

**STAFF ANALYSIS
TEMPORARY SPECIAL ACTION
WSA19-04**

ISSUES

Wildlife Special Action WSA19-04, submitted by the Northwest Arctic Subsistence Regional Advisory Council (Council), requests closure of the cow moose season in Unit 23 for the 2019/20 regulatory year.

DISCUSSION

The proponent is concerned about declines in the Unit 23 moose population. The Council states that they would like to eliminate the cow moose season to conserve cows and, in turn, help the Unit 23 moose population recover. The Council also mentions that this request would align State and Federal harvest seasons and harvest limits, which would reduce user confusion in the area.

The applicable Federal regulations are found in 50 CFR 100.19(b) (Temporary Special Actions) and state that:

“...After adequate notice and public hearing, the Board may temporarily close or open public lands for the taking of fish and wildlife for subsistence uses, or modify the requirements for subsistence take, or close public lands for the taking of fish and wildlife for nonsubsistence uses, or restrict take for nonsubsistence uses.”

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—I moose

Bulls may be harvested *July 1 – 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, remainder—I moose

Bulls may be harvested *Aug. 1 - Dec. 31*

Cows may be harvested *Nov. 1 – Dec. 31*

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

Proposed Federal Regulations

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~~bull

~~Bulls may be harvested~~

July 1 – 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, remainder—1 ~~moose~~bull

~~Bulls may be harvested~~

Aug. 1 – Dec. 31

~~Cows may be harvested~~

~~Nov. 1—Dec. 31~~

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

Existing State Regulation

Unit 23—Moose

Unit 23, north of and including Singoalik River drainage

*Residents—One antlered bull by permit available in person at license vendors within Unit 23 villages June 1-July 15
or*

RM880

July 1–Dec 31

Residents—One bull with 50-inch antlers or antlers with 4 or more brow tines on at least one side

HT

Sept 1–Sept 20

Nonresidents

*No open
season*

Unit 23, remainder

*Residents—One antlered bull by permit available in person at license vendors within Unit 23 villages June 1-July 15
or*

RM880

Aug 1–Dec 31

Residents—One bull with 50-inch antlers or antlers with 4 or more brow tines on at least one side

HT

Sept 1–Sept 20

Nonresidents—One bull with 50-inch antlers or antlers with 4 or more brow tines on at least one side by permit

*DM872/874
-876/885*

Sept 1–Sept 20

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**).

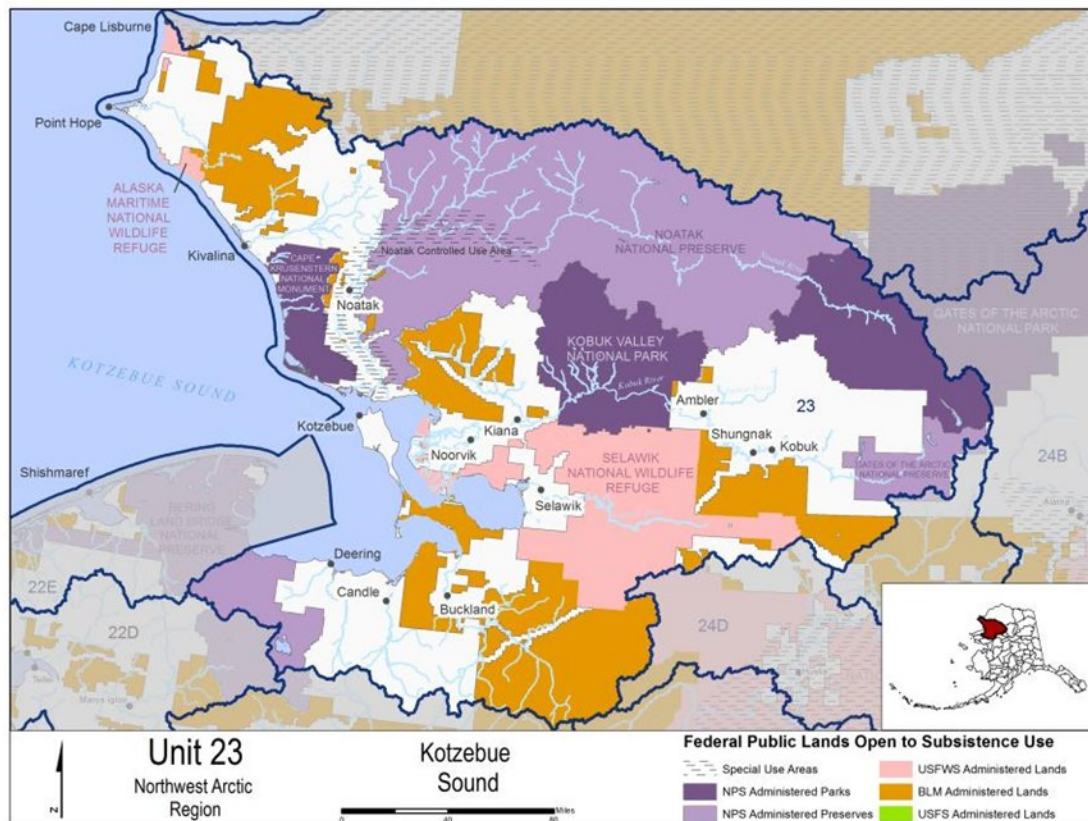


Figure 1. Federal public lands in Unit 23.

Customary and Traditional Use Determinations

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

Regulatory History

In 1994, the Federal moose hunt in Unit 23 consisted of three hunt areas: Unit 23 north and west of and including the Singoalik River drainage, and all lands draining into the Kukpuk and Ipewik rivers (Unit 23 NW), Unit 23 within the Noatak River drainage, and Unit 23 remainder. The harvest limit in each hunt area was one moose with a prohibition on the take of cows accompanied by calves. The season in the Unit 23 NW hunt area was July 1–Mar. 31; the season in the Noatak River drainage hunt area was Aug. 1–Sept. 15 and Oct. 1–Mar. 31, although antlerless moose could only be taken Nov. 1–Mar. 31; the season in Unit 23 remainder was Aug. 1–Mar. 31.

State moose regulations became more restrictive in 2003 when Alaska Board of Game (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 for better tracking of harvest.

