rate of radio-collared caribou in the Western Arctic caribou herd (Dau 2013, 2015a, 2016b). Collar Year = 1 Oct-30 Sept. 2015 collar year is Oct. 2015-Apr. 2016.

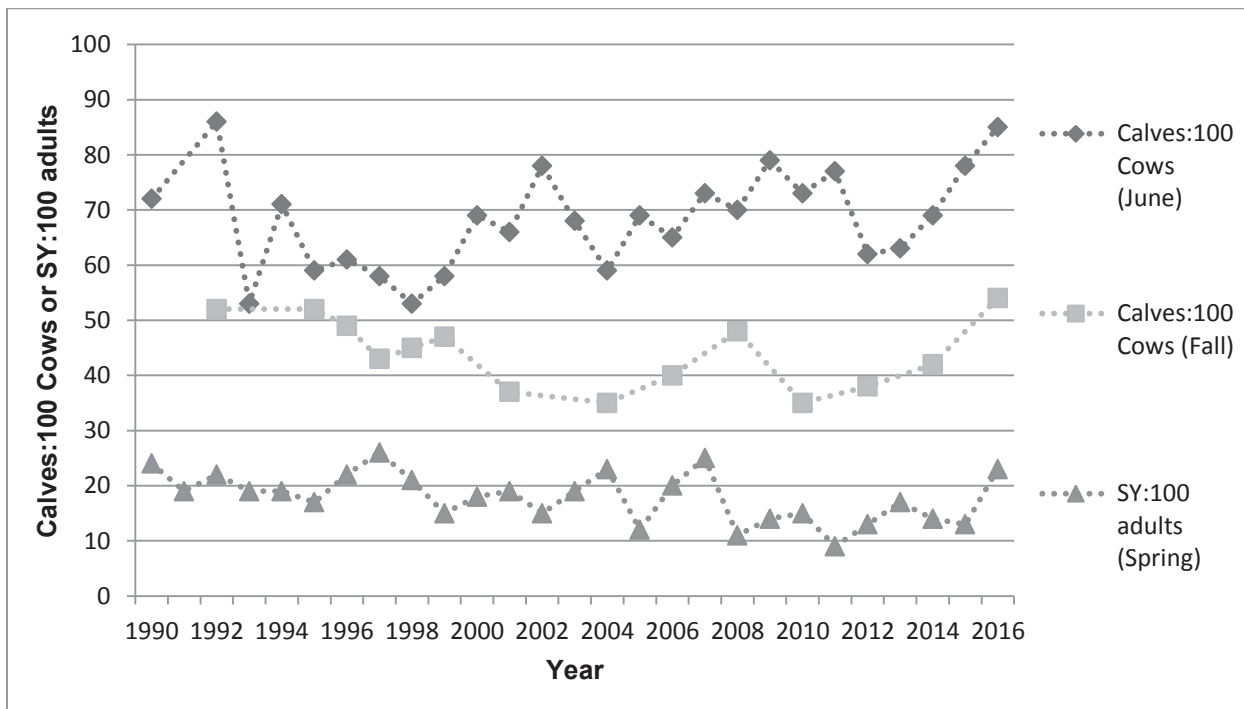


Figure 5. Calf:cow and short yearling (SY):adult ratios for the WACH (Dau 2013, 2015a, 2016a, ADF&G 2017c). Short yearlings are 10-11 months old caribou.

Teshkepuk Caribou Herd

The TCH calving and summering areas overlap with the eastern portion of the National Petroleum Reserve–Alaska. Most of the TCH moves toward Teshkepuk Lake in May to calve in early June. The primary calving grounds of the TCH (approximately 1.8 million acres) occur to the east, southeast and northeast of Teshkepuk Lake (**Map 1**, Person et al. 2007, Wilson et al. 2012).

From late June through July cows and bulls move to the Beaufort Sea coast from Dease Inlet to the mouth of the Kogru River (Utqiagvik to the Colville Delta), around the north and south side of the Teshkepuk Lake, and the sand dunes along the Ikpikpuk River to seek relief from insects (Carroll 2007, Parrett 2007). The narrow corridors of land to the east and northwest of the Teshkepuk Lake are important migratory corridors to insect relief areas (Yokel et al. 2009). River corridors are also used more during periods of insect harassment (Parrett 2015c).

Fall migration routes are variable due in part to highly variable wintering locations. Some TCH caribou are classified as non-migratory due to a lack of directional, seasonal movements. A substantial portion of the TCH remains on the coastal plain during the winter while other common wintering locations include the central Brooks Range and river drainages in Unit 23 (Parrett 2015c).

The State manages the TCH to provide for subsistence and other hunting opportunities on a sustained yield basis, ensure that adequate habitat exists, and provide for viewing and other uses of caribou (Parrett 2013). Specific State management objectives for the TCH are as follows (Parrett 2013):

- Attempt to maintain a minimum population of 15,000 caribou, recognizing that caribou numbers naturally fluctuate.
- Maintain a harvest level of 900–2,800 caribou using strategies adapted to population levels and trends.
- Maintain a population composed of least 30 bulls per 100 cows.
- Monitor herd characteristics and population parameters (on an annual or regular basis).
- Develop a better understanding of the relationships and interactions among North Slope caribou herds.
- Encourage cooperative management of the herd and its habitat among State, Federal, and local entities and all users of the herd.
- Seek to minimize conflicts between resource development and the TCH.

The TCH population is estimated from aerial photocensuses and using methods described by Rivest et al. (1998). Between 1984 and 2008, the TCH population increased from an estimated 18,292 caribou to 68,932 caribou. Since 2008, the TCH population declined 40% to an estimated 41,542 caribou in 2015 (**Figure 6**, Parrett 2015c, 2015d).

Between 1991 and 2016, the TCH bull:cow ratio averaged 53 bulls:100 cows, although surveys were not conducted every year (**Figure 7**). However, since 1993, the bull:cow ratio has exhibited a downward

trend. The 2016 bull:cow ratio (28 bulls:100 cows) was the lowest ratio since 1991 and is below management objectives of 30 bulls:100 cows (Parrett 2013, 2015c, ADF&G 2017c).

TCH calf production is measured as the percent of collared cows with calves at the end of June calving surveys. Between 1999 and 2016, calf production averaged 56%. However, from 2006-2014, calf production exhibited a declining trend, bottoming out at 16% in 2014. Production increased substantially in 2016 to 81% (**Figure 8**, Parrett 2015c, ADF&G 2017c).

Between 2009 and 2016, fall calf:cow ratios averaged 33 calves:100 cows and exhibited an increasing trend (**Figure 9**, Parrett 2015c, ADF&G 2017c). Over the same time period, spring SY:adult ratios averaged 16.5 SY:100 adults. This ratio was static between 2009 and 2014 (13-15 SY:100 adults), but increased substantially in 2016 to 29 SY:100 adults (**Figure 9**, Parrett 2015c, ADF&G 2017c).

The mortality rate for the TCH is measured from radio-collared cows by collar year (CY). CY is defined as July 1-June 30. Between CY 2000/01 and CY 2015/16, the TCH mortality rate averaged 16%. However, the highest mortality rates ever recorded for this herd occurred in 2012 (32%) and 2013 (28%), which contributed substantially to the current decline (**Figure 10**, Parrett 2015c, ADF&G 2017c). Mortality decreased substantially in CY 2015/16 to only 8% (ADF&G 2017c).

Mean calf weights from 2011-2014 were among the lightest weights ever recorded in North America (Parrett 2015c). Similarly, the 2014 parturition (calving) rate was only 28%, which is very low for caribou. These metrics suggest poor nutrition may be affecting the TCH (Parrett 2015c, ADF&G 2017c). However, in 2016, both metrics improved (ADF&G 2017c).

From 2011-2013, ADF&G conducted a TCH calf survival study. Survival on the calving grounds and through the summer was high (~80%) while over winter survival and recruitment into the herd was low (~25-40%). The primary causes of calf mortality included predation and starvation. Starvation was especially important spatially as calves that wintered in the Brooks Range had higher survival than calves wintering on the North Slope (ADF&G 2017c).

While recent population estimates (2013-2015) suggest that the TCH population may be stabilizing, demographic metrics (i.e. parturition and mortality rates) indicate that the population was likely still declining during those years. It is possible that the 2013 population estimate was an underestimate (Parrett 2015d). However, improved herd performance in 2016 (i.e. recruitment, calf production, calf weight) suggest that the TCH population may be stabilizing or declining at a slower rate (ADF&G 2017c).

Habitat

Caribou feed on a wide variety of plants including lichens, fungi, sedges, grasses, forbs, and twigs of woody plants. Arctic caribou depend primarily on lichens during the fall and winter, but during summer they feed on leaves, grasses and sedges (Miller 2003).

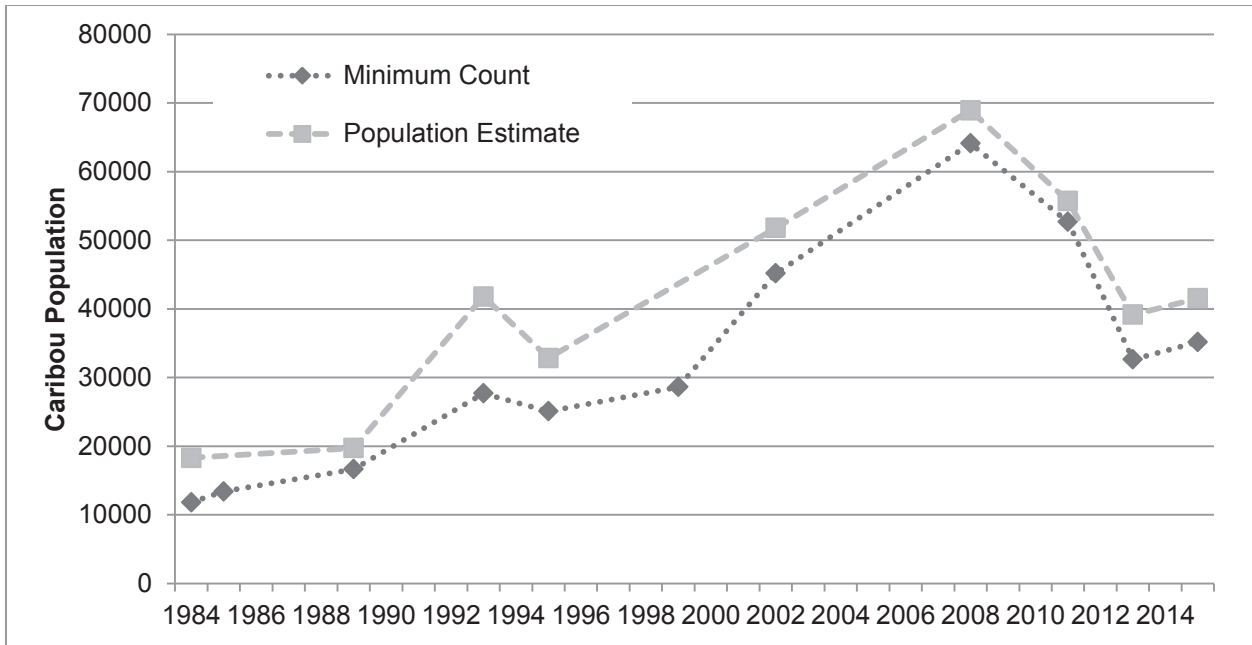


Figure 6. Minimum counts and population estimates of the Teshekpuk Caribou Herd from 1980-2015. Population estimates are based on aerial photographs of groups of caribou that contained radio-collared animals (Parrett 2011, 2013, 2015a, 2015d).

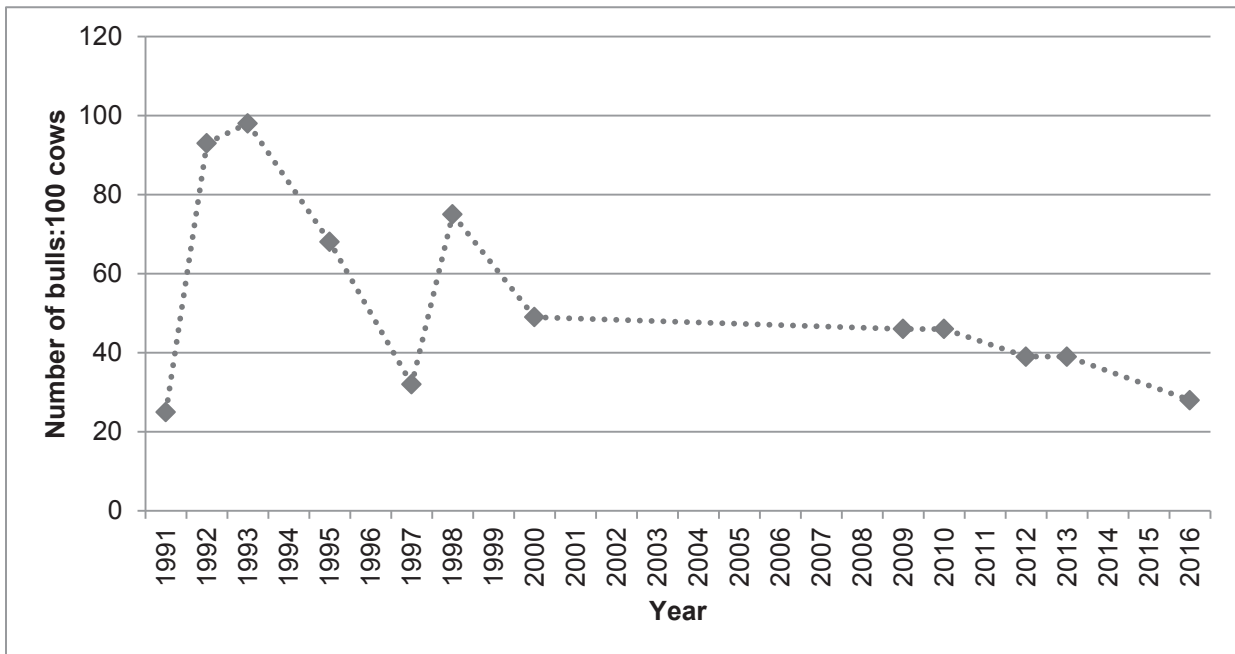


Figure 7. Bull:cow ratios of the Teshekpuk Caribou Herd. From 1991-2000, surveys were conducted in July. From 2009 onward, surveys were conducted in Nov. (Parrett 2013, 2015c, ADF&G 2017c).

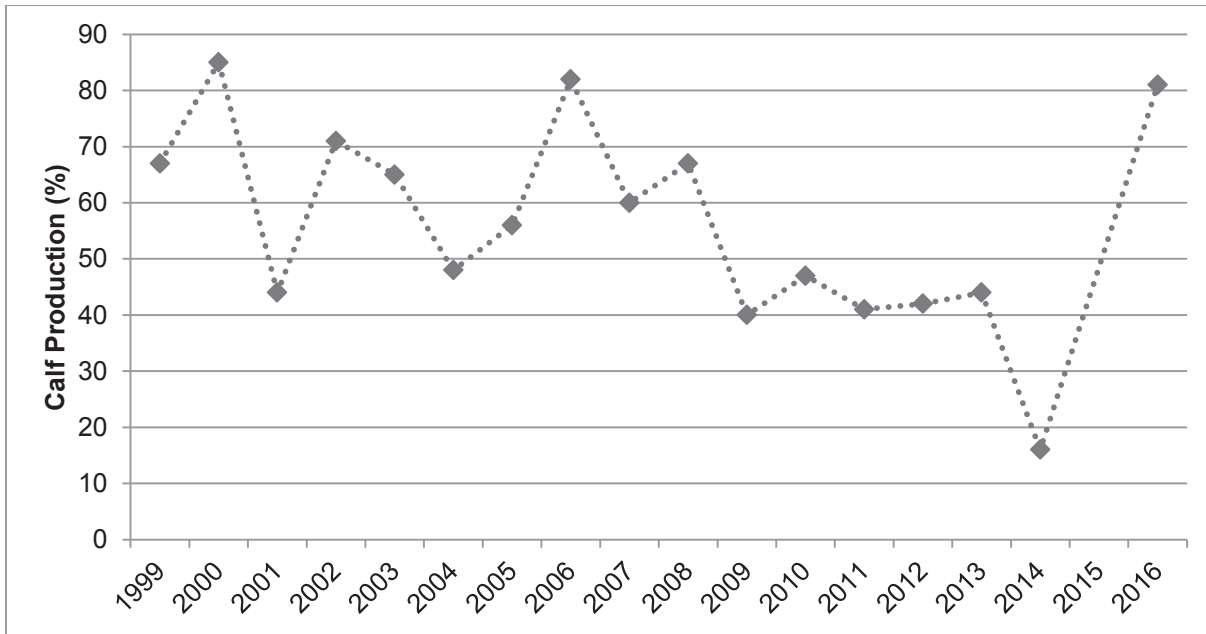


Figure 8. Teshekpuk caribou herd calf production (% of collared cows with calves) (Parrett 2015c, ADF&G 2017c).

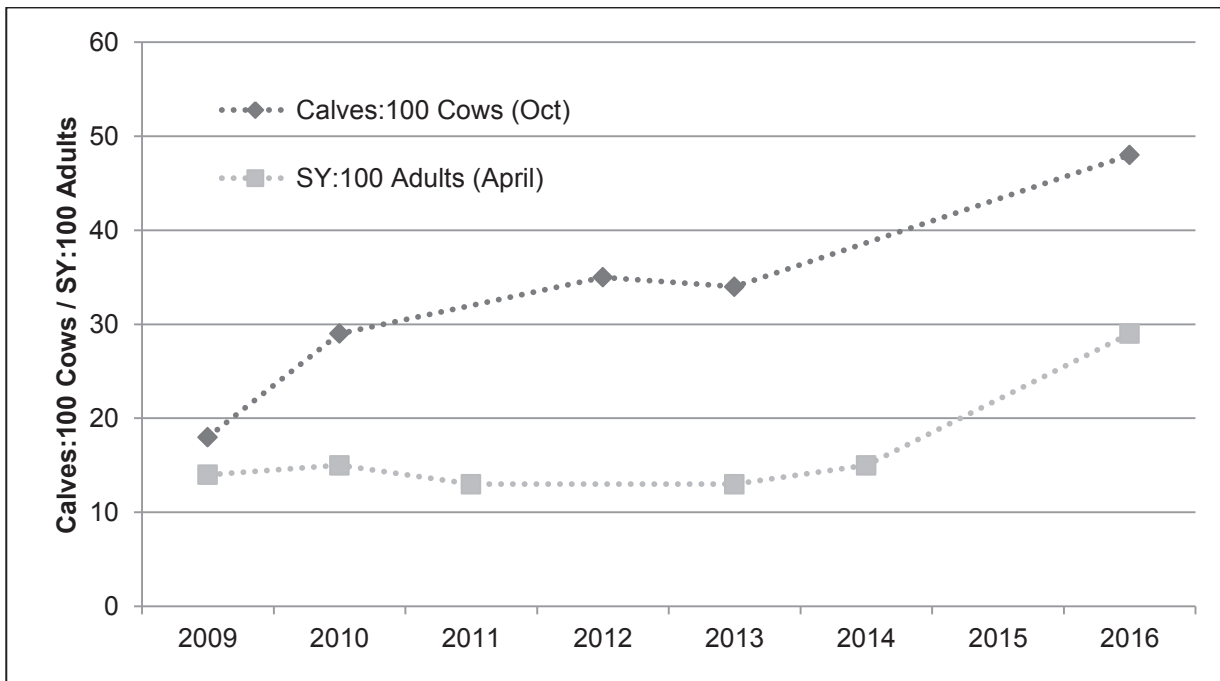


Figure 9. Fall calf:cow and spring short yearling (SY):adult ratios for the Teshekpuk Caribou Herd (Parrett 2015c, ADF&G 2017c). Short yearlings are 10-11 month old caribou.

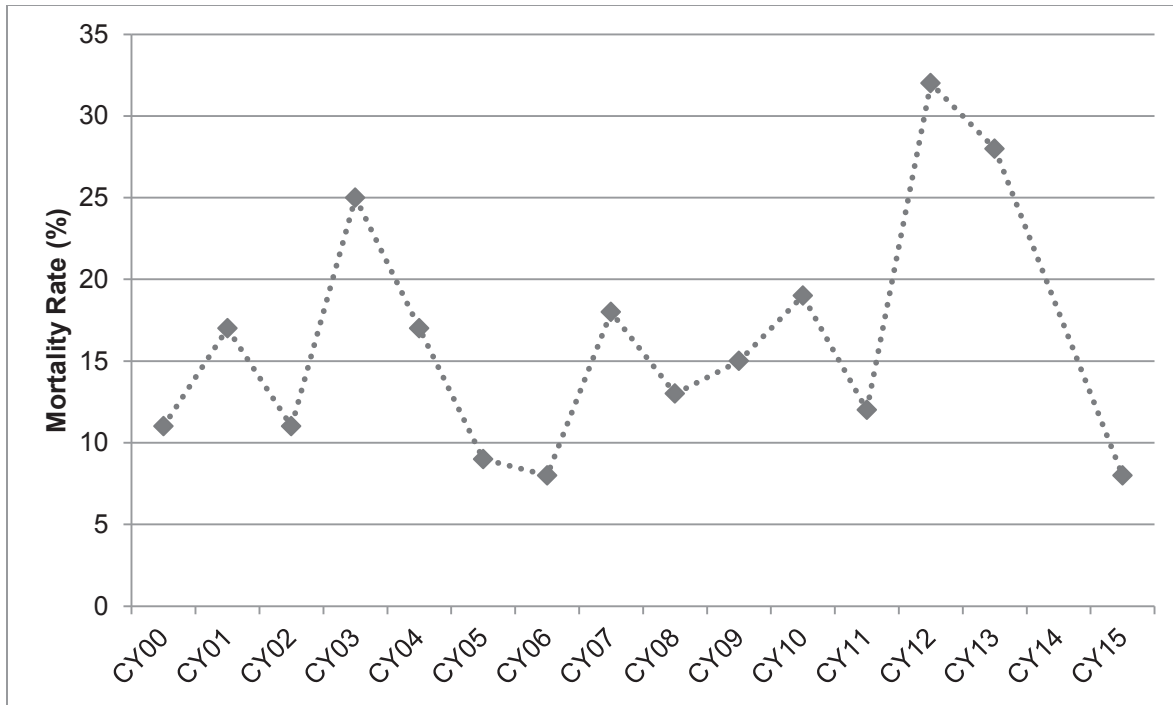


Figure 10. Annual mortality rate of radio-collared cows in the TCH (Parrett 2015c, ADF&G 2017c). Collar year (CY) is defined as July 1-June 30.

Cultural Knowledge and Traditional Practices

Meeting the nutritional and caloric needs of Arctic communities is vitally important and is the foundation of subsistence activities. Still, the meaning of subsistence extends far beyond human nutrition for Alaska’s native peoples. Holthaus (2012) describes subsistence as the base on which Alaska Native culture establishes its identity through “philosophy, ethics, religious belief and practice, art, ritual, ceremony, and celebration.” Fienup-Riordan (1990) also describes subsistence in terms of the cultural cycles of birth and death representing the close human relationship and reciprocity between humans and the natural world. Concerning caribou specifically, Ms. Esther Hugo – a lifelong resident of Anaktuvuk Pass - describes the human-caribou relationship as a “way of life”.

Caribou have been an important resource for the Iñupiat of the Seward Peninsula, Northwest Arctic, and North Slope regions for thousands of years. Caribou bones dating from 8,000 to 10,000 years ago have been excavated from archeological sites on the Kobuk River (ADF&G 1992). Foote (1959, 1961) wrote about caribou hunting in the Noatak region forty years ago, noting that life would not be possible in Noatak without this source of meat. Caribou were traditionally a major source of both food and clothing and continues today to be the most important land animal consumed in many communities (Burch 1984, 1994, 1998, ADF&G 1992).

Historically, during fall and spring caribou migrations, people built “drive fences” out of cairns, bundles of shrubs, or upright logs. These fences were sometimes several miles long and two to three miles wide. Ideally, the closed end of the fence crossed a river, and caribou were harvested while crossing the river and

retrieved later; or the fence would end in a corral where caribou were snared and killed with spears (Burch 2012). Burch (2012:40) notes, “The landscape of Northwest Arctic, especially in hills and mountains, is littered with the remains of drive fences that were in every stage of construction when they were abandoned.”

The WACH population declined rapidly beginning in the late 1800s. At its low point, its range had shrunk to less than half its former size. Famine ensued, primarily due to the absence of caribou. In the early 1900s, reindeer were introduced to fill the need for food and hides. The WACH began to rebound in the 1940s. Currently, among large terrestrial mammals, caribou are among the most abundant; however, the population in any specific area is subject to wide fluctuations from year to year as caribou migration routes change (Burch 2012).

Caribou were traditionally harvested any month of the year they were available. The objective of the summer hunt was to obtain the hides of adult caribou with their new summer coats. They provided the best clothing material available to the Iñupiat. The fall hunt was to acquire large quantities of meat to freeze for winter (Burch 1994). The timing and routing of migration determined caribou hunting. Hunting seasons change from year to year according to the availability of caribou (ADF&G 1991). The numbers of animals and the duration of their stays varies from one year to the next (Burch 1994) and harvest varies from community to community depending on the availability of caribou.

Caribou can be harvested in large numbers, when available, and can be transported back to villages by boat before freeze-up. Hunters search for caribou and attempt to intercept them at known river crossings. Some villages such as Anaktuvuk Pass settled specifically in locations where caribou migrate through, and residents of these communities await the annual arrival of caribou (NS RAC 2017). Ideally, caribou harvesting occurs when the weather is cool enough to prevent spoilage of meat. If not, meat is frozen for later use. Prior to freeze-up, bulls are preferred because they are fatter than cows (Braem et al. 2015, Georgette and Loon 1993).

Small groups of caribou that have over-wintered may be taken by hunters in areas that are accessible by snowmachine. Braem et al. (2015:141) explain, “Hunters harvest cows during the winter because they are fatter than bulls . . . Caribou harvested during the winter can be aged completely without removing the skin or viscera . . . Then in the spring, the caribou is thawed. Community members cut it into strips to make dried meat, or they package and freeze it.” In spring, caribou start their northward migration. The caribou that are harvested are “lean and good for making dried meat (*paniqtuq*) during the warm, sunny days of late spring” (Georgette and Loon 1993:80).

Harvest History

Western Arctic Caribou Herd

The State manages the WACH on a sustained yield basis (i.e. managing current harvests to ensure future harvests). The harvestable surplus when the WACH population is declining is calculated as 6% of the estimated population (WACH working group 2011, Parrett 2017, pers. comm.). In recent years, as the WACH population has declined, the total harvestable surplus for the WACH has also declined (Dau 2011,

Parrett 2015a). In 2016, the WACH harvestable surplus was 12,056 caribou (6% of 200,928 caribou). Comparatively, the harvestable surplus was 14,085 caribou in 2013 when the WACH numbered approximately 234,757 caribou. While there is substantial uncertainty in harvestable surplus estimates, it is likely that sustainable harvest will soon be exceeded (Parrett 2015a, Dau 2015a). Of particular concern is the overharvest of cows, which has probably occurred since 2010/11 (Dau 2015a). Dau (2015a:14-29) states, “even modest increases in the cow harvest above sustainable levels could have a significant effect on the population trajectory of the WACH.”

Harvest from the WACH, which has remained fairly consistent since 1990, now represents a larger proportion of the annual mortality. This is one of the factors that prompted the BOG and the Board to enact restrictions on WACH harvest in March 2015 and April 2016, respectively.

Caribou harvest by local hunters is estimated from community harvest surveys, if available, and from models developed by A. Craig with ADF&G’s Division of Wildlife Conservation, Region V. These models incorporate factors such as community size, availability of caribou, and per capita harvests for each community (Dau 2015a). In 2015, Craig’s models replaced models developed by Sutherland (2005), resulting in changes to local caribou harvest estimates from past years. While Craig’s models accurately reflect harvest trends, they do not accurately reflect actual harvest numbers (Dau 2015a). (Note: no model accurately reflects harvest numbers). This analysis only considers the updated harvest estimates using Craig’s new model as cited in Dau (2015a). Caribou harvest by nonlocal residents and nonresidents are based on harvest ticket reports (Dau 2015a). Local and nonlocal hunters are defined in ADF&G management reports as living within and outside the range of the WACH, respectively.

From 2000–2014, the average annual estimated harvest from the WACH was 11,984 caribou, ranging from 10,666–13,537 caribou per year (Dau 2015a, **Figure 11**). While these harvest estimates are within or below the conservative harvest level specified in the WACH Management Plan (**Table 1**), they approach or exceed the current harvestable surplus. Additionally, harvest estimates do not include wounding loss, which may be hundreds of caribou (Dau 2015a).

Local hunters account for approximately 95% of the total WACH harvest. Residents of Units 22, 23, and 26A account for approximately 17%, 58%, and 10% of the total WACH harvest, respectively (**Figure 12**, ADF&G 2017c). Comparison of caribou harvest by community from household survey data (**Appendix 1**) with **Figure 1** demonstrates that local community harvests parallel WACH availability rather than population trends. For example, Ambler only harvested 325 caribou when the WACH population peaked in 2003, but harvested 685 caribou in 2012 when most of the WACH migrated through western Unit 23. Similarly, Noatak only harvested 66 caribou in 2010 when zero GPS-collared caribou migrated through eastern Unit 23. Harvest increased substantially the following year when 37% of the GPS-collared caribou (and thus, a greater proportion of the WACH) migrated through eastern Unit 23.

From 2001–2013, total nonlocal WACH harvest averaged 598 caribou per year (**Figure 13**). Most (~76%) nonlocal WACH harvest occurs in Unit 23. In recent years (2012–2014), numbers of nonlocal hunters are slightly lower, partially because transporters have had to travel further to find caribou and thus, could not book as many clients (Dau 2015a).

From 1999-2013, 72% of nonlocal hunters on average accessed the WACH by plane. Most nonlocal harvest (85-90%) occurs between Aug. 25 and Oct. 7. In contrast, most local, subsistence hunters harvest WACH caribou whenever they are available using boats, 4-wheelers, and snowmachines (Dau 2015a, Fix and Ackerman 2015). In Unit 23, caribou are generally available during fall migration. The temporal concentration of nonlocal hunters during times of intensive subsistence hunting is responsible for user conflicts in Unit 23 (Dau 2015a). Commercially licensed transporters and guides assist approximately 60% and 10% of nonlocal hunters in Unit 23, respectively (Unit 23 Working Group 2016).

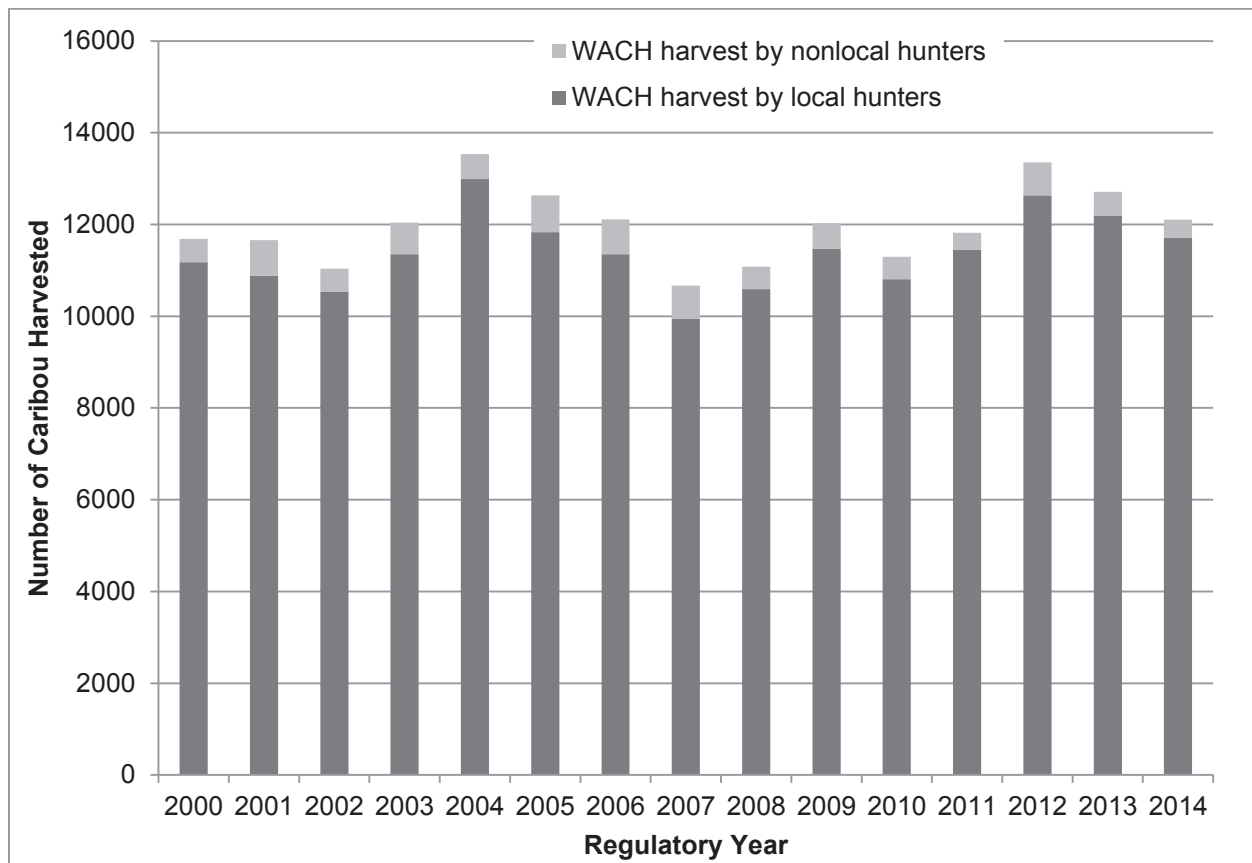


Figure 11. Estimated number of caribou harvested from the WACH by residency (Dau 2015a).

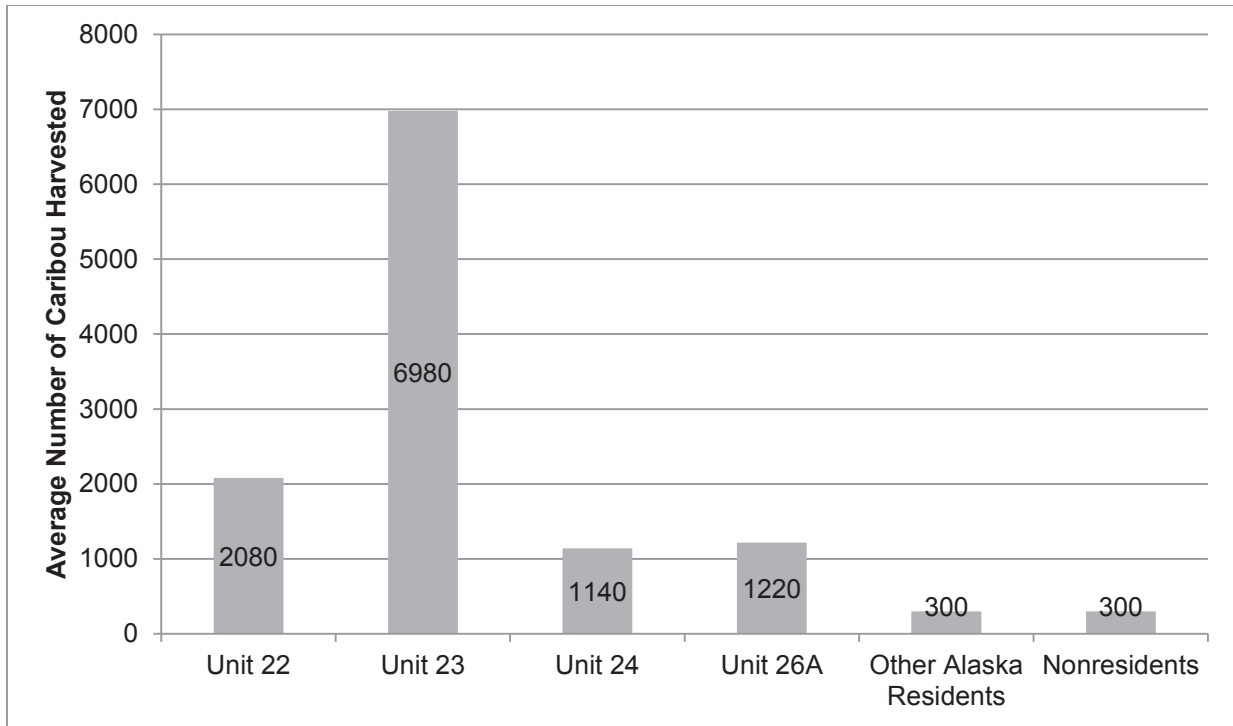


Figure 12. Average number of caribou harvested by unit and residency from 1998-2015 (ADF&G 2017c).

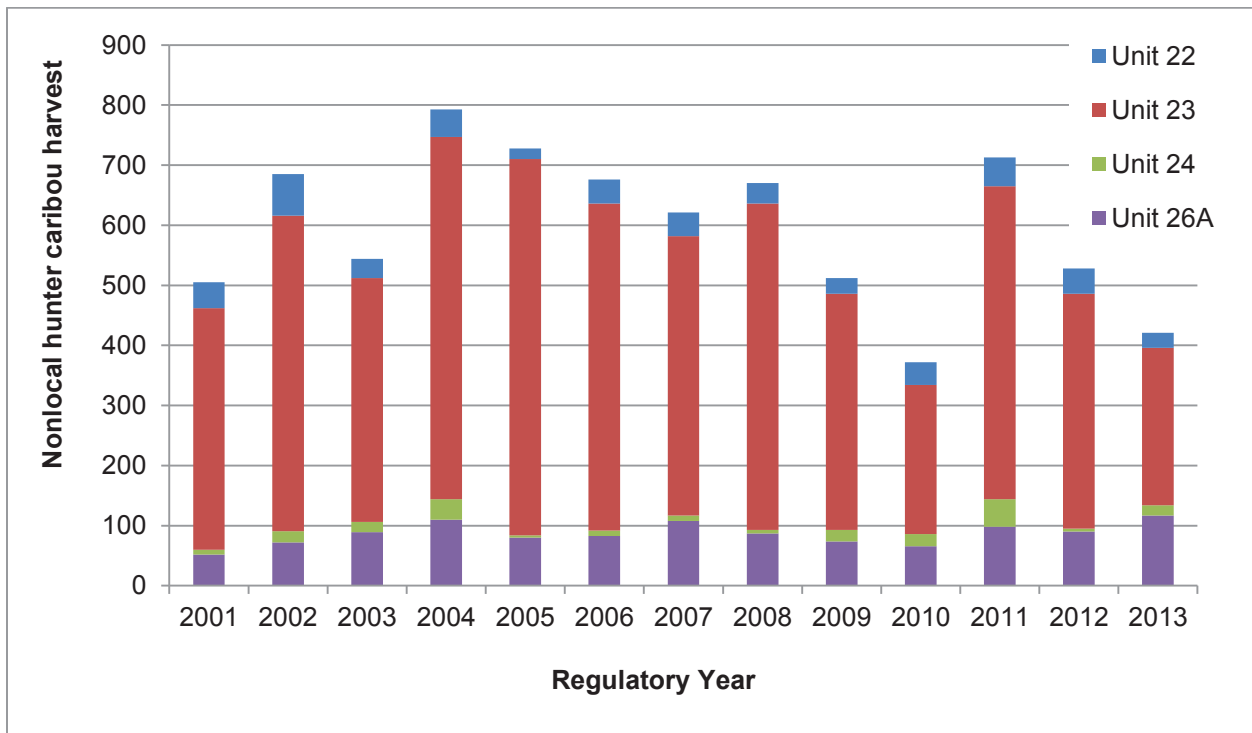


Figure 13. Nonlocal WACH harvest by unit (Dau 2015a, Dau 2013). Unit 21D was not included as only 0-2 caribou have been harvested from this unit each year.

Teshkepuk Caribou Herd

The State also manages the TCH on a sustained yield basis. The current TCH harvestable surplus is 2,500 caribou at a 6% harvest rate. However, if the herd declines below 35,000, the recommended harvest rate will decrease to 4-5% (ADF&G 2017c).

Estimating harvest from the TCH is difficult due to lack of harvest data, annual variation in community harvest survey effort and location, widely varying wintering distribution of the TCH, and overlap between herds within village harvest areas (Parrett 2015c). The recent (1984-2016) hunter registration and reporting system was not effective in estimating TCH harvest by local communities as few local hunters registered with ADF&G (Parrett 2015c). Therefore, local harvest from the TCH is estimated from community harvest surveys and extrapolated from long-term averages of per-capita caribou harvest and community population size (Parrett 2015c, ADF&G 2017d). Some community harvest estimates can be apportioned by herd using community harvest survey and satellite collared caribou data (ADF&G 2017d, 2017e).

Nonlocal resident harvest estimates are derived from harvest ticket reports (Parrett 2015c, ADF&G 2017d). Ten percent of the harvest reported from harvest tickets in Unit 26A is apportioned to the TCH while the remaining 90% is attributed to the WACH (ADF&G 2017d, 2017e). Local and nonlocal residents are considered those hunters living within and outside the range of the TCH, respectively.

TCH harvest primarily occurs in Unit 26A. While some harvest of TCH caribou does occur in Units 23, 24, and 26B, it is considered insignificant due to the small percentage of TCH caribou relative to WACH and CACH caribou in those units (Parrett 2015c, ADF&G 2017d). Local residents account for the vast majority of the TCH harvest. While nonlocal harvest in Unit 26A is low (~100 caribou per year), 90% of that harvest is apportioned to the WACH as it mostly occurs in southern Unit 26A (Parrett 2015c, ADF&G 2017e).

From 2002-2014, the estimated TCH harvest averaged 3,022 caribou (ADF&G 2017e). While there is much uncertainty in this estimate, it exceeds the current harvestable surplus and represents a 7% harvest rate. Harvest by local residents averaged 3,013 caribou, comprising 99.7% of the TCH harvest (**Table 2**). Harvest by nonlocal Alaska residents and nonresidents averaged 4.7 caribou and 4.5 caribou, respectively (ADF&G 2017d, 2017e).

The proportion of caribou harvested from a particular herd varies by community and year depending on village location, weather, terrain, caribou migration routes, fuel costs, etc. (**Table 2**). Most of the caribou harvested by Utqiagvik, Atkasuk, and Nuiqsuit residents is apportioned to the TCH while a lesser proportion of the harvest by Wainwright and Anaktuvuk Pass residents is usually apportioned to the TCH as these communities are on the herd's peripheral range. Harvest of TCH caribou by other communities is considered insignificant due to the overwhelming presence of caribou from other herds (ADF&G 2017d, 2017e).

Local residents primarily hunt caribou from July-Oct. by boat or ATV. Nonlocal hunters are concentrated in August and September and primarily use aircraft to access caribou (Parrett 2015c).

Table 2. Percent of caribou harvest by local communities apportioned to the Teshekpuk Caribou Herd and average annual TCH harvest by community (ADF&G 2017e).

Community	% Harvest from the TCH			Average TCH Harvest (# caribou/year)
	2002-2007	2011-2012	2014	
Atquasuk	84%	98%	86%	186.5
Utqiagvik	66%	97%	93%	2015.8
Nuiqsut	77%	77%	45%	359.0
Wainwright		60%		246.1
Anaktuvuk Pass	20%	30%	38%	205.5
Total				3012.9

Effects of the Proposal

If this proposal is adopted, registration permits will be required to hunt caribou in Units 22, 23, and 26A. This would align Federal and State reporting requirements, which would reduce regulatory complexity and user confusion. The difficulty in obtaining, and the inaccuracy of caribou harvest estimates for Units 22, 23, and 26A have presented continual challenges for herd management and conservation (Georgette 1994, Parrett 2015c, ADF&G 2017d). Registration permits would provide better harvest monitoring and herd management, which is particularly important given the current population declines and dwindling harvestable surpluses.

However, for this regulation to be adopted, concurrence would be needed from the State to allow Federally qualified subsistence users to use a State registration permit while hunting under Federal regulations. Requiring registration permits may burden Federally qualified subsistence users who would have to go into a licensed vendor and register. It is currently unclear whether there would be vendors in every village or whether permits could be obtained on-line as 2017 is the first year permits are required under State regulations. However, many rural residents in the region do not have internet access. If there are no vendors in a village, obtaining a registration permit may be a more substantial burden on residents of that village.

No biological impacts are expected from this proposal and there are no conservation concerns. While compliance with a new reporting system will likely take time, more accurate harvest data provided by registration permits could benefit the caribou resource and subsistence use via more informed herd management and hunting regulations.

OSM PRELIMINARY CONCLUSION

Support Proposal WP18-48; and **Take No Action** on Proposal WP18-49.

Justification

Requiring registration permits would improve harvest data and herd management, which is particularly important during periods of population declines. Additionally, adoption of this proposal would reduce regulatory complexity and user confusion by aligning Federal and State reporting requirements for caribou in Units 22, 23, and 26A. However, concurrence from the State to allow Federally qualified subsistence users to use a State registration permit while hunting under Federal regulations would be needed.

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Appendix 1

Estimated total caribou harvest by community, per capita caribou harvest by community, and data sources for Unit 23: Western Arctic caribou herd (ADF&G 2015).

Unit 23				
Community	Year/Period	Est Caribou Harv.	# caribou per capita	Source
Ambler	2003	325	1.12	Georgette et al. 2005, unpublished data
	2009	456	1.75	Braem 2012
	2012	685	2.54	Braem et al. 2015
Buckland	2003	637	1.56	Magdanz et al. 2011
	2009	561	1.30	Braem 2012
Deering	1994	142	0.96	Magdanz et al. 2002
	2007-2008	182	1.37	Braem 2011
	2011-2012	237	1.91	Braem 2011
	2013	393	2.85	ADF&G unpublished data
Kiana	1999	488	1.23	ADF&G unpublished data
	2006	306	0.77	Magdanz et al. 2011
	2009	440	1.18	Braem 2012
Kivalina	1982	346	0.48	CSIS
	1983	564	0.78	CSIS
	1992	351	0.49	CSIS
	2007	268	0.67	Magdanz et al. 2010
	2010-2011	86	0.23	Braem et al. 2014
Kobuk	2004-2005	134	1.06	ADF&G unpublished data
	2009	210	1.72	Braem 2012
	2012	119	0.84	Braem et al. 2015
Kotzebue	1986	1917	0.71	Georgette and Loon 1993
	1991	3782	1.04	CSIS
	2001	2376	0.77	Whiting 2003
	2002	1719	0.56	Whiting 2003
	2003	1915	0.61	Whiting 2003
	2012-2013	1804	0.56	CSIS
2013-2014	1629	0.51	ADF&G unpublished data	
Noatak	1994	615	1.62	Magdanz et al. 2002
	1999	683	1.61	Georgette et al 2000., unpubd data
	2002	410	0.90	Georgette et al. 2004, unpubd data
	2007	441	0.90	Magdanz et al. 2010
	2010	66	0.13	Braem et al. 2014
	2011	360	0.66	Mikow et al. 2014
Noorvik	2002	988	1.46	Georgette et al. 2004, unpubd data
	2008	767	1.19	Braem et al. 2012
	2012	851	1.36	CSIS

-continued-

Unit 23, continued

Community	Year/Period	Est Caribou Harv.	# caribou per capita	Source
Point Hope	1994-1995	355	0.49	Bacon et al. 2009, rev. 2011
	2000-2001	219	0.31	Bacon et al. 2009, rev. 2011
Selawik	1999	1289	1.68	CSIS
	2006	934	1.11	CSIS
	2011	683	0.79	Braem et al. 2013
Shungnak	1998	561	2.17	Georgette 1999, unpubd data
	2002	403	1.62	Magdanz et al. 2004
	2008	416	1.53	Braem 2012
	2012	396	1.47	Braem et al. 2015

WP18–57 Executive Summary

*Up to 3 cows per day may be harvested; July 16–Mar. 15
however cows accompanied by calves
may not be taken July 16 -Oct. 15*

Federal public lands in Unit 26A are closed to caribou hunting except by Federally qualified subsistence users hunting under these regulations.

*Unit 26B – that 5 caribou per day as follows:
portion south of
69°30' N. lat.
and west of the
Dalton
Highway*

*Bulls may be harvested July 1 -Oct. 14
Dec. 10–June. 30*

Cows may be harvested July 1–Apr 30

Federal public lands in Unit 26B are closed to caribou hunting except by Federally qualified subsistence users hunting under these regulations.

Unit 26B remainder 5 caribou per day as follows:

Bulls may be harvested July 1 -June 30

Cows may be harvested July 1 -May 15

Federal public lands in Unit 26B are closed to caribou hunting except by Federally qualified subsistence users hunting under these regulations.

You may not transport more than 5 caribou per regulatory year from Unit 26 except to the community of Anaktuvuk Pass.

WP18–57 Executive Summary	
OSM Preliminary Conclusion	Oppose
Southeast Alaska Subsistence Regional Advisory Council Recommendation	
Southcentral Alaska Subsistence Regional Advisory Council Recommendation	
Kodiak/Aleutians Subsistence Regional Advisory Council Recommendation	
Bristol Bay Subsistence Regional Advisory Council Recommendation	
Yukon-Kuskokwim Delta Subsistence Regional Advisory Council Recommendation	
Western Interior Alaska Subsistence	

WP18–57 Executive Summary	
Regional Advisory Council Recommendation	
Seward Peninsula Subsistence Regional Advisory Council Recommendation	
Northwest Arctic Subsistence Regional Advisory Council Recommendation	
Eastern Interior Alaska Subsistence Regional Advisory Council Recommendation	
North Slope Subsistence Regional Advisory Council Recommendation	
Interagency Staff Committee Comments	
ADF&G Comments	
Written Public Comments	None

**DRAFT STAFF ANALYSIS
WP18-57**

ISSUE

Proposal WP18-57, submitted by the North Slope Subsistence Regional Advisory Council, requests that Federal public lands in Units 26A and 26B be closed to caribou hunting by non-Federally qualified users (NFQU).

DISCUSSION

The proponent is concerned about the continued declines of the Western Arctic Caribou Herd (WACH), Teshekpuk Caribou Herd (TCH), and the Central Arctic Caribou Herd (CACH) and the ability of local subsistence users to meet their subsistence needs. The proponent is opposed to State regulations which allow a hunt for bulls from the CACH in Unit 26B through the rut when the population is in decline. The intent of this request is to ensure local people get the caribou they need, to protect the three caribou herds, and to reduce user conflicts. The proponent emphasizes the important traditional, cultural and nutritional value of caribou to local people and that a closure of Units 26A and 26B to NFQU will help local subsistence users harvest more caribou, increase their food security and reduce user conflicts.

Existing Federal Regulation

Unit 26—Caribou

Unit 26A—that portion of the Colville River drainage upstream from the Anaktuvuk River, and drainages of the Chukchi Sea south and west of, and including the Utukok River drainage

Calves may not be taken

*Bulls may be harvested; July 1– Oct. 14
Dec. 6–June 30*

*Cows may be harvested; however, cows accompanied by calves may not be taken July 16–Mar. 15
July 16–Oct. 15*

Unit 26A remainder *5 caribou per day as follows;*

Calves may not be taken

Bulls may be harvested; *July 1– Oct. 15*
Dec. 6 -June 30

Up to 3 cows per day may be harvested; *July 16–Mar.15*
however cows accompanied by calves
may not be taken July 16 -Oct. 15

Unit 26B – that portion south of 69°30' N. lat. and west of the Dalton Highway *5 caribou per day as follows:*

Bulls may be harvested *July 1 -Oct. 14*
Dec. 10–June. 30

Cows may be harvested *July 1–Apr 30*

Unit 26B remainder *5 caribou per day as follows:*

Bulls may be harvested *July 1 -June 30*

Cows may be harvested *July 1 -May 15*

You may not transport more than 5 caribou per regulatory year from Unit 26 except to the community of Anaktuvuk Pass.

Proposed Federal Regulation

Unit 26—Caribou

Unit 26A—that portion of the Colville River drainage upstream from the Anaktuvuk River, and drainages of the Chukchi Sea south and west of, and including the Utukok River drainage

5 caribou per day as follows:

Calves may not be taken

Bulls may be harvested;

July 1– Oct. 14

Dec. 6–June 30

Cows may be harvested; however, cows accompanied by calves may not be taken July 16–Oct. 15

July 16–Mar. 15

Federal public lands in Unit 26A are closed to caribou hunting except by Federally qualified subsistence users hunting under these regulations.

Unit 26A remainder

5 caribou per day as follows;

Calves may not be taken

Bulls may be harvested;

July 1– Oct. 15

Dec. 6–June 30

Up to 3 cows per day may be harvested; however cows

July 16–Mar. 15

accompanied by calves may not be taken July 16-Oct. 15

Federal public lands in Unit 26A are closed to caribou hunting except by Federally qualified subsistence users hunting under these regulations.

Unit 26B – that portion south of 69°30' N. lat. and west of the Dalton Highway

Bulls may be harvested *July 1 -Oct. 14*
Dec. 10–June. 30

Cows may be harvested *July 1–Apr 30*

Federal public lands in Unit 26B are closed to caribou hunting except by Federally qualified subsistence users hunting under these regulations.

Unit 26B remainder

5 caribou per day as follows:

Bulls may be harvested *July 1 -June 30*

Cows may be harvested *July 1 -May 15*

Federal public lands in Unit 26B are closed to caribou hunting except by Federally qualified subsistence users hunting under these regulations.

You may not transport more than 5 caribou per regulatory year from Unit 26 except to the community of Anaktuvuk Pass.

Existing State Regulation

Unit 26A—Caribou

Unit 26A the Colville River drainage

Resident Hunters: Five caribou per day, however, calves may not be taken:

upstream from the Anaktuvuk River, and drainages of the Chukchi Sea south and west of, and including the Utukok River drainage

Bulls	RC907	July 1 – Oct. 14 Feb. 1 – June 30
Cows	RC907	July 15 – Apr. 30
Nonresident hunters: One bull; however, calves may not be taken	HT	July 15– Sept.30

Unit 26A remainder

Resident Hunters: Five bulls per day; however, calves may not be taken	RC907	July 1 – July 15 Mar. 16-June 30
Five caribou per day three of which may be cows; calves may not be taken, and cows with calves may not be taken	RC907	July 16 – Oct. 15
Three cows per day however, calves may not be taken	RC907	Oct. 16 – Dec. 31
Five caribou per day three of which may be cows; calves may not be taken	RC907	Jan. 1 – Mar. 15
Nonresident Hunters: One bull however, calves may not be taken	HT	July 15 – Sept. 30

Unit 26B—Caribou

Unit 26(B), Northwest portion north of the 69° 30' N. lat. and west of the east bank of the Kuparuk River to a point at 70° 10' N. lat., 149° 04' W. long., and

Resident Hunters: 5 caribou per day		
Bulls	HT	No closed season

<i>west approximately 22 miles to 70°10' N. lat and 149°56' W. long, then following the east bank of the Kalubik River to the Arctic Ocean</i>	<i>Cows</i>	<i>HT</i>	<i>July 1- May 15</i>
	<i>Nonresident Hunters: 1-bull</i>	<i>HT</i>	<i>Aug. 1-Sept 15</i>
<i>26B remainder</i>	<i>Resident Hunters: 2 bulls</i>	<i>HT</i>	<i>Aug. 1-Apr. 30</i>
	<i>Nonresident Hunters: 1 bull</i>	<i>HT</i>	<i>Aug. 1-Sept. 15</i>

Extent of Federal Public Lands

Federal public lands comprise approximately 73% of Unit 26A and consist of 66.9% Bureau of Land Management (BLM) managed lands, 6.6% National Park Service (NPS) managed lands, and 0.1% U.S. Fish and Wildlife Service (USFWS) managed lands. Federal public lands comprise approximately 29% of Unit 26B and consist of 22.8% USFWS managed lands, 3.6% BLM managed lands, and 2.7% NPS managed lands (See **Unit 26 Map**).

Customary and Traditional Use Determinations

Residents of Unit 26, Anaktuvuk Pass, and Point Hope have a customary and traditional use determination for caribou in Unit 26A.

Residents of Unit 26, Anaktuvuk Pass, Point Hope, and Unit 24 within the Dalton Highway Corridor Management Corridor (DHCMA) have a customary and traditional use determination for caribou in Unit 26B.

Regulatory History

In 1995, the Federal Subsistence Board (Board) adopted Proposal P95-64 to increase the harvest limit from 5 caribou per day to 10 caribou per day in Unit 26 to increase opportunity for subsistence hunters (OSM 1995a). The Board also adopted Proposal P95-62 which closed the area east of the Killik River and south of the Colville River to NFQU (OSM 1995b). This closure was enacted to prevent NFQU from harvesting lead animals, which may have caused the migration to move away from the area that local subsistence users hunted in Unit 26A (OSM 1995b).

In 2005, the Alaska Board of Game (BOG) established a Controlled Use Area for the Anaktuvuk River drainage that prohibited the use of aircraft for caribou hunting from Aug. 15–Oct. 15. The intent of this proposal was to limit access by nonlocal hunters, reduce user conflicts, and lessen the impact on caribou

migration.

In 2006, the Board adopted Proposal WP06-65 which opened the area east of the Killik River and south of the Colville River to NFQU (OSM 2006). The 1995 closure was lifted for several reasons. First, due to changes in land status, lands formerly managed by BLM were transferred to Alaska Native corporations or the State pursuant to the Alaska Native Claims Settlement Act or the Statehood Act, respectively. However, only the lands east of Anaktuvuk Pass were affected by the closure, making the closure less effective. Second, the WACH, TCH, and CACH populations, which traverse Unit 26A, were healthy and could support both subsistence and non–subsistence uses.

In 2013, an aerial photo census indicated significant declines in the TCH (Caribou Trails 2014), WACH (Dau 2011), and possibly the CACH (Caribou Trails 2014). In response, the BOG adopted modified Proposal 202 (RC76) in March 2015 to reduce harvest opportunities for both residents and non-residents within the range of the WACH and the TCH. These regulation changes, which included lower bag limits, changes to harvest seasons, modification of hunt areas, restrictions on bull and cow harvest and a prohibition on calf harvest, were adopted to slow or reverse the population decline. These regulatory changes, which were the result of extensive discussion and compromise among a variety of user groups, took effect on July 1, 2015.

In an effort to enact conservation measures, the North Slope Subsistence Regional Advisory Council submitted four temporary wildlife special actions (WSA) for Units 23, 24, 26A, and 26B to change caribou harvest regulations on Federal public lands for the 2015/16 regulatory year. The Board approved Temporary Special Actions WSA15-03/04/05/06, which are similar to the changes made to State regulations in an attempt to reverse or slow the decline of the WACH and TCH. To address two primary factors contributing to the decline, low calf survival and high adult cow mortality, WSA15-03/04/05/06 prohibited the harvest of cows with calves, prohibited the harvest of calves, and reduced the harvest limit to 5 caribou per day, and shortened the cow and bull seasons. Some of the requested hunt areas were not included in the Special Action WSA15-03/04/05/06 because there was not sufficient time for the Councils to review the proposed changes before the start of the regulatory year.

In 2015, three proposals were submitted for the 2016-2018 wildlife regulatory cycle concerning caribou regulations in Unit 26A and 26B, two from the North Slope Subsistence Regional Advisory Council (WP16-63 and WP16-64) and one from Jack Reakoff of Wiseman (WP16-37). The Board adopted WP16-37 with modification and took no action on WP16-63/64 based on action taken on WP16-37 (OSM 2016). Changes to the 2016-2018 Federal regulations in Unit 26A included a reduction from ten to five caribou per day harvest limit, splitting Unit 26A into two hunt areas based on range and migration patterns of the WACH and TCH, selecting the opening date for bulls in the winter season as December 6, a prohibition on the take of calves, and protection of cows with calves from July 16-Oct. 15. Changes to caribou regulations in Unit 26B, where harvest is primarily from the CACH, were: a reduced harvest limit from ten to five caribou per day; splitting Unit 26B into two hunt areas, one south of 69°30' N. lat. west of the Dalton Highway and 26B remainder; a restricted cow season from July to April/May; and a reduction in the cow and bull seasons. Changes to caribou regulations in 2015 by the BOG and the Federal Subsistence Board represented the first time in over 30 years that harvest restrictions were

implemented for the WACH and TCH. These regulation changes for the WACH were also supported by management recommendations outlined in the Western Arctic Herd Management Plan (WACH Working Group 2011). The intent of these regulations was to reduce the overall harvest and cow mortality to allow the WACH and TCH populations to recover.

In 2015, the Northwest Arctic Subsistence Regional Advisory Council submitted a Temporary Special Action Request (WSA16-01) to close caribou hunting on Federal public lands in Unit 23 to NFQU for the 2016/17 regulatory year. The Northwest Arctic Council stated that its request was necessary for conservation purposes and because nonlocal hunting activities were negatively affecting subsistence harvests. In April 2016, the Board approved Special Action Request WSA16-01, basing its decision on the strong support of the Northwest Arctic and North Slope Councils, public testimony in favor of the request as well as concerns over conservation and continuation of subsistence use (FSB 2016).

In June 2016, the State submitted Temporary Special Action Request WSA16-03 to reopen caribou hunting on Federal public lands in Unit 23 to NFQU, providing new biological information (e.g. calf recruitment, weight, body condition) on the WACH. The State specified that there was no biological reason for the closure and that it could increase user conflicts. In January 2017, the Board rejected WSA16-03 due to the position of all four affected Councils (Northwest Arctic, North Slope, Seward Peninsula, and Western Interior Alaska Subsistence Regional Advisory Councils), public testimony, and Tribal consultation comments opposing the request. Additionally, the Board found the new information provided by the State to be insufficient to rescind the closure (FSB 2017, OSM 2017a).

In January 2017, the BOG adopted Proposal 2, requiring registration permits for residents hunting caribou within the range of the Western Arctic and Teshekpuk herds in Units 21, 23, 24, and 26 (a similar proposal was passed for Unit 22 in 2016). ADF&G submitted the proposal in order to better monitor harvest and improve management flexibility (ADF&G 2017a).

In February 2017, in response to the decline in the CACH, the BOG adopted Proposal 105 (RC22) with amendments to reduce overall caribou harvest from 930 to 680 and the cow harvest from 202 to 75 in Unit 26B (Lenart 2017a).

In March 2017, the Northwest Arctic and North Slope Subsistence Regional Advisory Councils submitted Temporary Special Action Requests WSA17-03, and WSA-04, to close caribou hunting on Federal public lands in Unit 23 and in Units 26A and 26B, respectively to NFQU for the 2017/18 regulatory year. Both Councils stated that the intent of the proposed closures was to ensure continuation of subsistence uses in the 2017/18 regulatory year, to protect declining caribou populations, and to reduce user conflicts. In June 2017, the Board approved Temporary Special Action WSA17-03 with modification to close Federal public lands to caribou hunting within a 10 mile wide corridor (5 miles on either side) along a portion of the Noatak River; within the Squirrel River drainage; and within the northern and southern boundaries of the Eli and Agashashok River drainages; for the 2017/2018 regulatory year. While these closures may help reduce user conflicts along these high use areas, the Board concluded that closure of all Federal public lands to NFQU was not warranted at that time.

In June 2017, the Board rejected WSA17-04 for a variety of reasons including: 1) the relatively small cow

harvest by NFQU in Unit 26A; 2) the need for adequate time to determine if the recently enacted conservation actions for WACH, TCH, and CACH are effective in reducing the caribou harvest and reversing or slowing down the population declines; 3) the closure of Federal public lands in Unit 26A would likely shift hunters to State lands around Anaktuvuk Pass; 4) closure of Federal public lands in Unit 26B, which makes up only about 30% of the unit, is not likely to have as much effect as recent BOG regulations to protect the CACH; and 5) a reduction in hunting pressure along the Dalton Highway Corridor Management Area (DHCMA), which is thought to affect the migration of the CACH, is unlikely to be effective, as most NFQU will use the DHCMA to access adjacent State lands.

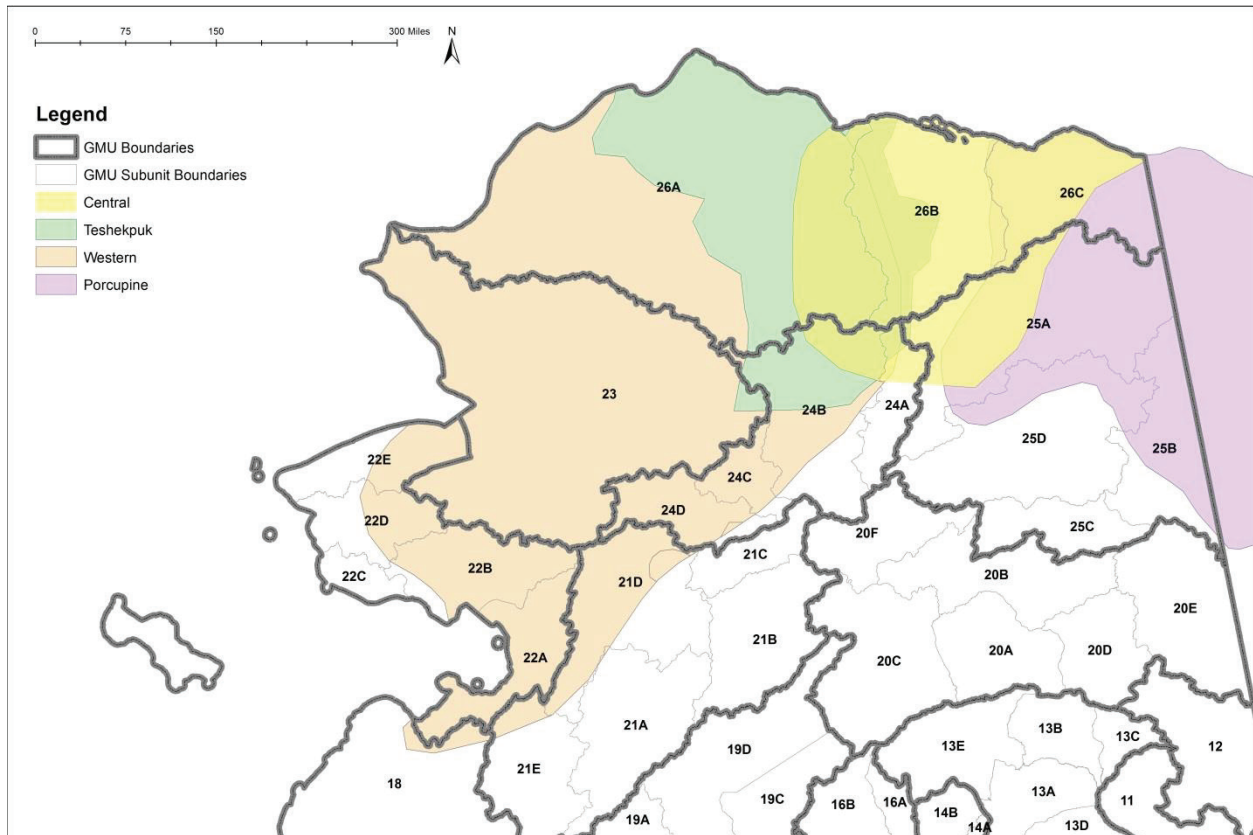
Biological Background

The TCH, WACH, and CACH have ranges that overlap in Unit 26A (**Map 1**) and there can be considerable mixing of herds during the fall and winter (Hemming 1971). During the early 2000s, the number of caribou from the WACH, TCH, CACH, and Porcupine Caribou Herd (PCH) peaked at over 700,000 animals, which may be the highest number since the 1970s (OSM 2017a). After declining slowly during the 1990s and early 2000s, the PCH has been increasing and by 2016 was at 197,000, which is the highest population yet recorded for this herd (OSM 2017b). Caribou abundance naturally fluctuates over decades (Gunn 2001, WACH Working Group 2011). Gunn (2001) reports the mean doubling rate for Alaskan caribou populations as 10 ± 2.3 years. Although the underlying mechanisms causing these fluctuations are uncertain, Gunn (2001) suggests climatic oscillations as the primary factor, exacerbated by predation and density-dependent reduction in forage availability, resulting in poorer body condition. During the 1970s, there was little overlap between these four herds, but the degree of mixing seemed to increase as the herds increased in the early 2000s (Lenart 2011, Dau 2011, Parrett 2011).

Caribou calving generally occurs during late May and early June. Weaning generally occurs in late October and early November before the breeding season (Taillon et al. 2011). Calves stay with their mothers through their first winter, which improves calves' access to food and body condition. Joly (2000) found that calves orphaned later in life have greater chances of surviving. Data from Russell et al. (1991) suggests 50% and 75% of the calves orphaned in September and November, respectively, survived the winter (Joly 2000). Indeed, there is little evidence that calves orphaned after weaning experience strongly reduced overwintering survival rates than non-orphaned calves (Rughetti and Festa-Bianchet 2014, Joly 2000, Holand et al. 2012), although Holand et al. (2012) found orphaned calves to have greater losses of winter body mass than non-orphaned calves.

The WACH, TCH, and CACH migrate between seasonal summer and winter ranges and calving areas. Over many years, traditional migration routes have developed in response to spatial and temporal variability of environmental conditions encountered (Duquette 1988). Migration routes that were successful in previous years are likely learned by young caribou following older, more experienced animals (Pullainen 1974). Maintaining connectivity between the seasonal areas is important because restoring disturbed migration routes can be challenging (Wilcove and Wikelski 2008, Singh and Milner-Gulland 2011). Long-term climate changes may affect seasonal ranges and migratory patterns through changes in forage abundance, quality, and weather. In addition, increased development along migration routes could increase energy costs, impede movements, or deflect caribou to less optimal areas.

Understanding the importance of spatial and temporal variation of the seasonal habitat use and the migration routes are important considerations for management of caribou herds.



Map 1. Herd overlap and ranges of the Western Arctic, Teshekpuk, Central Arctic and Porcupine Caribou herds (Caribou Trails 2014).

Central Arctic Caribou Herd

The CACH range includes the area from the eastern portion of the Arctic coastal plain of the North Slope to the Canadian border, the north side of the Brooks Range from the Itkillik River to the Canadian border, the south side of the Brooks Range from the North Fork of the Koyukuk River to the East Fork of the Chandalar River, and as far south as the Chandalar River valley (Lenart 2015). The traditional calving grounds of the CACH are between the Colville and Kuparuk rivers on the west side of the Sagavanirktok River and between the Sagavanirktok and Canning rivers on the east side. In response to oil and gas development and infrastructure in the 1990s caribou that calved in the western Unit 26B shifted their calving grounds to the southwest (Arthur and Del Vecchio 2009). The CACH summer range extends east from Fish Creek, just west of the Colville River, along the coast and inland about 30 miles to the Canadian border. Typically the CACH summer range extends from the Colville River to just east of the Katakturuk River and from the coast inland to the foothills of the Brooks Range. The winter range of the CACH occurs in the northern and southern foothills of the Brooks Range. In most years the CACH begin migrating toward the foothills of the Brooks Range in August and by September most of the caribou are

in the foothills around Toolik Lake, Galbraith Lake, Accomplishment Creek, Ivishak River and the upper Sagavanirktok River. Depending on the year, the rut, which typically occurs in mid-October, can occur on the north or south side of the Brooks Range (Lenart 2015). The range of the CACH often overlaps with the PCH on the summer and winter ranges to the east and with the WACH and TCH herds on the summer and winter ranges to the west (**Map 1**) (Lenart 2015).

The seasonal movements and migratory patterns of CACH have been studied using radiotelemetry for the past 30 years (Cameron et al. 1979, Whiten and Cameron 1983, Cameron et al. 1986, Carruthers et al. 1987, Cameron et al. 1995, Cameron et al. 2005). Migratory patterns of the CACH are oriented principally north-south, from the summer range and calving areas on the tundra-dominated Arctic coastal plain to the winter range in the foothills and mountains of the Brooks Range (Cameron et al. 1979, Carruthers et al. 1987, Fancy et al. 1989, Cameron et al. 2002, Nicholson et al. 2016). Spring migration to the calving areas, which is led by pregnant females, occurs during April and May (Duquette and Klein 1987). After calving, males and non-pregnant females form large groups in mid-June (Cameron and Whitten 1979). Similar to the TCH, CACH often move to windy areas along the Beaufort Sea coast or to areas with persistent patches of snow to avoid harassment by flies and mosquitoes during the middle of the summer (White et al. 1979). During August, when the insect activity lessens, the caribou begin a slow and irregular movement toward the foothills of the Brooks Range. The fall migration to the wintering areas starts in September and continues through November (Cameron et al. 1986, Lenart 2015).

From 2003-2007, movements of 54 caribou from the CACH were monitored (Nicholson et al. 2016). The annual summer and winter home ranges of the CACH, using a 90% fixed kernel utilization distribution, were similar between summer (mean = 27,929 km²) and winter (mean = 26,585 km²). Overlap between consecutive summer ranges was 62.4% and consecutive winter ranges 42.8% (Nicholson et al. 2016). The CACH typically cross the Dalton Highway from the northwest to the southeast during the fall migration, which is away from Anaktuvuk Pass (Nicholson et al. 2016). The CACH used multiple migration routes, or a network of corridors versus a single migration route. Although the caribou migratory patterns varied each year some areas were consistently used each year. The migration paths that consistently had high caribou concentrations during spring and fall migrations each year were along the Dalton Highway between Galbraith Lake and the Ribdon River (Nicholson et al. 2016).

The State manages the CACH to provide for subsistence and other hunting opportunities on a sustained yield basis. State management objectives for the CACH are as follows (Lenart 2015):

- Maintain a population of at least 28,000-32,000 caribou
- Maintain accessibility of seasonal ranges for CACH caribou
- Maintain a harvest of at least 1,400 caribou if the population is \geq 28,000 caribou
- Maintain a ratio of at least 40 bulls: 100 cows
- Reduce conflicts between consumptive and nonconsumptive uses of caribou along the Dalton Highway

When the CACH was recognized as a distinct herd in 1975, the population was estimated to be 5,000 caribou (Cameron and Whitten 1979). The population increased to approximately 23,000 in 1992 (Valkenburg 1993), decreased to 18,000 in 1995, and then increased rapidly from 27,000 in 2000 to 70,034 in 2010 (Lenart 2015). Low cow mortality, high parturition rates, and high calf survival and recruitment contributed to the population increase of approximately 12% per year from 1998-2008 (Lenart 2015). In 2013, the population dropped to approximately 50,000 and by 2016 the population decreased to 22,360 caribou, which is below State management objectives (Lenart 2011, 2013, 2017a, b). The recent decline from 2010 to 2016 represented a decline of approximately 17% per year. The late spring of 2013, which killed many adult and yearling females, likely contributed to the population decline from 2010 to 2013. Two major factors influencing the population decline from 2013 to 2016 were the high mortality of adult females and emigration (Lenart 2017b). From 2013-2016 54% of the collared females (n = 54 in 2013) died and 19% switched from the CACH to other caribou herds (Lenart 2017b). Previous research indicates that predation has not played a major role in calf mortality and it is not thought to be a major factor in the decline (Lenart 2017b). Disease is also not implicated as a major factor for the decline of the CACH (Lenart 2017b). The State attributes the decline between 2013 and 2016 censuses to a large proportion of older females that died of old age, the late spring of 2013, and the CACH that switched herds (Lenart 2017a).

Composition surveys are usually conducted during the fall near the peak of the rut to take advantage of the mixing of the bulls, cows, and calves. Composition counts were conducted in 2009-2012, 2014, and 2016 (Lenart 2015, 2017a). Composition surveys were not done in 2013 because the CACH was mixed with the PCH (**Table 1**) (Lenart 2015). The calf:cow ratio did not decline until after 2012 (**Table 1**). From 2009-2012 calf:cow ratios averaged 49 calves: 100 cows (**Table 1**) (Lenart 2015). The calf:cow ratio was 48 calves: 100 cows when the population dropped to 22,360 caribou in 2016 (Lenart 2017a). Calf: cow ratios for calves \leq 4 years old, was above 70 calves: 100 cows during the period when the herd was growing between 2000 and 2010 (Lenart 2017a). From 2010-2016, when the herd was declining, the calf:cow ratio for the older calves dropped below the 70 calves:100 cows. Although the bull:cow ratio had declined to 39 bulls: 100 cows in 2016 it was still close to the State recommended objective of 40 (Lenart 2015, 2017b).

Table 1. Central Arctic caribou sex and age composition information collected during fall composition surveys, 2009-2014 (Lenart 2015)^a.

<u>Date</u>	<u>Bulls:100 cows</u>	<u>Calves:100 cows</u>	<u>Percent Calves (n)</u>	<u>Percent Cows (n)</u>	<u>Percent Bulls (n)</u>	<u>Sample Size</u>	<u>Groups</u>
<u>13-14 Oct. 2009</u>	<u>50</u>	<u>33</u>	<u>18 (1,193)</u>	<u>55 (3,641)</u>	<u>27 (1,814)</u>	<u>6,648</u>	<u>19</u>
<u>23 Oct. 2010</u>	<u>50</u>	<u>46</u>	<u>23 (889)</u>	<u>51 (1,930)</u>	<u>26 (968)</u>	<u>3,787</u>	<u>12</u>
<u>13 Oct. 2011</u>	<u>69</u>	<u>56</u>	<u>25 (1303)</u>	<u>44 (2,306)</u>	<u>31 (1,590)</u>	<u>5,199</u>	<u>22</u>
<u>14 Oct. 2012</u>	<u>56</u>	<u>61</u>	<u>23 (1,132)</u>	<u>55 (1,845)</u>	<u>22 (1,039)</u>	<u>4,016</u>	<u>15</u>
<u>13-14 Oct. 2014^b</u>	<u>41</u>	<u>42</u>	<u>23 (462)</u>	<u>55 (1,097)</u>	<u>22 (445)</u>	<u>2,004</u>	<u>18</u>
<u>2016</u>	<u>39</u>	<u>48</u>					

^a 2016 data is incomplete (Lenart 2017b)

^b Data may not be comparable with previous years due to small sample size.

Teshkepuk Caribou Herd

The TCH calving and summering areas overlap with the eastern portion of the National Petroleum Reserve–Alaska (NPR–A). Most of the TCH moves toward Teshkepuk Lake in May to calve in early June. The primary calving grounds of the TCH (approximately 1.8 million acres) occur to the east, southeast and northeast of Teshkepuk Lake (Person et al. 2007, Wilson et al. 2012). From late June through July cows and bulls move to the Beaufort Sea coast from Dease Inlet to the mouth of the Kogru River (Utqiagvik to the Colville Delta), around the north and south side of the Teshkepuk Lake, and the sand dunes along the Ikpikpuk River to seek relief from insects (Carroll 2007, Parrett 2007). The narrow corridors of land to the east and northwest of the Teshkepuk Lake are important migratory corridors to insect relief areas as well (Yokel et al. 2009). River corridors are also used more during periods of insect harassment. Fall and winter movements are more variable, although most of the TCH winters on the coastal plain around Atqasuk, south of Teshkepuk Lake. However, the TCH has wintered as far south as the Seward Peninsula, as far east as the Arctic NWR, and in the foothills and mountains of the Brooks Range (Carroll 2007). In 2008/2009, the TCH used many of these widely disparate areas in a single year (Parrett 2011, 2015a). From 2007-2011, the TCH wintered in four relatively distinct areas: the coastal plain between Atqasuk and Wainwright; the coastal plain west of Nuiqsut; the central Brooks Range; and the shared winter ranges with the WACH in the Noatak, Kobuk, and Selawik drainages. During the winters of 2012-2013 and 2013-2014, the TCH wintered primarily near Atqasuk and Wainwright and east of Anaktuvuk Pass (Parrett 2015a)

The State manages the TCH to provide for subsistence and other hunting opportunities on a sustained yield basis, ensure that adequate habitat exists, and provide for viewing and other uses of caribou (Parrett 2011). Specific State management objectives for the TCH are as follows (Parrett 2011):

- Attempt to maintain a minimum population of 15,000 caribou, recognizing that caribou numbers naturally fluctuate.
- Maintain a harvest level of 900–2,800 caribou using strategies adapted to population levels and trends.
- Maintain a population composed of least 30 bulls per 100 cows.
- Monitor herd characteristics and population parameters (on an annual or regular basis).
- Develop a better understanding of the relationships and interactions among North Slope caribou herds.
- Encourage cooperative management of the herd and its habitat among State, Federal, and local entities and all users of the herd.
- Seek to minimize conflicts between resource development and the TCH.

Since 1984, the minimum population of the TCH has been estimated from aerial photo censuses and radio-telemetry data. Population estimates are determined by methods described by Rivest et al. (1998) which account for caribou in groups that do not have a collared animal and for missing collars. Based on these methods the TCH population increased from an estimated 18,292 caribou (minimum estimate 11,822) in 1982 to 68,932 caribou (minimum estimate 64,106) in 2008. From 2008 to 2014 the population declined by almost half to 39,000 caribou (**Figure 1**) (Parrett 2015a). Interpretation of population estimates is difficult due to movements and range overlap among caribou herds which results in both temporary and permanent immigration (Person et al. 2007). For example, following the 2013 census ADF&G made the decision to manage the TCH based on the minimum count because the bulk of the animals that were estimated rather than counted were with the WACH at the time of the photo census (Parrett 2015b, pers. comm.). In 2015, the minimum count was 35,181 with a population estimate of 41,542 (SE = 3,486) (Parrett 2017a, pers. comm.).

In 2013 and 2016 the number of bulls:100 cows was 39 bulls:100 cows and 28 bulls:100 cows in 2016, respectively (**Figure 2**) (Parrett 2011, 2013, 2015a, Parrett 2017a, pers. comm.). Comparison of bull:cow and calf:cow ratios from 1991-2000 and later years is not possible due to dramatic changes in methodology. From 2009-2013 the calf:cow ratio increased from 18 calves:100 cows to 48 calves: 100 cows in 2016 (Parrett 2013, 2015a, Parrett 2017a, pers. comm.). In addition, the number of short-yearlings:adults based on spring composition surveys, which is a measure of recruitment, declined from an average of 20 short-yearlings:100 adults between 1999 and 2008 to an average of 14 short-yearlings :100 adults from 2009-2014 (**Figure 3**) (Parrett 2013) and increased in 2016 to 29 short-yearlings: 100 adults (Parrett 2017a, pers. comm.).