In 2005, Proposal WP05-18, submitted by the Council, requested prohibiting the harvest of calves, shortening the season for moose in most of Unit 23 from July 1 (or Aug. 1)–Mar. 31 to Aug. 1–Dec. 31 (five month season), combining the Noatak drainage and remainder hunt areas, and allowing antlerless moose to be harvested only in November and December. The Federal Subsistence Board (Board) tabled this proposal in response to a Council recommendation to provide time for residents of local villages 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 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 hunt area be rescinded. The Board adopted WP06-54 under its consensus agenda.

In January 2017, the BOG adopted amended Proposal 36, changing the antlerless moose season in Unit 23 to one antlered bull due to conservation concerns (ADF&G 2017a). Of note, nonresident drawing permits had been reduced from 50 permits in 2016/17 to 34 permits in 2017/18 and, later in 2017, the Alaska Department of Fish and Game (ADF&G) cancelled the 2017/18 nonresident moose hunt in Unit 23, voiding all issued permits (ADF&G 2017a, 2017b, NWARAC 2017a, Saito 2017 pers. comm.).

In April 2017, the Board rejected Temporary Special Action WSA17-02, which requested that Federal public lands in Unit 23 be closed to moose harvest by non-Federally qualified users 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.

During the 2018/2020 regulatory cycle, the Council (WP18-41) and Louis Cusack (WP18-42) submitted similar proposals requesting changes to the Unit 23 moose season, including shortening the cow and overall moose seasons and aligning Federal and State hunt areas. Specifically, WP18-41 requested combining the Noatak River drainage and remainder hunt areas, changing the closing date of the bull season from Mar. 31 to Dec. 31, and restricting cow harvest to Nov. 1–Dec. 31. The Board adopted Proposal WP18-41 to protect the declining moose population and took no action on WP18-42.

In 2018, Emergency Special Action WSA18-04, which requested closing the cow moose season in Unit 23, was submitted to the Board. The Board approved with modification to close the Federal winter cow moose season and close moose hunting in Unit 23 except by Federally qualified subsistence users for the 2018/19 regulatory year. ADF&G also closed the non-resident moose season in Unit 23 and planned to continue the nonresident closure until moose populations rebound (NWARAC 2018a).

Controlled Use Areas

In 1988, the BOG established the Noatak Controlled Use Area (CUA) in part, “to help reduce harvests on a declining moose population” (ADF&G 1988:47, Alaska Board of Game 1995: 1). In 1990, the Noatak CUA was adopted under Federal subsistence regulations. The Noatak CUA is closed to the use of aircraft in any manner for big game hunting, including transportation of big game hunters, their hunting gear, and/or parts of big game from Aug. 15–Sep. 30. Currently, the Noatak CUA under State regulations consists of a corridor extending five miles on either side of, and including, the Noatak River beginning at the mouth of Agashashok River, and extending upstream to the mouth of the Nimiuktuk River. Currently, the Noatak CUA under Federal regulations consists of a corridor extending five miles on either side of the Noatak River beginning at the mouth of the Noatak River and extending upstream to the mouth of Sapun Creek.

In 2011, Selawik National Wildlife Refuge 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. The purpose of this closure was to minimize trespass on private lands and to reduce user conflicts (FWS 2011).

Current Events

Tribal and Alaska Native Claims Settlement Act (ANSCA) consultations were held on July 1, 2019, via teleconference. No Tribal or ANSCA representatives called in to provide comment.

A public hearing was held on July 11, 2019, in Kotzebue to provide members of the public an opportunity to comment on Temporary Special Action WSA19-04. Approximately five individuals attended the public hearing while another seven individuals listened to the hearing via teleconference. Three people provided testimony in person or via teleconference during the meeting. Of those that provided testimony, all three were in support of the Temporary Special Action.

An elder of Kotzebue mentioned that warmer temperatures and deep snow in the area are taking their toll on the moose population. It was mentioned that moose get stuck in deep snow and are vulnerable to predators and hypothermia. The elder said that he likes the idea of giving the cow moose a break and supports this request.

Likewise, a hunter from Anchorage mentioned that he was in support of this request to conserve moose in the area. He mentioned that he has noticed a shift in harvest by locals, from caribou to moose, due to low caribou numbers and that this request would help to preserve the moose population into the future.

A local Kotzebue resident commented that that this Special Action is a good idea and will give moose populations the chance to recover.

The State of Alaska submitted written comments in support of WSA19-04 (Appendix 1). The State mentioned that the moose population has declined from an estimate of 7,500 moose in 2017 to a current population estimate of 5,600. Composition counts have also demonstrated a continued trend of poor recruitment. The State mentioned that antlerless moose harvest should not occur in Unit 23 until the

moose population increases. It was also mentioned that WSA19-04 would align State and Federal moose hunting regulations in Unit 23.

The Council also submitted Proposal WP20-47 to mirror this Special Action Request and to require the use of a registration permit. This proposal will be taken up by the Board at the April 2020 meeting.

Biological Background

Moose first appeared in eastern Unit 23 during the 1920s, expanding their range from the east. Over the next several decades, moose spread northwest across Unit 23 to the Chukchi Sea coast (**Figure 2**) (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 objectives for moose in Unit 23 include (Saito 2014):

- Maintain a unit-wide adult moose population of 8,100–10,000 moose
 - Noatak River and northern drainages 2,000–2,300 moose
 - Upper Kobuk River drainage 600–800 moose
 - Lower Kobuk River drainage 2,800–3,400 moose
 - Northern Seward Peninsula drainages 700–1,000 moose
 - Selawik River drainage 2,000–2,500 moose
- Maintain a minimum fall ratio of 40 bulls:100 cows, except in the Lower Kobuk where bull:cow ratios are skewed by its disproportional use by maternal cows. The higher bull:cow ratio goals are due to the low densities and wide distribution of moose throughout Unit 23 (Saito 2014).