The annual mortality of adult radio collared females from the TCH has remained close to the long term (1991-2012) average of 14.5% (range 8–25%) (Parrett 2011, Caribou Trails 2014, Parrett 2015a). As the TCH has declined, calf weights declined indicating that poor nutrition may be having a significant effect on this herd (Carroll 2015, pers. comm., Parrett 2015b, pers. comm.). In 2016 increased calf weights,

high adult female survival (92%), high yearling recruitment (29 yearlings / 100 adults), and high calf production (81%), and a high calf:cow ratio (48 calves:100 cows) suggest that the population may be stable or declining at a slower rate (Parrett 2017a, pers. comm.) In contrast, the body condition of individuals from the WACH, which also declined dramatically, has remained relatively good, indicating that caribou are still finding enough food within their range (Caribou Trails 2014, Dau 2014). A recent study found that calf production was low, calf survival on calving grounds was high, 40% of the concentrated wintering range was on NPS land, and that starvation was a significant mortality factor on non-NPS lands (Parrett 2017a, pers. comm.). The late spring in 2013 likely contributed to the decline in winter survival in 2014.

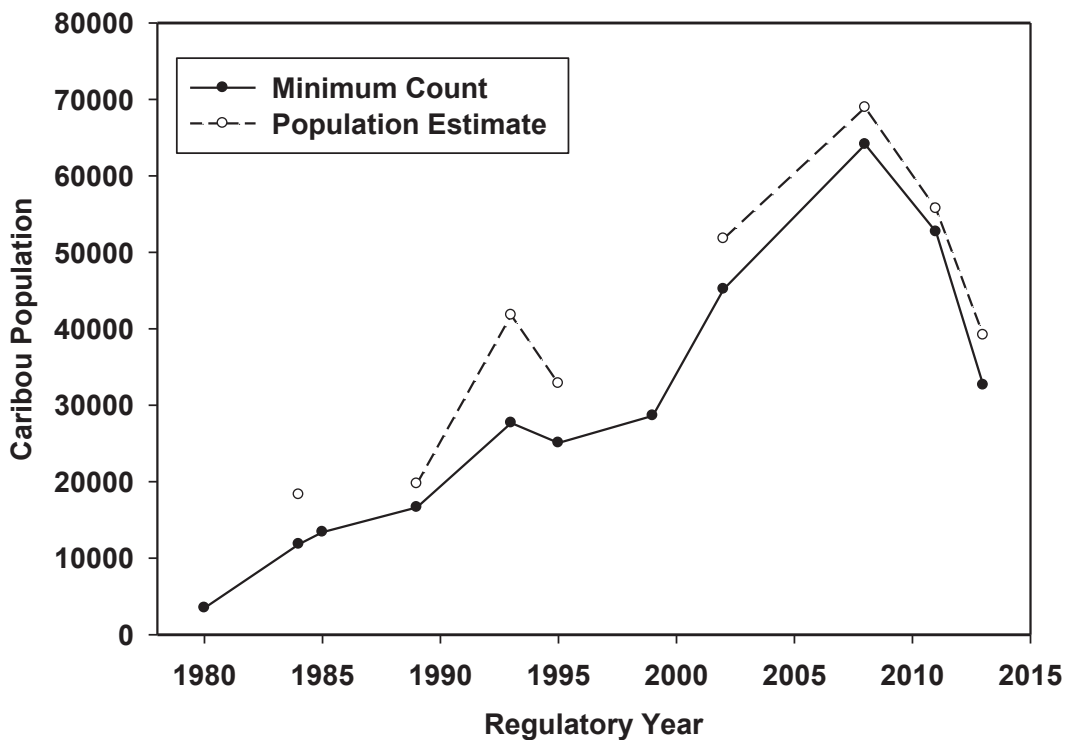


Figure 1. Minimum counts and population estimates of the Teshekpuk Caribou Herd from 1980-2014. Population estimates from 1984-2013 are based on aerial photographs of groups of caribou that contained radio-collared animals (Parrett 2011, 2013, Parrett 2015a).

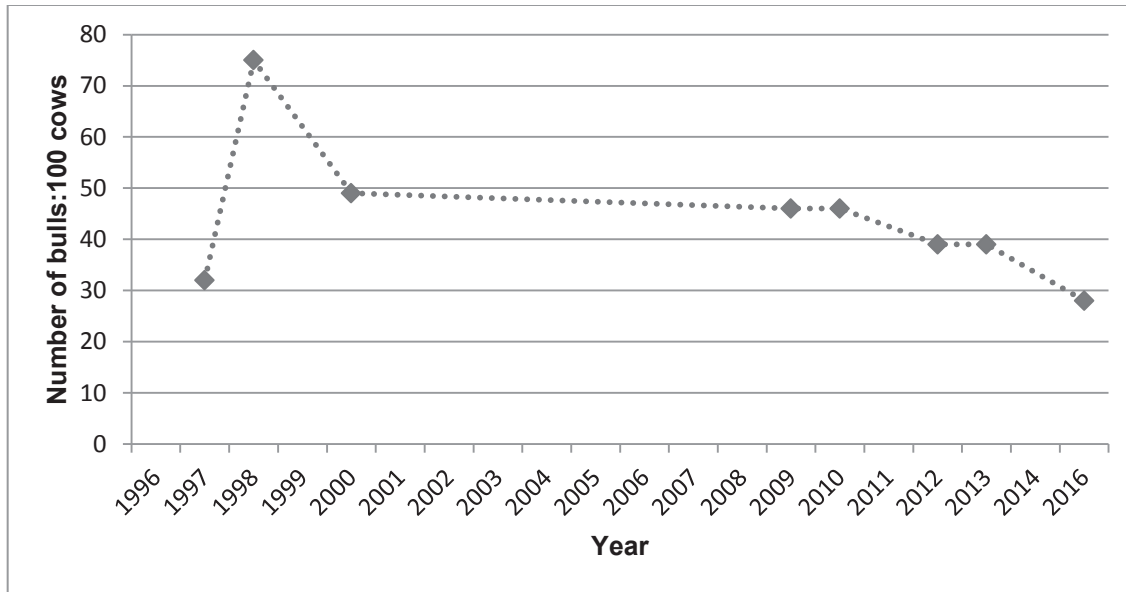


Figure 2. Bull:cow ratios of the Teshekpuk Caribou Herd (Parrett 2013).

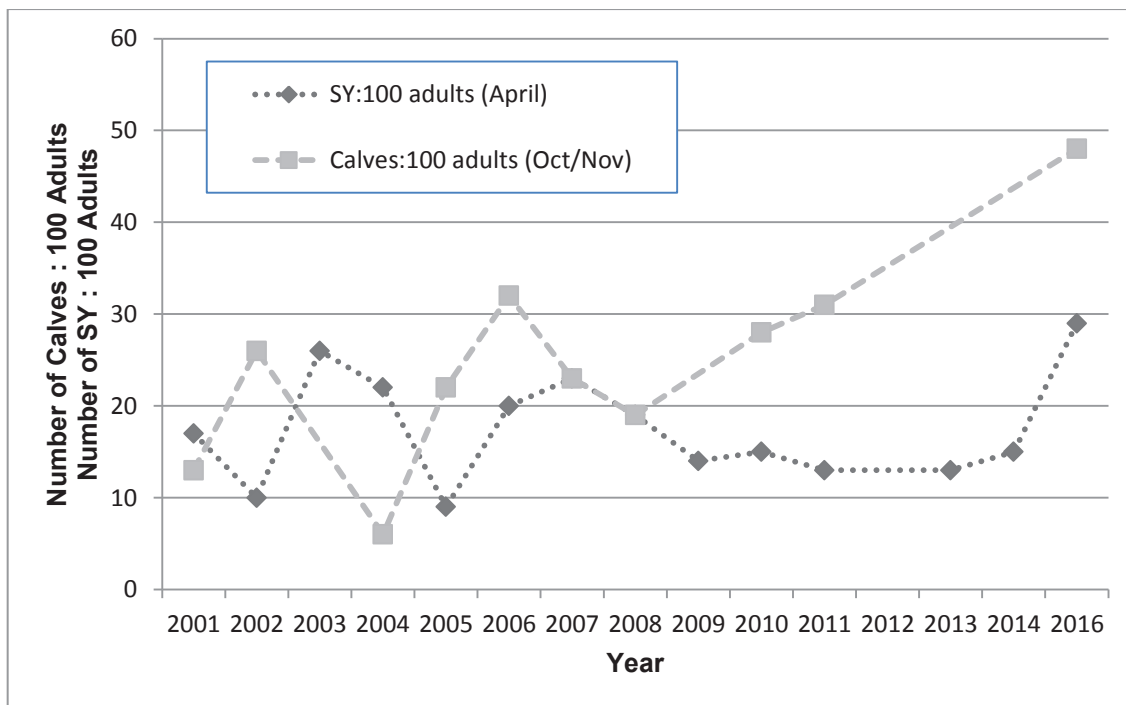
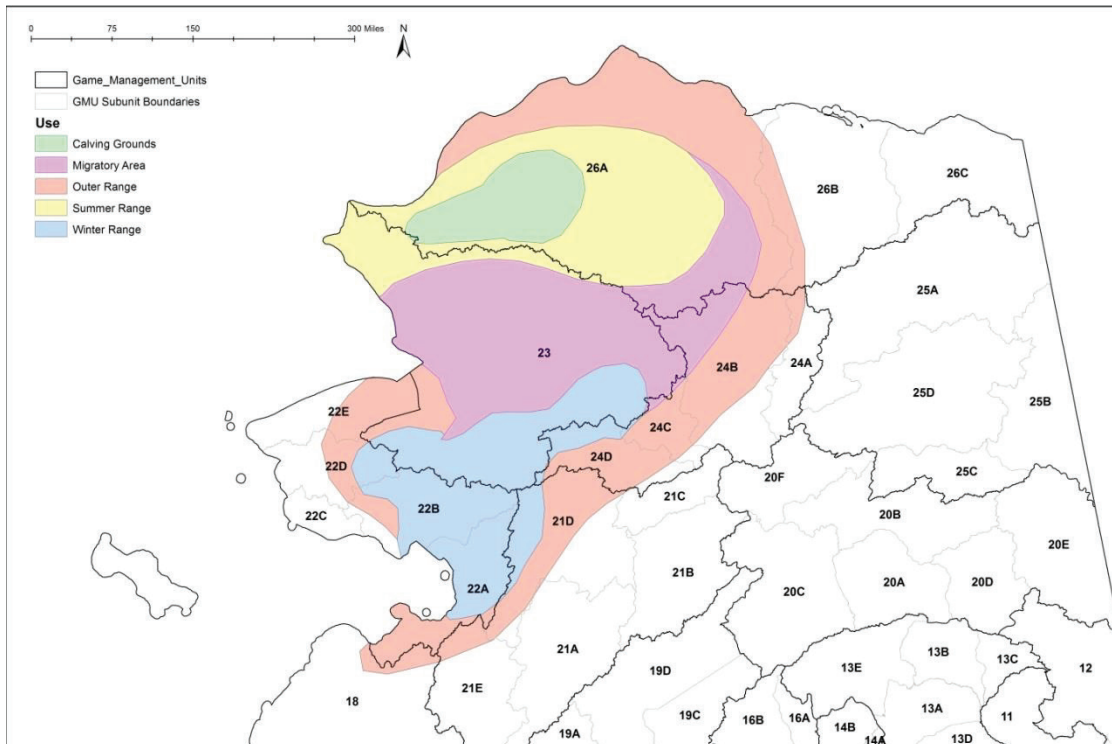


Figure 3. Calf:adult and short yearling (SY):adult ratios for the Teshekpuk Caribou Herd (Parrett 2015a). Short yearlings are 10-11 months old caribou.

Western Arctic Caribou Herd

The WACH, the largest herd in Alaska, has a home range of approximately 157,000 mi² in northwestern Alaska (**Map 2**). In the spring, most mature cows move north to calving grounds in the Utukok Hills, while bulls and immature cows lag behind and move toward summer range in the Wulik Peaks and Lisburne Hills (Dau 2011, WACH Working Group 2011). Dau (2013) determined the calving dates for the WACH to be June 9–13. This is based upon long-term movement and distribution data obtained from radio-collared caribou (these are the dates cows ceased movements and were assumed to be calving). After calving, cows and calves move west toward the Lisburne Hills where they mix with the remaining bulls and non-maternal cows. During the summer the herd moves rapidly to the Brooks Range.

In the fall the herd moves south toward their wintering grounds in the northern portion of the Nulato Hills. Rut occurs during fall migration (Dau 2011, WACH Working Group 2011). Dau (2013) determined the WACH rut dates to be October 22–26. This is based on back-calculations from calving dates using a 230-day gestation period. Since about 2000, the timing of fall migration has been less predictable, often occurring later than in previous decades (Dau 2015a). The proportion of caribou using certain migration paths varies each year (Joly and Cameron 2017). In recent years (2012-2014), the path of fall migration has shifted east (Dau 2015a).



Map 2. Calving grounds, wintering range, summering range, migratory areas, and home range extent of the Western Arctic Caribou Herd (WACH Working Group 2011)

In part, due to the collapse of the WACH in the 1970s, the WACH Working Group was formed. In 2003 it developed a WACH Cooperative Management Plan, and revised it in 2011 (WACH Working Group 2011). The WACH Management Plan identifies seven plan elements: cooperation, population management, habitat, regulations, reindeer, scientific and traditional ecological knowledge, and education as well as associated goals, strategies, and management actions. As part of the population management element, the WACH Working Group developed a guide to herd management determined by population size, population trend, and harvest rate. Revisions to recommended harvest levels under liberal and conservative management (2,850 caribou +/- 100) were made in December 2015 (WACH Working Group 2015, **Table 2**). Potential management actions and harvest recommendations for each management level can be found in Appendix 2 of the Western Arctic Caribou herd Cooperative Management Plan (WACH Working Group 2011).

The State manages the WACH to protect the population and its habitat, provide for subsistence and other hunting opportunities on a sustained yield basis, and provide for viewing and other uses of caribou (Dau 2011). State management objectives for the WACH are listed in the 2011 Western Arctic Caribou Cooperative Management Plan (WACH Working Group 2011, Dau 2011) and include:

- Encourage cooperative management of the WACH among State, Federal, local entities, and all users of the herd.
- Manage for healthy populations using management strategies adapted to fluctuating population levels and trends.
- Assess and protect important habitats.
- Promote consistent and effective State and Federal regulations for the conservation of the WACH.
- Seek to minimize conflict between reindeer herders and the WACH.
- Integrate scientific information, traditional ecological knowledge of Alaska Native users, and knowledge of all users into management of the herd.
- Increase understanding and appreciation of the WACH through the use of scientific information, traditional ecological knowledge of the Alaska Native users, and knowledge of all other users.

The WACH population declined rapidly in the early 1970s bottoming out at about 75,000 animals in 1976. Aerial photo censuses have been used since 1986 to estimate population size. The WACH declined at an average annual rate of 7.1% from approximately 490,000 in 2003 to 235,000 in 2013 (Dau 2011, 2013, 2014, 2015a, Caribou Trails 2014) (**Figure 4**).

Between 1982 and 2011, the WACH was within the liberal management level prescribed by the WACH Working Group (**Table 2**). In 2013, the WACH population estimate fell below the threshold for liberal management of a decreasing population (265,000), slipping into the conservative management level. In July 2015, ADF&G attempted an aerial photo census of the herd. However, the photos taken could not be used due to poor light conditions that obscured unknown portions of the herd (Dau 2015b). ADF&G conducted a successful photo census of the WACH on July 1, 2016. This census resulted in a minimum count of 194,863 caribou with a point estimate of 200,928 (Standard Error = 4,295), suggesting the

WACH is still within the conservative management level, although close to the threshold for preservative management (**Figure 4, Table 2**)(Parrett 2016a). Results of this census indicate an average annual decline of 5% per year since 2013, representing a much lower rate than the 15% annual decline between 2011 and 2013. The large cohorts of 2015 and 2016, which currently comprise a substantial proportion of the herd, contributed to the recent decreased rate of decline (Parrett 2016a). The data from the 2017 photo census is currently being analyzed by ADF&G (Parrett 2017b, pers. comm.).

Table 2. Western Arctic Caribou Herd management levels using herd size, population trend, and harvest rate (WACH Working Group 2011, 2015).

Management and Harvest Level	Population Trend			Harvest Recommendations May Include:
	Declining Low: 6%	Stable Med: 7%	Increasing High: 8%	
Liberal	Pop: 265,000+	Pop: 230,000+	Pop: 200,000+	<ul style="list-style-type: none"> • Reduce harvest of bulls by nonresidents to maintain at least 40 bulls: 100 cows • No restriction of bull harvest by resident hunters unless bull:cow ratios fall below 40 bulls:100 cows
	Harvest: 16,000-22,000	Harvest: 16,000-22,000	Harvest: 16,000-22,000	
Conservative	Pop: 200,000-265,000	Pop: 170,000-230,000	Pop: 150,000-200,000	<ul style="list-style-type: none"> • No harvest of calves • No cow harvest by nonresidents • Restriction of bull harvest by nonresidents • Limit the subsistence harvest of bulls only when necessary to maintain a minimum 40:100 bull:cow ratio
	Harvest: 12,000-16,000	Harvest: 12,000-16,000	Harvest: 12,000-16,000	
Preservative	Pop: 130,000-200,000	Pop: 115,000-170,000	Pop: 100,000-150,000	<ul style="list-style-type: none"> • No harvest of calves • Limit harvest of cows by resident hunters through permit hunts and/or village quotas • Limit the subsistence harvest of bulls to maintain at least 40 bulls:100 cows • Harvest restricted to residents only, according to state and federal law. Closure of some federal public lands to nonqualified users may be necessary
	Harvest: 8,000-12,000	Harvest: 8,000-12,000	Harvest: 8,000-12,000	
Critical Keep Bull: Cow ratio ≥ 40 Bulls:100 Cows	Pop: < 130,000	Pop: < 115,000	Pop: < 100,000	<ul style="list-style-type: none"> • No harvest of calves • Highly restrict the harvest of cows through permit hunts and/or village quotas • Limit the subsistence harvest of bulls to maintain at least 40 bulls:100 cows • Harvest restricted to residents only, according to state and federal law. Closure of some federal public lands to nonqualified users may be necessary
	Harvest: 6,000-8,000	Harvest: 6,000-8,000	Harvest: 6,000-8,000	

Between 1970 and 2016, the bull:cow ratio exceeded critical management levels in all years except 1975, 2001, and 2014 (**Table 3**). Reduced sampling intensity in 2001 likely biased the 2001 bull:cow ratio low (Dau 2013). Since 1992, the bull:cow ratio has trended downward (Dau 2015a). The average annual number of bulls:100 cows was greater during the period of population growth (54:100 between 1976–2001) than during the recent period of decline (44:100 between 2004–2016). Additionally, Dau (2015a) states that while trends in bull:cow ratios are accurate, actual values should be interpreted with caution due to sexual segregation during sampling and the inability to sample the entire population, which likely account for more annual variability than actual changes in composition.

Although factors contributing to the decline are not known with certainty, increased adult cow mortality and decreased calf recruitment and survival played a role (Dau 2011). Since the mid-1980s, adult mortality has slowly increased while recruitment has slowly decreased (Dau 2013). In a population model developed specifically for the WACH, Prichard (2009) found adult survival to have the largest impact on population size.

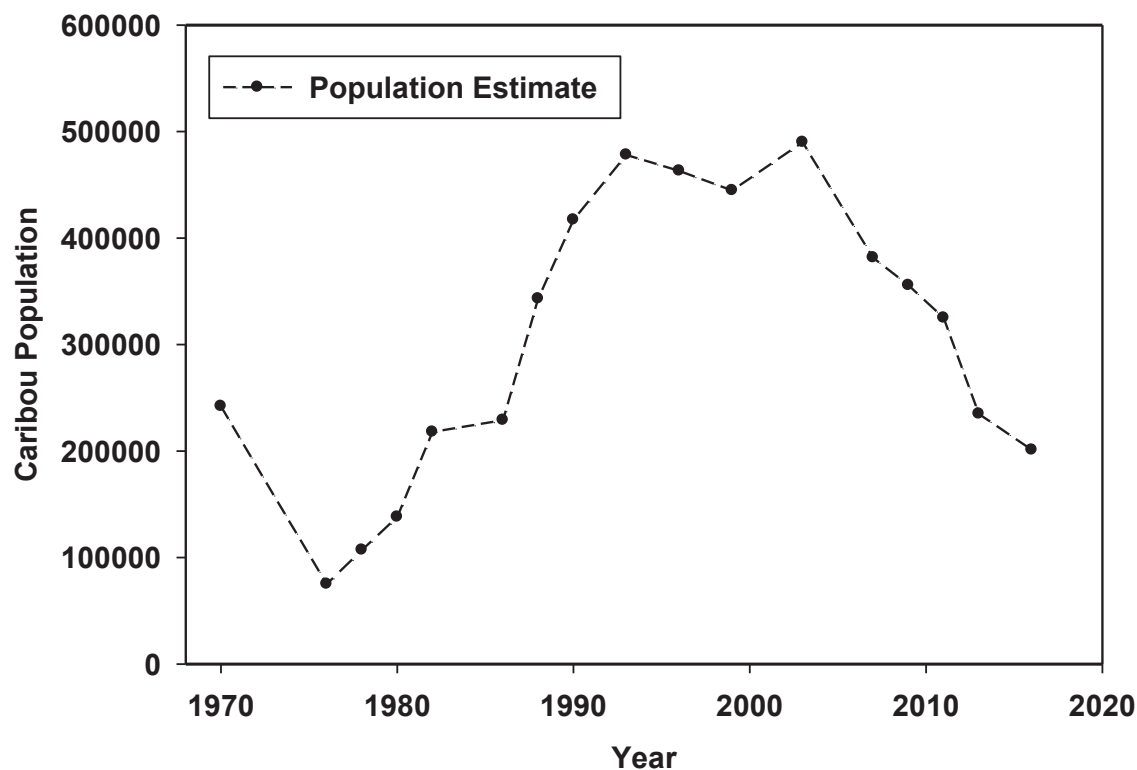


Figure 4. Maximum estimated population estimates of the Western Arctic Caribou Herd from 1970-2016. Population estimates from 1986-2016 are based on aerial photographs of groups of caribou that contained radio-collared animals (Dau 2011, 2013, 2014, 2015a, Parrett 2017a, pers. comm.).

Calf production has likely had little influence on the population trajectory (Dau 2013, 2015a). Between 1990 and 2003, the June calf:cow ratio averaged 66 calves:100 cows/year. Between 2004 and 2016, the June calf:cow ratio averaged 71 calves:100 cows/year (**Table 3, Figure 5**). In June 2016, 85 calves:100 cows were observed, which approximates the highest parturition level ever recorded for the herd (86 calves:100 cows in 1992) (Dau 2016a).

Decreased calf survival through summer and fall and recruitment into the herd are likely contributing to the current population decline (Dau 2013, 2015a). Fall calf:cow ratios indicate calf survival over summer. Between 1976 and 2016, the fall calf:cow ratio ranged from 35 to 59 calves:100 cows/year, averaging 46 calves:100 cows/year (**Figure 5**). Fall calf:cow ratios declined from an average of 46 calves:100 cows/year between 1990-2003 to an average of 42 calves:100 cows/year between 2004-2016 (Dau 2015a, **Figure 5**). Since 2008, ADF&G has recorded calf weights at Onion Portage as an index of herd nutritional status. In September 2015, calf weights averaged 100 lbs., the highest average ever recorded (Parrett 2015c).

Table 3. Western Arctic Caribou Herd fall composition 1976 – 2014 (Dau 2011, 2013, 2014, 2015a, 2016b).

Regulatory Year	Total bulls: 100 cows ^a	Calves: 100 cows	Calves: 100 adults	Bulls	Cows	Calves	Total
1976/1977	63	52	32	273	431	222	926
1980/1981	53	53	34	715	1,354	711	2,780
1982/1983	58	59	37	1,896	3,285	1,923	7,104
1992/1993	64	52	32	1,600	2,498	1,299	5,397
1995/1996	58	52	33	1,176	2,029	1,057	4,262
1996/1997	51	49	33	2,621	5,119	2,525	10,265
1997/1998	49	43	29	2,588	5,229	2,255	10,072
1998/1999	54	45	29	2,298	4,231	1,909	8,438
1999/2000	49	47	31	2,059	4,191	1,960	8,210
2001/2002	38	37	27	1,117	2,943	1,095	5,155
2004/2005	48	35	24	2,916	6,087	2,154	11,157
2006/2007	42	40	28	1,900	4,501	1,811	8,212
2008/2009	45	48	33	2,981	6,618	3,156	12,755
2010/2011	49	35	23	2,419	4,973	1,735	9,127
2012/2013	42	38	27	2,119	5,082	1,919	9,120
2014/2015	39	b	b	b	b	b	b
2015/2016	41 ^c	54	b	b	b	b	b

^a 40 bulls:100 cows is the minimum level recommended in the WACH Cooperative Management Plan (WACH Working Group 2011)

^b Data not available

^c Estimated from power point presentation presented at the WACH Working Group Meeting December 13, 2016 (Parrett 2016b)

Similarly, the ratio of short yearlings (SY, 10-11 months old caribou) to adults provides a measure of overwintering calf survival and recruitment. Between 1990 and 2003, SY:adult ratios averaged 20 SY:100 adults/year. Since the decline began in 2003, SY:adult ratios have averaged 16 SY:100 adults/year (2004-2016, **Figure 5**). However, 23 SY:100 adults were observed during spring 2016 surveys, the highest ratio recorded since 2007 (Dau 2016b). The overwinter calf survival for the 2015 cohort (Oct. 2015-June 2016) was 84% (Parrett 2016b). While 2016 measures suggest improvements in recruitment, the overall trend since the early 1980s has been downward (Dau 2015a).

Increased cow mortality is likely affecting the trajectory of the herd (Dau 2011, 2013). The annual mortality rate of radio-collared adult cows increased, from an average of 15% between 1987 and 2003, to 23% from 2004–2014 (Dau 2011, 2013, 2014, 2015a). Estimated mortality includes all causes of death including hunting (Dau 2011). Dau (2015a) states that cow mortality estimates are conservative due to exclusion of unhealthy (i.e. diseased) and yearling cows. Dau (2009, 2013) reported that rain-on-snow events, deep snow and winter thaws may have contributed to the relatively high estimated mortality rates of 23% during 2008-2009, 27% during 2009-2010 and 33% in 2011-2012. Prior to 2004, estimated adult cow mortality only exceeded 20% twice, but has exceeded 20% in 7 out of 9 regulatory years between 2004 and 2012. The annual mortality rate was 8% as of April 2016 (Dau 2016b). This may fluctuate substantially throughout the year based on changing local conditions and harvest levels. Dau (2015a) indicates that mortality rates may also change in subsequent management reports as the fate of collared animals is determined, and that these inconsistencies are most pronounced for the previous 1–3 years.

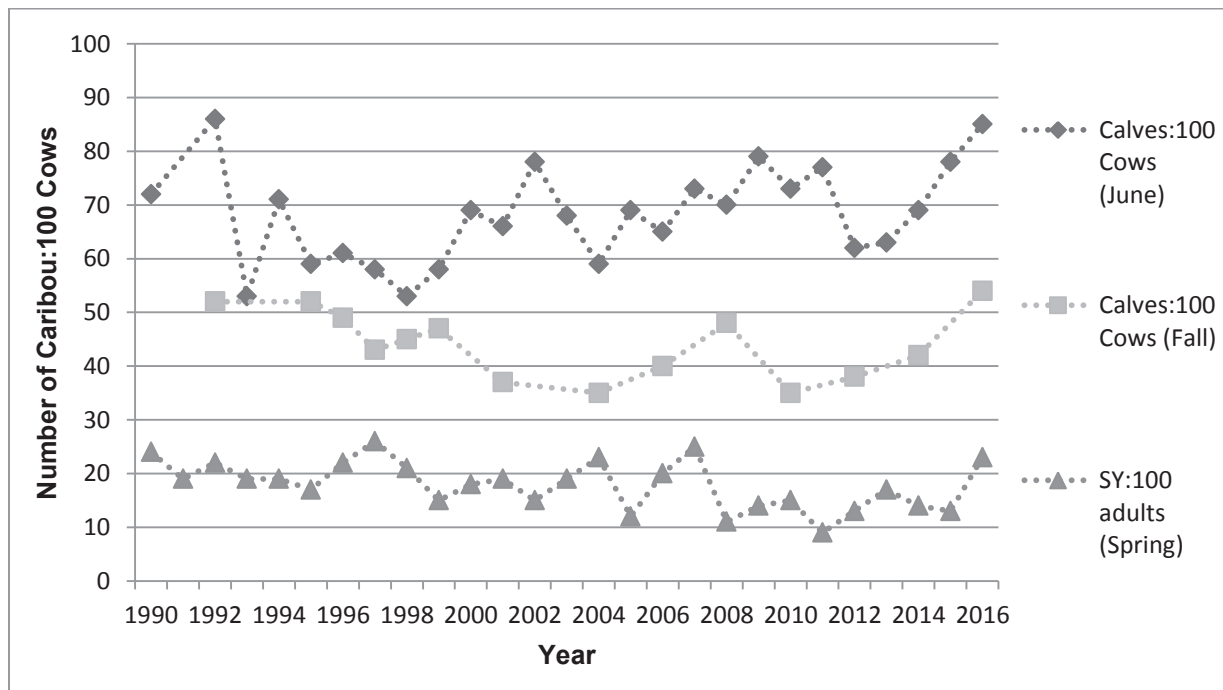


Figure 5. Calf:cow and short yearling (SY):adult ratios for the WACH (Dau 2013, 2015a, 2016a, ADF&G 2017c). Short yearlings are 10-11 months old caribou.

Far more caribou died from natural causes than from hunting between 1992 and 2012. Cow mortality remained constant throughout the year. However, natural and harvest mortality for bulls spiked during the fall. Predation, particularly by wolves, accounted for the majority of the natural mortality (Dau 2013). However as the WACH has declined and estimated harvest has remained relatively stable, the percentage of mortality due to hunting has increased relative to natural mortality. For example, during the period October 1, 2013 to September 30, 2014, estimated hunting mortality was approximately 42% and estimated natural mortality about 56% (Dau 2014). In previous years (1983–2013), the estimated hunting mortality exceeded 30% only once in 1997-1998 (Dau 2013). Additionally, Prichard (2009) and Dau (2015a) suggest that harvest levels and rates of cow harvest can greatly impact population trajectory. If bull:cow ratios continue to decline, harvest of cows may increase, exacerbating the current population decline.

Dau (2015a) cites fall and winter icing events as the primary factor initiating the population decline in 2003. Increased predation, hunting pressure, deteriorating range condition (including habitat loss and fragmentation), climate change, and disease may also be contributing factors (Gunn 2001, Dau 2013, 2014, 2015a). Changing climatic conditions can affect snow depth, icing, forage quality and growth, frequency, location, and intensity of wildfires, insect abundance, and predation which can affect migration and have long-term population level effects (Joly et al. 2011). Joly et al. (2007) documented a decline in lichen cover in portions of the wintering areas of the WACH. Dau (2011, 2014) reported that degradation in range condition is not thought to be a primary factor in the decline of the WACH because animals in the WACH, unlike the TCH, have generally maintained good body condition since the decline began. Body condition is assessed on a subjective scale from 1-5. The body condition of adult females in 2015 were characterized as “fat” (mean = 3.9/5) with no caribou being rated as skinny or very skinny (Parrett 2015c). However, the body condition of the WACH in spring may be a better indicator of the effects of winter range condition versus the fall when the body condition of the WACH is routinely assessed and when caribou are in prime condition, and weights may be more reflective of summer range conditions (Joly 2015, pers. comm.). Fall condition is also the best indicator of whether or not caribou are likely to become pregnant (Parrett 2017a, pers. comm.).

Habitat

Caribou feed on a wide variety of plants including lichens, fungi, sedges, grasses, forbs, and twigs of woody plants. Arctic caribou depend primarily on lichens during the fall and winter but, during summer they feed on leaves, grasses and sedges (Miller 2003). The importance of high use areas for the TCH at Teshekpuk Lake during the summer has been well documented (Person et al. 2007, Carroll 2007, Parrett 2011, Wilson 2012, Smith et al. 2015). Presumably the importance of areas to the north, south, and east of Teshekpuk Lake during calving is due to the high concentration of sedge-grass meadows (Wilson et al. 2012) and extremely low predator densities (Parrett 2017a, pers. comm.). In 2013 BLM closed 3.1 million acres around Teshekpuk Lake in the NPR–A to oil and gas development in recognition of the importance of these areas for caribou, waterfowl and shorebirds (BLM 1998, 2008, 2013; Cameron et al. 2005, Arthur and Del Vecchio 2009).

Harvest History

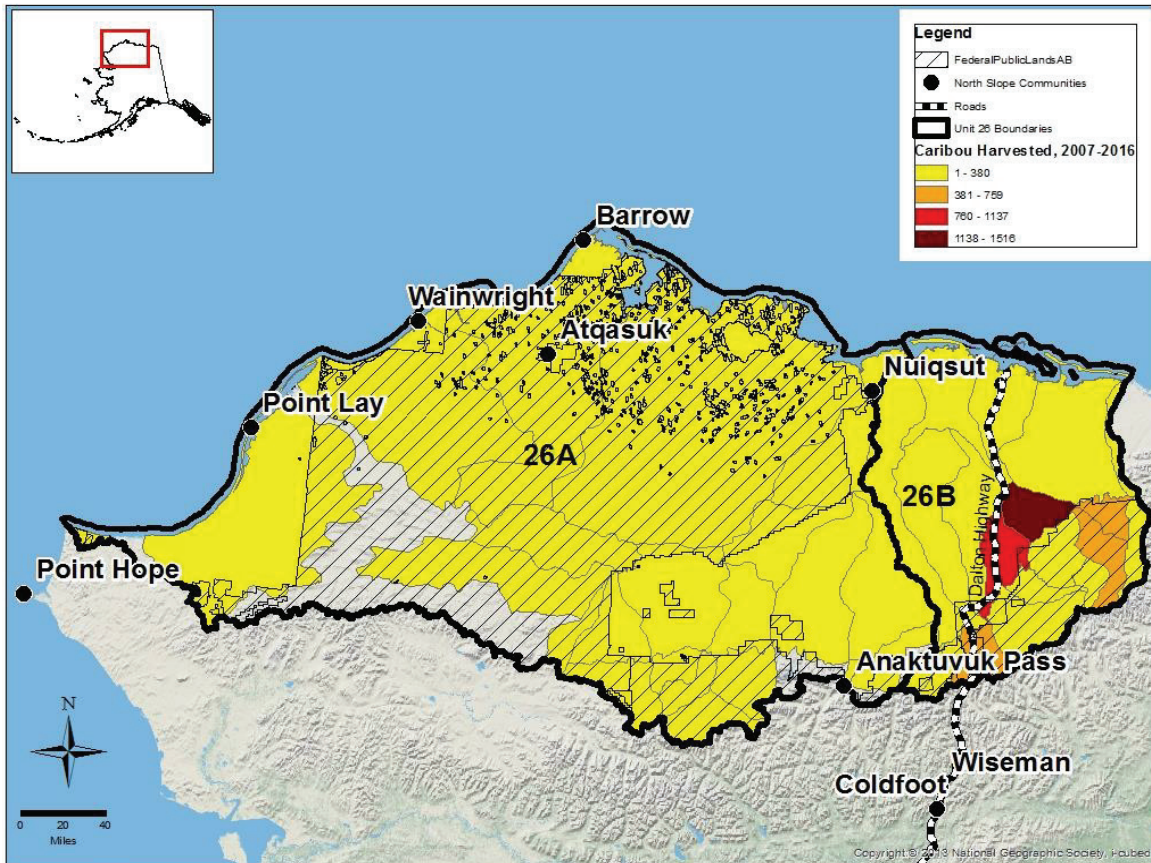
Reliance on caribou from a particular herd varies by community. Weather, distance of caribou from the community, terrain, and high fuel costs are some of the factors that can affect the availability and accessibility of caribou (Parrett 2015a). Local residents for Units 23, 26A and 26B are defined as those having customary and traditional use in these units. Point Hope, which is located in Unit 23, and Anaktuvuk Pass, which is located in Unit 24B near the border with Unit 26A, are included in this analysis because they have a Customary and Traditional Use for caribou in Units 26A and 26B. Documentation of harvest for Alaska residents has varied depending on whether they live north or south of the Yukon River. Prior to 2017/2018, Alaska residents who lived north of the Yukon River were not required to obtain harvest tickets although they were required to register with ADF&G or an authorized vendor. Compliance with registration requirement was low and not enforced (Braem 2017a, pers. comm.). Harvest by Alaska residents who live south of the Yukon River and nonresidents was monitored using harvest reports (Lenart 2015, Dau 2015a).

Understanding the overlap between caribou hunting by local users and nonlocal users is complicated by the lack of annual information on the exact location, harvest numbers, and caribou herd used by local hunters. Recently-enacted State regulations requiring registration permits for residents hunting caribou within the range of the Western Arctic and Teshekpuk herds in Units 21, 23, 24, and 26 seek to improve harvest monitoring and allow for more detailed analysis of harvest trends and distribution.

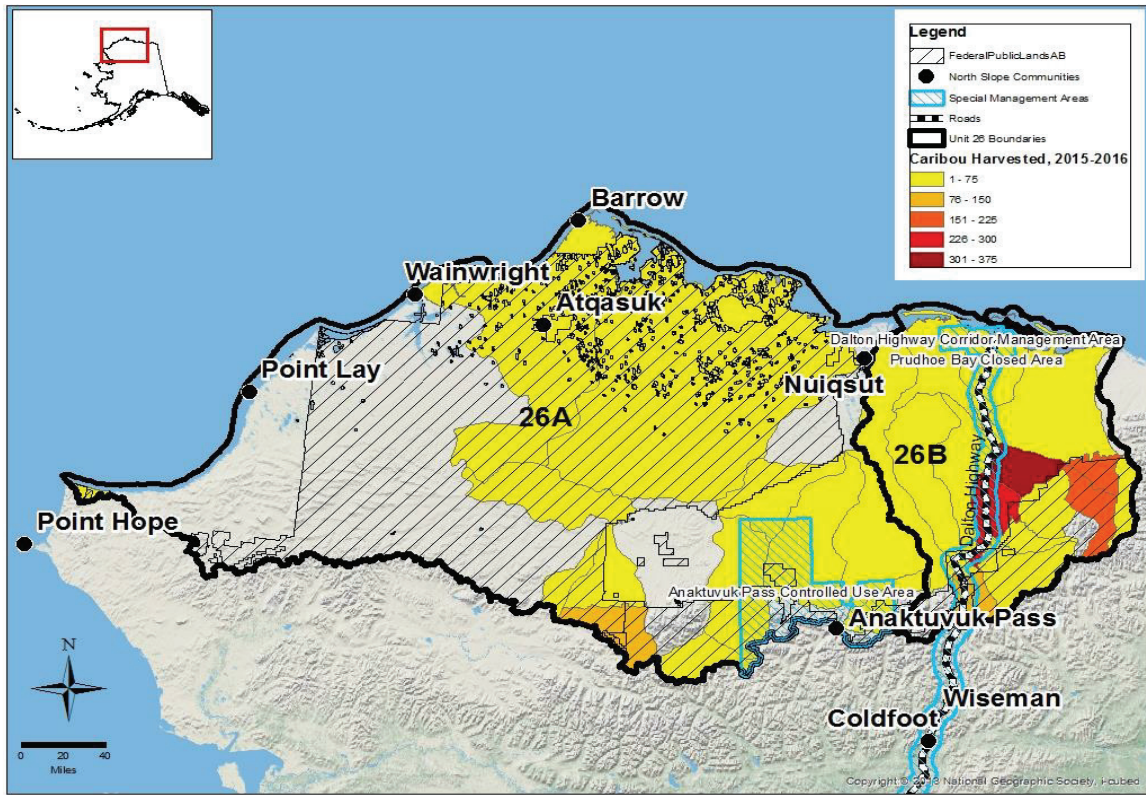
Generalized caribou harvest patterns by NFQU in Units 26A and 26B, which are based on specific areas within the Units (Uniform Coding Unit –UCU) includes nonresidents and nonlocal residents of Alaska from 2007-2016, are shown in **Map 3**. It should be noted that the displayed spatial data is reflective of reported harvest records with locational data at fine scales; records lacking spatial specificity are not represented. Assuming unreported data is proportional to available data, **Maps 3-6 and 8-10** represent general spatial harvest patterns. Between 2007 and 2016, a total of 9,429 caribou were harvested by NFQU in Units 26A and 26B. Among those, 6,405 (66%) were from nonlocal Alaska residents and 3,024 (34.0%) from nonresidents (ADF&G 2017a). All the hunting in the Unit that extends from the Arctic Coast south along the western boundary of Unit 26B occurs in the Toolik Lake area which is very near the Dalton Highway at the southern end of the UCU. Hunter success was greater in the DHCMA north of the area where the Echooka River crosses the road, on State land adjacent to the Ivishak and Echooka Rivers, and in an area farther east in the Arctic NWR which is typically accessed by airboats using the Ivishak and Echooka Rivers (WIRAC 2016:100-101).