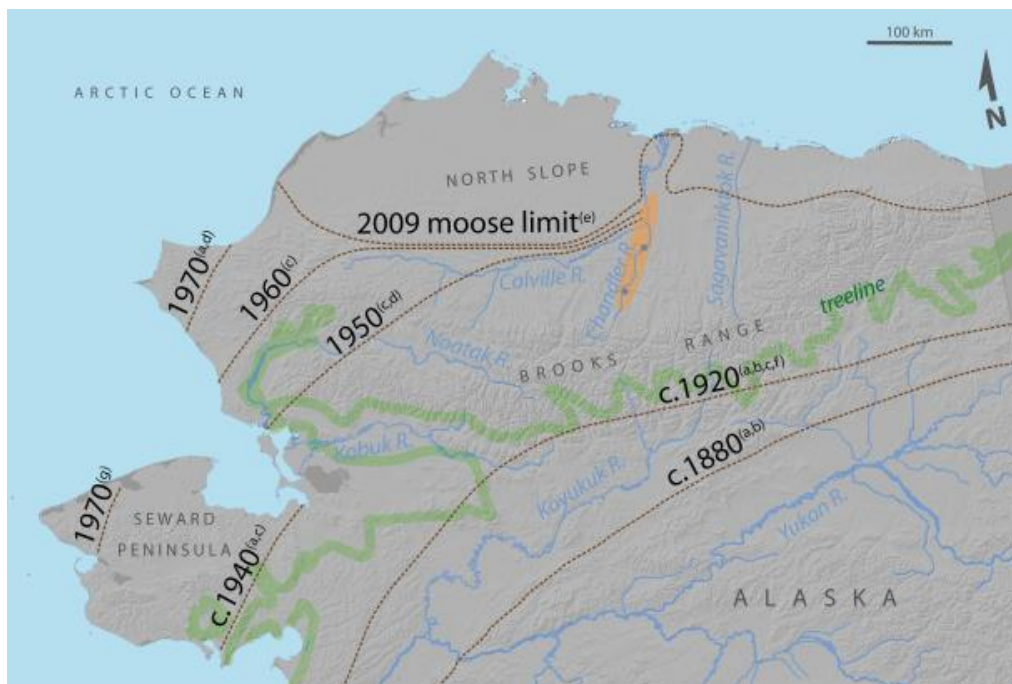


Figure 2. Temporal moose distribution changes in northern Alaska (figure from Tape et al. 2016).

ADF&G, in cooperation with Federal partners, conducts spring population and fall composition surveys for moose in Unit 23. Surveys are conducted within census areas on a rotating basis with each census area being surveyed approximately every five years (**Figure 3**) (Alaska Board of Game 2017). Census areas have fluctuated throughout the years due to time and financial constraints as well as evolving survey techniques (Saito 2017, pers. comm.). In 2012, the Squirrel River drainage was moved from the Lower Noatak census area to the Lower Kobuk census area (Saito 2014). In 2014, the Upper Kobuk census area was expanded to include previously unsurveyed areas (Saito 2017, pers. comm.). Current census areas are static for the foreseeable future.

Moose density is primarily influenced by local factors such as snow depth, fire frequency, forage availability, and predators (Gasaway et al. 1992, Stephenson et al. 2006, Boertje et al. 2009, Street et al. 2015). Therefore, moose in Unit 23 are not evenly distributed across the landscape, with some drainages experiencing higher densities of moose than others. Between 2001 and 2017, total moose densities ranged across census areas from 0.03-0.7 moose/mi² while adult moose densities ranged from 0.03-0.59 moose/mi² (**Table 1**) (Saito 2014, 2016a, pers. comm., Robison 2017).

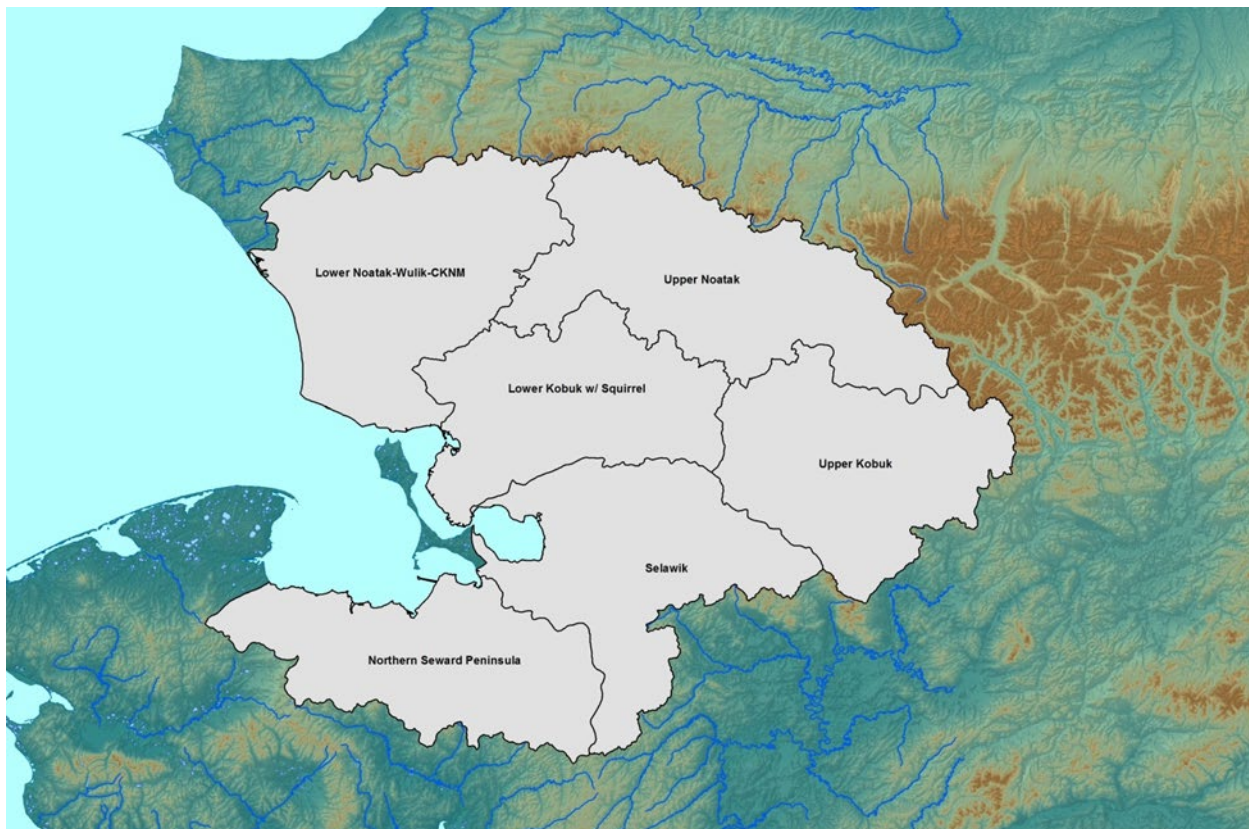


Figure 3. ADF&G moose census areas in 2017 (figure from Saito 2017, pers. comm.).