Harvest patterns by NFQU from 2015-2016, the period when the more restrictive Federal and State caribou regulations were in place, are shown in **Map 4**. Between 2015 and 2016, a total of 2,392 caribou were harvested by NFQU in Units 26A and 26B. Among those, 1,265 (53%) were from nonlocal Alaska residents and 1,126 (47.0%) from nonresidents (ADF&G 2017a). The core areas used during the 10 year assessment were essentially the same following the new more restrictive caribou regulations. In 2015-2016, NFQU harvested fewer caribou in the northwest corner of the Arctic NWR and harvested more caribou in the State areas adjacent to the Arctic NWR and southern portion of the DHCMA than in 2013-2014. Between 2013 and 2014, a total of 1,976 caribou were harvested by NFQU in Units 26A and 26B. Among those, 1,152 (58%) were from nonlocal Alaska residents and 824 (42%) and from nonresidents

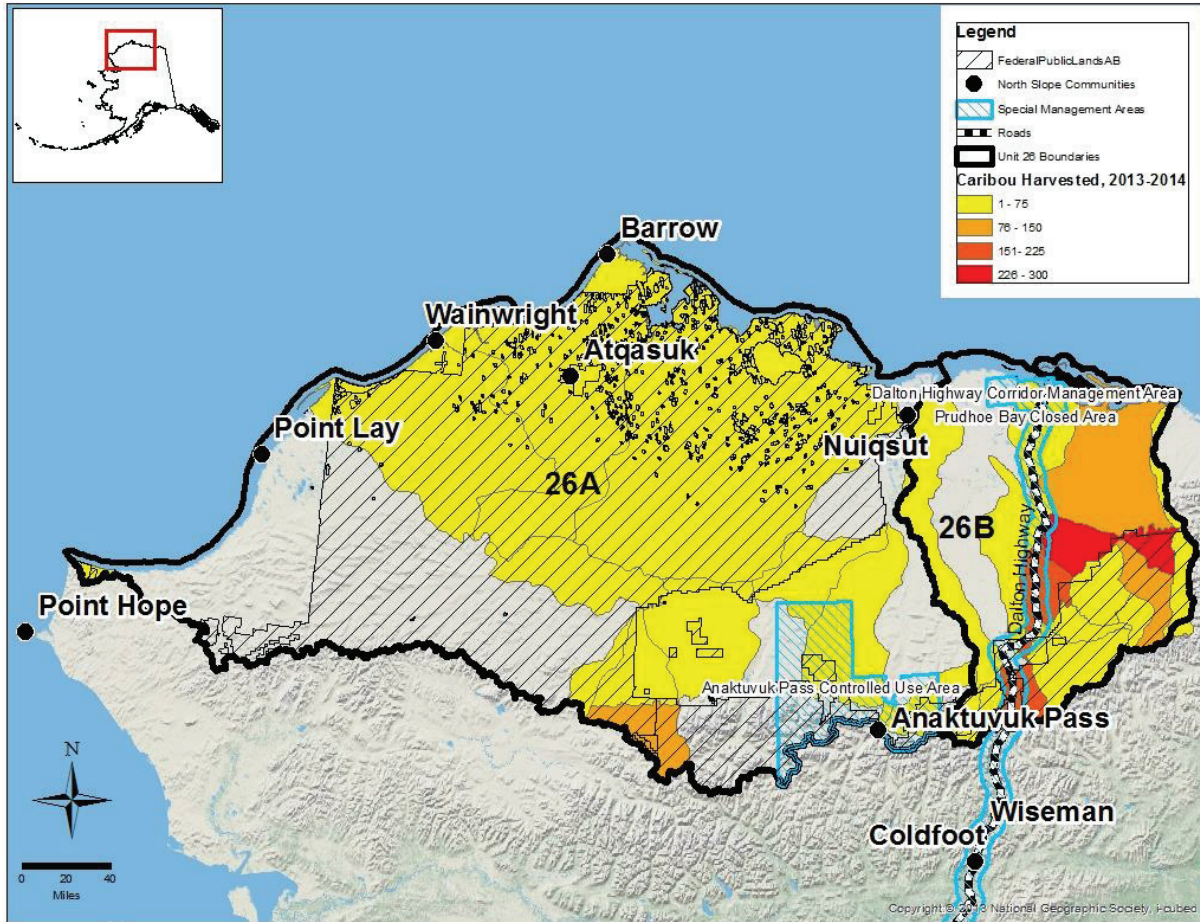
(ADF&G 2017a). Comparison of the two year period from 2013-2014 (Map 5) with 2015-2016 (Map 4) shows an increase in 2015-2016 of the harvest within the vicinity of Anaktuvuk Pass in Unit 26A. These changes in harvest patterns may be due in part to hunters shifting hunting areas and intensity to areas within Unit 26A and 26B in response to changes in the movement of the caribou herds as a result of the closure of Federal public lands to caribou hunting by NFQU in Unit 23 in 2016/2017.



Map 3. Reported caribou harvest in Units 26A and 26B from the WACH, TCH, and CACH by NFQU, 2007-2016 (WinfoNet 2017).



Map 4. Reported caribou harvest in Units 26A and 26B from the WACH, TCH, and CACH by NFQU , 2015-2016 (WinfoNet 2017).



Map 5. Reported caribou harvest in Units 26A and 26B from the WACH, TCH, and CACH by NFQU , 2013-2014 (WinfoNet 2017).

Central Arctic Caribou Herd

Although most of the harvest from the CACH comes from Unit 26B some occurs in Units 24A, 24B, 25A, 26A, and 26C. Harvests in summer and early fall that occur in Units 24A, 24B, 25A, and 26C are be primarily from other herds such as the PCH, TCH, or WACH. Additional harvest from the CACH may occur when it is near Kaktovik (Unit 26C) in the summer, near Wiseman and Coldfoot (Unit 24A) in the fall and winter, and near Arctic Village (Unit 25A) in the fall and winter (**Figure 6**). During the fall and winter some caribou from the TCH and WACH occasionally mix with the CACH. For the purposes of documenting the annual harvest from the CACH from community harvest surveys by local residents outside of Unit 26B, Lenart (2017a) used an estimate of 100 caribou (Lenart 2017b) (**Table 4**). Harvest information presented for the CACH will refer to Unit 26B unless noted otherwise.

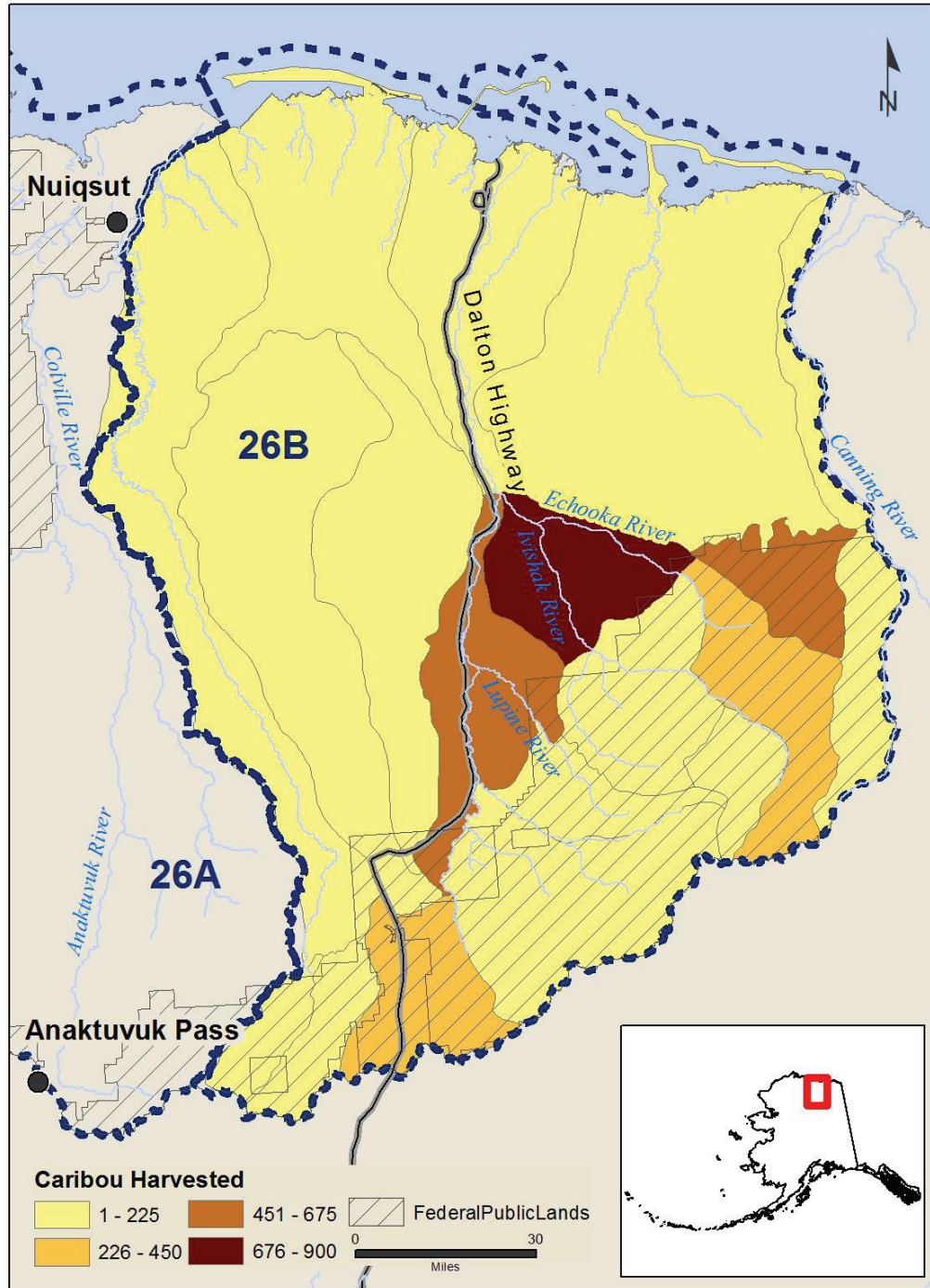
Harvest by local hunters from Nuiqsut occurs in the summer and fall, from July through September, and during the spring, from March through April (Braem et al. 2011, Brown et al. 2016). A little more than 50% of the caribou harvest taken by Nuiqsut hunters occurs in the summer and fall and is from both the

TCH and CACH (Lenart 2015). Nuiqsut hunters, who usually hunt west of the community, represent most of the local harvest from the CACH. Based on the distribution of caribou and the timing and location, Braem et al. (2011) estimated that 13% of the total harvest between 2002 and 2007 by Nuiqsut residents was in Unit 26B, just west across the border with Unit 26A where the community is located. Braem et al. (2011) estimated that Nuiqsut hunters averaged approximately 61 caribou from the CACH annually from 2002 and 2007. The average total annual caribou harvest by Nuiqsut hunters, which includes TCH and CACH, from 2000-2006 was 474 caribou. In 2014, 774 caribou were estimated to have been harvested by Nuiqsut residents (Braem 2015). Harvest by local hunters as documented by community surveys, Nuiqsut residents harvested approximately 317 caribou (41%) from the CACH in 2014 (Braem 2017b). In 2014, Nuiqsut residents harvested caribou in all months except May. The most productive months were June (114), July (189), and August (215). Harvest declined sharply after August, only 73 caribou were harvested in September. The fewest caribou were taken in April (2) and November (4). There were 43 caribou harvested for which the date of harvest was not known. Of the caribou harvested in 2014, 72% were bulls. An estimated 166 cows were harvested in 2014 with 45% being harvested in January and February (Brown et al. 2016).

The average annual CACH harvest from 2013/14 to 2015/16 in Unit 26B was approximately 937 caribou. (**Table 4**) (Lenart 2017a, WinfoNet 2017). Bow hunters took approximately 21% of the total harvest during this time. The average number of bulls harvested annually from the CACH from 2012-2015 was 699 and the average number of cows harvested was 234 (**Table 4**). A majority of the reported caribou harvest from the CACH occurs in August and September (Lenart 2015).

The proportion of resident and nonresident harvest has fluctuated with CACH population trends (**Figure 6, Table 5**). In general resident harvest has decreased with the recent population decline and the nonresident harvest has increased slightly (**Figure 6, Table 5**). Nonlocal residents accounted for 89% of the total caribou harvest from 2013-2015, which is approximately 827 caribou annually (Lenart 2017a). The location and total caribou harvest by NFQU hunters from the CACH during the population decline from 2011-2016 is shown in **Map 6**. Between 2011 and 2016, a total of 5,049 caribou were harvested by NFQU in Unit 26B. Among those, 3,433 (68%) were from nonlocal Alaska residents and 1,616 (32%) and from nonresidents (WinfoNet 2017). The annual cow harvest by NFQU in Unit 26B increased from 47 in 2006-2009 to 234 in 2010-2016 (**Figure 7**). This increase coincided with the change in the harvest limits from two to five caribou and harvest season for cows from Oct.1-Apr. 30 to July 1-Apr. 30 in the 2010 State regulations.

Although a harvest rate of 5% of the population has been used as a guideline by ADF&G since 1991 to determine the allowable harvest, the reported harvest has been well below the harvestable surplus, averaging less than 2% since 2000/01 (Lenart 2015). However, with the recent population decline, Lenart (2017a) recommended a harvest level of 3% of the population. ADF&G adopted new caribou regulations for Unit 26B in 2017/2018 with the intended goal of reducing the annual harvest from an average of 937 caribou from 2013-2015 to 680 (3% of 22,360) and reduce the cow harvest from approximately 200 to 75 (Lenart 2017a).



Map 6. Reported caribou harvest in Unit 26B from the CACH by NFQU during the population decline 2011-2016 (WinfoNet 2017).

Table 4. Reported harvest from the Central Arctic Caribou Herd by sex and method of take in Alaska, 2006-2015 (Braem et al. 2011, Braem 2015; Lenart 2013, 2015, 2017a; ADF&G 2017b).

^a Estimated yearly average from Unit 26A residents from community harvest surveys, Kaktovik and

Regulatory Year ^a	Male	Female	Unit 26A Residents ^a	Total Harvest (# harvested by bow) ^b	Total Hunters
2006/07	795	32	100	927 (301)	1,331
2007/08	596	65	100	761 (183)	1,380
2008/09	658	47	100	805 (180)	1,362
2009/10	750	45	100	895 (224)	1,317
2010/11	976	234	100	1,310 (296)	1,622
2011/12	808	344	100	1,252 (330)	1,401
2012/13	727	276	100	1,103 (285)	1,430
2013/14	721	134	100	955 (190)	1,423
2014/15	717	195	100	1,012 (198)	na ^c
2015/16	522	222	100	844 (92)	na ^c
Mean	699	234	100	1,033 (219)	–

Nuiqsut

^b Total includes bow harvest and harvest from Unit 26A residents

^c Not available

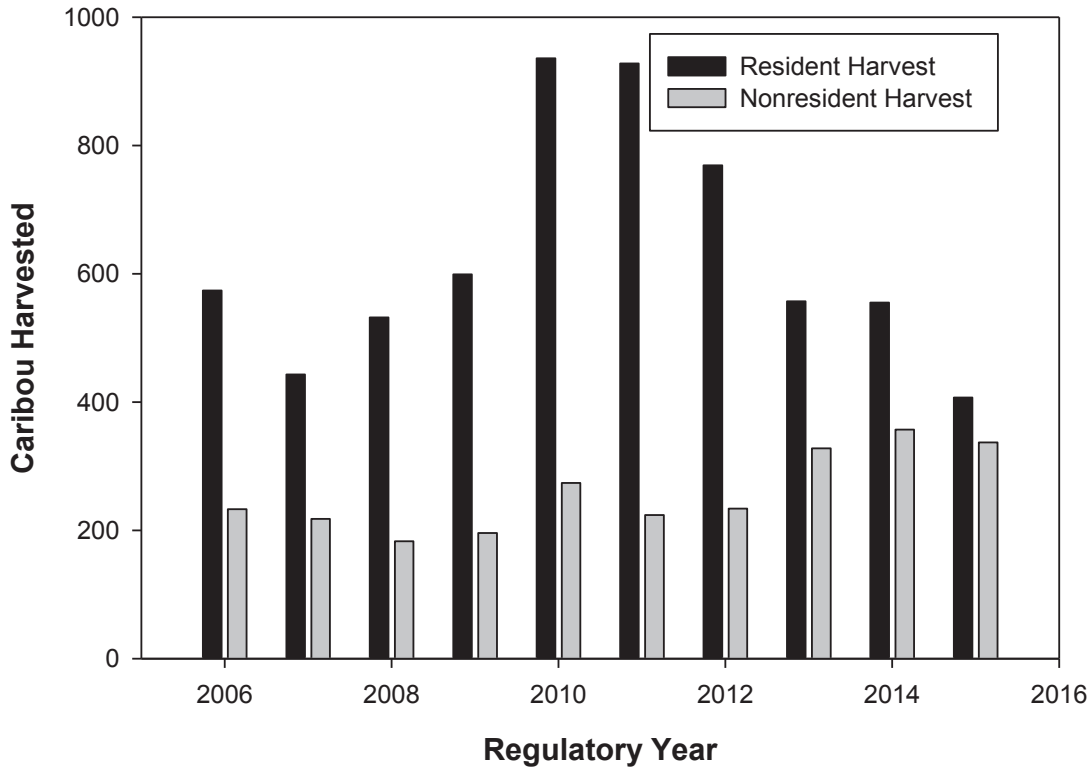


Figure 6. Reported CACH harvest by residency, 2006-2015.

Table 5. Characteristics of the Central Arctic Caribou Herd average annual harvest in Unit 26B by residency, 2013-2015. The proportion of the total Unit 26B caribou harvest by residency for 2006-2015 is included for comparison (Lenart 2017a).

Residency	Total CACH Harvest	Female CACH Harvest	Proportion of the Harvest (%) 2013-2015	Proportion of the Harvest (%) 2006-2015	Hunters	Success Rate (%)
Unit 26A Residents	100	20	11%	10%	na	na
Other Alaskan Residents	490	158	53%	64%	910	38%
Nonresident	340	24	36%	26%	430	62%
Total	930	202	-	-	-	-

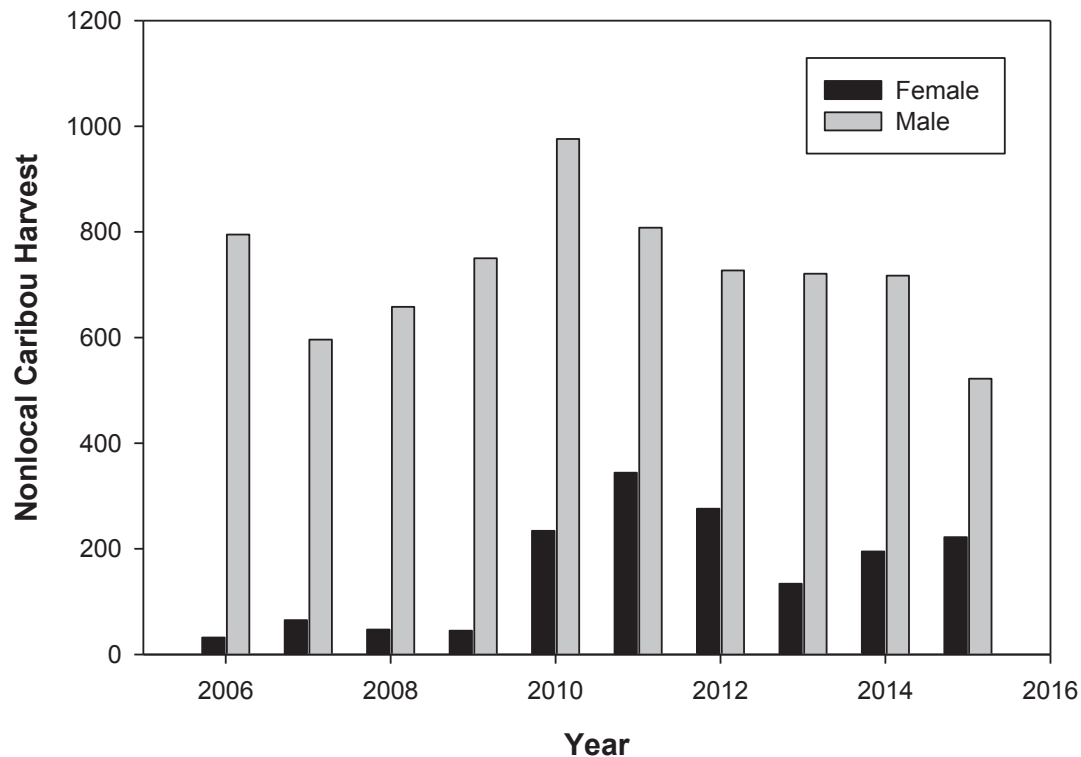
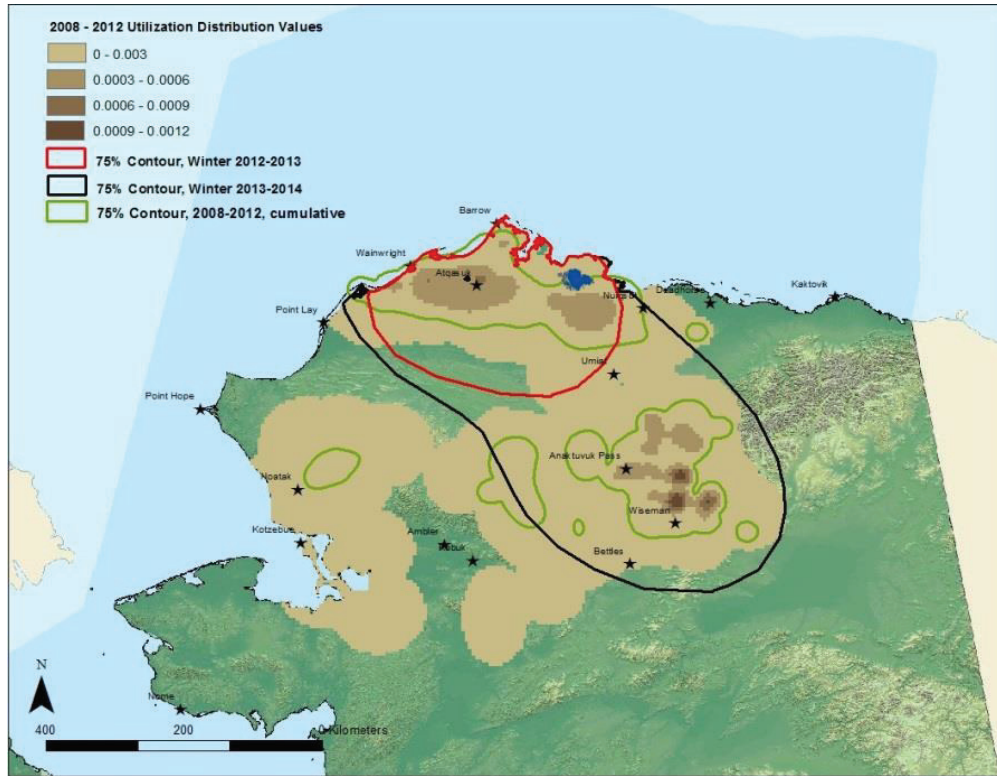


Figure 7. Central Arctic caribou herd harvest by sex by Nonlocals in Unit 26B, 2006-2016

Teshkepuk Caribou Herd

The TCH annual caribou harvest is 4,000-5,000 year (Parrett 2015a). Most of the harvest is by local Federally qualified subsistence users (FQSU). Less than 1% of the TCH harvest is by nonlocal residents in Alaska and nonresidents (Parrett 2011, Parrett 2015a). Residents of Atqasuk, Utqiagvik, Nuiqsut, and Wainwright harvest caribou primarily from the TCH while residents from Anaktuvuk Pass, Point Lay, and Point Hope harvest caribou primarily from the WACH (**Table 6**) (Dau 2011, Parrett 2011). For example the TCH winter range did not overlap Anaktuvuk Pass in 2012/2013 but did in 2013/2014 (**Map 7**). Residents of Nuiqsut, which is on the northeast corner of Unit 26A, harvested approximately 77% and 86% of their caribou from the TCH between 2002 and 2007 and 2010 and 2011, respectively (Parrett 2013). A little more than 50% of the caribou harvest taken by Nuiqsut hunters occurs in the summer and fall and is from both the TCH and CACH (Lenart 2015). Although some harvest from the TCH occurs outside of Unit 26A in Units 23, 24, and 26B, it is unlikely that the overall harvest is significant when the TCH is mixed with other caribou herds (Parrett 2013, 2015a).



Map 7. Cumulative Teshekpuk caribou herd winter range, Alaska, 2008-2012, with utilization distribution values depicted in shades of brown, 75% kernel contour from the 2008-2012 in green. The 75% contours from the two individual winters from 2012-2014 are depicted by the red and black outlines (Parrett 2015a).

Range overlap between the three caribou herds, frequent changes in the wintering distribution of the TCH and WACH, and annual variation in the community harvest survey effort and location make it difficult to determine the proportion of the TCH, WACH and CACH in the harvest. Knowledge of caribou distribution at the time of the reported harvest is often used to estimate the proportion of the harvest from each herd. Community harvest surveys continue to be the preferred method to estimate harvest by FQSU, since previous attempts to conduct registration hunts were not effective (Georgette 1994, Parrett 2015a).

The use of harvest tickets required by nonlocal hunters provides time and location of the harvest and, together with knowledge of the caribou distribution and allows for a more accurate assessment of the proportion of caribou harvested from each herd. For harvests by FQSU, analysis of the proportional harvest from different herds has been difficult due to poor or non-existent reporting, variation in the timing and effort of community harvest surveys, changes in the distribution and timing of TCH migration, and overlapping distribution with adjacent herds. However, previous efforts from 2002-2007 determined that Utqiagvik residents harvest primarily from the TCH (Parrett 2013, Braem 2017b). If used throughout the range harvest tickets would allow for better tracking of the FQSU harvests with respect to the overlapping caribou herds.

For communities where harvest surveys have not been conducted or the estimates are unreliable, the Division of Wildlife Conservation estimated annual harvests based on the current community population, previous per capita harvest estimates, and yearly caribou availability. A general overview of the relative utilization of caribou herds by community from 2008/09 to 2009/10 is presented in **Table 6** (Parrett 2011, Dau 2011, and Lenart 2011). These years were chosen because there was good separation between the herds during this period. The total estimated annual harvest from the TCH during 2008/09 (3,219 caribou) (Parrett 2011) was similar to 2012/13 and 2013/14 (3,387 caribou) (Parrett 2015a) (**Table 6**). Most of the caribou harvest in 2012/2013 and 2013/2014 occurred in August and September (Parrett 2015a). The estimated annual harvest during 2012/13 and 2013/14 using this method was approximately 3,387 (Parrett 2015a).

Table 6. Estimated caribou harvest of the Teshekpuk, Western Arctic and Central Arctic caribou herds during the 2008/2009 regulatory years by FQSU in Unit 26A (Parrett 2011, Dau 2011, Lenart 2011, Sutherland 2005). Note: Due to the mixing of the herds, annual variation in the community harvest surveys and missing data, the percentages for each community do not add up to 100%.

Community	Human population ^a	Per capita caribou harvest ^{bc}	Approximate total community harvest	Estimated annual TCH harvest (%) ^d	Estimated annual WACH harvest (%) ^d	Estimated annual CACH harvest (%) ^d
Anaktuvuk Pass	298	1.8	524	157 (30)	431 (82)	
Atqasuk	218	0.9	201	197 (98)	6 (2)	
Barrow (Utqiagvik)	4,127	0.5	2,063	2,002 (97)	62 (3)	
Nuiqsut	396	1.1	451	388 (86)	3 (1)	58 (13)
Point Lay	226	1.3	292	58 (20)	210 (40)	
Point Hope	689	0.3	220	0	220 (100)	
Wainwright	547	1.3	695	417 (60)	48 (15)	
Total Harvest				3,219	980	58

^a Community population size based on 2007 census estimates

^b Citations associated with per-capita caribou harvest assessment by community can be found in **Table 5** (Parrett 2011).

^c Sutherland (2005)

^d Percent of the total community harvest

The harvest estimate for Utqiagvik, from household surveys conducted by ADF&G in 2014/15 was 4,231 caribou (Braem 2015). Based on data collected by the North Slope Borough Wildlife Department the average annual harvest estimate for Utqiagvik from 1992-2003 was 2096 caribou (Braem 2015). Currently the harvestable surplus for the TCH is estimated to be approximately 2,500 at a 6% harvest rate. A conservative estimated harvest rate for the period between 2012/13 to 2013/14 is approximately 10% of the 2013 (3,917 caribou) population estimate of 39,172 (range 32,000-45,000) (Parrett 2015a). However, due to the mixing of TCH with the WACH and CACH, lack of annual harvest data for FQSU and lack of spatial data it is difficult to determine the actual TCH harvest. The conservative TCH harvest rate of

10% is almost double the harvest rate estimates for the WACH and CACH (Parrett 2015a) and a conservation concern. If the TCH population declines to below 35,000 the harvest rate may be reduced to 4-5%, assuming that the harvest composition remains consistent at approximately 15% bulls and 2% cows (Parrett 2017a, pers. comm.).

Due to the remoteness and inaccessibility of much of the area most of the TCH harvest is by local hunters (Parrett 2015a). TCH harvest by local hunters in recent years occurs primarily from July to October (Braem et al. 2011, Parrett 2011, Braem 2015) whereas nonresidents and nonlocal residents typically harvest most of their caribou from the WACH, along the Colville River drainage, in August and September (Parrett 2015a). For example, greater than 95% of the caribou harvested by nonresidents and nonlocal residents in 2012/13 and 2013/14 occurred in August and September (Parrett 2015a). The nonresident and nonlocal resident harvest from the TCH, which averages about 100 caribou a year or 3% of the total TCH harvest, is split evenly between the nonlocal and nonresidents (Parrett 2013).

Western Arctic Caribou Herd

Annual caribou harvest by local residents is estimated from community harvest surveys, when available. In 2015 the linear model (Sutherland 2005) used to estimate caribou harvests by hunters who live within the range of the WACH was replaced by a new analysis of covariance developed by Adam Craig, a biometrician with ADF&G's Division of Wildlife Conservation Region V (Arctic and Western Alaska). These models incorporate factors such as community size and availability of caribou (Dau 2015a). Craig's models replaced models developed by Sutherland (2005) in 2015, resulting in changes to local caribou harvest estimates from past years. While Craig's model accurately reflects long-term trends in annual local harvests, it is too insensitive to detect short-term changes in harvest levels useful to real time management decisions to regulate harvests and does not accurately reflect actual harvest levels or harvest levels by Unit (Dau 2015a). This analysis only considers the updated harvest estimates using the new model from Dau (2015a). The accuracy of harvest reporting by locals may improve with the requirement for harvest tickets for those that live north of the Yukon River. Caribou harvest by NFQU is based on harvest ticket reports (Dau 2015a).

From 2000–2014, the estimated harvest from the WACH averaged 11,984 caribou/year, ranging from 10,666-13,537 caribou/year (**Figure 8**) (Dau 2015a). The total harvest during 2012/13 and 2013/14 was 13,352 and 12,713 caribou, respectively. These harvest estimates assumed that 95% of all caribou harvested by nonlocal hunters in Unit 26A were from the WACH and the remainder from the TCH. Using the 2011 and 2013 population estimates the total annual harvest during 2012/13 and 2013/14 was approximately 4-5% of the population (Dau 2015a). These harvest levels are within or below the conservative harvest level specified in the WACH Management Plan (**Table 2**). However, harvest estimates do not include wounding loss or caribou killed but not salvaged, which may be hundreds of caribou (Dau 2015a). Local residents, as defined as living within the range of the WACH, account for approximately 95% of the WACH harvest, with residents of Unit 23 accounting for the approximately 58% (**Figure 9**) (Parrett 2017a, pers. comm.). Approximately 37% of the annual WACH harvest is taken by the local residents in Unit 26A, 26B, and 24B (**Figure 9**).

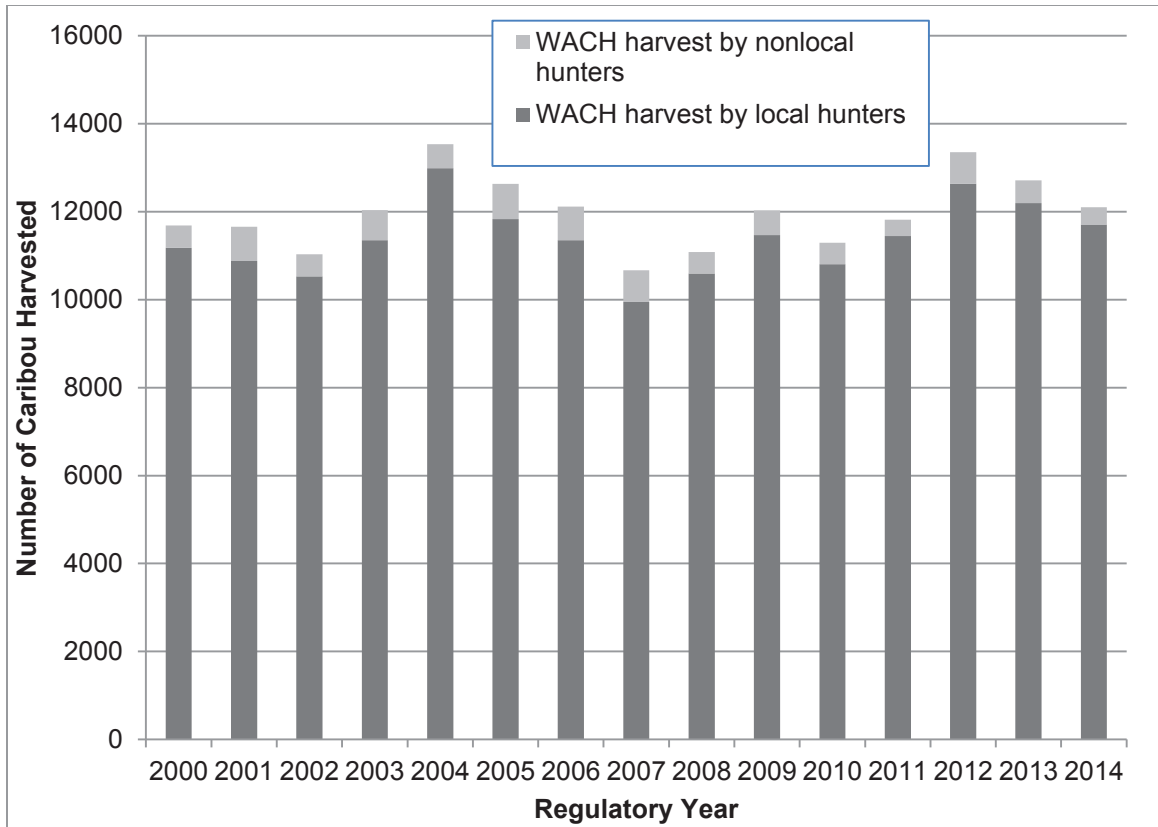


Figure 8. Estimated number of caribou harvested from the WACH by residency (Dau 2015a).

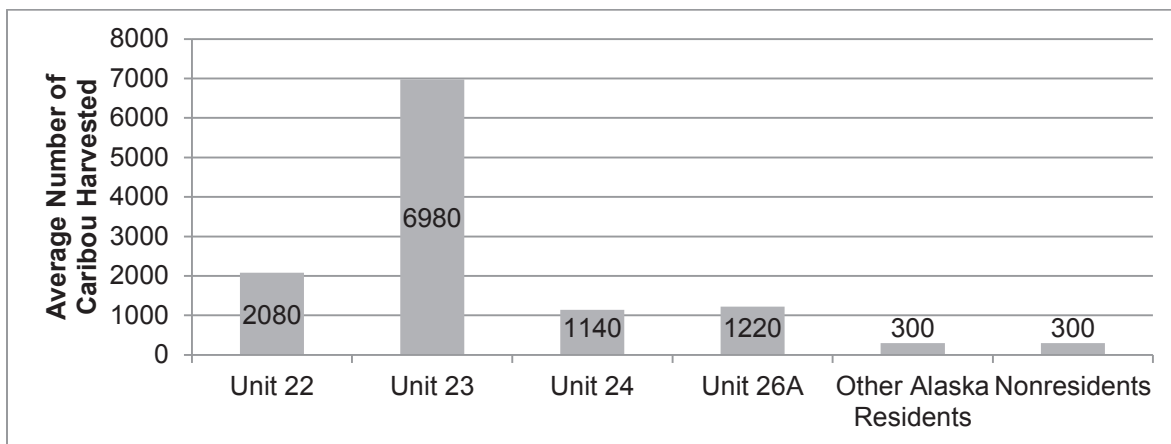


Figure 9. Average WACH annual caribou harvest by unit and residency from 1998-2015 (Parrett 2017a, pers. comm.).

From 2001-2013, total average annual nonlocal WACH harvest was 598 caribou (range 421-793) (**Figure 10**). Over the same time period, nonlocal WACH harvest from Units 26A, 26B, and 24B averaged 102 caribou/year (range 60-144) (**Figure 10**). Nonlocal WACH harvest from Unit 23 and Units 26A, 26B, and 24B combined accounts for 76% and 14% of the total nonlocal WACH harvest on average, respectively.

Between 1998 and 2014, the number of NFQU hunting caribou and the number of caribou harvested by NFQU in Unit 23 averaged 487 hunters (range: 404-662) and 511 caribou (range: 248-669), respectively (**Figure 11**, USFWS 2017). In 2015, after the BOG enacted restrictions, the number of NFQU and caribou harvested by NFQU decreased appreciably (340 hunters and 230 caribou). In 2016, during the closure of Federal lands to NFQU, the number of NFQU and caribou harvested by NFQU decreased even further (149 hunters and 111 caribou), although there may still be some outstanding 2016 harvest reports from nonlocal residents (**Figure 11**, WinfoNet 2017). Based on patterns in submission rates and timing of harvest reports, the State estimates a 50% reduction in the number of and harvest by nonlocal caribou hunters in Unit 23 during 2016/17 as a result of the closure (Parrett 2016b, ADF&G 2017c).

Based on those hunters that provided harvest ticket reports for Unit 26A, the number of nonresidents compared to Alaska residents outside the WACH range that harvested caribou from the WACH increased from 2011-2015 (**Figure 12**). Approximately 95% of the total Unit 26A caribou harvest was from the WACH and by residents within the WACH range (Dau 2013). The annual harvest by NFQU is a very small percentage ($\approx 1\%$) of the total WACH harvest (**Figures 10 and 13**). Female harvest by NFQU in Unit 26A averaged 10% (range 2-19) from 2006-2016.

Harvestable surplus for the WACH is calculated as 6% of the total population (Braem 2017a, pers. comm.) and when evaluated separately by sex is approximately 15% bulls and 2% cows (Dau 2015a). In recent years, as the WACH population has declined, the total harvestable surplus has also declined (Dau 2011, Parrett 2015a). In 2015/16, the combined TCH/WACH harvestable surplus declined from an estimated 13,250 caribou in 2014/15 to an estimated 12,400 caribou. While there is substantial uncertainty in the harvestable surplus estimates, the overall trend is decreasing and it is likely that sustainable harvest will soon be exceeded if the decline continues (Parrett 2015a, Dau 2015a). Of particular concern is the overharvest of cows, which has probably occurred since 2010/11 (Dau 2015a). Dau (2015a) states, “even modest increases in the cow harvest above sustainable levels could have a significant effect on the population trajectory of the WACH (14-29). Harvest from the WACH, which has remained fairly consistent, is one of the factors that prompted the BOG to enact restrictions to WACH and TCH caribou harvest in March 2015.

Using the percentage of harvest reported by community from the WACH in 2008/09 (**Table 6**) and the 2014 community harvest estimates for Utqiagvik, Anaktuvuk Pass, Nuiqsut, and Point Hope (Braem 2015) and the 2014 total nonlocal harvest (117 caribou) (ADFG 2017a), the total WACH caribou harvest for Unit 26A in 2014 was approximately 1,185 caribou. Adding another 120 caribou from Point Lay and Atkasuk (Parrett 2011) would bring the total to approximately 1,305 caribou harvested from the WACH in 2014 in Unit 26A. This year (2014) was chosen because this was the most recent community harvest records for the North Slope communities (Braem 2015).