Table 1. 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., 2018 pers. comm., Robison 2017, NWARAC 2019).

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
	2018	--	866	--	--	--	--	--
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
	2019	--	601	--	--	--	--	23
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
	2017	796	1346	5338.0	--	0.25	--	15
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

Since 2009, the estimated moose population in every census area has declined (**Figure 4**) and the most recent population estimates are well below population objectives in every area except the Upper Kobuk, which just meets its lower population objective (**Table 2**) (Saito 2014, 2016a, pers.comm., Robison 2017, NWARAC 2019). An estimated 70% of the Unit 23 moose population is found in the Selawik, Lower Kobuk, and Lower Noatak River census areas (NWARAC 2018a). All three of these areas have experienced >40% population declines since 2011. (Note: Both the old (smaller) and new (larger) Upper Kobuk census areas were surveyed in 2014. The old census area data is depicted in **Figure 3** for better comparability across years while the new census area data is listed in **Table 2**).

In 2016 and 2017, ADF&G provided a unit-wide population estimate of 7,500 moose (ADF&G 2017a). In 2018, ADF&G estimated the Unit 23 moose population at 6,300 moose, representing a 16% decline in the unit-wide population estimate (NWARAC 2018a). The Council and the public have also repeatedly reported at recent meetings that there are noticeably less moose than in the past (NWARAC 2017b, 2018a).

ADF&G conducts composition surveys in the fall to estimate bull:cow and calf:cow ratios. In 2008, ADF&G changed the methodology of fall composition surveys, and data are not comparable between survey methods (Saito 2014). From 2004–2007, Unit 23 bull:cow ratios averaged 39 bulls:100 cows. Since 2008, bull:cow ratios have ranged across survey areas from 34–54 bulls:100 cows, although composition surveys are conducted sporadically (**Table 3**) (Saito 2014, 2016a pers.comm., 2018 pers.comm.). However, in all census areas with multiple composition surveys since 2008, bull:cow ratios have declined and are below or near the State management objectives (**Table 3**).

Fall calf:cow ratios of < 20 calves:100 cows, 20–40 calves:100 cows, and > 40 calves:100 cows may indicate declining, stable, and growing moose populations, respectively (Stout 2010). Since 2008, calf:cow ratios have ranged across survey areas from 4–24 calves:100 cows (**Table 3**) (Saito 2014, 2016a pers. comm., 2018 pers. comm.). These low ratios indicate the Unit 23 moose population is declining with the possible exception being the Lower Kobuk survey area, which has a larger percentage of maternal cows, where fall calf:cow ratios suggest a stable population while population estimates indicate a severely declining population (**Table 3**). During spring population surveys, ratios of calves:100 adults are also estimated as a measure of recruitment. Between 2001 and 2019, ratios ranged across survey areas from 7-23 calves:100 adults (Saito 2016a, pers. comm., 2018, pers. comm., Robison 2017, NWARAC 2019). No clear trend is detectable with ratios increasing over time in some survey areas and decreasing or fluctuating in others.

While predation by brown bears, black bears, and wolves affects moose population dynamics in Unit 23, the relative importance of predators in relation to other factors such as weather, snow depth, disease, and human harvest is unknown, although deep snow and icing events limit moose movements, increasing their susceptibility to predation (Saito 2014, Fronstin 2018 pers. comm.). Relatively high moose densities and calf:cow ratios in the Kobuk River delta, where predator populations are lower due to its proximity to year-round human travel routes, suggest predators may be affecting moose in the more remote portions of the unit (Saito 2014). However, preliminary results from the first 6 months of a 3-year calf survival study in the Lower Kobuk drainage indicate 60% (46 out of 77) of collared calves died from bear predation, which is comparable to other moose populations in Alaska (Hansen 2018 pers. comm., NWARAC 2018b).

As humans primarily harvest bull moose and bull:cow ratios have not substantially declined across years despite substantial population declines, human harvest may not be a limiting factor (NWARAC 2017a).