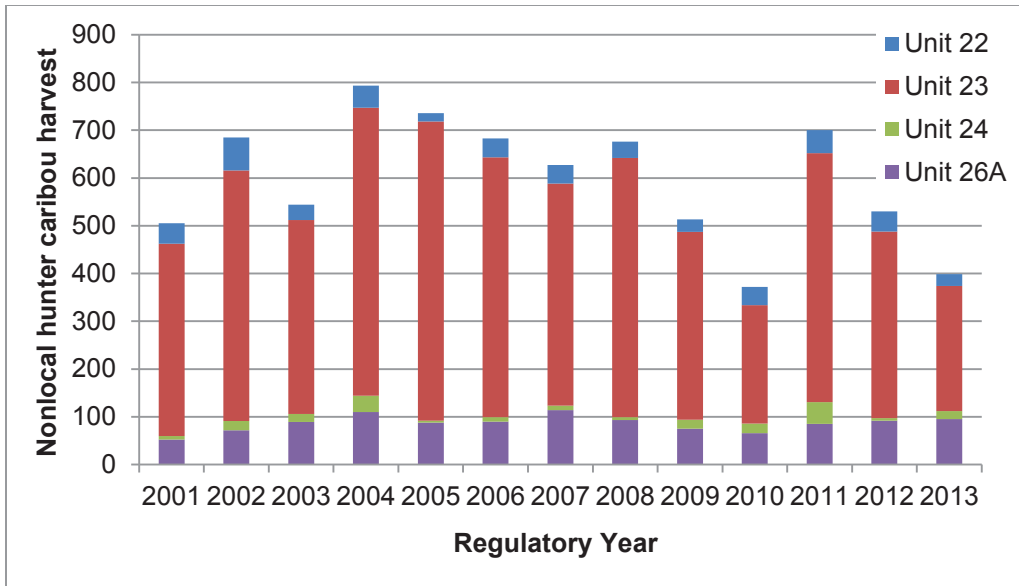
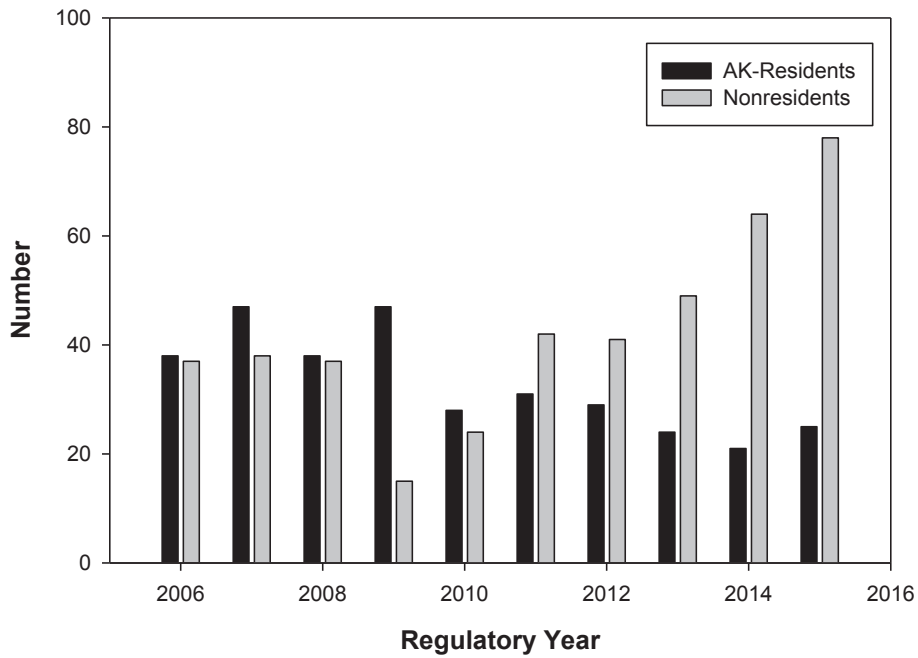


Figure 10. Nonlocal WACH harvest by unit (Dau 2015a, Dau 2013). Unit 21D was not included as only 0-2 caribou have been harvested from this unit each year.



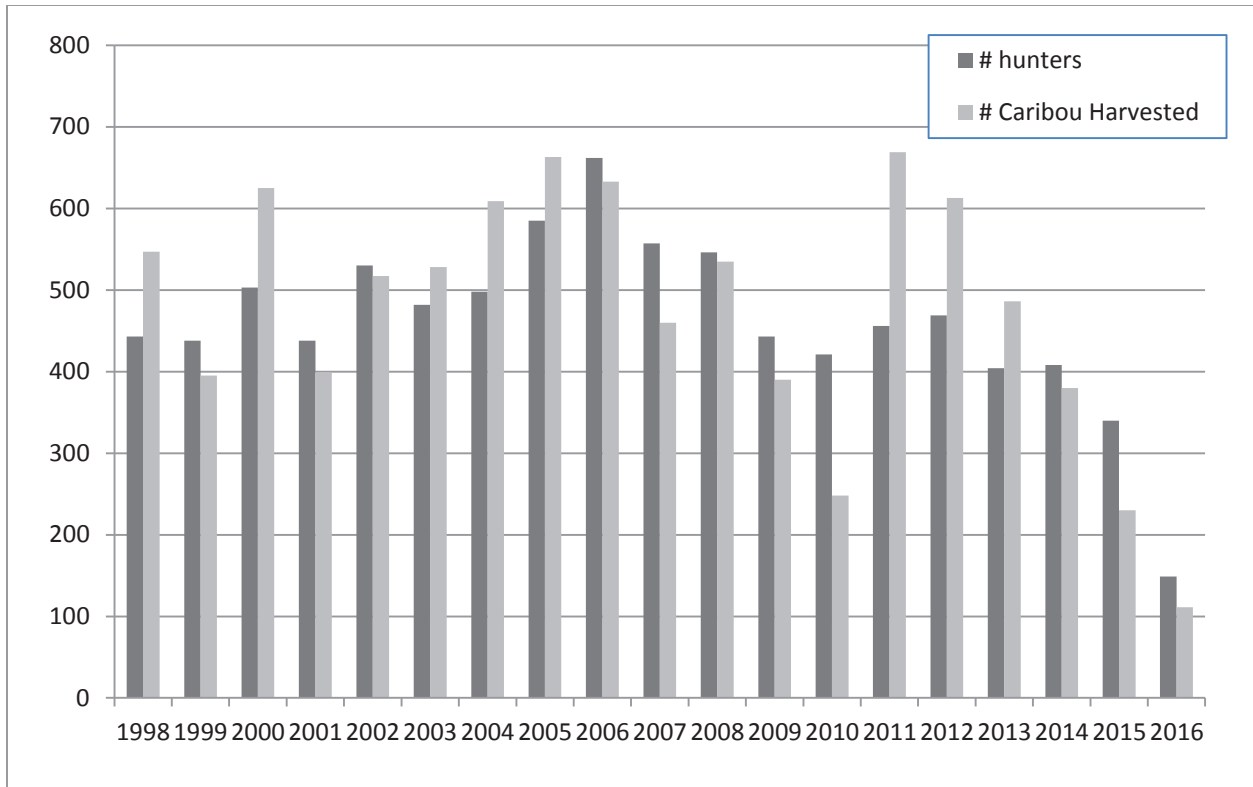


Figure 11. Number of non-Federally qualified users (NFQU) and number of caribou harvested by NFQU in Unit 23 (ADF&G 2016, FWS 2016, WinfoNet 2017).

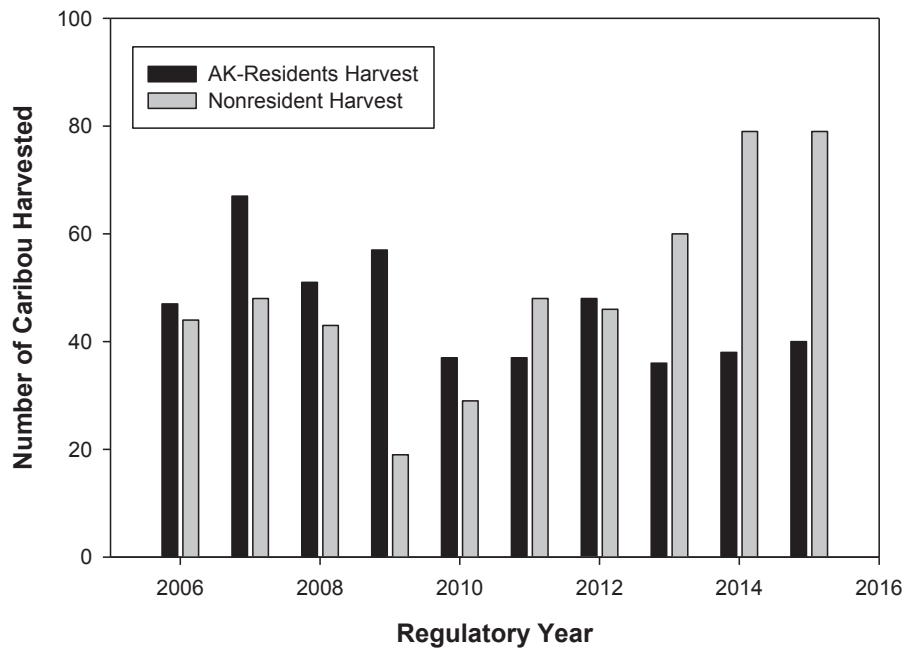


Figure 12. Residency of successful nonlocal caribou hunters from the WACH in Unit 26A, 2006-2015 (Dau 2013, 2015a).

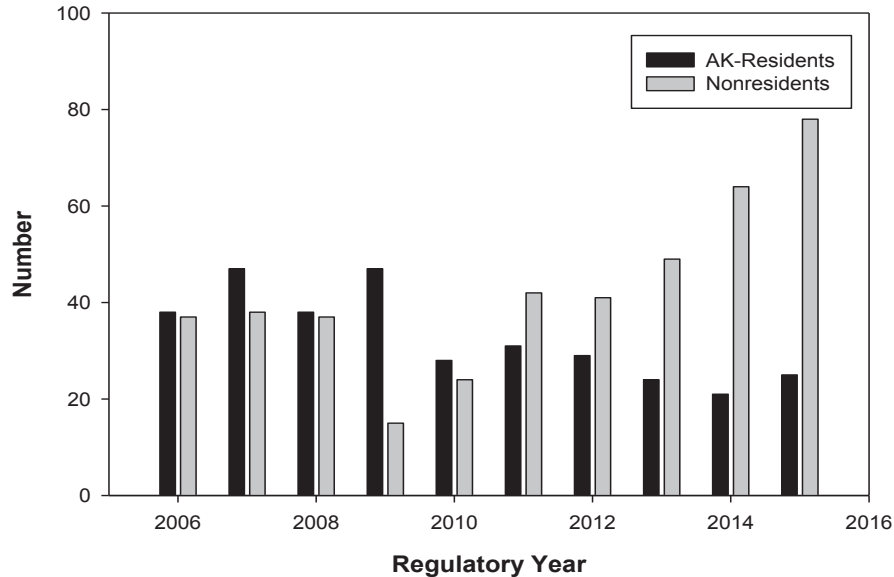


Figure 13. Nonlocal WACH harvest in Unit 26A, 2006-2015 (Dau 2013, ADF&G 2017b).

Cultural Knowledge and Traditional Practices

The archaeological record of the region extends 8,000 to 10,000 years before present and sites are scattered across the Brooks Range and the North Slope (Anderson 1984, Dumond 1984). Prior to 1840, the Inupiat people of the region were loosely organized in six groups or nations of small kin-based settlements (Burch 1980). These groupings largely disappeared by 1900 but communities still use the territories that preceded modern villages (Braem 2013).

Caribou are an important subsistence resource for the Inupiaq people of northern Alaska (Burch 1998, Spencer 1984). This is particularly true for inland communities such as Atqasuk and Anaktuvuk Pass where marine mammals are not available. While whaling communities tended to be more permanent, inland peoples traditionally tended toward annual and seasonal movements to reflect caribou migrations (Spencer 1984). The abandonment of this more mobile lifestyle has probably had significant consequences for the adaptability of hunters and their ability to meet subsistence needs. The two predominant modes of subsistence were intertwined by trading relationships between inland and coastal communities that sometimes helped to supplement dietary needs (Spencer 1984).

Historically the North Slope Inupiat hunted caribou year-round (Braem 2013). This continues today, with heavier harvests in certain months and seasons depending on the community (Braem 2013). A variety of methods were used to harvest caribou historically including spearing swimming animals, driving caribou into natural and manmade barriers, snaring, bow and arrow, and deadfalls (Braem 2013). Caribou drives

allowed a large number of caribou to be harvested in a short time (Burch 2012, Spencer 1959, Murdoch 1988). These methods were replaced with firearms in the 19th century.

Burch (1988) described the importance of caribou for the people of Northwest. Caribou were used for sustenance but also for material to make parkas, underwear, socks, boots, mittens, and gloves (Braem 2013). Burch (1998) documented a unanimous preference for the late summer coats of caribou cow and calf hides, seen as providing both the softness and quality needed for high quality clothing, after the summer shedding and before acquiring a shaggy winter coat. While bulls were targeted for their fat stores and meat, cows and calves were targeted for their hides, considered prime during the early part of August (Burch 1998). The main objective for summer hunting was the acquisition of hides, “It reportedly took two calf skins to make one parka, and every hunter tried to get at least twenty of them” (Burch 1998:163).

Traditionally, coastal groups tended to store caribou frozen in ice cellars while inland groups more commonly stripped and dried the meat (Braem 2013). Today, caribou is frozen, dried, and eaten fresh (Braem 2013). As a food resource, caribou remain important to meeting the subsistence needs of Inupiaq families on the North Slope. In 1989 the coastal community of Wainwright harvested approximately 83,187 lb. of caribou (178 lb. per capita), representing 24% of the community’s harvest in that year (ADF&G 2017c). Comparatively, Wainwright harvested approximately 243,594 lbs. of marine mammals (521 lb. per capita), representing 69% of the community’s harvest (ADF&G 2017c).

In 2014, the inland community of Anaktuvuk Pass harvested approximately 104,664 lb. of caribou (330 lb. per capita), representing 84% of the community harvest in that year (Brown et al. 2016). Among the harvested animals, 51% were bulls, 39% were cows, and 10% were of unknown sex (Brown et al. 2016). Cows were primarily harvested between November and April while bulls were primarily harvested throughout the rest of the year (Braem 2015). Approximately 89% of Anaktuvuk Pass households reported using caribou in 2014, with 47% of households giving caribou away and 68% of households receiving caribou (ADF&G 2017c); use and sharing of caribou in this community remains high and has led to food security concerns in recent years when caribou migration patterns shifted away from the community.

In addition to Anaktuvuk Pass, ADF&G conducted surveys in Point Hope, Nuiqsut, and Utqiagvik in 2015 for the 2014 harvest year (Brown et al. 2016). Anaktuvuk Pass’ per capita harvest was highest (2.4 caribou; 315 lb. edible weight per capita) but the total number of harvested caribou was modest (770 caribou). Point Hope represented the lowest caribou harvest by number of animals (185) and by per capita edible weight (34 lb.). Utqiagvik, the largest community in the region, harvested 4,231 caribou in 2014, representing 103 lb. per capita of edible weight.

Residents from communities along the DHCMA have documented use of caribou from CACH, TCH and WACH. Holen et al. (2012) and Brown et al. (2016) documented that the 2011 caribou hunting areas followed the DHCMA north from Wiseman up to Galbraith and Toolik lakes in Unit 26. In addition there were two small caribou hunting areas near Wiseman and Nolan (**Appendix A**). Some of the respondents interviewed from Wiseman during the community harvest surveys in 2011 noted that hunting pressure on caribou and Dall Sheep from nonlocal hunters had increased substantially making it harder

for local residents to meet their harvest goals (Holen et al. 2012, p 376-378). Residents from Coldfoot also mentioned that overharvesting was depleting the CACH, TCH, and WACH that utilize the area (Holen et al. 2012)

Meeting the nutritional and caloric needs of arctic communities is important and is the foundation of subsistence activities. Still, the meaning of subsistence extends far beyond human nutrition for Alaska's native peoples. Holthaus (2012) describes subsistence as the base on which Alaska Native culture establishes its identity through "philosophy, ethics, religious belief and practice, art, ritual, ceremony, and celebration." Fienup-Riordan (1990) also describes subsistence in terms of the cultural cycles of birth and death representing the close human relationship and reciprocity between humans and the natural world. Concerning caribou specifically, Ms. Esther Hugo – a lifelong resident of Anaktuvuk Pass, describes the human-caribou relationship as a "way of life." The holistic view of subsistence was embodied in the special action request motion for WSA17-04 by the North Slope Council to, among other things, provide for a "reasonable traditional subsistence experience" (NSRAC 2017:248).

User Conflicts

While the percentage of diets comprised by caribou varies from community to community, this resource clearly remains a staple of subsistence in Alaska's arctic. Recent declines in caribou herds and shifts in caribou migration patterns have led to food security concerns, especially for inland communities that lack access to more abundant coastal resources such as marine mammals. Because commercial goods are both limited and expensive in rural Alaska, they often do not represent an adequate replacement to meet the traditional nutritional needs of residents.

Caribou populations naturally fluctuate over decades (Gunn 2001, WACH Working Group 2011) and this may result in proportional constrictions and expansions of migratory pathways that shift caribou near or away from communities. Other factors may influence migratory patterns such as anthropogenic disturbance, industrial development, habitat suitability, and climactic conditions. The influence of NFQU hunting activities, especially the use of aircraft and motorized vehicles as well as the harvest of lead caribou adjacent to what are considered important migratory corridors, has been an ongoing and contentious topic in the northwestern Arctic, since at least the 1980s (Georgette and Loon 1988, Jacobson 2008, Harrington and Fix 2009 *in* Fix and Ackerman 2015, Halas 2015, NWARAC 2015, Braem et al. 2015). In the Northwest Arctic, the Unit 23 Working Group was established to assist with some of these concerns among various user groups. These user conflicts were, in part, the impetus for the closure of Federal public lands to NFQU in Unit 23 for the 2016/2017 regulatory year.

Similar user conflict concerns have been voiced in the North Slope region over time (NWARAC and NSRAC 2016, WIRAC 2016, NSRAC 2015 2016, 2017). In 1995 the Board adopted a proposal from the City of Anaktuvuk Pass to close Federal public lands in Unit 26A, south of the Colville River, upstream from and including the Anaktuvuk River drainage, to NFQU from August 1st through September 30th. The justification was to allow for caribou migrations to take their normal route into Anaktuvuk Pass. While concerns for caribou migration through Anaktuvuk Pass continue to be voiced, many of the recent concerns expressed for Unit 26 have pertained to the DHCMA and NFQU hunter access via this road;

some have also expressed concern for disturbance activities facilitated by guides and transporters north of Anaktuvuk Pass (NWARAC AND NSRAC 2016, WIRAC 2016). NFQU caribou harvest in Unit 26 is highest in the vicinity of the Dalton Highway and along river corridors east of this road (see **Maps 8, 9, 10**). The chair of the Western Interior Alaska Regional Advisory Council, Jack Reakoff, expressed his concerns as follows (WIRAC 2016:100-101):

I live over there by the pipeline and we had zero caribou in our valley this year, mainly because of the increased harvest of cow caribou into July 1 on the Haul Road (Dalton Highway). That basically lets those hunters kill all those lead cows and stop the migration... they have jet boats, air boats, they put those in the rivers on the North Slope, they pound those caribou... It's the high power boat traffic that can get into the upper drainages that affect those caribou migrations. The other is the aspect of air taxis dumping off hunters in the middle of, in the front of migrations... There's hundreds and hundreds of hunters that go on the Dalton Highway. They're deflecting the Central Arctic Herd off to the east.

The Council chair later explained that state regulations enacted in 2010 that increased harvest limits, caused cows that had not been previously exposed to hunting during the fall migration to be hunted extensively, especially by hunters accessing the Ivishak and Ribdon rivers by boat and by air (Reakoff 2017, pers. comm.). He said that if caribou approached the road, cows were frequently killed by many bow hunters in the area. He also stated that after several seasons, many cows learned to stay north and circumvent the Dalton Highway, thus travelling in a semi-circle fashion to reach the area of Itkilik and Toolik. The BOG closed the caribou season west of the Dalton Highway in 2014 to protect the Teshekpuk herd, and the Council chair indicated that CAH caribou are learning to stay to the west to avoid being hunted in the winter (Reakoff 2017, pers. comm.).

The Council chair also elaborated on his concerns regarding the use of airboats and jetboats (Reakoff 2017, pers. comm.). He said that while boats themselves can scare caribou, it is really about the concentration of hunters that can deter herd migration. He used an example of a voluntary hunter check station operated by ADF&G in the late 1990s at the Yukon River Bridge. According to Reakoff there was an average of 2000 hunters tabulated annually and that this only included those that stopped voluntarily and while the station was open on the weekends (Reakoff 2017, pers. comm.). He believes that the recent BOG implemented season changes will address the problems in Unit 26B.

Maps 8, 9, and 10 project relative hunting intensity by minor river drainage over a ten year period (2007-2016) in two recent years (2015 and 2016), and in two prior years (2013 and 2014), respectively.

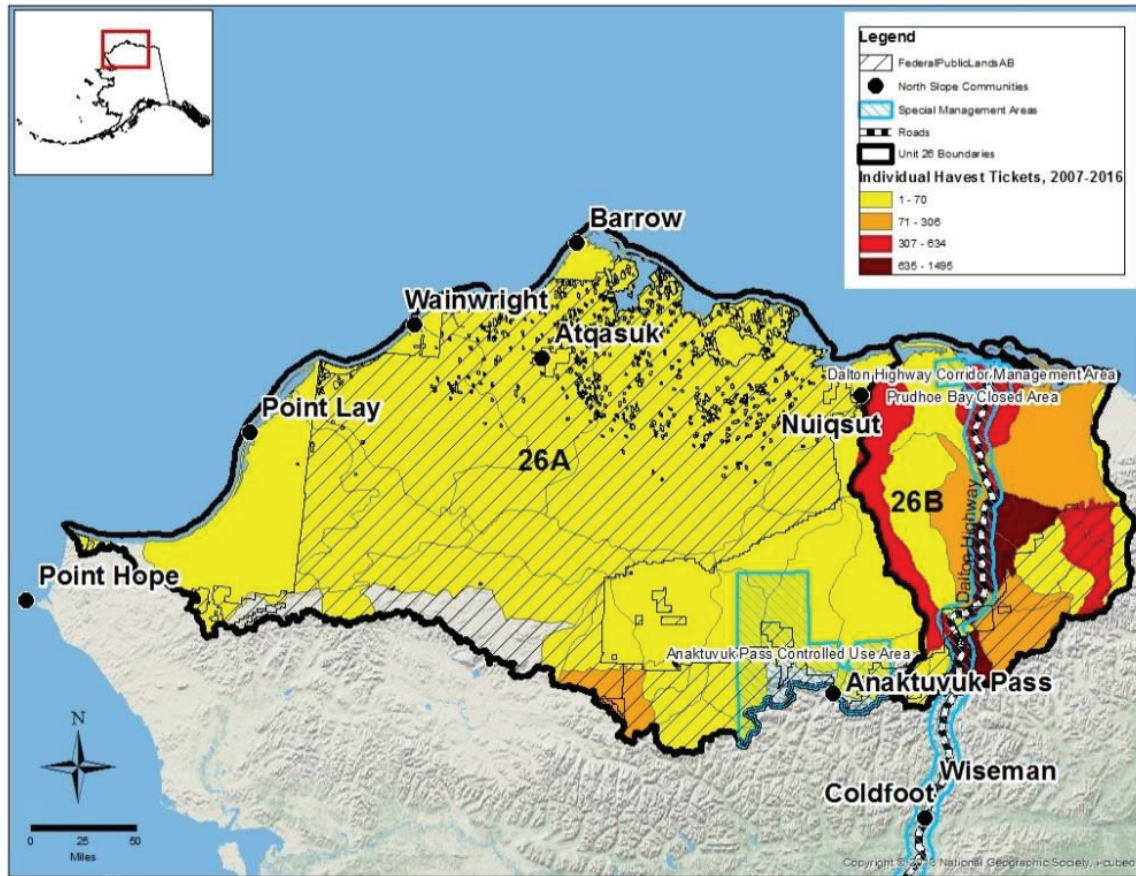
Relative hunting intensity is spatially calculated using unique individual ticket numbers for all hunters indicating that they hunted and either killed (successful) or did not kill (unsuccessful) a caribou. For each time scale hunting intensity is relatively low and dispersed throughout Unit 26A and intensity is substantially greater and more variable in Unit 26B. In Unit 26A, the only area exhibiting slightly greater relative hunting intensity between 2013/2014 and 2015/2016 was in the vicinity of the Nigu River, to the north and west of Gates of the Arctic National Park and Preserve. In 2013/2014 there were 59 individual harvest tickets indicating hunting activity in this drainage; in 2015/2016 there were 71. This slight increase isn't visible in the graduated symbology scales used in **Map 9** and **Map 10**. It is possible that

the slightly higher relative hunting intensity in this area is a result of a 2016 closure to NFQU hunting caribou on Federal public lands in adjacent Unit 23. This was corroborated by a representative of the Arctic Slope Regional Corporation who also attributed the increased hunting activity to increased guide and transporter use of the area (see Current Events).

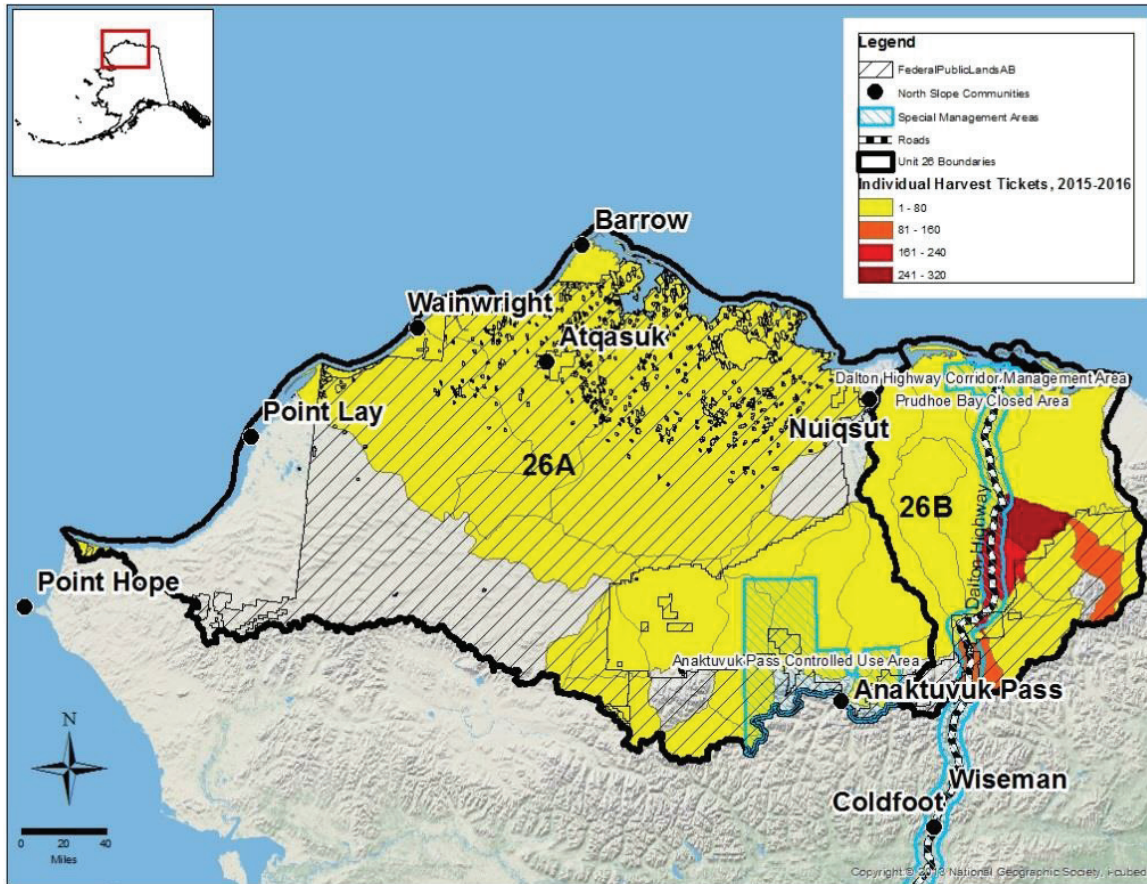
There have been shifts in relative hunting intensity in drainages in Unit 26B over time (**Maps 8, 9, 10**). In recent years, hunting intensity has lessened for many drainages in the subunit except for those that already exhibited relatively little hunting intensity and along and to the east of the Dalton Highway in the central portion of the subunit. These recent reductions in relative harvest intensity may reflect recent regulatory changes. The minor drainage represented along the western boundary of the subunit does not accurately depict harvest as the majority of records here are from the Toolik Lake area in the southeastern most portion of the minor drainage, an area more easily accessible from the Dalton Highway.

Despite relative hunting intensity reductions in many drainages of Unit 26B, the DHCMA remains the most intensely hunted area within the subunit, particularly from the southern border of Unit 26 north to where the Sagavanirktok River diverges from the road. Areas to the east of this region also exhibit higher hunting intensity which may be the result of motorized boat access along river corridors. Boats can be used to access the lower and middle sections of the Ivishak and Echooka Rivers within the Arctic NWR. Rafts can be used in the shallower headwaters of the Ivishak and Echooka Rivers (**Map 6**). Much of the highest hunting intensity along the Dalton Highway occurs on State land, though the southernmost stretch of road within the unit is surrounded by BLM managed land. This BLM managed land surrounds popular NFQU hunting areas in proximity to Toolik Lake and Galbraith Lake. The Western Interior Council chair indicated however that hunting activity has decreased in these areas due to an absence of nearby caribou (Reakoff 2017, pers. comm.). Another popular hunting area in this vicinity is in Atigun Gorge and along the confluence of the Sagavanirktok and Atigun Rivers, both of which fall largely within the Arctic NWR to the east of the BLM managed lands described previously. The Western Interior Council chair suggested that it has been several seasons since large numbers of caribou have been present in “Atigun country” in the fall (Reakoff 2017, pers. comm.).

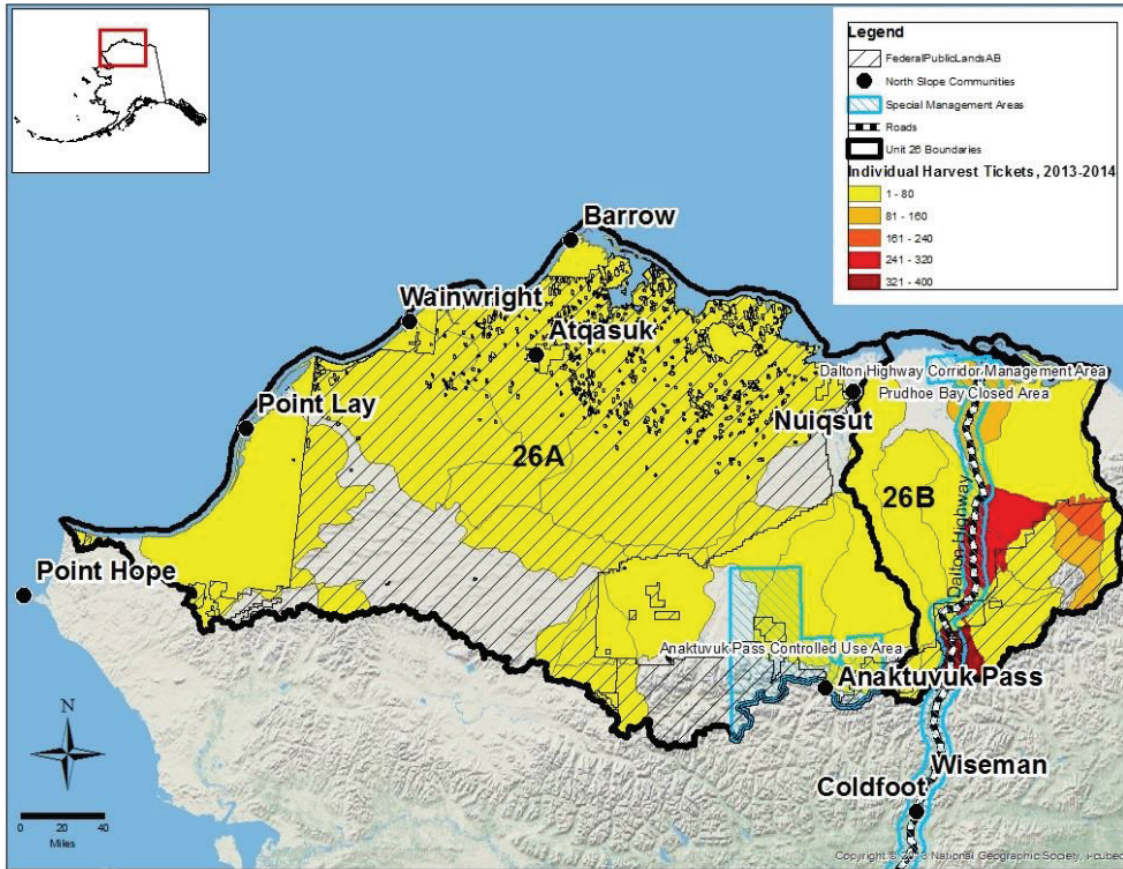
Members of the North Slope Council have expressed concern for an expanded harvest season that allows the taking of cow caribou from the vicinity of the Dalton Highway during their migration (NSRAC 2016), though state regulations for the 2017/2018 regulatory year have eliminated cow caribou harvest in Unit 26B remainder. Given that cow caribou can no longer be legally harvested in 26B remainder, concerns over the use of jetboats and airboats in accessing mountain corridors and the associated killing of lead caribou may be somewhat lessened. Relative hunting intensity and harvest data in subsequent years may elucidate the spatial effects of the cow closure.



Map 8. Cumulative caribou hunting intensity (number of hunters) by NFQU by minor river drainages from 2007-2016 (WinfoNet 2017). Includes both successful and non-successful hunters.



Map 9. Cumulative caribou hunting intensity (number of hunters) by NFQU by minor river drainages from 2015-2016 (WinfoNet 2017). Includes both successful and non-successful hunters.



Map 10. Cumulative caribou hunting intensity (number of hunters) by NFQU by minor river drainages from 2013-2014 (WinfoNet 2017). Includes both successful and non-successful hunters.

The North Slope Council has also expressed concern regarding observations of animals injured as a result of bow hunting (NSRAC 2016). Despite documented concerns through repeated public testimony, information is lacking on the degree of impact that these hunting activities have on both short and long-term caribou migration patterns. A member of the WACH Working Group indicated that she perceived the closure in Unit 23 in 2016 to have facilitated improved migration to the vicinity of Anaktuvuk Pass (NSRAC 2016), though it is unclear how this would have affected the migration of WACH animals. The Northwest Arctic Subsistence Regional Advisory Council stated that closure of Federal public lands in Unit 23 to caribou hunting by NFQU in 2016 helped local people harvest more caribou, increasing their food security and reducing user conflicts (NWARAC 2016, 2017).

Whether the effects of NFQU hunting activity on the North Slope are perceived or realized, the reality is that three of the four caribou herds in the region (WACH, TCH, and CACH) have experienced recent declines. User conflicts are likely to intensify when resources are scarce and when food security is threatened (Homer-Dixon 1994, Cohen and Pinstrip-Andersen 1999, Pomeroy et al. 2016). An Anaktuvuk Pass resident expressed her concerns as follows (NSRAC2015:45-46):

We're talking about lives here. Food for our stomach, food for our health, food that our parents and our grandparents had passed on. Just tears because we did not catch what we needed again and again... It's just the pain and the hurt and I don't have [any] caribou to eat like it used to be.

Other Alternatives Considered

The first alternative considered was to reduce hunter conflicts by closing both the BLM lands occurring on either side of the Dalton Highway in the southern portion of the unit and the portion of the Arctic NWR falling within Unit 26B. Given the intensity of use along the Dalton Highway and within several Arctic NWR drainages, this option may decrease competition and user conflict between NFQU and FQSU. While NFQU harvest may shift northward along the Dalton Highway, this option may provide Federally qualified users with an area of substantially reduced competition.

Given that this alternative would close lands with boundaries that largely include the northern edge of the Brooks Range, including small mountain corridors from the interior to the North Slope, it may reduce barriers to caribou migrating through the mountain passes, river corridors, and across the DHCMA on Federal public lands. While NFQU may still use jetboats and airboats to access the Lupine, Echooka and Ivishak Rivers and Juniper Creek within Arctic NWR, hunting of caribou would be restricted to the gravel bars. Additionally, closure of Federal public lands along the DHCMA may reduce hunting pressure, thus allowing for more unrestricted movement of caribou across the DHCMA.

This alternative could increase competition with other hunters on State lands which are adjacent to the DHCMA especially in southern portions of Unit 26B. The relatively small area under Federal jurisdiction, the relatively short amount of time to determine the effects of recent changes to State and Federal caribou hunting regulations implemented in 2015/2016, and the newly enacted State regulations for the CACH for 2017/2018, which limit NFQU to 1 bull caribou and eliminate cow harvest in Unit 26B remainder, suggest that restrictions on these Federal public lands to caribou hunting by NFQU are not warranted at this time. It is unlikely that closing Federal public lands to NFQU in Unit 26B would reduce the harvest because hunters may shift locations to the adjacent State lands.

Effects

If this proposal is adopted, caribou hunting on Federal public lands in Unit 26A and Unit 26B would be limited to FQSU with a customary and traditional use determination for caribou in Unit 26A and 26B. This would reduce competition between FQSU and NFQU on Federal public lands in Units 26A and 26B and may increase hunting pressure on State or private lands.

While the sustainable harvest of WACH caribou may soon be exceeded, the overharvest of cows is of particular concern (Dau 2015a). As nonresidents may only harvest one bull, their impact on the herd's population trajectory is likely negligible. Total NFQU harvest from Unit 26A accounts for only about 9% of the total WACH in Unit 26A and about 1% of the total estimated harvest from the WACH (117 caribou out of an estimated total harvest of 11,984 caribou on average). The nonresident and nonlocal resident harvest from the TCH is minimal although from the TCH (Parrett 2015a). Parrett (2015a) estimated that approximately 100 caribou, which represents approximately 3% of the total annual TCH harvest, are

harvested annually by nonlocal users. From a biological perspective, eliminating the nonlocal harvest, which accounts for less than 1% in Unit 26A, will not have a meaningful impact on WACH or TCH conservation or population recovery. It may, however, alleviate some FQSU concerns regarding the possible deflection of caribou in critical migratory corridors or in areas of increasing harvest activity.

Closing caribou hunting to NFQU on all Federal public lands in Unit 26B would have the greatest impact to NFQU that hunt in Unit 26B from the CACH population. Nonlocal residents accounted for 89% of the total caribou harvest from the CACH between 2013 and 2015, which is approximately 827 caribou annually. The proportion of nonresidents has been increasing in recent years whereas hunting by nonlocal residents has decreased (Table 5, Figure 6). Most of the CACH harvest in Unit 26B occurs on State lands so closing the relatively small amount of Federal land in Unit 26B to NFQU will shift hunters to State land with a little reduction in the overall harvest (Arthur 2017 pers. comm). New State regulations, which take effect July 1, 2017, eliminate cow harvest, except in the northwest corner of Unit 26B, and reduce the nonresident harvest to one bull. These new regulations should reduce the overall caribou harvest from the CACH to sustainable levels (Lenart 2017b).

It is unclear to what extent hunting pressure in the DHCMA and in the headwaters of various river drainages influences the migratory patterns of the CACH caribou and to a lesser extent caribou from the TCH and WACH. The northwest-southeast direction of the fall CACH migration across the Dalton Highway and the variability of the migration patterns suggest that disturbance within the area of greatest caribou concentration that occurs between Galbraith Lake and Ribdon River is not likely to reduce the availability of caribou to local residents living west of the highway.

OSM PRELIMINARY CONCLUSION

Oppose Proposal WP18-57.

Justification

In total, the TCH, WACH, and CACH caribou populations in northern and western Alaska have declined approximately 50%. The declines have not been uniform among the herds. Low calf survival and recruitment, high adult cow mortality, and human harvest, coupled with deteriorating range conditions, climate change, predation and disease, are all contributing factors to the overall decline of caribou. The State's estimated harvestable surplus for both the TCH and the CACH is declining and is currently fully allocated among users based on the most recent Federal and State harvest rates. The WACH is approaching a similar situation.

Beginning in 2015, State and Federal regulations have been adopted to reduce the cow harvest by FQSU and NFQU, and to slow and/or reverse the overall caribou population declines. Cow harvest by NFQU is relatively small in the WACH and TCH, but has increased in recent years. In response to the recent decline in the CACH population, the BOG adopted new caribou hunting regulations which eliminated the cow harvest, reduced the harvest from 5 caribou per day to 2 bull caribou for residents, and 1 bull caribou for nonresidents in Unit 26B remainder for 2017/2018. Recently enacted conservation actions for the WACH, TCH, and CACH need to be given time to determine if they are effective in reducing the caribou

harvest, and in slowing down or reversing the population declines in these caribou herds before additional closures are enacted.

It is likely that closing the relatively small amount of Federal public lands in Unit 26B would shift the hunters onto State land. Anaktuvuk Pass hunters are the most impacted by NFQU hunting nearby, many of whom hunt on State land north, northeast, and northwest of the community. Closing Federal land further north (in NPR-A) risks further concentrating NFQU onto State lands adjacent to Anaktuvuk Pass, thereby increasing impacts to that community. Additionally, closure of Federal public lands to NFQU in Unit 26B will not have as much of an effect as the recent BOG action to protect cows and reduce the overall caribou harvest since much of the harvest occurs on State lands.

In addition to closing Federal public lands to NFQU, local users, particularly those from communities along the DHCMA (which includes areas in Units 26A and B), would not see much reduction in competition as most NFQU would likely continue to hunt caribou from the CACH or Porcupine Herd on State lands in Unit 26B. Subsequently, the effects of hunting intensity and motorized vehicle use along the highway would likely not alleviate FQSU concerns that these activities alter caribou migration in the area. The closure is unlikely to deter non-local hunters from hunting within and adjacent to the DHCMA, thus the proponent's goal of "reducing non-local take" would not be achieved.

Under ANILCA §815.3 and the Board's Closure Policy, the Board may adopt closures to hunting by non-Federally qualified users if it is necessary for the conservation of healthy wildlife populations or continuation of subsistence uses of wildlife populations by Federally qualified subsistence users. The number of caribou harvested by NFQU is not biologically significant for the WACH and TCH in Unit 26A. However, caribou harvest by NFQU in Unit 26B from the CACH was considered to potentially have more significant consequences for that herd, which have now been addressed with newly enacted State regulations for 2017/2018. The goals of these new State regulations for the CACH are to reduce the overall caribou harvest from 930 to 680 and reduce the cow harvest from 202 to no more than 75. ADF&G harvest and population objectives are very specific, and they expect to meet the newly proposed harvest objectives this year. We recommend that these changes take effect in lieu of enacting additional regulations.