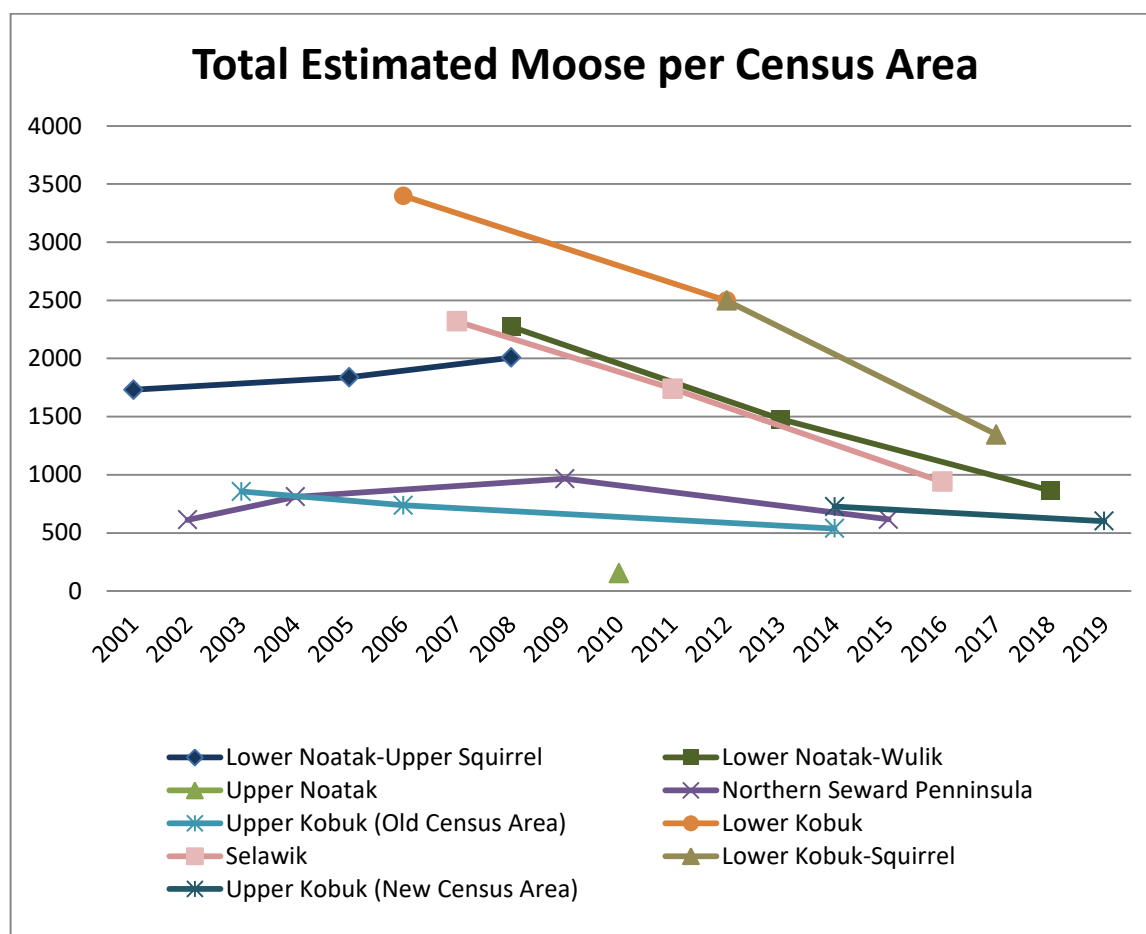


Figure 4. Total moose population estimates from 2001 to 2019 by census area. The old Upper Kobuk census area population estimates are shown here due to improved comparability across years (Robison 2017, Saito 2016a, pers. comm., NWARAC 2019).

Table 2. Comparisons across Unit 23 study areas of the most recent moose population estimates, population objectives, and harvestable surpluses. The harvestable surplus is calculated as 6% of the population. The Upper Kobuk census area represents the updated census area that was created in 2014. The spring 2017 and 2018 surveys in the Lower Kobuk and Lower Noatak-Wulik survey areas, respectively are incorporated in the table, but not into the extrapolated population total. Extrapolated total incorporates estimated populations in non-surveyed portions of Unit 23 (Robison 2017; Saito 2016a pers. comm., 2018 pers. comm.; NWARAC 2018a, 2019).

Unit 23 Study Area	Most Recent Survey Year	Population Estimate	Population Objective	% Below Population Objective	Harvestable Surplus
Noatak River Drainages	2010 (Upper) 2018 (Lower)	1,019	2,000-2,300	49	61
Lower Kobuk River Drainage	2017	1,346	2,800-3,400	52	81
Upper Kobuk River Drainage	2019	601	600-800	0	36
Selawik River Drainage	2016	940	2,000-2,500	53	56
Northern Seward Peninsula	2015	617	700-1,000	12	37
Total		4,523			271
Extrapolated 2017 Total		7,500			450
Extrapolated 2018 Total		6,300			378

Table 3. Bull:cow and calf:cow ratios in fall composition surveys conducted after 2007 (Saito 2014, 2016a pers. comm., 2018 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
	2017	38	24
Lower Noatak	2013	53	4
	2018	41	17
Northern Seward Peninsula	2009	53	4
Seward Peninsula	2014	34	16

Habitat is not thought to be a limiting factor (NWARAC 2018a). Moose rely on willow and shrub habitats for browsing and for cover from predators. Shrub and willow productivity, height, and cover have increased and expanded in Unit 23 in response to rising average temperatures (Tape et al. 2016). Taller vegetation provides more suitable cover and increased available forage above the snowpack (Tape et al. 2016). Wildfire (the primary driver of boreal forest succession) frequency and shrub habitat is also forecasted to increase in Northern Alaska as the Arctic climate warms, resulting in more moose habitat in Unit 23 (Joly et al. 2012, Swanson 2015). During a 2005 habitat survey in Unit 23, willows did not appear to be over-browsed by moose (Westing 2012). A 2017 browse survey, completed in the Lower Kobuk,

suggested that winter forage is not a limiting factor for moose populations (NWARAC 2018a). Twinning rates are another indicator of habitat and food limitations. In 2016, 41% of cows surveyed in Unit 23 had twins, further suggesting food is not a limiting factor and the population is not experiencing a density-dependent response (NWARAC 2018a).

Cultural Knowledge and Traditional Practices

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 Iñupiat 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).

Historically, the people of the Northwest Arctic lived in small family clusters that were spread widely across the landscape (Burch 1980: 265). It was not 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 Iñupiat 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 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 Iñupiat 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 made them more difficult to butcher and pack than caribou, and hunters often preferred 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 were 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). Although much of this information was collected more than 25 year ago, much of this still holds true today.

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 recent declines in the Western Arctic Caribou Herd (Dau 2015), moose may already be becoming a more prominently sought after resource for meeting subsistence needs in the region.

Harvest History

Harvest data is derived from State harvest reports and community household surveys. Community household surveys are used, in part, as a method to determine 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.

Between 2005 and 2018, total reported moose harvest in Unit 23 ranged from 55-189 moose, averaging 137 moose (**Table 4**) (ADF&G 2016, 2018a, 2019). The lowest reported harvest was in 2018, after ADF&G cancelled the nonresident moose season and Federal public lands were closed to moose harvest except by Federally qualified subsistence users (WSA18-04). Local resident (residents of Unit 23), nonlocal resident, and nonresident reported harvest averaged 73 moose (54%), 42 moose (31%), and 21 moose (15%) per year, respectively (**Table 4**) (ADF&G 2016, 2018a, 2019). Cows comprised 7% of the annual reported harvest on average, with 1-21 cows being harvested each year, although the actual cow harvest is likely double what is reported (Alaska Board of Game 2017). The vast majority of moose are harvested in September (**Figure 5**) (WINFONET 2017). Since 2006, more moose have been harvested from the Kobuk River drainage than from other drainages within Unit 23 (**Figure 6**) (ADF&G 2017a).

Table 4. Reported moose harvest in Unit 23 for 2005-2018 from ADF&G harvest ticket and permit reports (ADF&G 2016, 2018a, 2019).

Year	Local Resident Harvest	Nonlocal Resident Harvest	Nonresident Harvest	Total Harvest	Male	Female	Unknown Sex
2005	65	41	41	148	137	10	1
2006	79	49	30	159	150	7	2
2007	64	29	25	123	116	7	0
2008	62	48	40	151	143	7	1
2009	80	50	23	155	144	10	1
2010	102	63	22	189	169	17	3
2011	72	45	26	144	133	11	0
2012	75	57	24	156	146	10	0
2013	88	53	21	164	151	12	1
2014	74	40	10	124	109	14	1
2015	85	59	20	165	144	21	0
2016	63	18	11	95	90	4	1
2017	66	18	0	84	78	5	1
2018	42	13	0	55	54	1	0
Average	73	42	21	137	126	10	1

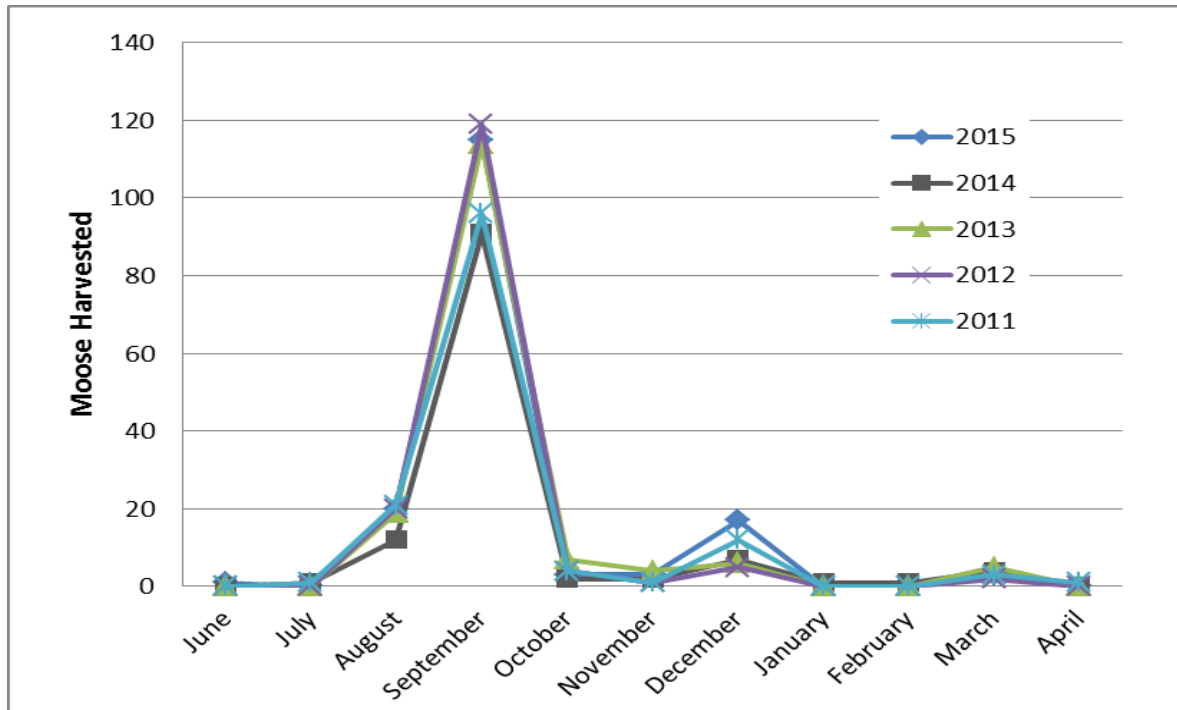


Figure 5. Moose harvest, by month, for Unit 23 from 2011-2015 according to State harvest reports (WINFONET 2017).

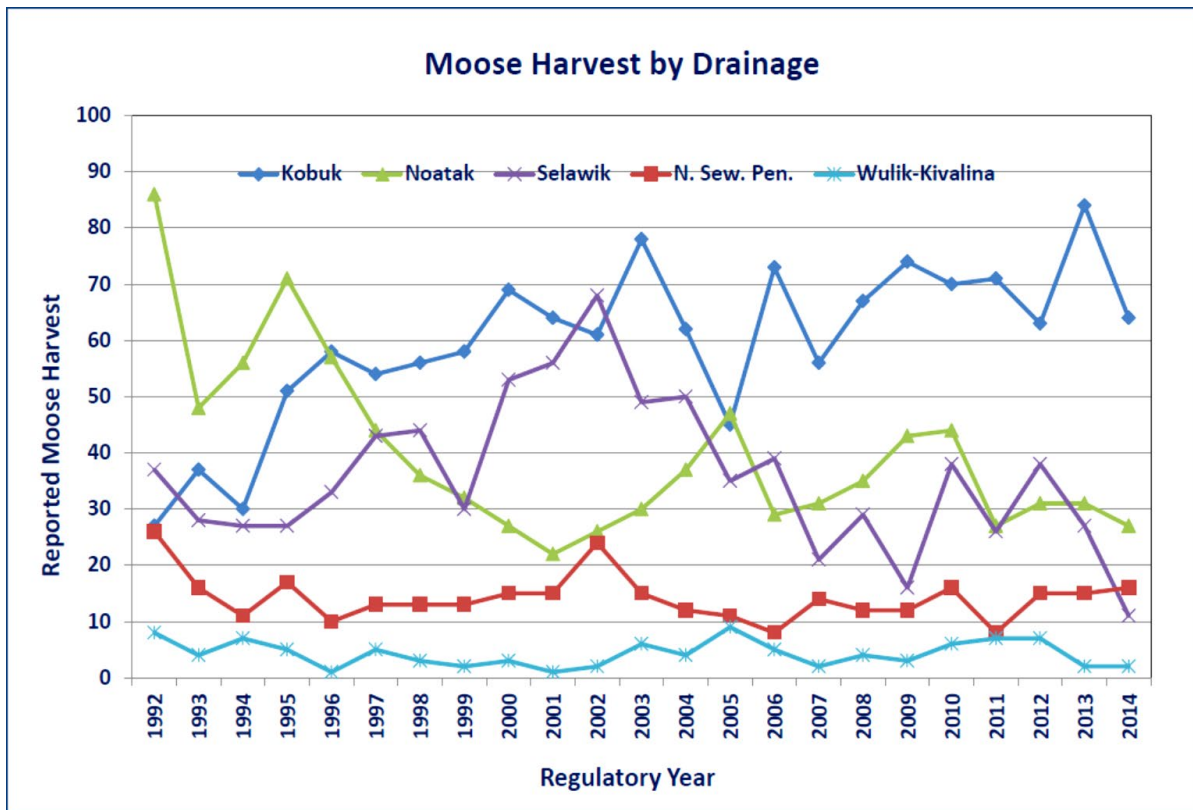


Figure 6. Moose harvest, by drainage, among users of Unit 23 from 1992-2014 according to State harvest reports (figure from ADF&G 2017a).