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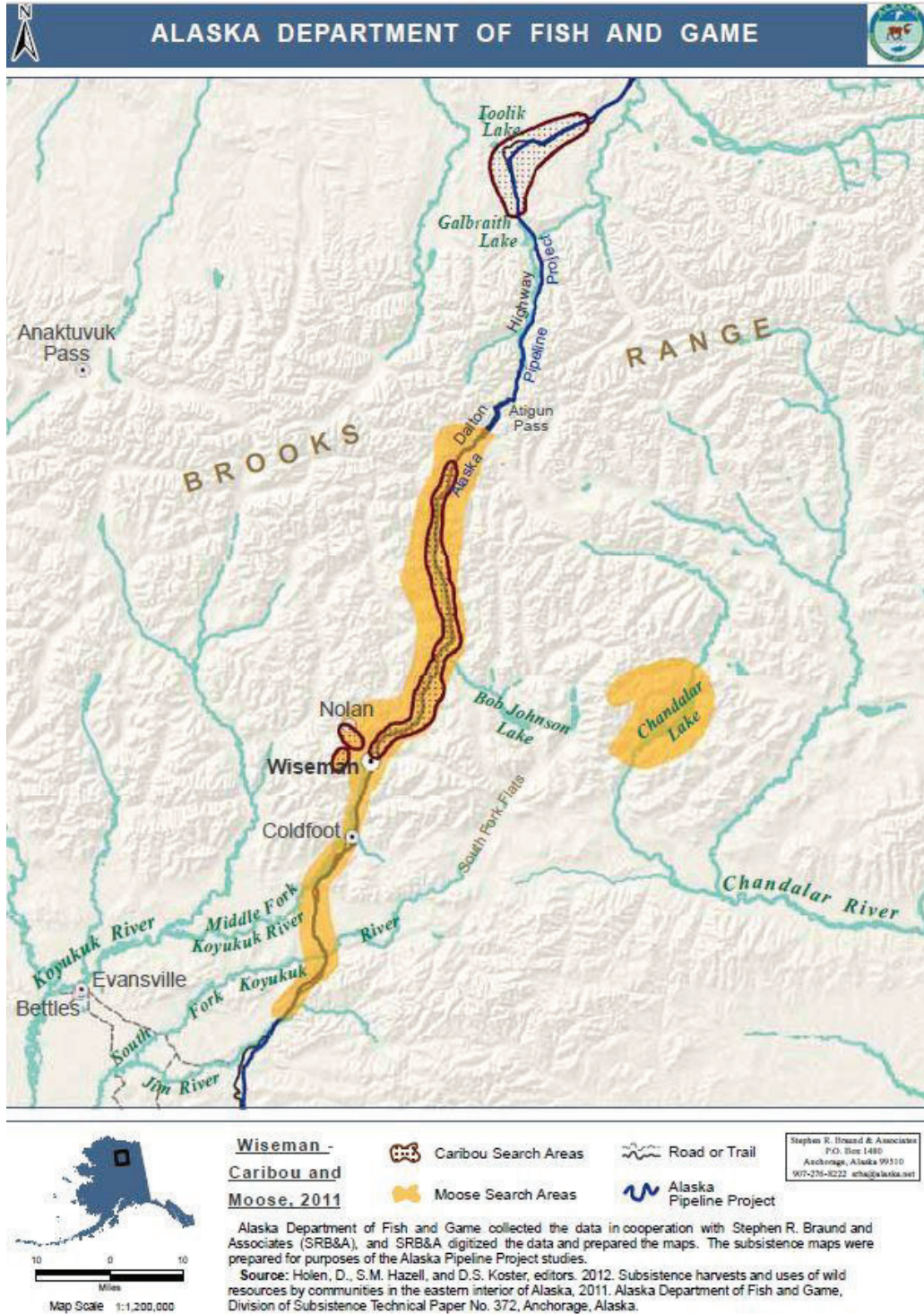
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Appendix A



Map 11. Location of two small caribou hunting areas near Wiseman and Nolan

WP18–51 Executive Summary

<p>General Description</p>	<p>Proposal WP18-51 requests that Federal (statewide) bear baiting restrictions be aligned with State regulations, specifically the use of biodegradable materials. <i>Submitted by: Eastern Interior Alaska Subsistence Regional Advisory Council.</i></p>
<p>Proposed Regulation</p>	<p>§ __.26(b) <i>Prohibited methods and means. Except for special provisions found at paragraphs (n)(1) through (26) of this section, the following methods and means of taking wildlife for subsistence uses are prohibited:</i></p> <p style="text-align: center;">* * * *</p> <p>(14) <i>Using bait for taking ungulates, bear, wolf, or wolverine; except you may use bait to take wolves and wolverine with a trapping license, and you may use bait to take black bears and brown bears with a hunting license as authorized in Unit-specific regulations at paragraphs (n)(1) through (26) of this section. Baiting of black bears and brown bears is subject to the following restrictions:</i></p> <p style="text-align: center;">* * * *</p> <p>(iii) <i>You may use only biodegradable materials for bait; if fish or game is used as bait, you may use only the head, bones, viscera, or skin of legally harvested fish and big game, the skinned carcasses of furbearers and fur animals, small game (including the meat, except the breast meat of birds), and unclassified game wildlife for bait may be used, except that in Units 7 and 15, fish or fish parts may not be used as bait. Scent lures may be used at registered bait stations;</i></p>
<p>OSM Preliminary Conclusion</p>	<p>Support Proposal WP18-51 with modification to establish a definition for scent lure and clarify the regulatory language.</p> <p>The modified regulation should read:</p> <p>§ __.25(a) <i>Definitions. The following definitions apply to all regulations contained in this part: scent lure (in reference to bear baiting) means any biodegradable material to which biodegradable scent is applied or infused.</i></p> <p>§ __.26(b)(14)(iii) <i>You may use only biodegradable materials for bait; if fish or wildlife is used as bait, you may use only the head, bones, viscera, or skin of legally harvested fish and wildlife for bait, the skinned carcasses of furbearers, and unclassified wildlife may be used, except that in Units 7 and 15, fish or fish parts may not be used as bait. Scent lures may be used at registered bait stations;</i></p>

WP18–51 Executive Summary	
Southeast Alaska Subsistence Regional Advisory Council Recommendation	
Southcentral Alaska Subsistence Regional Advisory Council Recommendation	
Kodiak/Aleutians Subsistence Regional Advisory Council Recommendation	
Bristol Bay Subsistence Regional Advisory Council Recommendation	
Yukon-Kuskokwim Delta Subsistence Regional Advisory Council Recommendation	
Western Interior Alaska Subsistence Regional Advisory Council Recommendation	
Seward Peninsula Subsistence Regional Advisory Council Recommendation	
Northwest Arctic Subsistence Regional Advisory Council Recommendation	
Eastern Interior Alaska Subsistence Regional	

WP18-51 Executive Summary	
Advisory Council Recommendation	
North Slope Subsistence Regional Advisory Council Recommendation	
Interagency Staff Committee Comments	
ADF&G Comments	
Written Public Comments	3 Oppose

**DRAFT STAFF ANALYSIS
WP18-51**

ISSUES

Proposal WP18-51, submitted by the Eastern Interior Alaska Subsistence Regional Advisory Council, requests that Federal (statewide) bear baiting restrictions be aligned with State regulations, specifically the use of biodegradable materials.

DISCUSSION

The proponent states that the current Federal bear baiting restrictions are much more restrictive than the State's and do not provide for a Federal subsistence priority. The proponent proposes to align Federal and State bear baiting restrictions in order to reduce regulatory complexity, reduce user confusion, and allow baiting with items (e.g. dogfood, anise, popcorn, baked goods, grease, syrup, etc.) that have traditionally been used as bear bait by Federally qualified subsistence users and are currently allowed under State regulations.

Existing Federal Regulations

§__.26(b) Prohibited methods and means. Except for special provisions found at paragraphs (n)(1) through (26) of this section, the following methods and means of taking wildlife for subsistence uses are prohibited:

* * * *

(14) Using bait for taking ungulates, bear, wolf, or wolverine; except you may use bait to take wolves and wolverine with a trapping license, and you may use bait to take black bears and brown bears with a hunting license as authorized in Unit-specific regulations at paragraphs (n)(1) through (26) of this section. Baiting of black bears and brown bears is subject to the following restrictions:

* * * *

(iii) You may use only biodegradable materials for bait; you may use only the head, bones, viscera, or skin of legally harvested fish and wildlife for bait;

Proposed Federal Regulations

§__.26(b) Prohibited methods and means. Except for special provisions found at paragraphs (n)(1) through (26) of this section, the following methods and means of taking wildlife for subsistence uses are prohibited:

* * * *

(14) Using bait for taking ungulates, bear, wolf, or wolverine; except you may use bait to take wolves and wolverine with a trapping license, and you may use bait to take black bears and brown bears with a hunting license as authorized in Unit-specific regulations at paragraphs (n)(1) through (26) of this section. Baiting of black bears and brown bears is subject to the following restrictions:

* * * *

(iii) You may use only biodegradable materials for bait; **if fish or game is used as bait, you may use only the head, bones, viscera, or skin of legally harvested fish and big game, the skinned carcasses of fur-bearers and fur animals, small game (including the meat, except the breast meat of birds), and unclassified game** ~~wildlife for bait~~ may be used, except that in Units 7 and 15, fish or fish parts may not be used as bait. Scent lures may be used at registered bait stations;

Note: The proposal as submitted omitted the word “fish”. However, this was an oversight as the proponent’s intention was to align State and Federal regulations.

State Regulations

5 AAC 92.044. Permit for hunting bear with the use of bait or scent lures.

(a) A person may not establish a bear bait station to hunt bear with the use of bait or scent lures without first obtaining a permit from the department under this section.

(b) In addition to any condition that the department may require under 5 AAC 92.052, a permit issued under this section is subject to the following provisions:

* * * *

(8) only biodegradable materials may be used as bait; if fish or big game is used as bait, only the head, bones, viscera, or skin of legally harvested fish and game may be used, except that in Units 7 and 15, fish or fish parts may not be used as bait;

5 AAC 92.085. Unlawful methods of taking big game; exceptions: The following methods and means of taking big game are prohibited in addition to the prohibitions in 5 AAC 92.080:

* * * *

(4) with the use of bait for ungulates and with the use of bait or scent lures for any bear, except that bears may be taken with the use of bait or scent lures as authorized by a permit issued under 5 AAC 92.044;

5 AAC 92.210. Game as animal food or bait. A person may not use game as food for a dog or furbearer, or as bait, except for the following:

(1) the hide, skin, viscera, head, or bones of game legally taken or killed by a motorized vehicle, after salvage as required under 5 AAC 92.220;

(2) parts of legally taken animals that are not required to be salvaged as edible meat, if the parts are moved from the kill site;

(3) the skinned carcass of a bear, furbearer, or fur animal, after salvage as required under 5 AAC 92.220;

(4) small game; however, the breast meat of small game birds may not be used as animal food or bait;

(5) unclassified game;

(6) deleterious exotic wildlife;

(7) game that died of natural causes, if the game is not moved from the location where it was found; for purposes of this paragraph, "natural causes" does not include death caused by a human;

(8) game furnished by the state, as authorized by a permit under 5 AAC 92.040.

Extent of Federal Public Lands

Federal public lands comprise approximately 54% of Alaska and consist of 20% U.S. Fish and Wildlife Service (USFWS) managed lands, 15% Bureau of Land Management (BLM) managed lands, 14% National Park Service (NPS) managed lands, and 6% U.S. Forest Service (USFS) managed lands.

Customary and Traditional Use Determinations

Customary and traditional use determinations for specific areas and species are found in subpart C of 50 CFR part 100, §__.24(a)(1) and 36 CFR 242 §__.24(a)(1).

Regulatory History

In 1990, Federal regulations for bear baiting were adopted from State regulations. These regulations, specifically §__.26(b)(14)(iii), have not been modified since that time.

In 1992, Proposal P92-149 requested that bear baiting be prohibited due to habituation of bears to bait stations and human garbage, which results in bears becoming more dangerous. The Federal Subsistence Board (Board) rejected the proposal as there was no biological reason to restrict subsistence opportunity.

Currently, black bears may be taken at bait stations under Federal regulations in all units, except Units 1C, 4, 8, 9, 10, 14, 18, 22, 23, and 26. In 2014, the Board adopted Proposal WP14-50, allowing brown bears to be taken at bait stations in Unit 25D. In 2016, the Board adopted Proposal WP16-18, allowing brown bears to be taken at bait stations in Units 11 and 12.

In 2001, the Alaska Board of Game (BOG) adopted Proposal 156 to prohibit the use of fish parts as bear bait in Units 7 and 15 (ADF&G 2001). The intent of the proposal was to minimize human-bear interactions and to reduce defense of life or property (DLP) brown bear kills on the Kenai Peninsula (ADF&G 2001).

In 2015, the NPS published Final Rule 36 CFR 13.42(g)(10) prohibiting the take of black and brown bears over bait on National Preserves under State regulations. In 2016, the USFWS published a similar rule prohibiting the take of brown bears over bait on National Wildlife Refuges under State regulations. The USFWS rule was nullified when the President of the United States signed House Joint Resolution 69 into law on April 3, 2017. The Resolution invoked the Congressional Review Act, a law that permits regulations passed during the last six months of a previous administration to be overturned.

In 2016, the BOG adopted Proposal 61 as amended to insert the word “big” before game in 5 AAC 92.044(8) (see State regulations above). This was done to clarify that the skinned carcasses of legally harvested furbearers could be used as bear bait (ADF&G 2016).

In January 2017, the NPS published Final Rule 36 CFR 13.480(b) limiting types of bait that may be used for taking bears under Federal Subsistence Regulations to native fish or wildlife remains from natural mortality

or parts not required to be salvaged from a legal harvest. Based on public comment, the final rule includes a provision that allows to allow the superintendent of Wrangell-St. Elias National Park and Preserve (WRST) to issue a permit to allow use of human-produced foods upon a determination that such use is compatible with park purposes and values and the applicant does not have reasonable access to natural materials that could be used as bait (36 CFR 13.1902(d)). The exception for WRST was based on documented history of bear baiting.

Cultural Knowledge and Traditional Practices

Both black bears and brown bears are traditionally and contemporarily harvested, used, and shared across much of Alaska, though regional variations in harvest patterns, seasonal rounds and methods exist (Blackman 1990; Burch 1984; Clark 1981; Crow & Obley 1981; de Laguna & McClellan; de Laguna 1990; Hosley 1981; Lantis 1984; Slobodin 1981; Snow 1981; Townsend 1981). Historical methods of harvest among Alaska Native cultural groups included spearing (Brown 2012; Crow & Obley 1981; de Laguna & McClellan 1981; de Laguna 1990; Townsend 1981), harvest at winter den sites (Brown 2012; Hosley 1981; de Laguna 1990), snaring (Burch 1984; de Laguna & McClellan 1981; de Laguna 1990), bow and arrows (de Laguna 1990; Townsend 1981), deadfalls (de Laguna & McClellan 1981; de Laguna 1990), and with dogs (de Laguna & McClellan 1981; de Laguna 1990). Today, bears are frequently hunted with rifles while in pursuit of other large land mammals (ADF&G 1992; ADF&G 2008; Brown 2012).

The occurrence of bear baiting as a component of traditional harvest methods is limited within published literature; it is unknown if the practice occurred rarely or if it was merely seldom documented. Among the Upper Kuskokwim (Kolchan) Athabascans, some hunters were known to use ground squirrel nests to attract bears that had recently emerged from their dens in the spring (Brown 2012). A squirrel would be released near the bear and the bear would follow the tracks back to the nest where it would be harvested with lances (Brown 2012).

In Southeast Alaska, Tlingit hunters sometimes used dead falls to harvest bears and these were either set across bear trails or baited to attract bears (ADF&G 1992). The bait ingredients are unknown. Among several Athabaskan groups in Alaska's interior, documented methods of harvesting black bears included hunting with bow and arrow or lacing bait with coiled baleen that would expand and rupture the bear's digestive tract (ADF&G 2008). Use of bear baiting stations to attract and harvest black bears has also been documented specifically for hunters from the community of Tok (ADF&G 2008). In a 2001-2002 study of 18 southwest Alaska communities there was no documentation of the use of baiting stations for harvesting bears (Holen et al. 2005).

Contemporary use of bait stations for bear hunting in Alaska has been contentious (Harns 2004). While some people believe that baiting black bears is acceptable, others have suggested that the method violates fair chase ethics (Harns 2004). The method allows hunters to be selective and humane, it helps hunters with limited mobility to participate by reducing trekking distance, and it facilitates clean kills by bow hunters that harvest animals at a closer range (Harns 2004). Additionally, it allows hunters to be more selective, to more easily identify sex, and to verify the presence or absence of cubs with sows (Harns 2004).

Opponents of bear baiting often reference safety concerns and food conditioning (Cunningham 2017, Hilderbrand et al. 2013). The National Park Service has also cited concerns regarding preventing the

defense of life and property killing of bears and maintaining natural processes and behaviors (Hilderbrand et al. 2013). To alleviate some of these concerns, BOG and the Board have implemented several restrictions that stipulate where bear baiting stations are allowed, that require bear baiting stations to be registered with ADF&G, and that require the completion of an ADF&G bear baiting clinic for all hunters age 16 and older.

Other Alternatives Considered

Adoption of this proposal would permit the use of scent lures at bear baiting stations under Federal regulations. According to 50 CFR §__.25(a) *Definitions* and 5 AAC 92.990 *Definitions*, bait is defined as “any material excluding scent lures, that is placed to attract an animal by its sense of smell or taste; however, those parts of legally taken animals that are not required to be salvaged and which are left at the kill site are not considered bait.” While scent lures are excluded from the bait definition, they are not explicitly defined under Federal or State regulations. If scent lures are not defined, any material and chemical could be used at registered bait stations on Federal public lands, including toxic and non-biodegradable ones.

Effects of the Proposal

If this proposal is adopted, Federally qualified subsistence users would be able to use any biodegradable material as well as scent lures at registered bear baiting stations on lands administered by the USFWS, BLM, and USFS. As bear bait is limited to native fish and wildlife remains on NPS administered lands, this proposal would not affect NPS lands (with some exceptions in WRST). This will provide Federally qualified subsistence users with greater opportunity on most Federal public lands and will align State and Federal baiting restrictions, reducing regulatory complexity and user confusion. Currently, Federal regulations are more restrictive than State regulations. As the requested changes are already permitted under State regulations, no appreciable differences in bear harvests, populations, subsistence uses, or habituation of bears to human foods are expected from this proposal.

OSM PRELIMINARY CONCLUSION

Support Proposal WP18-51 **with modification** to establish a definition for scent lure and clarify the regulatory language.

The modified regulation should read:

*§__.25(a) Definitions. The following definitions apply to all regulations contained in this part: **scant lure means any biodegradable material to which biodegradable scent is applied or infused.***

*§__.26(b)(14)(iii) You may use only biodegradable materials for bait; **if fish or wildlife is used as bait, you may use only the head, bones, viscera, or skin of legally harvested fish and wildlife for bait, the skinned carcasses of furbearers, and unclassified wildlife may be used, except that in Units 7 and 15, fish or fish parts may not be used as bait. Scent lures may be used at registered bait stations;***

Justification

Adoption of this proposal will reduce regulatory complexity and provide greater opportunity for Federally qualified subsistence users by expanding and clarifying the use of biodegradable materials and scent lures as bear bait. There are no conservation concerns as these proposed clarifications are already permitted under State regulations.

Defining scent lures in regulation is necessary to ensure that only appropriate and non-harmful materials and scents are used on Federal public lands. The terms “game”, “fur animals”, and “small game” are not defined under Federal regulations, but are included in the Federal definition of “wildlife.” While the term “big game” is defined under Federal regulations, it is also included within the Federal definition of “wildlife.”

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WRITTEN PUBLIC COMMENTS



Mckinney, Kayla <kayla_mckinney@fws.gov>

Fwd: comments on proposal WP 18-51, 18-03,18-04, 18-05, 18-24

AK Subsistence, FW7 <subsistence@fws.gov> Fri, Aug 4, 2017 at 1:55 PM
To: Theo Matuskowitz <theo_matuskowitz@fws.gov>, Paul Mckee <paul_mckee@fws.gov>, Jennifer Hardin <jennifer_hardin@fws.gov>, Kayla Mckinney <kayla_mckinney@fws.gov>

----- Forwarded message -----

From: **Sharon Alden** <fwxsc@yaho.com>
Date: Fri, Aug 4, 2017 at 1:52 PM
Subject: comments on proposal WP 18-51, 18-03,18-04, 18-05, 18-24
To: "subsistence@fws.gov" <subsistence@fws.gov>

To: Office of Subsistence Management
Attention: Theo Matuskowitz
From: Sean McGuire
Re: comments on proposal WP 18-51, 18-03, 18-4, 18-5, 18-24

I am opposing proposal WP 18-51 There should be no human food or any human substance to bait any animals. This is so basic. The last thing we want is to habituate bears or any wild animal to human food. This is an ethical as well as a safety issue. The last thing we want to see is the federal baiting regulations aligned with the state of Alaska's. The State baiting regulations are painfully out dated and present a glaring safety issue.

I am opposing proposal WP 18-03 the extended hunting and trapping season in game unit one. Over kill.

I am really opposed to proposal WP 18-04. Why in the world would you want to put more pressure on a wolf population that's already in trouble this appears to be contrary to the basic concept of wildlife management?

I am also opposing proposal WP 18-05 relates to my opposition to WP18-04.

I am also opposing in the strongest possible terms proposal WP 18-24
To heard wildlife with snow machines is one of the most unethical things I can imagine and the backlash would be harsh.

Thank you for your attention
Sean McGuire
159 Kniffen Rd

Fairbanks, Ak.
ph 907-888-0124
email fwxsc@yahoo.com



Mckinney, Kayla <kayla_mckinney@fws.gov>

Fwd: Comment on Proposed WP 18-51

AK Subsistence, FW7 <subsistence@fws.gov> Thu, Aug 3, 2017 at 7:48 AM
To: Theo Matuskowitz <theo_matuskowitz@fws.gov>
Cc: Paul Mckee <paul_mckee@fws.gov>, Kayla Mckinney <kayla_mckinney@fws.gov>

----- Forwarded message -----
From: **Jim & Suzanne Kowalsky** <jimkowalsky@yahoo.com>
Date: Wed, Aug 2, 2017 at 5:07 PM
Subject: Fwd: Comment on Proposed WP 18-51
To: subsistence@fws.gov

Attention as noted below.
Begin forwarded message:

From: Jim & Suzanne Kowalsky <jimkowalsky@yahoo.com>
Subject: Comment on Proposed WP 18-51
Date: August 1, 2017 at 12:17:30 PM AKDT

August 1, 2017

To: Office of Subsistence Management
p: Theo Matuskowitz
FR: Alaskans FOR Wildlife, Jim Kowalsky, Chair
Re: Comments on Proposal WP 18-51

Alaskans FOR Wildlife is a statewide member organization that advocates for naturally occurring Alaskan wildlife through education and advocacy headquartered in Fairbanks, Alaska PO Box 81957 99708 phone 907-488-2434

We wish to most strongly oppose proposal WP 18-51 which proposes to allow federally qualified subsistence hunters to add the use of human-produced foods and scent to the presently permitted use of biodegradable materials used to bait bears on all public federal lands, e.g.: federal wildlife refuges, national forests, BLM and National Park Service lands now open to rural subsistence.

We understand this proposal emerges from a request from the Eastern Alaska Regional Subsistence Advisory Council, purportedly to align federal with state bear baiting regulations which allow use of such as dog food, popcorn, grease, syrup, etc., to be used by federally qualified subsistence users currently, but only on state lands.

Our objection to WP 15-18 arises from the reality that such liberalization increases the already adverse effect of human food used to attract bears especially as a matter of public safety. Use of human foods will continue to alter bear behavior, increasing the numbers of human food-conditioned bears, attracting them to specific locations where conflicts with humans is certain to occur with increasing frequency. Such encounters would likely increase over time, resulting in serious human injuries and wrenching tragic deaths of the sort that Alaska currently experiences, and also more

killing offending bears.

Further negative impacts already occurring with frequency are bears attracted to humans and their food wastes in specific locations being killed in defense of life and property. Recent examples of bears that likely have become habituated to human foods being killed in defense of life and property have occurred at Prudhoe Bay and in Southeast Alaska with many other examples over time.

We view enactment of WP 15-18 would be highly irresponsible by perpetuating and increasing the already unfortunate practice of use of human produced foods at bait sites on state lands. This proposal amounts to making a serious increased threat to public safety on federal lands and to that already perpetuated on state lands.

Important also, WP15-18 proposes to gradually alter what should also be a natural growth and behavior of wild bears which should be allowed to exist and flourish in its natural wildlands habitat.

The proposal should not be enacted in the best interests of human and bear populations.
Thank you for consideration of our comment.



Mckinney, Kayla <kayla_mckinney@fws.gov>

Fwd: Comments on Proposals to the Federal Subsistence Board Attn. Theo Matuskowitz

AK Subsistence, FW7 <subsistence@fws.gov> Fri, Aug 4, 2017 at 7:51 AM
To: Theo Matuskowitz <theo_matuskowitz@fws.gov>, Paul Mckee <paul_mckee@fws.gov>, Kayla Mckinney <kayla_mckinney@fws.gov>

----- Forwarded message -----

From: **Francis Mauer** <fmauer@mosquitonet.com>
Date: Thu, Aug 3, 2017 at 9:02 PM
Subject: Comments on Proposals to the Federal Subsistence Board Attn. Theo Matuskowitz
To: subsistence@fws.gov

Comments Regarding Federal Subsistence Proposals: WP 18-03, 18-04, 1805, 18-24, and 18-51

Submitted to the Federal Subsistence Board by Fran Mauer, P.O. Box 80464, Fairbanks, AK 99708. August 3, 2017.

WP 18-03 I am opposed to extending the wolf hunting and trapping seasons in Unit 1. Wolves are highly vulnerable to harvest as it is, further extending of seasons is not justified, and would likely lead to excessive harvest of wolves as occurred on Prince of Wales Island last year which was supposed to be regulated by a quota, but even with quota rules in place the actual harvest exceeded the quota by 2.6 times. This proposal should be denied.

WP 18-04 This proposal would allow 30% of the wolf population on Prince of Wales Island to be harvested when existing harvest is 20%. As noted above, wolves are highly vulnerable to harvest, and last year's harvest exceeded the quota by 2.6 times! The extensive network of roads and trails on Prince of Wales render wolves exceptionally vulnerable. Expanding the harvest to 30% of the population following excessive harvest last year can not be justified given the failed management of this quota system last year. This proposal would lead to excessive harvest of an already depleted population and should be denied to conserve wolves on the Island.

WP 18-24 This proposal will open the door to harassment of wildlife by snow machines and violate a basic premise of hunting: respect for animals and fair chase principles. It would also result in excessive impacts to other animals that are not harvested due to disturbance associated with this "practice." Furthermore, it will exacerbate difficulty in enforcement of harassment rules. Approval of this proposal would give a black eye to subsistence in general, and certainly the Federal Subsistence Board, specifically for condoning such an inappropriate practice on the Federal public lands of

Alaska. Deny this proposal.

WP 18-51 This proposal would lower Federal standards for baiting to the lowest common denominator: State requirements. By allowing the use of human food items such as syrup, old dough nuts and other human refuse will habituate bears to humans and contribute to human – bear conflicts, and expose innocent people to risks from bears that no longer fear humans. Every spring the Alaska Dept of Fish and Game sponsors public service announcements advising folks to keep their garbage and bird feeder refuse secure from bears, clearly stating the danger to humans from habituated bears. There is absolutely no justification to also allow the use of human foods and scent to bait bears. I urge the Board to reject this proposal (18-51).

Thank you for the opportunity to comment.

Fran Mauer

FISHERIES RESOURCE MONITORING PROGRAM

BACKGROUND

Beginning in 1999, the Federal government assumed expanded management responsibility for subsistence fisheries on Federal public lands in Alaska under the authority of Title VIII of the Alaska National Interest Lands Conservation Act (ANILCA). Expanded subsistence fisheries management introduced substantial new informational needs for the Federal system. Section 812 of ANILCA directs the Departments of the Interior (DOI) and Agriculture (USDA), cooperating with the State of Alaska and other Federal agencies, to undertake research on fish and wildlife and subsistence uses on Federal public lands. To increase the quantity and quality of information available for management of subsistence fisheries, the Fisheries Resource Monitoring Program (Monitoring Program) was established within the Office of Subsistence Management (OSM). The Monitoring Program was envisioned as a collaborative interagency, interdisciplinary approach to enhance existing fisheries research, and effectively communicate information needed for subsistence fisheries management on Federal public lands.

Biennially, OSM announces a funding opportunity for investigation plans addressing subsistence fisheries on Federal public lands. The 2018 Notice of Funding Opportunity focused on priority information needs developed by the Subsistence Regional Advisory Councils with input from strategic plans and subject matter specialists. The Monitoring Program is administered through regions to align with stock, harvest, and community issues common to a geographic area. The six Monitoring Program regions are shown in **Figure 1**.

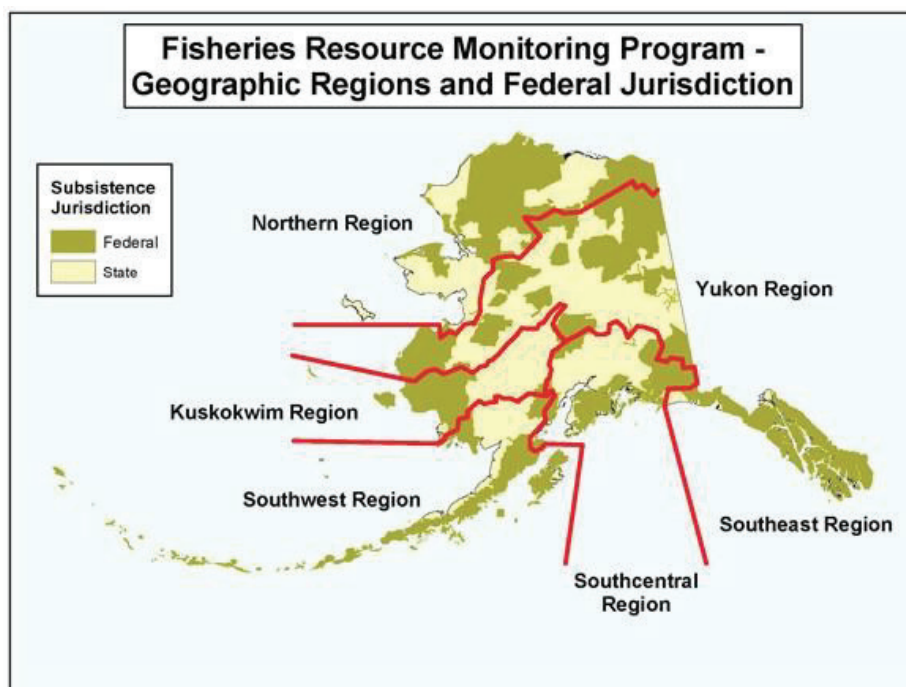


Figure 1. Geographic Regions for the Fisheries Resource Monitoring Program.

Strategic plans sponsored by the Monitoring Program have been developed by workgroups of fisheries managers, researchers, Subsistence Regional Advisory Councils, and by other stakeholders for three of the six regions: Southeast, Southcentral (excluding Cook Inlet Area), and Southwest Alaska. These plans identify prioritized information needs for each major subsistence fishery and are available for viewing on the Federal Subsistence Management Program website (<https://www.doi.gov/subsistence/frmp/funding>). Individual copies of plans are available by placing a request to OSM. Independent strategic plans were completed for the Yukon and Kuskokwim regions for salmon in 2005. For the Northern Region and the Cook Inlet Area, assessments of priority information needs were developed from regional working groups and experts on the Subsistence Regional Advisory Councils, the Technical Review Committee (a committee comprised of representatives from each of the five Federal agencies involved with subsistence management, and relevant experts from the Alaska Department of Fish and Game), and Federal and State managers, with technical assistance from OSM staff. Finally, a strategic plan specifically for research on whitefish species in the Yukon and Kuskokwim River drainages was completed in spring 2011 as a result of efforts supported through Monitoring Program project 08-206 (Yukon and Kuskokwim Coregonid Strategic Plan).

Investigation plans are reviewed and evaluated by OSM and Forest Service staff, and then by the Technical Review Committee. The Technical Review Committee's function is to provide evaluation, technical oversight, and strategic direction to the Monitoring Program. Each investigation plan is scored on these five criteria: strategic priority; technical and scientific merit; investigator ability and resources; partnership and capacity building; and cost benefit.

Project abstracts and associated Technical Review Committee proposal scores are assembled into a draft 2018 Fisheries Resources Monitoring Plan. The draft plan is distributed for public review and comment through Subsistence Regional Advisory Council meetings, beginning in August 2017. The Federal Subsistence Board will review the draft plan and will accept written and oral comments at its January 2018 meeting. The Federal Subsistence Board takes into consideration recommendations and comments from the process, and forwards their comments to the Assistant Regional Director of OSM. Final funding approval lies with the Assistant Regional Director of OSM. Investigators will subsequently be notified in writing of the status of their proposals.

HISTORICAL OVERVIEW

The Monitoring Program was first implemented in 2000, with an initial allocation of \$5 million. Since 2001, a total of \$117.2 million has been allocated for the Monitoring Program to fund a total of 452 projects (**Figure 2; Figure 3**).

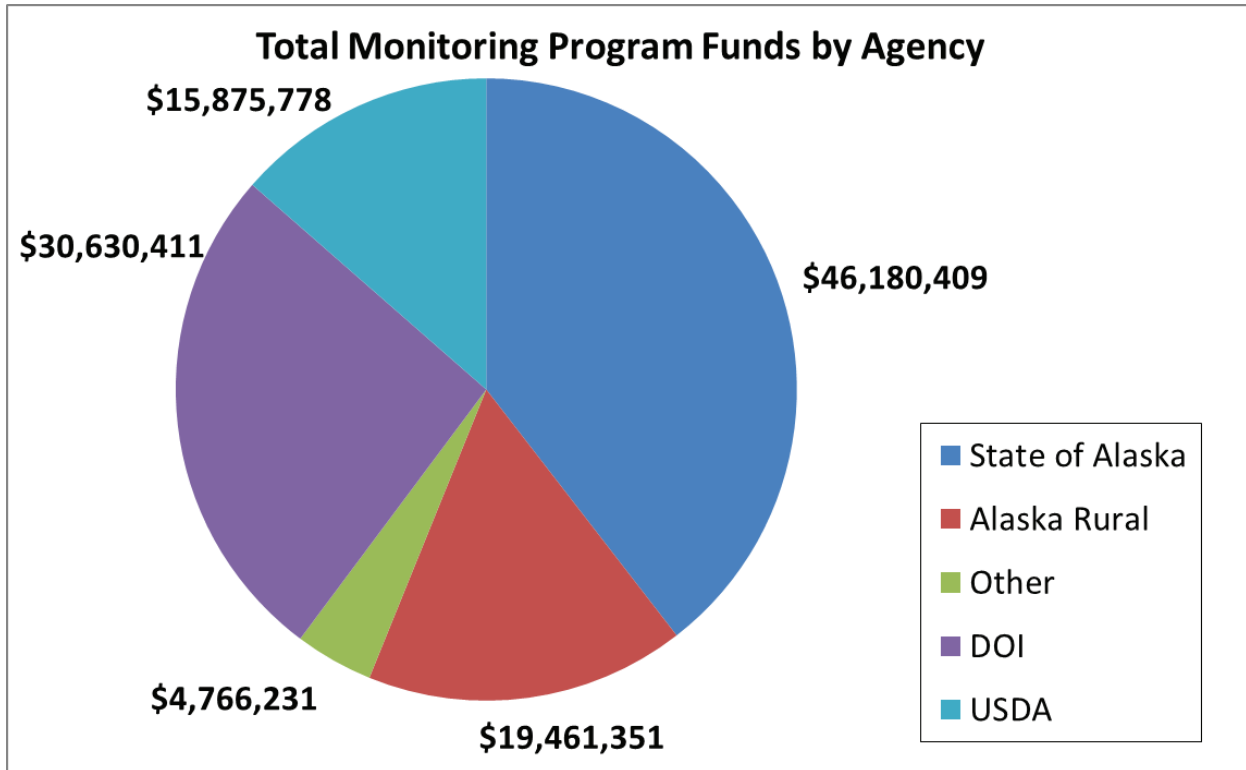


Figure 2. Total Project funds through the Monitoring Program from 2000 through 2016 listed by the organization of the Principal Investigator for projects funded. The funds listed are the total approved funds from 2000 to 2016. DOI = Department of Interior and USDA = U.S. Department of Agriculture.

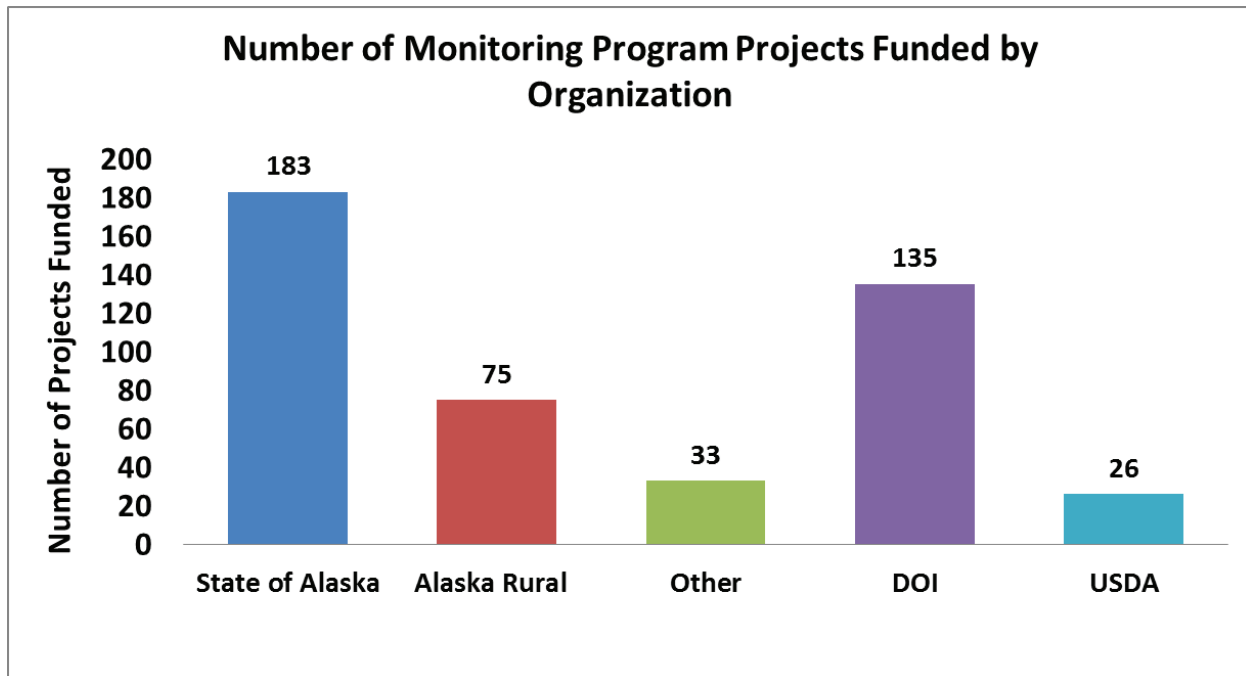


Figure 3. The total number of projects funded through the Monitoring Program from 2000 through 2016 listed by the organization of Principal Investigator. DOI = Department of Interior and USDA = U.S. Department of Agriculture.

During each biennial funding cycle, the Monitoring Program budget funds ongoing multi-year projects (2, 3 or 4 years) as well as new projects. Budget guidelines are established by geographic region (Table 1) and data type. The regional guidelines were developed using six criteria that included level of risk to species, level of threat to conservation units, amount of subsistence needs not being met, amount of information available to support subsistence management, importance of a species to subsistence harvest and level of user concerns with subsistence harvest. Budget guidelines provide an initial target for planning; however they are not final allocations and will be adjusted annually as needed (Figure 4; Figure 5).

Table 1. Regional allocation guideline for Fisheries Resource Monitoring Funds.

Region	Department of Interior Funds	U.S. Department of Agriculture Funds
Northern	17%	0%
Yukon	29%	0%
Kuskokwim	29%	0%
Southwest	15%	0%
Southcentral	5%	33%
Southeast	0%	67%
Multi-Regional	5%	0%

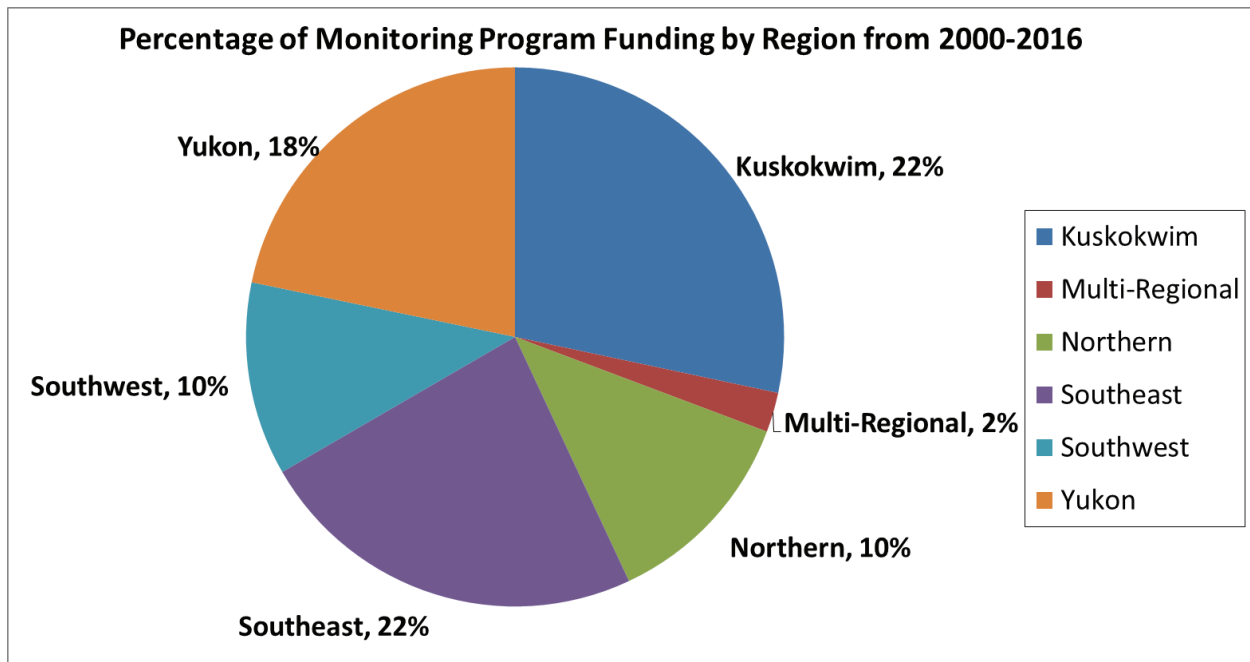


Figure 4. Total Project Funding by Geographic Region from 2000 through 2016.

Two primary types of research projects are solicited for the Monitoring Program including Harvest Monitoring/Traditional Ecological Knowledge (HMTEK) and Stock, Status and Trends (SST), although projects that combine these approaches are also encouraged. Project funding by type is shown in Figure 5.

Definitions of the two project types are listed below:

Harvest Monitoring and Traditional Ecological Knowledge (HMTEK) -These projects address assessment of subsistence fisheries including quantification of harvest and effort, and description and assessment of fishing and use patterns.

Stock Status and Trends Studies (SST) - These projects address abundance, composition, timing, behavior, or status of fish populations that sustain subsistence fisheries with linkage to Federal public lands.

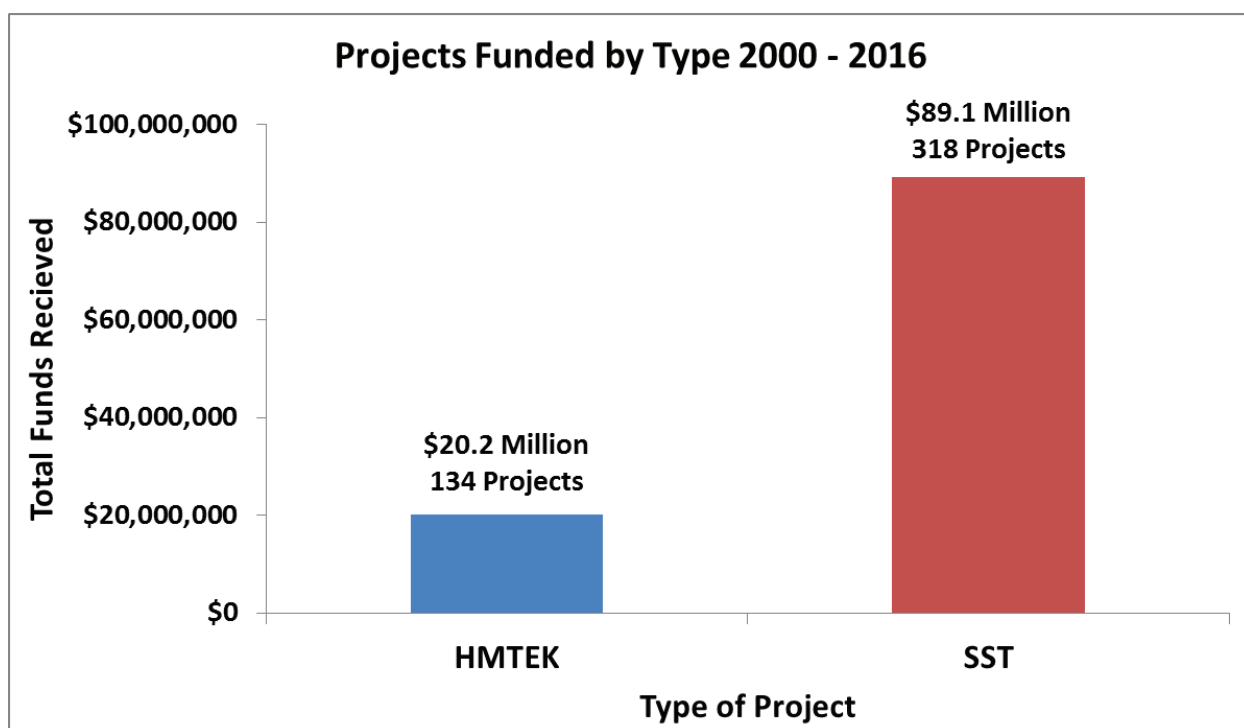


Figure 5. Total Project funding by type from 2000 through 2016. HMTEK = Harvest Monitoring/ Traditional Ecological Knowledge and SST = Stock, Status and Trends.

PROJECT EVALUATION PROCESS

In the current climate of increasing conservation concerns and subsistence needs, it is imperative that the Monitoring Program prioritizes high quality projects that address critical subsistence questions. Projects are selected for funding through an evaluation and review process that is designed to advance projects that are strategically important for the Federal Subsistence Program, technically sound, administratively competent, promote partnerships and capacity building, and are cost effective. Projects are evaluated by a panel called the TRC. This committee is a standing interagency committee of senior technical experts that is foundational to the credibility and scientific integrity of the evaluation process for projects funded by the Monitoring Program. The TRC reviews, evaluates, and make recommendations about proposed projects, consistent with the mission of the Monitoring Program. Fisheries and Anthropology staff from

the OSM provide support for the TRC. Recommendations from the TRC provide the basis for further comments from Subsistence Regional Advisory Councils, the public, the Interagency Staff Committee (ISC), and the Federal Subsistence Board, with final approval of the Monitoring Plan by the Assistant Regional Director of OSM.

To be considered for funding under the Monitoring Program, a proposed project must have a nexus to Federal subsistence fishery management. Proposed projects must have a direct association to a Federal subsistence fishery, and the subsistence fishery or fish stocks in question must occur in or pass through waters within or adjacent to Federal public lands. Complete project packages need to be submitted on time and must address five specific criteria (see below) to be considered a high quality project. Five criteria are used to evaluate project proposals:

1. ***Strategic Priorities*** – Studies should be responsive to information needs identified in the *2018 Priority Information Needs* <https://www.doi.gov/subsistence/frmp/funding>. All projects must have a direct linkage to Federal public lands and/or waters to be eligible for funding under the Monitoring Program. To assist in evaluation of submittals for projects previously funded under the Monitoring Program, investigators must summarize project findings in their investigation plans. This summary should clearly and concisely document project performance, key findings, and uses of collected information for Federal subsistence management. Projects should address the following topics to demonstrate links to strategic priorities:
 - **Federal jurisdiction,**
 - **Conservation mandate,**
 - **Potential impacts on the subsistence priority,**
 - **Role of the resource, and**
 - **Local concern.**
2. ***Technical-Scientific Merit*** – Technical quality of the study design must meet accepted standards for information collection, compilation, analysis, and reporting. Studies must have clear objectives, appropriate sampling design, correct analytical procedures, and specified progress, annual, and final reports.
3. ***Investigator Ability and Resources*** – Investigators must show they are capable of successfully completing the proposed study by providing information on the ability (training, education, and experience) and resources (technical and administrative) they possess to conduct the work. Applicants that have received funding in the past will be evaluated and ranked on their past performance, including fulfillment of meeting deliverable deadlines. A record of failure to submit reports or delinquent submittal of reports will be taken into account when rating investigator ability and resources.
4. ***Partnership and Capacity Building*** – Collaborative partnerships and capacity building are priorities of the Monitoring Program. ANILCA Title VIII mandates that rural residents be afforded a meaningful role in the management of subsistence fisheries, and the Monitoring

Program offers opportunities for partnerships and participation of local residents in monitoring and research. Investigators must not only inform communities and regional organizations in the area where work is to be conducted about their project plans, but must also consult and communicate with local communities to ensure that local knowledge is utilized and concerns are addressed. Letters of support from local communities or organizations that will collaborate on the proposed project add to the strength of a proposal. Investigators and their organizations must demonstrate their ability to maintain effective local relationships and commitment to capacity building. This includes a plan to facilitate and develop partnerships so that investigators, communities, and regional organizations can pursue and achieve the most meaningful level of involvement.

Investigators are encouraged to develop the highest level of community and regional collaboration that is practical. Investigators must demonstrate that capacity building has already reached the communication or partnership development stage during proposal development, and ideally, include a strategy to develop capacity building to higher levels, recognizing, however, that in some situations higher level involvement may not be desired or feasible by local organizations. Successful capacity building requires developing trust and dialogue among investigators, local communities, and regional organizations. Investigators need to be flexible in modifying their work plan in response to local knowledge, issues, and concerns, and must also understand that capacity building is a reciprocal process in which all participants share and gain valuable knowledge. The reciprocal nature of the capacity building component(s) must be clearly demonstrated in proposals.

5. *Cost Benefit*

Cost/Price Factors – An applicant’s cost/price proposal will be evaluated for reasonableness. For a price to be reasonable, it must represent a price to the government that a prudent person would pay when consideration is given to prices in the market. Normally, price reasonableness is established through adequate price competition, but may also be determined through cost and price analysis techniques.

Selection for Award – Applicant should be aware that the Government shall perform a “best value analysis” and the selection for award shall be made to the Applicant whose proposal is most advantageous to the Government, taking into consideration the technical factors listed above and the total proposed price across all agreement periods.

POLICY AND FUNDING GUIDELINES

Several policies have been developed to aid in implementing funding. These policies include:

1. Projects of up to four years duration may be considered in any year’s monitoring plan.
2. Studies must not duplicate existing projects.
3. A majority of Monitoring Program funding will be dedicated to non-Federal agencies.

4. Long term projects will be considered on a case by case basis.
5. Capacity building is considered a critical component of all projects, and all investigators are expected to incorporate capacity building and partnerships within their projects.
6. Activities that are not eligible for funding include:
 - a) habitat protection, mitigation, restoration, and enhancement;
 - b) hatchery propagation, restoration, enhancement, and supplementation;
 - c) contaminant assessment, evaluation, and monitoring; and
 - d) projects where the primary or only objective is outreach and education (for example, science camps, technician training, and intern programs), rather than information collection.

The rationale behind these policy and funding guidelines is to ensure that existing responsibilities and efforts by government agencies are not duplicated under the Monitoring Program. Land management or regulatory agencies already have direct responsibility, as well as specific programs, to address these activities. However, the Monitoring Program may fund research to determine how these activities affect Federal subsistence fisheries or fishery resources.

The Monitoring Program may fund assessments of key Federal subsistence fishery stocks in decline or that may decline due to climatological, environmental, habitat displacement, or other drivers; however applicants must show how this knowledge would contribute to Federal subsistence fisheries management. Similarly, the Monitoring Program may legitimately fund projects that assess whether migratory barriers (e.g. falls, beaver dams) significantly affect spawning success or distribution; however, it would be inappropriate to fund projects to build fish passes, remove beaver dams, or otherwise alter or enhance habitat.

2018 FISHERIES RESOURCE MONITORING PLAN

For 2018, a total of 53 investigation plans were received and 53 are considered eligible for funding. Of the projects that are considered for funding, 40 are SST projects and 13 are HMTEK projects.

For 2018, the Department of the Interior, through the U.S. Fish and Wildlife Service, will provide an anticipated \$1.0 to \$1.5 million in funding for new projects and up to \$1.6 million for ongoing projects that were initially funded in 2016. The U.S. Department of Agriculture, through the U.S. Forest Service, has historically provided \$1.8 million annually. The amount of U.S. Department of Agriculture funding available for 2018 projects is uncertain.

FISHERIES RESOURCE MONITORING PROGRAM NORTHERN REGION OVERVIEW

Since the inception of the Monitoring Program in 2000, 49 projects have been undertaken in the Northern Alaska Region for a total of \$11.8 million (**Figure 1**). Of these, the State of Alaska was the lead agency for 26 projects, the Department of the Interior for 15 projects, and Alaska Rural Organizations for 5 projects, and other organizations took the lead on 3 projects (**Figure 2**). Thirty-three were Stock, Status, and Trends (SST) projects, and 16 were Harvest Monitoring and/or Traditional Ecological Knowledge (HM/TEK) projects. A list of all Northern Region Monitoring Program projects from 2000 to 2016 is provided in **Appendix A**.

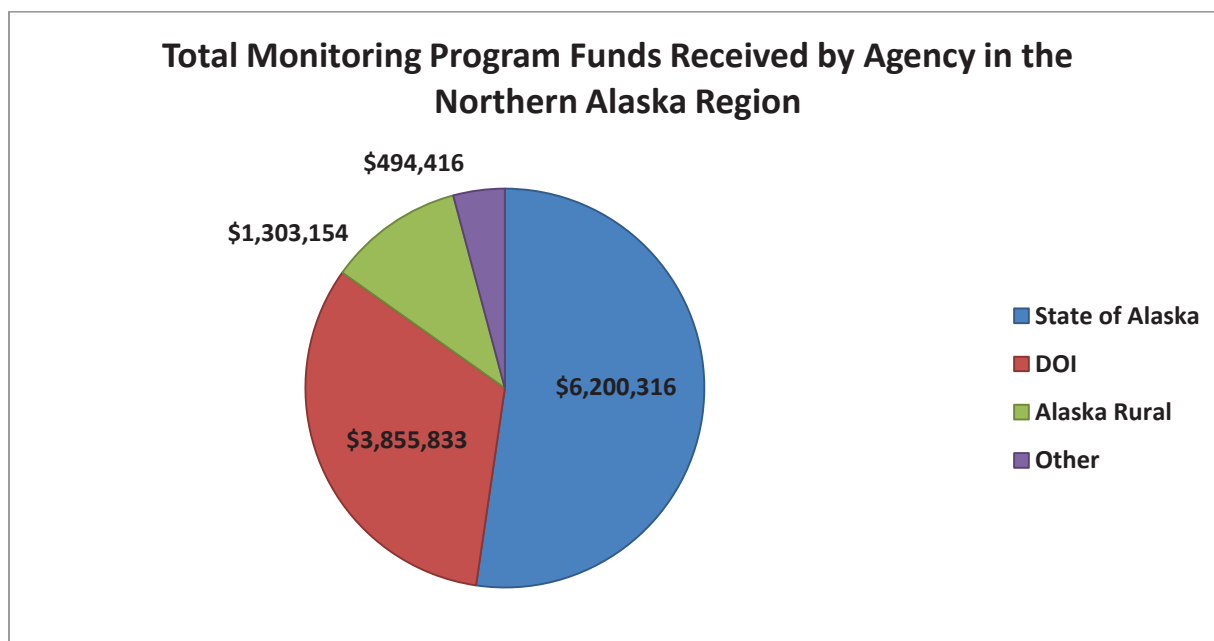


Figure 1. Monitoring Program funds received by Agency for projects in the Northern Alaska Region. The funds listed are the total approved funds from 2000 to 2016. DOI = Department of the Interior.

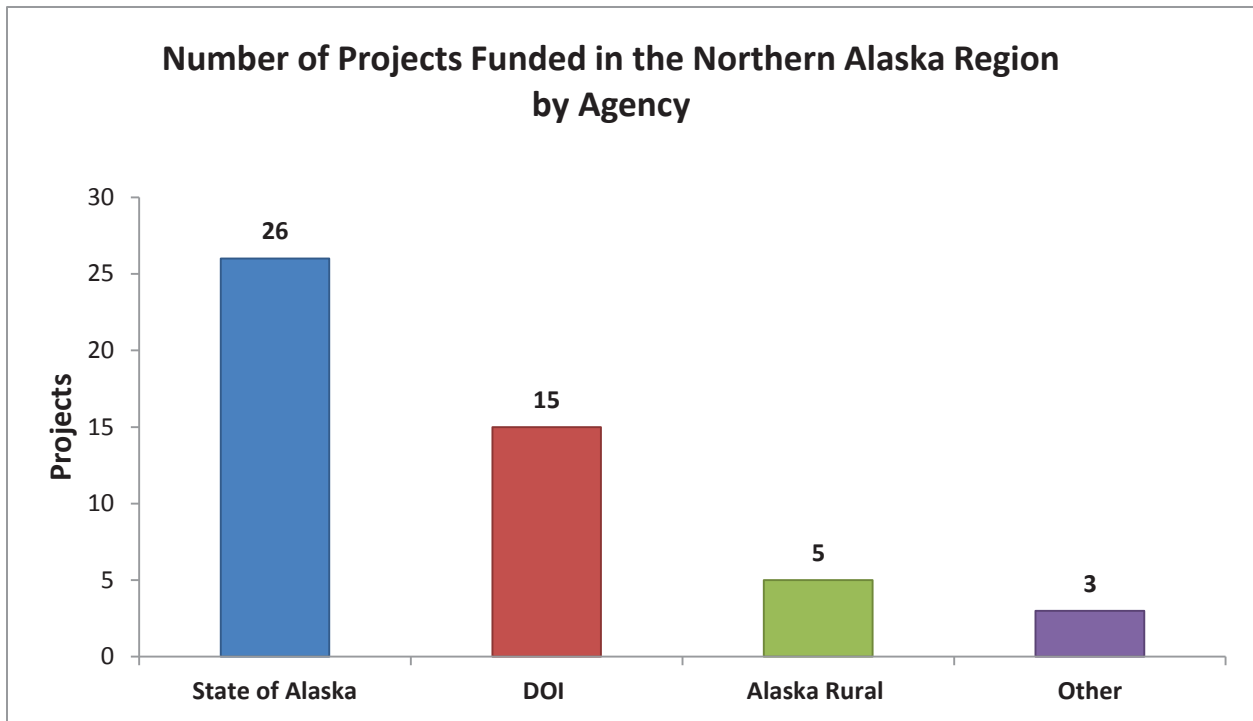


Figure 2. Total number of Monitoring Program projects funded, by agency, in the Northern Alaska Region from 2000 to 2016. DOI = Department of the Interior.

2018 DRAFT NORTHERN ALASKA REGION FISHERIES RESOURCE MONITORING PLAN

OVERVIEW

Priority Information needs

The 2018 Notice of Funding Opportunity for the Northern Alaska Region identified eleven priority information needs:

- Fish species inventory/survey in the Bering Land Bridge National Preserve, utilizing local and traditional knowledge from the communities of Shishmaref, Deering and Wales. Include application to Federal subsistence management.
- Unalakleet River Chinook Salmon escapement assessment.
- Salmon migration patterns in Norton Sound (between the Bering Sea and terminal rivers and streams).
- Understanding differences in cultural knowledge, beliefs, and perceptions of subsistence resources between fishery managers and subsistence users in Northwestern Alaska such as rural residents' beliefs, attitudes, and knowledge about beavers and perceptions of changes to fish habitat related to beavers.
- Traditional/local knowledge of subsistence fish. Include application to Federal subsistence management, such as identifying critical habitat, refining range maps, and shedding light on ecological relationships.
 - Dolly Varden in the communities of Noatak, Kivalina and the Kobuk River.
- Identify genetic diversity of Dolly Varden stocks harvested for subsistence use in Northwest Alaska.
- Dispersal, distribution, abundance and life history of Dolly Varden.
- Baseline harvest assessment and traditional/local knowledge of broad whitefish subsistence fisheries in tributaries of Smith Bay. Including application to Federal subsistence management, such as identifying critical habitat, refining range maps and understanding ecological relationships.
- Collect baseline information on Humpback, Broad and Least Cisco whitefish as it relates to spawning areas especially Selawik Lake.

- Baseline information including abundance, distribution, movement, fish health of Arctic Grayling in the Lower Colville River and its tributaries in context of climate change.
- Document Broad Whitefish health in Northern Alaska; of special interest is the comparison of the Colville and Ikpikpuk River populations in the context of climate change.

Available Funds

Federal Subsistence Board guidelines direct initial distribution of funds among regions and data types. Regional budget guidelines provide an initial target for planning. For 2018, the U.S. Department of the Interior, through the U.S. Fish and Wildlife Service, will provide an anticipated \$1.0 to \$1.5 million in funding for new projects and up to \$1.6 million for ongoing projects that were initially funded in 2016. The U.S. Department of Agriculture, through the U.S. Forest Service, has historically provided up to \$1.8 million annually. The amount of the U.S. Department of Agriculture funding available for 2018 projects is uncertain.

Technical Review Committee Proposal Score

The mission of the Monitoring Program is to identify and provide information needed to sustain subsistence fisheries on Federal public lands for rural Alaskans through a multidisciplinary and collaborative program. It is the responsibility of the TRC to develop the strongest possible Monitoring Plan for each region and across the entire state.

For the 2018 Monitoring Program, seven project proposals were submitted for the Northern Alaska Region. The TRC evaluated and scored each proposal for Strategic Priority, Technical and Scientific Merit, Investigator Ability and Resources, Partnership and Capacity Building, and Cost/Benefit. The final score determined the scoring of each proposal within the region (**Table 1**, 1= first place, 2 = second place, etc.). Projects that are placed higher comprise a strong Monitoring Plan for the region by addressing strategically important information needs based on sound science and promote cooperative partnerships and capacity building. The projects listed are currently being considered for funding in the 2018 Monitoring Program. Projects which were not eligible due to the nature of the activity are not included. For more information on projects submitted to the 2018 Monitoring Program please see the abstracts in **Appendix B**.

Table 1. Technical Review Committee (TRC) score for projects in the Northern Alaska Region. Projects are listed by TRC score and include the total funds requested and the average annual request for each project submitted to the 2018 Monitoring Program within the Northern Alaska Region (1 = first place, 2 = second place, etc.). The projects listed are currently being considered for funding in the 2018 Monitoring Program. Projects which were not eligible due to the nature of the activity are not included.

TRC Score	Project Number	Title	Total Project Request	Average Annual Request
1	18-103	Unalakleet River Weir	\$662,645	\$155,661
2 (tied)*	18-100	Lower Colville River Arctic Grayling-Nuiqst Subsistence Fishery	\$246,503	\$82,168
2 (tied)*	18-101	Kobuk River Dolly Varden Genetics	\$55,800	\$27,900
2 (tied)*	18-151	Priority Knowledge Dolly Varden South Chukchi Sea	\$644,228	\$214,743
3	18-150	Bering Land Bridge National Preserve TEK & Scientific Surveys	\$421,282	\$105,321
4	18-102	Dolly Varden Life History-North Slope AK	\$313,579	\$156,790
5	18-104	Broad Whitefish Health in Northern Alaska	\$137,950	\$45,983
Total			\$2,481,987	\$788,566

* Proposals with identical scores during the rating process may be further assessed by comparing the average annual cost. Proposals with a lower average annual cost may be ranked above a similar rated proposal that has a higher annual average cost.

2018 TECHNICAL REVIEW COMMITTEE JUSTIFICATION FOR PROJECT SCORE

TRC Score: 1
Project Number: 18-103
Project Title: Unalakleet River Chinook Salmon Escapement Assessment-Continuation

Project Justification: This proposal is for continuation funding to monitoring Chinook Salmon escapement using a resistance board-floating weir in the Unalakleet River. This weir has been funded since 2010: (2010-2013, project 10-102) and (2014-2017, project 14-101). Estimates from the weir provide Chinook Salmon inseason daily passage estimates and run timing. This information aids Federal and State fishery managers in making timely management decisions. Additionally, the long-term goal of the weir is to use the data to create a run-reconstruction using escapement, age, sex, and length. This information will be used to set escapement goals for the river. For future implementation, it is recommended that the investigator consider the use of a video recorder to help possibly reduce the costs of the project.

Two of the three investigators have been involved with the Unalakleet River Weir since its inception providing a wealth of knowledge about Unalakleet River. While the principle investigator is new to the project, her agency (ADF&G) has been involved with the project since its inception in 2010. The project represents a working partnership between State and Federal agencies and a local community based organizations. Efforts have been made to increase capacity by incorporating both a ANSEP Bridge students and a local fisheries technicians from the village of Unalakleet, with the goal of training young professionals in fisheries resource management.

The cost of the proposal is in line with previous years funding and is typical of large weirs (320 ft. weir, largest in Alaska). The cost of the weir is reduced by the investigators ability to leverage funds from other contributors (Alaska Department of Fish and Game, Bureau of Land Management, Norton Sound Economic Development Corporation, and the Native Village of Unalakleet), creating a total in-kind match of \$220,055 for the four years.

TRC Score: (2 tied)
Project Number: 18-100
Project Title: Seasonal Habitats and Migrations of Arctic Grayling of the Lower Colville River Relative to the Nuiqsut Subsistence Fishery Area

Project Justification: This projects purpose is to describe the annual distribution of Arctic grayling in the lower Colville River. This research will provide insight to fisheries managers to better understand the movement patterns of Arctic Grayling that were previously unknown for the Colville River. This project contains a linkage to Federal public lands/waters for subsistence use located in the National Petroleum Reserve. This project involves the investigation of one fish species that is harvested by Federally qualified subsistence users and it directly addresses a priority information need: *gather baseline*

information including abundance, distribution, movement, and health of Arctic grayling in the lower Colville River and its tributaries in the context of climate change.

The proposer intends to investigate the distribution, movement patterns, and seasonal use of Arctic Grayling, however the proposal does not clearly address the second component of the priority information need addressed in terms of relating the seasonal movements of Arctic grayling in the Colville River in terms of climate change. In addition, the proposal lacked details concerning how the investigator determined the number of radio tags to be deployed.

This project did receive support from the North Slope Regional Advisory Committee; however there still remains concern about the research timing possibly interfering with the local subsistence activities when caribou are migrating through the area. If funded, the investigator needs to continue to consult with local residents. The investigator has the ability and experience to successfully carry out a this project and has included a way to build / increase local involvement and capacity building through gathering local knowledge, hiring of locals, and by partnering with the ANSEP to hire a University student.

TRC Score: (2 tied)

Project Number: 18-101

Project Title: Genetic Diversity of Dolly Varden Populations in Kobuk River

Project Justification: This project aims to build upon a previously funded Monitoring Program project identifying important stocks of Dolly Varden that are harvested in an important mixed stock fishery. Dolly Varden are an important subsistence resource in the Kobuk River drainage and this project directly addresses two of the 2018 Priority Information Needs identified for the Monitoring Program by the Council: *Genetic diversity of Dolly Varden stocks harvested for subsistence use in Northwest Alaska,* and the second, *dispersal, distribution, abundance, and life history of Dolly Varden.*

This stock, status and trends project proposal justifies its request to continue gathering genetic baseline information from a previously funded Monitoring Program project (16-103), which hopes to assist fishery managers in identifying the portion of Dolly Varden harvested in the Wulik River winter subsistence fishery. The funding to collect an adequate sample size is justified by the need to obtain more baseline information to complete the genetic analysis. The investigators plan to collect and analyze genetic samples from the Kobuk River Dolly Varden population, however the methods used to capture the Dolly Varden remain the same as the previously funded project that did not capture enough fish to provide adequate sample size for the genetic analysis. If the methods of capture are to remain the same, it is unclear if the total samples needed to achieve the genetic resolution can be achieved. This project proposes to build / increase capacity by hiring an ANSEP University student to aid in the sampling and genetic analysis of the project.

TRC Score: (2 tied)

Project Number: 18-151

Project Title: Addressing Priority Knowledge Needs for Subsistence Stocks of Dolly Varden (aqalukpik) Along the Southern Chukchi Sea Coastline.

Project Justification: This is an ambitious project that seeks to better understand many biological aspects of Dolly Varden in the southern Chukchi Sea using a multifaceted research approach. Dolly Varden is an important subsistence resource to communities in the region, though substantial information on the life history characteristics, genetics, and critical habitat remains unknown. This proposal intends to rectify the data gap by collecting data on these variables through the use of TEK and laboratory genetic analysis. The study will use biological and ethnographic techniques to examine genetic diversity critical habitat, range, ecological relationships, nutritional value, diet, dispersal, distribution, abundance, and life history of this species. Laboratory and field methods will be deployed to collect and analyze associated data.

This project has a Federal nexus in the public lands/waters managed by the National Park Service (Noatak National Preserve, Cape Krusenstern National Monument, Kobuk Valley National Park), Bureau of Land Management (Kobuk-Seward Management Area), and the U.S. Fish and Wildlife Service (Selawik National Wildlife Refuge). It involves a subsistence resource, Dolly Varden, that is harvested by Federally qualified subsistence users. It directly addresses three priority information needs including 1) *genetic diversity of Dolly Varden stocks harvested for subsistence use in Northwest Alaska* 2) *TEK of fish harvested in subsistence fisheries, for example identifying critical habitat, refining range maps and shedding light on ecological relationships* and 3) *dispersal, distribution, abundance and life history of Dolly Varden*.

Two local hires from the communities of Kotzebue and Kivalina will be utilized for project management and fieldwork. Local hires will assist with the collection of traditional ecological knowledge in project communities and an ANSEP student will build collaborative and outreach capacity. These individuals will assist with logistics, project management, ethnographic data collection and dissemination. The proposed partnerships with representatives of the Native Village of Kotzebue and the Native Village of Kivalina appear meaningful, especially in undertaking the traditional ecological knowledge and sampling aspects of the project.

Dissemination through five peer-reviewed journal publications, reports, community presentations and half-day workshops with partner agencies seems overly ambitious for the project period and budget. The principal investigators and key personnel appear to have the capacity to undertake this research, though ethnographic methods and travel budgets should have been further developed. A well-published anthropologist will be contracted for the ethnographic component of this research which may help to alleviate initial concern regarding these items. The principal investigator has letters of support for this project from the Bureau of Land Management, the National Park Service, the Native Village of Kotzebue and the Selawik National Wildlife Refuge.

TRC Score: 3

Project Number: 18-150

Project Title: Bering Land Bridge National Preserve: Combining Traditional Ecological Knowledge and Scientific Surveys for a Contemporary Baseline

Project Justification: This project seeks to document the presence and distribution of important subsistence fish species that utilize federal public lands/waters in Bering Land Bridge National Preserve. Information on stock status, species distribution, and population age structure are lacking for this area with many of the major rivers and lakes having been surveyed sporadically or not at all. This project contains a linkage to federal public lands/waters for subsistence use as it focuses on the fisheries of Bering Land Bridge NP. It involves several species of fish harvested by Federally qualified subsistence users and it directly addresses a priority information need: *an inventory and survey of fish species in Bering Land Bridge National Preserve, utilizing traditional ecological knowledge from the communities of Shishmaref, Deering, and Wales.*

The proposer intends to document traditional ecological knowledge to identify species and habitats within the Preserve. The project would then use biological methods to survey for these species. While the research objectives certainly address priority information needs that would support effective management for several subsistence resources, the proposal lacks a clear plan for the collection of TEK data. This project proposes to build / increase capacity by hiring and training local people in data collection, data entry techniques, and report writing. Sampling capacity building will occur for fish sampling and water quality sampling. The proposal does not involve partnerships with other agencies or organizations currently, but mentions potential future partnerships. The principal investigator provided letters of support from Bering Land Bridge National Preserve, the North Slope Economic Development Corporation, the Native Village of Shishmaref, the Wales IRA Council, and the Deering IRA Council.

TRC Score: 4

Project Number: 18-102

Project Title: Life History and Movement of an Important Subsistence Species, the Dolly Varden Char

Project Justification: This project proposes to continue research that was previously funded with the Monitoring Program in 2014 (14-103) to assess summer distributions and ecology of Dolly Varden fully addressing a priority information needs that were identified by the Council. Information of Dolly Varden life history in the Beaufort Sea still remains limited. Results from this project will identify age compositions, growth rate, fresh water and marine residency timing, and summer distribution of Dolly Varden sampled in the Ivishak river near Kaktovik. Assuming the same success rate of satellite tags transferring data from the previously funded project 14-103 of 70%, it is unknown if only tagging 15 fish that is proposed in this project would be enough and will provide detailed information to adequately describe the life history of Dolly Varden in such a short time frame (<45 days over one summer). The investigator did not make the connection as to how this newly acquired information would benefit fisheries managers in terms of management implications. The investigator also noted a consultation with the UFSWS Conservation Gene Lab, however did not identify which lab would proceed to work with the genetic lab samples or budget. Without identifying the lab, the budget justification is unclear and it is unclear if there would be enough funds to carry out this genetic work when the budget for this proposal is

near the cap for FRMP funding. The investigators have the experience needed to successfully conduct this ongoing project. The principle investigator has been experienced with a previously funded Monitoring Program and has provided timely and complete deliverables. This project presents an excellent opportunity to partner with the University of Alaska Fairbanks, United States Fish & Wildlife Service – Fairbanks Field Office, and the Canadian Department of Fisheries and Oceans.

TRC Score: 5
Project Number: 18-104
Project Title: Broad whitefish health of northern Alaska

Project Justification: The *Saprolegnia parasitica* occurrence has been a concern for both the local subsistence users, the Council and was identified as a 2016 Priority Information Need; however, not the 2018 Priority Information Need. The results of this project would describe the environmental factors of water temperature and water level that occur during the presence of the freshwater mold *Saprolegnia parasitica* on broad whitefish in the Colville River and Ikpikpuk River. By obtaining environmental data and specimens (mold and fish) from local, subsistence fishermen, this work will describe the presence of this mold but will not establish causation. The investigator wishes to investigate if water level has an effect on mold presence however makes no mention of how the water level will be assessed on these two rivers. The investigator mentions use of traditional ecological knowledge but the proposal lacks details describing how this information will be incorporated into the project methods and results. The results for this project would provide the foundation for further research but the methodologies would not establish causation and the management implications are unclear. The last objective is to analyze total metals, diesel range organics, residual range/heavy oil organics, and Nitrate/Nitrite. The Monitoring Program typically does not fund projects that include a) habitat protection, mitigation, restoration, and enhancement; b) hatchery propagation, restoration, enhancement, and supplementation; and c) contaminant assessment, evaluation, and monitoring. The rationale behind this approach is to ensure that existing responsibilities and effort by government agencies are not duplicated under the Monitoring Program; however, the Monitoring Program may fund research to determine how these activities affect subsistence fisheries or fishery resources. If this be the case, the principle investigator must show how this knowledge would contribute to Federal subsistence fisheries management. The project proposal lacks this connection to show how gaining knowledge of changing health of Broad Whitefish in the Colville and Ikpikpuk Rivers can aid fisheries managers in terms of a changing climate. It is recommended that the investigator further refines the traditional and ecological knowledge component of this proposal. The sampling frequency did not seem to adequately meet objective C in the proposal due to the rivers always changing dynamic with flowing water. It was unclear why 30 data loggers were deemed appropriate to answer the objectives. Sampling design needs refinement to better address the objectives. Alaska Department of Fish and Game have not identified *Saprolegnia parasitica* to be a concern for the abundance of fish populations in the Arctic. While the project is responsive to community concerns, the methodologies need to be further refined.

APPENDIX A

Table A.1. Monitoring Program projects funded in the Northern Region from 2000 to 2016.

Project Number	Project Title	Investigators (Lead listed first)
North Slope		
00-002	Eastern NS Dolly Varden Spawning and Over-wintering Assessment	ADF&G, USFWS
01-113	Eastern NS Dolly Varden Genetic Stock ID Stock Assessment	ADF&G, USFWS
01-101	Eastern NS (Kaktovik) Subsistence Fish Harvest Assessment	AD&FG, KIC
02-050	NS (Anaktuvuk Pass) Subsistence Fish Harvest Assessment	ADF&G, NSB, AKP
03-012	SST of Arctic Cisco and Dolly Varden in Kaktovik Lagoons	USFWS
04-103	North Slope Dolly Varden Sonar Feasibility	USFWS
06-108	North Slope Dolly Varden Aerial Monitoring	ADF&G
07-105	North Slope Dolly Varden Genetic Baseline Completion	USFWS
07-107	Hulahula River Dolly Varden Sonar Enumeration	USFWS
12-155	Climate Change and Traditional Ecological Knowledge of Subsistence Whitefish and Cisco on the North Slope of Alaska	SWCA
14-103	Beaufort Sea Dolly Varden Dispersal Patterns	UAF
16-101	Arctic Dolly Varden Telemetry	USFWS
16-106	Aerial Monitoring of Dolly Varden Overwintering Abundance	ADF&G, USFWS
16-107	Chandler Lake Trout Abundance Estimation	ADF&G
16-152	Meade River Changes in Subsistence Fisheries	ADF&G
Northwest Arctic		
00-001	Northwestern Dolly Varden and Arctic Char Stock Identification	ADF&G, USFWS
00-020	Hotham Inlet Kotzebue Winter Subsistence Sheefish Harvest	ADF&G
01-136	Northwestern Alaska Dolly Varden Genetic Diversity	ADF&G, USFWS
01-137	Northwestern Alaska Dolly Varden Spawning Stock Assessment	ADF&G
02-023	Qaluich Nigingnaqtuat: Fish That We Eat	AJ
02-040	Kotzebue Sound Whitefish Traditional Knowledge	ADF&G, MQ
03-016	Selawik River Harvest ID, Spring and Fall Subsistence Fisheries	USFWS
04-101	Selawik River Inconnu Spawning Abundance	USFWS
04-102	Selawik Refuge Whitefish Migration and Habitat Use	USFWS
04-109	Wulik River Dolly Varden Wintering Stocks	USFWS, ADF&G
04-157	Exploring Approaches to Sustainable Fisheries Harvest Assessment	ADF&G, MQ
07-151	Northwest Alaska Subsistence Fish Harvest Patterns and Trends	ADF&G, MQ

Continued on next page

Table A. 1. continued

Project Number	Project Title	Investigators (Lead listed first)
Northwest Arctic (continued)		
08-103	Kobuk River Sheefish Spawning and Run Timing	ADF&G, USFWS
10-100	Selawik Drainage Sheefish Winter Movement Patterns	UAF, USGS, USFWS, NVK
10-104	Hotham Inlet Kotzebue Winter Subsistence Sheefish Harvest	USFWS
10-152	Climate Change and Subsistence Fisheries in Northwest Alaska	UAF
12-100	Selawik River Sheefish Spawning Abundance and Age Structure	USFWS
12-103	Kobuk River Sheefish Spawning Frequency, Location, and Run Timing	ADF&G, USFWS
12-104	Noatak River Dolly Varden Evaluation of Overwintering Populations	ADF&G, NPS
12-153	NW AK Key Subsistence Fisheries Harvest Monitoring Program	ADF&G, MQ
14-104	Selawik R Inconnu Spawning Population Abundance	USFWS
16-103	Kobuk River Dolly Varden Genetics	ADF&G, USFWS
16-104	Selawik Sheefish Age Structure and Spawning Population	USFWS
16-105	Kobuk River Sheefish Abundance	ADF&G
Seward Peninsula		
01-224	Nome Sub-district Subsistence Salmon Survey	ADF&G, KI
02-020	Pikmiktalik River Salmon Site Surveys and Enumeration	USFWS, NPS, STB, KI
04-105	Pikmiktalik River Chum and Coho Salmon Enumeration	KI
04-151	Customary Trade of Fish in the Seward Peninsula Area	ADF&G, KI
05-101	Unalakleet River Coho Salmon Distribution and Abundance	ADF&G, NVU
06-101	Pikmiktalik River Chum and Coho Salmon Enumeration	KI
10-102	Unalakleet River Chinook Salmon Abundance Estimate	ADF&G, BLM, NSEDC
10-151	Local Ecological Knowledge of Non-Salmon Fish in the Bering Strait	KI
12-154	North Slope Salmon Fishery HM/TEK	ADF&G
14-101	Unalakleet River Chinook Salmon Abundance Estimate	ADF&G, BLM, NSEDC

Abbreviations used for investigators are: **ADF&G** = Alaska Department of Fish and Game, **AJ** = Anore Jones, **AKP** = City of Anaktuvuk Pass, **KI** = Kawarek Inc., **KIC** = Kaktovik Inupiat Corp., **MQ** = Maniilaq, **NSEDC** = Norton Sound Economic Development Corporation, **NVU** = Native Village of Unalakleet, **NSB** = North Slope Borough, **STB** = Stebbins IRA, **SWCA** = SWCA Environmental Consultants, **UAF** = University Alaska Fairbanks, **USFWS** = U.S. Fish and Wildlife Service, and **USGS** = U.S. Geological Survey.

APPENDIX B

The following Abstracts were written by the Principal Investigators and submitted to the Office of Subsistence Management as part of the proposal package. The statements and information contained in the Abstracts were not altered and may not reflect the opinions of the Office of Subsistence Management and/or the TRC.

Project Number: 18-103
Title: Unalakleet River Chinook salmon escapement assessment-continuation
Geographic Region(s): Northern Region
Data Type: Stock Status and Trends
Principal Investigator: Jenefer Bell, Alaska Department of Fish and Game

Project Cost:	2018: \$144,288	2019: \$156,895	2020: \$161,047	2021: 160,415
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Total Cost: \$622,645

The Unalakleet River supports the largest Chinook salmon subsistence fishery in Norton Sound and over the last 10 years decreasing run size has led to increasing subsistence fishery restrictions. The recent 5-year (2011–2015) average subsistence harvest of Chinook salmon in Subdistrict 6 was 657 fish, 78% below the long-term (1994–2006) average subsistence harvest estimate of 2,913 fish.