Since 2000, community household survey data has indicated 350–450 moose are harvested each year by local residents (Saito 2014). In regulatory year 2012/13 specifically, ADF&G estimated moose harvest by local residents as 342 moose (**Table 5**) (Saito 2014). The only community household survey data available for the number of cow moose harvested by local residents are for 2008 and 2009 in the villages of Noorvik, Shungnak, Ambler, Buckland, Kiana, and Kobuk. These data indicate 3 out of 67 total moose harvested were cows, although 6 moose were of unknown sex (ADF&G 2018b).

Table 5. Estimated moose harvest in Unit 23 villages from community harvest estimates 1991-2013 (Saito 2014).

Village	Year of Survey	Mean human population in survey years	Mean number of moose reported harvested	Per capita moose harvest	Estimated village population in 2012	Estimated annual moose harvest in 2012-2013
Ambler	2002, 2009, 2012	271	10	0.04	283	11
Buckland	2003, 2009	421	13	0.03	421	13
Deering	1994, 2007	159	8	0.05	153	8
Kiana	1999, 2006, 2009	387	13	0.03	378	13
Kivalina	1992, 2007, 2010	380	11	0.03	367	11
Kobuk	2004, 2009, 2012	135	6	0.04	164	7
Kotzebue	1991, 2013	3,362	154	0.05	3,076	154
Noatak	1994, 1999, 2001, 2007, 2010, 2011	481	7	0.02	545	11
Noorvik	2002, 2008, 2012	621	35	0.06	585	35
Point Hope	1992	685	14	0.02	674	14
Selawik	1999, 2006, 2011	797	50	0.06	856	51
Shungnak	1998, 2002, 2008, 2012	258	12	0.05	275	14
Unit 23 Total					7,777	342

ADF&G calculates the harvestable surplus of moose in Unit 23 as 6% of the population (Saito 2016a, pers. comm.). As the 2018 unit-wide population estimate is 6,300 moose, 378 moose is the estimated harvestable surplus. Reported harvest by nonlocal residents and nonresidents (~67 moose/year) combined with community household survey harvest estimates for local residents (350–450 moose/year) indicate that total Unit 23 moose harvests likely exceed the harvestable surplus. While the State has closed the nonresident season, and nonlocal resident reported harvest declined in 2016 and 2017 (**Table 4**), harvest estimates by local residents alone may still exceed the harvestable surplus (Saito 2014).

Harvest within individual drainages may be particularly high or have disproportionate effects on the population. For example, ADF&G estimates that approximately 70 moose are taken from Selawik drainage each year, which translates to a 7% harvest rate (**Table 2**) (NWARAC 2016). 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). The Lower Kobuk River drainage hosts a

disproportionate number of maternal cows, possibly because this area appears to support fewer large predators due to its proximity to human travel corridors (Saito 2014). More moose are also harvested from the Kobuk River drainage than any other drainage (**Figure 6**). This suggests cow moose in the Kobuk River drainage are particularly susceptible to harvest, although the taking of cows with calves is prohibited under both State and Federal regulations. While recent restrictions to State regulations have decreased reported moose harvest, decline of the Western Arctic Caribou Herd has likely increased moose harvest by local residents trying to meet their subsistence needs (Saito 2014, NWARAC 2017b, 2018a). During recent Council meetings, subsistence users have commented on the importance of moose as a subsistence resource, particularly when caribou are scarce (OSM 2017, NWARAC 2017b, 2018a).

Other Alternatives Considered

One alternative considered is, in addition to closing the cow moose season to Federally qualified users, closure of Federal public lands in Unit 23 to moose hunting by non-Federally qualified users may be warranted for the continuation of subsistence uses. The estimated 2018 harvestable surplus is 378 moose. As harvest estimates for Federally qualified subsistence users (local residents) are 350-450 moose per year, the harvestable surplus may be met or exceeded by local resident harvest alone. Additionally, bull:cow ratios have declined in all census areas (**Table 3**).

Due to recent declines in the Western Arctic Caribou Herd population, local subsistence users are depending more on moose to meet their subsistence needs (NWARAC 2017b, 2018a). Therefore, moose harvest by Federally qualified subsistence users has likely increased in recent years. Local residents have also emphasized that non-Federally qualified and Federally qualified subsistence users should share the burden of restricted moose harvest; this burden should not be put upon Federally qualified subsistence users alone who depend on moose to increase their food security (NPS 2016, OSM 2017, NWARAC 2017b, 2018a).

While the State closed the non-resident moose hunt in Unit 23, starting in the 2017/18 regulatory year, nonlocal residents still harvest approximately 44 moose from Unit 23 each year. While nonlocal resident harvest comprises only 12% of the harvestable surplus, ANILCA mandates a rural subsistence priority and indicates restrictions to non-Federally qualified users are necessary if resources are limited.

Due to comments shared by the Council at their April 2019 meeting, this alternative was not considered further. At this meeting, the Council shared their apprehension about closing Federal public lands due to the possibility of concentrating non-local hunters on State lands near the villages.

A second alternative could be to modify the harvest limit to “one antlered bull” rather than “one bull”. This alternative could further limit cow harvest, as well as cow harassment by hunters, by ensuring that a cow is not inadvertently harvested when the user believes they are targeting an antlerless bull in December, after antlers have dropped. However, this alternative would limit Federally qualified subsistence users from harvesting antlerless bulls during a month when moose harvest is important to users who were not able to harvest a moose in the fall. Due to December serving as an important month for moose harvest by Federally qualified subsistence users in Unit 23, and the fact that Council and public input on such a modification was not possible during this special action process, this alternative was not further considered.

Effects of the Proposal

If this Special Action is approved, the Federal subsistence cow moose season in Unit 23 will be closed for the remainder of the 2019/20 season. This would decrease opportunity for Federally qualified subsistence users as fewer moose would be available for harvest. However, Federally qualified subsistence users would still be able to harvest bull moose during the winter season under either Federal or State regulations. Approval of WSA19-04 would also align State and Federal moose seasons in Unit 23 for the 2019/20 regulatory year, which could decrease user confusion and regulatory complexity.