Prior to 2010, management of Unalakleet River Chinook salmon was dependent on an enumeration tower on the North River, a tributary of the Unalakleet River, and radiotelemetry studies. Inconsistent operation of the counting tower due to funding and high water events called into question the efficacy of the project to guide management decisions. In recognition of significant data gaps and the need to make informed fishery management decisions, the United States Fish and Wildlife Service Office of Subsistence Management (USFWS OSM) funded a four-year resistance board-floating weir project on the Unalakleet River beginning in 2010, to address 3 objectives:

1. Estimate daily and total Unalakleet River Chinook salmon escapement from mid-June to August 15 each year.
2. Describe the timing of Unalakleet River Chinook salmon run.
3. Estimate age, sex, and length (ASL) composition of the Unalakleet River Chinook salmon escapement to achieve 90% and 95% confidence intervals of age and sex composition, respectively.

A resistance board weir will be placed in the Unalakleet River in mid-June and operated until August 15 to enumerate the Chinook salmon run. Counting periods will occur during three 8-hour shifts, 24 hours a day and flood lamps will be used during low-light conditions. Counting schedules will be adjusted for changes in diurnal migratory patterns or operational constraints such as suboptimal viewing conditions caused by high water levels. Salmon migrating upstream will be identified by species and recorded on multiple tally counters for a minimum of an hour or until fish passage diminishes. Individual counts of salmon passage throughout the night and day will be added together for a total daily passage by species.

Active sampling will be used to collect ASL samples from Chinook salmon. To ensure adequate temporal distribution ASL samples will be collected following a daily collection schedule in proportion to the previous 5-year average cumulative weir escapement by date. Sampling distributions and schedules will be adjusted inseason to address differences between expected and observed run abundance and timing. As a continuing project, The Unalakleet River weir escapement estimates and ASL data are being used to manage Chinook salmon subsistence and sport fisheries in Norton Sound Subdistrict 6, develop outlooks of run abundance for subsequent years, evaluate brood year productivity, and examine effects of harvest practices on the spawning escapement. Further, concurrent operation of the weir and the enumeration tower on the North River, has led to 5 years of accurate drainage wide escapement, which will be used to build run reconstructions and develop recruit-per-spawner analyses such that a scientifically defensible escapement goal can be established.

Project Number: 18-100
Title: Seasonal habitats and migrations of Arctic grayling of the lower Colville River relative to the Nuiqsut Subsistence fishery area
Geographic Region: Northern Alaska Region
Data Type: Stock Status and Trends (SST)
Principal Investigator: Andrew D. Gryska, Alaska Department of Fish and Game, Division of Sport Fish.

	2018 (4/1/18-3/31/19)	2019 (4/1/18-3/31/19)	2020 (4/1/18-3/31/19)
Project Cost:	\$179,083	\$59,120	\$8,300

Total Cost: \$246,503

Issue Addressed: Arctic grayling *Thymallus arcticus* are an important component of subsistence fisheries of the Colville River drainage (Fall and Utermohle 1993; Holen et al. 2012). Unfortunately, very little is known about this stock, and although the river and drainage are large, the available winter habitat may be limited. During winter, river discharge reaches annual lows and some streambeds go dry while others freeze to the bottom. To avoid these areas, Arctic grayling migrate to winter habitats some of which may become isolated refugia from which fish cannot migrate and are vulnerable to declines in water quality and quantity. Identification of overwintering habitats and timing of migrations to and from all seasonal habitats is needed to avoid or greatly reduce impacts associated with development, alterations of the hydrologic regime (e.g. droughts) due to climate change and narrowly directed fisheries at vulnerable times and places. This project directly addresses the FRMP priority information need for baseline information including abundance, distribution, movement, and health of Arctic Grayling in the Lower Colville River and its tributaries in the context of climate change.

Objective: The objective of this project is to use radiotelemetry to describe the seasonal movements and locations of mature Arctic grayling that inhabit the lower Colville River drainage between the Killik River and the village of Nuiqsut from August 2018 through December 2019.

Methods: Radio tags will be distributed throughout the study area systematically, and will be surgically implanted in 150 mature fish. The systematic distribution of the tags throughout the drainage will serve to maximize identification of seasonal habitats and migratory behavior for the majority of the population

from August 2018 through December 2019. Nearly all sample reaches are extremely remote. The lower 160 km (100 miles) of the Colville River near Nuiqsut will be accessed via small powerboats, while a small helicopter will be used to access small rivers and streams near Umiat. All Arctic grayling will be captured by hook and line or beach seines. Locations of radio tagged Arctic grayling will be determined using periodic flights during a 16-month period in a fixed wing aircraft. Seasonal locations and migratory periods will be described and depicted on detailed maps using ArcMap software.

Partnerships and Capacity Building: Local knowledge and involvement of residents of Nuiqsut and of the RAC is essential for the project’s success. A local hire and/or contracted services of a local powerboat operator will be solicited. An ANSEP intern to hire a university student as an intern to work with this project. The BLM has offered logistical support in Umiat for this project. In addition, biologists at the North Slope Borough Department of Wildlife Management in Barrow will be invited to accompany the investigators during the experiment to become familiar with Colville River Arctic grayling ecology, radiotelemetry, and gain experience in conducting tracking surveys. Fishers from Nuiqsut will be approached to participate in fish collection and tagging whenever possible.

Project Number: 18-101
Title: Genetic diversity of Dolly Varden populations in Kobuk River
Geographic Region: Northern Alaska Region
Data Type: Stock Status and Trends (SST)
Principal Investigator: James Savereide, Alaska Department of Fish and Game, Division of Sport Fish and Penelope Crane, U. S. Fish and Wildlife Service, Conservation Genetics Laboratory

	2018 (4/1/18-3/31/19)	2019 (4/1/18-3/31/19)
Project Cost:	\$34,400	\$21,400

Total Cost: \$55,800

Issues Addressed: The Dolly Varden charr *Salvelinus malma* population that overwinters in the Wulik River is the most important subsistence fish resource for the residents of Kivalina, Alaska and one of the largest and most important overwintering sites for Dolly Varden in northwestern Alaska. Fish natal to the Noatak, Kivalina, Wulik, Kobuk, Buckland, Omikviorok, Rabbit, and Pilgrim rivers in Alaska, as well as the Anadyr and Amguema rivers in Russia have all used the Wulik River as an overwintering site. This project directly addresses two priority information needs in the Northern Alaska Region: 1) genetic diversity of Dolly Varden stocks harvested for subsistence use; and, 2) dispersal, distribution, abundance, and life history of Dolly Varden. We will improve the method developed by the co-investigator and the Conservation Genetics Laboratory (CGL) that identifies the origin of Dolly Varden harvested in the Wulik River subsistence fishery and our understanding of Dolly Varden life history in northwestern Alaska. Adding three of the four known Dolly Varden spawning stocks in the Kobuk River, the Hunt, Salmon, and Tutuksuk River stocks, to the established baseline will advance the mixed-stock analysis of this important subsistence fishery and allow managers to assess the impacts of harvest on Dolly Varden stocks represented in this overwintering aggregation.

Objectives: The objective of this project will be to:

1. Collect and genetically analyze juvenile Dolly Varden fin clips taken from three known spawning streams in the Kobuk River drainage, to add to the Northwest Alaska genetic baseline for mixed-stock subsistence harvest analysis.

Methods: Two crews with two biologists will sample each river in July 2018 and if water conditions or catch rates impede our ability to collect necessary sample sizes, we will continue sampling in July, 2019. The Salmon, Tutuksuk, and Hunt rivers will be sampled for a minimum of three days using minnow traps baited with cured salmon roe. Fin clips will be sent to the U. S. Fish and Wildlife (USFWS) Conservation Genetics Laboratory (CGL) in Anchorage for analysis and archival.

Partnerships and Capacity Development: An ANSEP internship, up to four weeks in duration in August 2018–2019, will be available in the CGL. The principal investigator will work closely with local communities to learn about the rivers to be sampled and gain any insight from their knowledge of fish in those areas. Knowledge gained from local fishermen before and during study 16-103 will be applied while sampling in 2018–2019.

Project Number: 18-151
Title: Addressing priority knowledge needs for subsistence stocks of Dolly Varden (Aqalukpik) along the southern Chukchi Sea coastline
Geographic Region(s): Northern Region
Data Type: Stock status and trends (SST), and traditional ecological knowledge (TEK)
Principal Investigators: Dr. Trevor Haynes, Wildlife Conservation Society, Arctic Beringia Program
Co-Investigator: Mr. Alex Whiting, Native Village of Kotzebue

Project Cost:	2018: \$214,850	2019: \$214,909	2020: \$214,469
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Total Cost: \$644,228

Issue: Our project will address three Priority Information Needs identified by the 2018 Fisheries Resource Monitoring Program through information gathered in Regional Advisory Committee Meetings. Those needs are: characterizing the genetic diversity of Dolly Varden harvested for subsistence in Northwest Alaska, synthesizing TEK on these fish harvested in subsistence fisheries, and gathering information on dispersal, distribution, abundance and life history of Dolly Varden.

Objectives:

1. Document TEK of Dolly Varden life histories across Northwestern Alaska through interviews or focus groups in Alaska Native Villages;
2. Conduct a field campaign that incorporates TEK knowledge into the study design, and collect Dolly Varden otoliths, genetic samples, tissue and diet samples for analysis;
3. Conduct laboratory analysis of samples from 200 individual Dolly Varden collected through field research and subsistence harvest;

4. Create a comprehensive picture of the life history strategies of Dolly Varden by coordinating our sampling, lab analysis, and TEK surveys;
5. Relate life history patterns to subsistence harvest and stock management needs.

Methods: Our project design reflects the co-production of knowledge through integration of input from experts about both scientific and the Traditional Knowledge (Objective 1) of Dolly Varden. These experts will design a sampling strategy for the four primary study areas (Kivalina, Noatak, and Kobuk rivers, and coastal lagoons neighboring these rivers). Tissue from samples taken at these locations (Objective 2) will be analyzed in laboratories for genetic, body condition, age, microchemistry, and diet data (Objective 3). The data requirements will be tuned to inform both the key questions forwarded by the RAC as impetus for this project, and to inform other relevant questions that arise during the assessment of TEK of Dolly Varden in the study area. Finally, through the sharing of information among all project partners (Objective 4), outreach materials and management recommendations will be produced (Objective 5).

Partnerships/Capacity Building: We partner with local fishermen/managers in each community to answer questions about Dolly Varden, building on their capacity to help manage their own subsistence needs. As Co-PI, Alex Whiting will coordinate all activities involving the Native Village of Kotzebue, a fundamental partner in collecting harvest samples and linking the project partners with members of the community. Similarly, we work with Kyle Sage from the Native Village of Kivalina, a prominent subsistence fisherman who WCS is currently funding through a National Science Foundation grant. He is instrumental in conducting TEK interviews, collecting harvest samples, and again performing community outreach. We maintain strong relationships with tribal governments and regional organizations that are interested in this work, and defer to their decisions about research conducted in their communities, including the Northwest Arctic Borough and Maniilaq, Inc.

Project Number: 18-150
Title: Bering Land Bridge National Preserve: Combining Traditional Ecological Knowledge and Scientific Surveys for a Contemporary Baseline
Geographic Region: Bering Land Bridge National Preserve, National Park Service
Data Type: Traditional Ecological Knowledge, Stock Status and Trends, and Harvest Monitoring
Principal Investigator: Dr. Carol Ann Woody, National Park Service, Subsistence Fisheries Division
Co-Investigator(s): Sarah Apsens M.S., Alaska SeaGrant Program Fellow.

Project Cost:	2018: \$91,369	2019: \$147,880	2020: \$118,370	2021: \$63,703
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Total Cost: \$421,322

Issue: Fish are a traditional and culturally important food source for Seward Peninsula residents and comprise a significant portion of subsistence harvests. For example, during 2009-2010 Shishmaref residents harvested an estimated 93,971 lbs. of non-salmon fish from waters in or near the Bering Land Bridge National Preserve (Raymond-Yakoubian 2013). Despite the importance of fish to area cultures and food security, basic information on subsistence fish including precise ID, essential habitat locations and

characteristics (e.g., spawning, rearing & feeding), basic population characteristics (anadromous? freshwater? age and size at first reproduction?) are lacking for fishes of the Bering Land Bridge National Preserve. The Federal Office of Subsistence Management listed the following priority information need, identified by the Seward Peninsula Subsistence Regional Advisory Council during the Nome Nov. 2016 meeting: “*An inventory and survey of fish species in the Bering Land Bridge National Preserve, utilizing traditional ecological knowledge from the communities of Shishmaref, Deering and Wales.*”

Objectives: Our overarching goal is to build on existing cultural knowledge by enhancing it with scientific surveys to create the first comprehensive freshwater fisheries baseline inventory for the Bering Land Bridge National Preserve. Working collaboratively with subsistence fishing experts from Deering, Shishmaref, and Wales during 2018-2020 we will:

1. Map (GIS) important subsistence fishing areas in & near the Preserve (2018-2019),
2. Map (GIS) known or documented essential fish habitats (spawning, rearing, feeding) TEK in and near the Preserve (2018-2020),
3. ID species and sample (age, length, sex, condition) subsistence harvests (2018-2019)
4. Compile and share important ecological knowledge on subsistence species (2018-2020)
5. Design & implement targeted systematic scientific fisheries survey focused on key subsistence tributary systems (2019).
6. Conduct a probabilistic scientific survey of tributaries and lakes in and near the Preserve to provide a better understanding of less accessible fish assemblages(2020)
7. Document essential fish habitat characteristics including: depth, flow, substrate, pH, O₂, conductivity, temperature.
8. Collaborate with villages to establish a long-term temperature and water quality monitoring program in important subsistence waters.

Methods: Tribal Councils in Deering, Shishmaref and Wales will identify and establish contact with recognized fishing experts in each village that are willing to work with us on this project. Semi-directed group and mapping interviews with fishing experts (Miraglia 1998) will be conducted with experienced anthropologists to share and gather fish ecology information (e.g. precise species ID, essential habitat locations, run time info. Etc.). The first trip will be planned to coincide with opportunities to sample key subsistence harvests. We will work to identify and train intern(s) in each village to: sample subsistence harvests, sample basic water quality, record results. This internship will be ongoing through the project. Remote temperature monitoring equipment will be installed in tributaries near each village to facilitate data extraction. Remote thermal monitoring sites will be selected based on ability to access sites to download data in the future.

Systematic fisheries surveys will be conducted in tributary systems identified by village fishing experts as important subsistence fishing habitats; fish and aquatic habitat sampling will follow USEPA (2013).

Probabilistic fisheries surveys will be based on GRTS see: <https://science.nature.nps.gov/im/datamgmt/statistics/r/advanced/grts.cfm>) to provide resource managers an overall fish assemblage and habitat baseline for tributaries and lakes in the Preserve. Standard electrofishing and trapping methods will be

used (USEPA 2013). Standard EPA protocols will be used to measure water quality and habitat parameters; this work will be helicopter supported.

Project Number: 18-102
Title: Life history and movement of an important subsistence species, the Dolly Varden char

Geographic Region(s): Northern Region

Data Type: Stock Status and Trends

Principal Investigator: Andrew C Seitz, University of Alaska Fairbanks

Co-Investigator: Randy Brown, U.S. Fish and Wildlife Service

Project Cost:	2018: \$214,963	2019: \$98,616
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Total Cost: \$313,579

Issue: To understand potential impacts of climate change and human activities on Dolly Varden, as well as to design potential management strategies in response to these stressors, it is imperative to have a sound understanding of their biology and ecology. Findings from recent research on Dolly Varden demonstrate variability in behavior between years and are challenging many long-standing assumptions, indicating the need to examine several basic aspects of the biology, ecology and behavior of Dolly Varden. Without this information, it is impossible to design well-informed management approaches that maximize fishing opportunity while minimizing the risk of overexploitation of this species, should the need arise in the future.

Objectives:

1. By capturing Dolly Varden near Kaktovik and attaching Pop-up Satellite Archival Tags to them, we will continue to collect information about the oceanic phase of Dolly Varden that summer in the Beaufort Sea, including:
 - a. Movement and distribution
 - b. Depth and temperature occupancy
2. Using genetic molecular techniques, we will describe the origin of Dolly Varden harvested in the Kaktovik subsistence fishery, including those from the Ivishak River.
3. Using sagittal otoliths collected from Dolly Varden in the Ivishak River, we will describe and reexamine life history information, including:
 - a. Age and age-at-length
 - b. Age at first seaward migration
 - c. Frequency of seaward migration

Methods: Ultimately, the long term goal of our research is to understand the variability in biology, ecology and behavior of Dolly Varden that spawn in rivers of the North Slope to provide a landscape-wide understanding of this species on the North Slope. To accomplish this in a financially feasible manner, we propose an incremental approach in which we conduct a series of modest

research projects whose results can be combined in the future to achieve our long term goal. This OSM proposal represents the first modest research project, and we propose to:

1. Continue to examine the migration and behavior of Dolly Varden in the ocean to provide information that can be used to understand potential impacts of human activities, as well as provide information about the potential implications of changing ocean conditions on this species;
2. Describe the stock origin of Dolly Varden captured in a mixed-stock subsistence fishery near Kaktovik, which ultimately can be used to understand and potentially predict the variability in several aspects of catches; and 3. Collect basic life history information about Dolly Varden from the Ivishak River, which can be used to understand several aspects of the biology and ecology of this species in that drainage, particularly its population dynamics.

Partnerships/Capacity Building: The proposed project seeks to increase the collective knowledge about Dolly Varden on the North Slope of Alaska. While doing this, we will develop partnerships with residents of Kaktovik, AK to aid in the collection of tissue samples. Additionally, we will conduct public outreach through presentations and informal conversations to foster mutual exchange of knowledge about this species. With an increase in collective knowledge, residents, scientists and managers will be empowered to make more informed decisions regarding management of Dolly Varden, should an active management program need to be implemented in the future.

Project Number: 18-104
Title: Baseline Information on Broad Whitefish (*Coregonus nasus*) Health in Northern Alaska

Geographic Region(s): Northern Region

Data Type: Stock Status and Trends/TEK

Principal Investigator: Todd Sformo, PhD, North Slope Borough-Department of Wildlife Management

Project Cost:	2018: \$54,100	2019: \$41,925	2020: \$41,925
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Total Cost: \$137,950

Broad whitefish (*Coregonus nasus*) is an invaluable subsistence resource on the North Slope of Alaska in general and on the Colville and Ikpikpuk River drainages in particular. Generations of Native subsistence fishing have taken place and continue to be activity pursued in this area for this species of fish. It is not only important nutritionally but it also functions as a driving force in the perpetuation of Inupiaq culture. I propose to establish baseline parameters of health of this fish by enlisting the assistance of subsistence fishermen through monitoring their catch and subsampling specimens. Monitoring and subsampling will produce 1) a field health assessment index based on a modified method of Goede (Goede and Barton 1990; Adams et al. 1993) that utilizes both organismic and hematological indices and 2) a enlist a professional fish pathologist, when necessary, to conduct histopathology on a subset of fish. The field health assessment index is a quantitative assessment that produces a fish health condition profile by population and will create a baseline health assessment that can be utilized statistically (Adams et al.

1993). In addition, baseline environmental parameters will be establishment by monitoring temperature salinity at individual subsistence nets and analyzing water quality once a month (especially May – January) and at key locations of potential broad whitefish spawning. Since a known emerging disease on broad whitefish in this area recently began in 2013, I will also use collected water samples to confirm presence of the freshwater mold *Saprolegnia* sp. over time. The specific project activities will examine broad whitefish from subsistence-caught specimens within the Colville and Ikpikpuk River drainages to establish baseline information on healthy vs. diseased fish and establish baseline environmental conditions where these fish are caught, including temperature, salinity, and water quality analyses. Anticipated outputs and outcomes will be establishing a Health Assessment Index (HAI) and publishing the results regarding the health and disease of broad whitefish from this area that will also include baseline environmental details.

Goals: Establish baseline information on broad whitefish health and environmental conditions through a comparison of subsistence-caught specimens, temperature recordings, and water quality within the Colville and Ikpikpuk river drainages.

Objectives:

1. Record catch (species, mass, fork length, other TEK) from subsistence-caught specimens
2. Create Goede organismic and hematological indices through gross measurement and necropsies
3. Deploy data loggers to subsistence fishermen to attach to nets to record water temperature and salinity and water level
4. Deploy loggers in waters where potential broad whitefish spawn independent of subsistence fishing

Collect and create a regular water sampling regime for not only water quality parameters but also for the seasonal occurrence and distribution of *Saprolegnia* sp.

ANNUAL REPORTS

Background

ANILCA established the Annual Reports as the way to bring regional subsistence uses and needs to the Secretaries' attention. The Secretaries delegated this responsibility to the Board. Section 805(c) deference includes matters brought forward in the Annual Report.

The Annual Report provides the Councils an opportunity to address the directors of each of the four Department of Interior agencies and the Department of Agriculture Forest Service in their capacity as members of the Federal Subsistence Board. The Board is required to discuss and reply to each issue in every Annual Report and to take action when within the Board's authority. In many cases, if the issue is outside of the Board's authority, the Board will provide information to the Council on how to contact personnel at the correct agency. As agency directors, the Board members have authority to implement most of the actions which would effect the changes recommended by the Councils, even those not covered in Section 805(c). The Councils are strongly encouraged to take advantage of this opportunity.

Report Content

Both Title VIII Section 805 and 50 CFR §100.11 (Subpart B of the regulations) describe what may be contained in an Annual Report from the councils to the Board. This description includes issues that are not generally addressed by the normal regulatory process:

- an identification of current and anticipated subsistence uses of fish and wildlife populations within the region;
- an evaluation of current and anticipated subsistence needs for fish and wildlife populations from the public lands within the region;
- a recommended strategy for the management of fish and wildlife populations within the region to accommodate such subsistence uses and needs related to the public lands; and
- recommendations concerning policies, standards, guidelines, and regulations to implement the strategy.

Please avoid filler or fluff language that does not specifically raise an issue of concern or information to the Board.

Report Clarity

In order for the Board to adequately respond to each Council's annual report, it is important for the annual report itself to state issues clearly.

- If addressing an existing Board policy, Councils should please state whether there is something unclear about the policy, if there is uncertainty about the reason for the policy, or if the Council needs information on how the policy is applied.
- Council members should discuss in detail at Council meetings the issues for the annual report and assist the Council Coordinator in understanding and stating the issues clearly.

- Council Coordinators and OSM staff should assist the Council members during the meeting in ensuring that the issue is stated clearly.

Thus, if the Councils can be clear about their issues of concern and ensure that the Council Coordinator is relaying them sufficiently, then the Board and OSM staff will endeavor to provide as concise and responsive of a reply as is possible.

Report Format

While no particular format is necessary for the Annual Reports, the report must clearly state the following for each item the Council wants the Board to address:

1. Numbering of the issues,
2. A description of each issue,
3. Whether the Council seeks Board action on the matter and, if so, what action the Council recommends, and
4. As much evidence or explanation as necessary to support the Council's request or statements relating to the item of interest.



FISH and WILDLIFE SERVICE
BUREAU of LAND MANAGEMENT
NATIONAL PARK SERVICE
BUREAU of INDIAN AFFAIRS

Federal Subsistence Board

1011 East Tudor Road, MS 121
Anchorage, Alaska 99503 - 6199



FOREST SERVICE

OSM 17052.ZS

AUG 14 2017

Enoch Shiedt, Chair
Northwest Arctic Subsistence
Regional Advisory Council
c/o Office of Subsistence Management
1101 East Tudor Road, MS 121
Anchorage, Alaska 99503

Dear Chairman Shiedt:

This letter responds to the Northwest Arctic Subsistence Regional Advisory Council's (Council) fiscal year 2016 Annual Report. The Secretaries of the Interior and Agriculture have delegated to the Federal Subsistence Board (Board) the responsibility to respond to these reports. The Board appreciates your effort in developing the Annual Report. Annual Reports allow the Board to become aware of the issues outside of the regulatory process that affect subsistence users in your region. We value this opportunity to review the issues concerning your region.

1. Perceived benefits to Federally qualified subsistence users resulting from the closure of Federal public lands in Unit 23 to caribou hunting by non-Federally qualified users

The Council is noticing possible benefits to Federally qualified subsistence users resulting from the closure of federal public lands in Unit 23 to caribou hunting by non-Federally qualified users following the adoption of Wildlife Special Action 16-01 (WSA 16-01) by the Board in April 2016. These benefits include reduced user conflicts and improved caribou harvest by Federally qualified subsistence users in the vicinity of Noatak, in particular that people were getting enough caribou for the first time in a long while. Council members also noted that there is hope that the closure will aid in restoring traditional migration routes. Additional endorsements for WSA 16-01 were recognized by the Council, including four letters of support for the closure, submitted by Herbert Walton, Sr., Tribal Administrator, Native Village of Noatak; Eva Onalik, Treasurer, Native Village of Noatak; Hannah Onalik, Tribal Secretary, Native Village of Noatak; and N. Carol Wesley, Noatak Resident (see enclosed).

Because of the complexity of this issue, the continued decline of the herd, the likelihood of future

Chairman Shiedt

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regulatory changes and the fact that the WACH is a critical subsistence resource for at least four Council regions, ongoing coordination among Councils will be beneficial in providing a framework for addressing regulations for the WACH into the future in a cohesive way. We encourage the Board to support these efforts and to do whatever is necessary to ensure the continued viability of this vital subsistence resource.

Response:

The Board is pleased that its actions may have helped Federally qualified subsistence users continue subsistence use of their caribou resource. The Board supports efforts of the Council to coordinate with other affected Regional Advisory Councils about WACH regulations and is aware that other Councils share your concerns. At its winter 2017 meeting, the Western Interior Alaska Subsistence Regional Council expressed a need to have a conference call with the Northwest Arctic, North Slope, and Seward Peninsula Subsistence Regional Advisory Councils to discuss caribou issues. Similarly, the North Slope Council supported the proposal by this Council to form a wildlife working group in order to discuss caribou issues. The Board recommends contacting the Council Coordination Division Chief at the Office of Subsistence Management (OSM) in order to organize a conference call and facilitate coordination between Councils.

Additionally, at its meeting in January 2017, the Board directed OSM to create an interagency user conflict group to discuss solutions to user conflict issues in Unit 23, specifically targeted closures. The group, which includes members from all of the Federal land management agencies and the Alaska Department of Fish and Game, met for the first time in April 2017. The meeting provided a forum for State and Federal agency personnel to come to the table to discuss their observations and concerns, and to offer suggestions for moving forward on these issues. The Board acknowledges that both herd declines and user conflicts are central to this issue and that both must be addressed in our efforts to effectively manage caribou populations. We recognize a long-history of concerns about user conflict and herd deflection in the vicinity of the Noatak, Squirrel, Agashashok, and Eli Rivers in Unit 23, as well as along the Dalton Highway corridor in Unit 26B. We furthermore recognize that subsistence activities provide more to rural residents than food alone. Title XIII of ANILCA affirms the sociocultural aspect of subsistence activities by stating explicitly states that subsistence opportunity "...is essential to Native physical, economic, traditional, and cultural existence and to non-Native physical, economic, traditional, and social existence."

The Board will continue to encourage our member agencies, the State of Alaska, academic institutions, and private organizations to undertake collaborative caribou research in the Arctic that would enhance our understanding of populations, migration patterns, and disturbance behavior.

2. Need for Federal agencies to exercise precaution when managing the rapidly changing subsistence resources and uses in the Northwest Arctic

There is increasing need for Federal agencies to exercise caution when managing the rapidly changing subsistence resources and uses in the Northwest Arctic. These changes include:

- a. Proliferation of beaver – Increase in beaver populations shown by the decline of willows and the damming of creeks extending as far north as Point Hope. These impacts may*
- b. adversely affect subsistence fisheries, increasingly important to Federally qualified subsistence users given the decline of the region's caribou.*
- c. Changes in fish size and fish health – Increase in large, though seemingly healthy, fish containing worms (some a quarter inch in length).*
- d. Preserving customary and traditional uses – Concern that further limits on caribou harvest may result in the unintended consequence of criminalizing customary and traditional subsistence uses. The Council wishes to highlight and emphasize customary use of subsistence resources, differing by location and season, including sheefish and whitefish in Selawik, caribou and trout (Dolly Varden) in Noatak, and sheep.*
- e. Changes in water quality and quantity – Concerns regarding impacts to Federally qualified subsistence users from changes in water temperature associated with global warming. Council members have noted a drop in river levels near remote communities.*
- f. Impacts from potential road development and mineral extraction – Concern regarding the potential for adverse impacts to water quality and increased pressure to harvest subsistence resources associated with the potential development of the Ambler Road.*

The Council requests that the Board remain engaged with these issues and take whatever actions are necessary and possible to continue conservation of vital subsistence resources.

Response:

The Board shares the concerns of this Council with regard to changing resources in its region as a result of a rapidly changing climate. The Federal Subsistence Management Program will remain actively engaged with all of the Regional Advisory Councils and with rural Alaskans to ensure that the Program is responsive to the needs of Federally qualified subsistence users. For instance, the Board has adopted several proposals and special action requests in recent years for changes to harvest seasons and limits in response to changes in climatic conditions that have made it difficult for Federally qualified subsistence users to harvest, access, or care for game in the field. The Board will continue to address these issues through the regulatory and special action processes as needed.

Chairman Shiedt

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3. Need to reduce caribou harvest limits and maintain the closure of Federal public lands in Unit 23 to caribou hunting by non-Federally qualified users

The Council is concerned with the continued decline of the region's caribou population, from approximately 231,000 down to just shy of 201,000 animals. The Council recommends a reduction in caribou harvest bag limits from 5 caribou per day to 3 caribou per day. The Council also emphasizes the need to maintain the closure of Federal public lands in Unit 23 for more than one regulatory year to caribou hunting by non-Federally qualified users. The continuation of the closure is needed to see if the closure is having a positive effect on conservation of the herd and continuation of subsistence opportunity, thus allowing Federally qualified subsistence users to meet their food security needs. The Council underscores the significance of subsistence resources to feeding families in the Northwest Arctic, noting the high cost of store-bought food throughout the region.

Response:

The Council voted to submit a proposal to decrease the Federal caribou harvest limit in Unit 23 from 5 to 3 caribou per day for the 2018-2020 regulatory cycle. The Board will act on this proposal at its meeting in April 2018. However, even if this proposal is adopted, hunters will still be able to harvest 5 caribou per day in Unit 23 under State regulations unless closed by the Board. If the Council would like this harvest limit reduction to apply to all users, it will need to submit proposals to the Federal Subsistence Board and the Alaska Board of Game. If the Council would like this reduction to apply across the range of the WACH, it will need to submit both Federal and State proposals for Units 21D, 22, 24, 26A, and 26B.

The closure of Federal public lands in Unit 23 as a result of WSA16-01 has reduced the caribou harvest in the unit by non-rural hunters. State permit returns will help quantify the harvest. However, the reduction generated by the closure is not anticipated to have a measurable effect on the herd's productivity as on-rural users account for a small percentage of the harvest. In addition, some of the non-rural effort to harvest caribou from the WACH potentially shifted to other available areas as a result of the closure.

The Board recently took action on Temporary Special Action request WSA17-03, which was submitted by the Council and requested that caribou hunting in Unit 23 be closed to non-Federally qualified users for the 2017/18 regulatory year. It modified the request, closing all Federal lands within a 10 mile wide corridor (5 miles either side) along the Noatak River from the western boundary of Noatak National Preserve upstream to the confluence with the Cutler River; within the northern and southern boundaries of the Eli and Agashashok River drainages, respectively; and within the Squirrel River drainage to caribou hunting except by Federally qualified subsistence users for the July 1, 2017 – June 30, 2018 regulatory year. Continued complaints about conflicts surrounding the Noatak, Eli, Agashashok and Squirrel River drainages and the apparent benefit of the 2016-2017 Federal closure to Noatak residents, as

Chairman Shiedt

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evidenced by letters and public testimony, supported the closure of Federal public lands in these areas.

In closing, I want to thank you and your Council for their continued involvement and diligence in matters regarding the Federal Subsistence Management Program. I speak for the entire Board in expressing our appreciation for your efforts and our confidence that the subsistence users of the Northwest Arctic Region are well represented through your work.

Sincerely,



Anthony Christianson
Chair

cc: Federal Subsistence Board
Northwest Arctic Subsistence Regional Advisory Council
Eugene R. Peltola, Jr., Assistant Regional Director, Office of Subsistence Management
Thomas Doolittle, Deputy Assistant Regional Director
Office of Subsistence Management
Carl Johnson, Council Coordination Supervisor, Office of Subsistence Management
Zachary Stevenson, Subsistence Council Coordinator, Office of Subsistence Management
Jill Klein, Special Assistant to the Commissioner, Alaska Department of Fish and Game
Interagency Staff Committee
Administrative Record

Winter 2018 Regional Advisory Council Meeting Calendar

February-March 2018

Meeting dates and locations are subject to change.

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Feb. 4	Feb. 5 <i>Window Opens</i>	Feb. 6	Feb. 7 EI — Fairbanks	Feb. 8	Feb. 9	Feb. 10
		SE — Wrangell				
Feb. 11	Feb. 12	Feb. 13 NS — Utqiagvik	Feb. 14	Feb. 15	Feb. 16	Feb. 17
Feb. 18	Feb. 19 PRESIDENT'S DAY HOLIDAY	Feb. 20	Feb. 21 KA — Kodiak	Feb. 22	Feb. 23	Feb. 24
		WI — Anchorage				
Feb. 25	Feb. 26	Feb. 27 BB — Naknek (1st opt.)	Feb. 28	Mar. 1	Mar. 2	Mar. 3
			NWA — Kotzebue			
Mar. 4	Mar. 5	Mar. 6 SC — Anchorage	Mar. 7	Mar. 8	Mar. 9	Mar. 10
	SP — Nome					
Mar. 11	Mar. 12	Mar. 13	Mar. 14 YKD — Bethel	Mar. 15	Mar. 16 <i>Window Closes</i>	Mar. 17
		BB — Naknek (2nd opt.)				

Fall 2018 Regional Advisory Council Meeting Calendar

Meeting dates and locations are subject to change.

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Aug. 19	Aug. 20	Aug. 21	Aug. 22	Aug. 23	Aug. 24	Aug. 25
Aug. 26	Aug. 27	Aug. 28	Aug. 29	Aug. 30	Aug. 31	Sept. 1
Sept. 2	Sept. 3 LABOR DAY HOLIDAY	Sept. 4	Sept. 5	Sept. 6	Sept. 7	Sept. 8
Sept. 9	Sept. 10	Sept. 11	Sept. 12	Sept. 13	Sept. 14	Sept. 15
Sept. 16	Sept. 17	Sept. 18	Sept. 19	Sept. 20	Sept. 21	Sept. 22
Sept. 23	Sept. 24	Sept. 25	Sept. 26	Sept. 27	Sept. 28	Sept. 29
Sept. 30	Oct. 1	Oct. 2	Oct. 3	Oct. 4	Oct. 5	Oct. 6
Oct. 7	Oct. 8 COLUMBUS DAY HOLIDAY	Oct. 9	Oct. 10	Oct. 11	Oct. 12	Oct. 13
		SE — TBD				
Oct. 14	Oct. 15	Oct. 16	Oct. 17	Oct. 18	Oct. 19	Oct. 20
				AFN — Anchorage		
Oct. 21	Oct. 22	Oct. 23	Oct. 24	Oct. 25	Oct. 26	Oct. 27
Oct. 28	Oct. 29	Oct. 30	Oct. 31	Nov. 1	Nov. 2	Nov. 3
Nov. 4	Nov. 5	Nov. 6	Nov. 7	Nov. 8	Nov. 9	Nov. 10

**Department of the Interior
U. S. Fish and Wildlife Service**

Northwest Arctic Subsistence Regional Advisory Council

Charter

1. **Committee's Official Designation.** The Council's official designation is the Northwest Arctic Subsistence Regional Advisory (Council).
2. **Authority.** The Council is renewed by virtue of the authority set out in the Alaska National Interest Lands Conservation Act (16 U.S.C. 3115 (1988)), and under the authority of the Secretary of the Interior, in furtherance of 16 U.S.C. 410hh-2. The Council is regulated by the Federal Advisory Committee Act (FACA), as amended, 5 U.S.C. Appendix 2.
3. **Objectives and Scope of Activities.** The objective of the Council is to provide a forum for the residents of the Region with personal knowledge of local conditions and resource requirements to have a meaningful role in the subsistence management of fish and wildlife on Federal lands and waters in the Region.
4. **Description of Duties.** The Council has authority to perform the following duties:
 - a. Recommend the initiation of, review, and evaluate proposals for regulations, policies, management plans, and other matters relating to subsistence uses of fish and wildlife on public lands within the Region.
 - b. Provide a forum for the expression of opinions and recommendations by persons interested in any matter related to the subsistence uses of fish and wildlife on public lands within the Region.
 - c. Encourage local and regional participation in the decisionmaking process affecting the taking of fish and wildlife on the public lands within the Region for subsistence uses.
 - d. Prepare an annual report to the Secretary containing the following:
 - (1) An identification of current and anticipated subsistence uses of fish and wildlife populations within the Region.
 - (2) An evaluation of current and anticipated subsistence needs for fish and wildlife populations within the Region.

- (3) A recommended strategy for the management of fish and wildlife populations within the Region to accommodate such subsistence uses and needs.
 - (4) Recommendations concerning policies, standards, guidelines, and regulations to implement the strategy.
 - e. Appoint three members to each of the Cape Krusenstern National Monument and the Kobuk Valley National Park Subsistence Resource Commissions and one member to the Gates of the Arctic National Park Subsistence Resource Commission in accordance with Section 808 of ANILCA.
 - f. Make recommendations on determinations of customary and traditional use of subsistence resources.
 - g. Make recommendations on determinations of rural status.
 - h. Provide recommendations on the establishment and membership of Federal local advisory committees.
5. **Agency or Official to Whom the Council Reports.** The Council reports to the Federal Subsistence Board Chair, who is appointed by the Secretary of the Interior with the concurrence of the Secretary of Agriculture.
 6. **Support.** The U.S. Fish and Wildlife Service will provide administrative support for the activities of the Council through the Office of Subsistence Management.
 7. **Estimated Annual Operating Costs and Staff Years.** The annual operating costs associated with supporting the Council's functions are estimated to be \$130,000, including all direct and indirect expenses and 0.9 staff years.
 8. **Designated Federal Officer.** The DFO is the Subsistence Council Coordinator for the Region or such other Federal employee as may be designated by the Assistant Regional Director – Subsistence, Region 7, U.S. Fish and Wildlife Service. The DFO is a full-time Federal employee appointed in accordance with Agency procedures. The DFO will:
 - Approve or call all of the advisory committee's and subcommittees' meetings,
 - Prepare and approve all meeting agendas,
 - Attend all committee and subcommittee meetings,
 - Adjourn any meeting when the DFO determines adjournment to be in the public interest, and
 - Chair meetings when directed to do so by the official to whom the advisory committee reports.

9. **Estimated Number and Frequency of Meetings.** The Council will meet 1-2 times per year, and at such times as designated by the Federal Subsistence Board Chair or the DFO.
10. **Duration.** Continuing.
11. **Termination.** The Council will be inactive 2 years from the date the Charter is filed, unless prior to that date it is renewed in accordance with the provisions of Section 14 of the FACA. The Council will not meet or take any action without a valid current charter.
12. **Membership and Designation.** The Council's membership is composed of representative members as follows:

Ten members who are knowledgeable and experienced in matters relating to subsistence uses of fish and wildlife and who are residents of the Region represented by the Council. To ensure that each Council represents a diversity of interests, the Federal Subsistence Board in their nomination recommendations to the Secretary will strive to ensure that seven of the members (70 percent) represent subsistence interests within the Region and three of the members (30 percent) represent commercial and sport interests within the Region. The portion of membership representing commercial and sport interests must include, where possible, at least one representative from the sport community and one representative from the commercial community.

The Secretary of the Interior will appoint members based on the recommendations from the Federal Subsistence Board and with the concurrence of the Secretary of Agriculture.

Members will be appointed for 3-year terms. A vacancy on the Council will be filled in the same manner in which the original appointment was made. Members serve at the discretion of the Secretary.

Council members will elect a Chair, Vice-Chair, and Secretary for a 1-year term.

Members of the Council will serve without compensation. However, while away from their homes or regular places of business, Council and subcommittee members engaged in Council, or subcommittee business, approved by the DFO, may be allowed travel expenses, including per diem in lieu of subsistence, in the same manner as persons employed intermittently in Government service under Section 5703 of Title 5 of the United States Code.

13. **Ethics Responsibilities of Members.** No Council or subcommittee member will participate in any specific party matter in which the member has a direct financial interest in a lease, license, permit, contract, claim, agreement, or related litigation with the Department

14. **Subcommittees.** Subject to the DFO's approval, subcommittees may be formed for the purpose of compiling information and conducting research. However, such subcommittees must act only under the direction of the DFO and must report their recommendations to the full Council for consideration. Subcommittees must not provide advice or work products directly to the Agency. The Council Chair, with the approval of the DFO, will appoint subcommittee members. Subcommittees will meet as necessary to accomplish their assignments, subject to the approval of the DFO and the availability of resources.

15. **Recordkeeping.** Records of the Council, and formally and informally established subcommittees or other subgroups of the Council, shall be handled in accordance with General Records Schedule 6.2, and other approved Agency records disposition schedule. These records shall be available for public inspection and copying, subject to the Freedom of Information Act, 5 U.S.C. 552.



Secretary of the Interior

NOV 20 2015

Date Signed

DEC 03 2015

Date Filed

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