Approval of WSA19-04 could also aid in the recovery of the Unit 23 moose population. There are substantial conservation concerns that threaten the viability of the population. Surveys indicate substantial declines in almost every survey area (**Figure 3**), population estimates are below State objectives, and calf:cow ratios are below 20:100, which indicates a declining population. The Selawik, Lower Noatak, and Lower Kobuk census areas, where most of the moose in Unit 23 reside, have experienced > 40% population declines since 2011. Moose densities vary by drainage and winter populations can be highly concentrated near villages, making them more susceptible to harvest. While most of the land immediately surrounding villages are Native lands that are already closed to cow moose harvest under State regulations, Federal lands are within 10-15 miles of every village in Unit 23.

Additionally, the harvestable surplus has likely been exceeded. While harvest data show relatively few cows are harvested, conserving cows is particularly important in maintaining a healthy moose population as cow moose are the engine of population growth (NWARAC 2017a). Typically, cow moose harvest is only permitted in populations showing signs of nutritional stress and/or to limit a growing population (ADF&G 2008). Cow harvest is not advised in areas with low or declining moose populations (ADF&G 2008) such as Unit 23. Closing the cow season would help the population recover more quickly and curtail further declines, especially in drainages where moose congregate during winter months. As the cow moose season is closed under State regulations, approving this request would result in no legal harvest of cow moose in Unit 23 for the remainder of the 2019/20 regulatory year.

OSM CONCLUSION

Support Wildlife Special Action WSA19-04.

Justification

There are serious population viability concerns for the Unit 23 moose population due to substantial declines in population estimates, low calf:cow ratios, and likely exceedance of the harvestable surplus. Actual cow moose harvest is likely double what is reported. Since cow moose are the keystone to population growth, conserving cows is essential to maintaining a healthy moose population. Cow moose harvest is not recommended in a low density, declining population. Closing the cow season should help the Unit 23 moose population recover more quickly and prevent further declines. While approval of this special action reduces opportunity for Federally qualified subsistence users to harvest cow moose, they will still be able to harvest bulls during the winter season under both Federal and State regulations.

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APPENDIX 1



THE STATE
of **ALASKA**
GOVERNOR MICHAEL J. DUNLEAVY

Department of Fish and Game

OFFICE OF THE COMMISSIONER
Headquarters Office

1255 West 8th Street
P.O. Box 115526
Juneau, Alaska 99811-5526
Main: 907.465.6136
Fax: 907.465.2332

MEMORANDUM

TO:	Anthony Christianson, Chair Federal Subsistence Board	DATE:	July 17, 2019
FROM:	Ben Mulligan <i>BJM</i> Deputy Commissioner	PHONE:	267-2190
		SUBJECT:	Wildlife Special Action Request 19-04

The Alaska Department of Fish and Game (ADF&G) appreciates the opportunity to provide comments on Wildlife Special Action request 19-04 (WSA19-04). WSA 19-04 was submitted by the Northwest Arctic Subsistence Regional Advisory Council to close the cow moose harvest season in Unit 23.

ADF&G supports this change that would align state and federal moose hunting regulations in Unit 23. During the January 2017 Board of Game meeting the Department requested the Board not reauthorize the antlerless moose hunts in Unit 23 due to the widespread declines in moose abundance in Unit 23. At that time the Department estimated that there were about 7500 moose in the unit. Since then, additional abundance estimates have been calculated and a downward trend in moose numbers has continued. The current population is estimated at about 5600 moose.

Composition counts have been conducted in several parts of Unit 23 in the past few years (2014-2018). These counts demonstrate a continued trend of poor recruitment. Calf to cow ratios have been in the mid-teens for many of the count areas and some areas have been as low as 7 calves per 100 cows. The only time the ratio has been above 20 calves per 100 cows is in the Upper Kobuk count area in 2018 when the calf to cow ratio was 27 calves per 100 cows. Poor recruitment and the downward trend in the moose population indicates the taking of cows is not warranted at this time.

Year	Area	Calves per 100 Cows
2014	N. Seward Peninsula	16
2015	Selawik	7
2016	Lower Kobuk	15
2017	Lower Noatak	17
2018	Upper Kobuk	27

Antlerless moose harvest should not occur in Unit 23 until moose abundance increases. Ongoing browse utilization research focused on browse removal rates; and surveys to determine twinning rates, and calf survival will inform managers as to at what level the population should increase to before antlerless hunts again occur.

cc: Eddie Grasser, Director, ADF&G, Division of Wildlife Conservation
Lisa Olson, Assistant Director, ADF&G, Subsistence
Cheryl Brooking, Assistant Attorney General, Department of Law
George Pappas, State Liaison, Office of Subsistence Management

INTERAGENCY STAFF COMMITTEE RECOMMENDATION

Support Wildlife Special Action WSA19-04.

The OSM staff analysis provided a thorough and accurate evaluation of the Temporary Wildlife Special Action Request. The moose population in Unit 23 is in decline and there are serious concerns for its viability. Elimination of the cow moose season is necessary to address these concerns. Closing the cow season is likely to help the Unit 23 moose population recover more quickly and prevent further declines. Approval of this special action reduces opportunity for Federally qualified subsistence users to harvest cow moose. However, they will still be able to harvest bulls during the winter season under both Federal and State regulations

In 2018 the Federal Subsistence Board approved Emergency Special Action WSA18-04 with modification to close the Federal (Nov. 1 – Dec. 31, 2018) winter cow moose season and close moose hunting on public lands in Unit 23 except by Federally qualified subsistence users. Closure to non-Federally qualified users may again be warranted due to the limited harvestable surplus, to allow for continuation of subsistence uses, and to provide a priority for Federally qualified subsistence users as mandated by ANILCA. However, the Northwest Arctic Subsistence Regional Advisory Council (Council) stated concerns at its spring 2019 meeting that a closure to non-Federally qualified users could be detrimental to Federally qualified subsistence users due to the potential for this action to concentrate non-Federally qualified users on State-managed lands in Unit 23. For this reason, the ISC is not recommending a modification to include a closure for moose hunting by non-Federally qualified users hunting on Federal public lands in Unit 23. The Board will have an opportunity to consider further action when deliberating Proposal WP20-47 which requests closure of the cow moose season and to require the use of a State registration permit (RM880) to harvest moose in Unit 23. The proposal process will allow for additional input from the public and the Council.

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