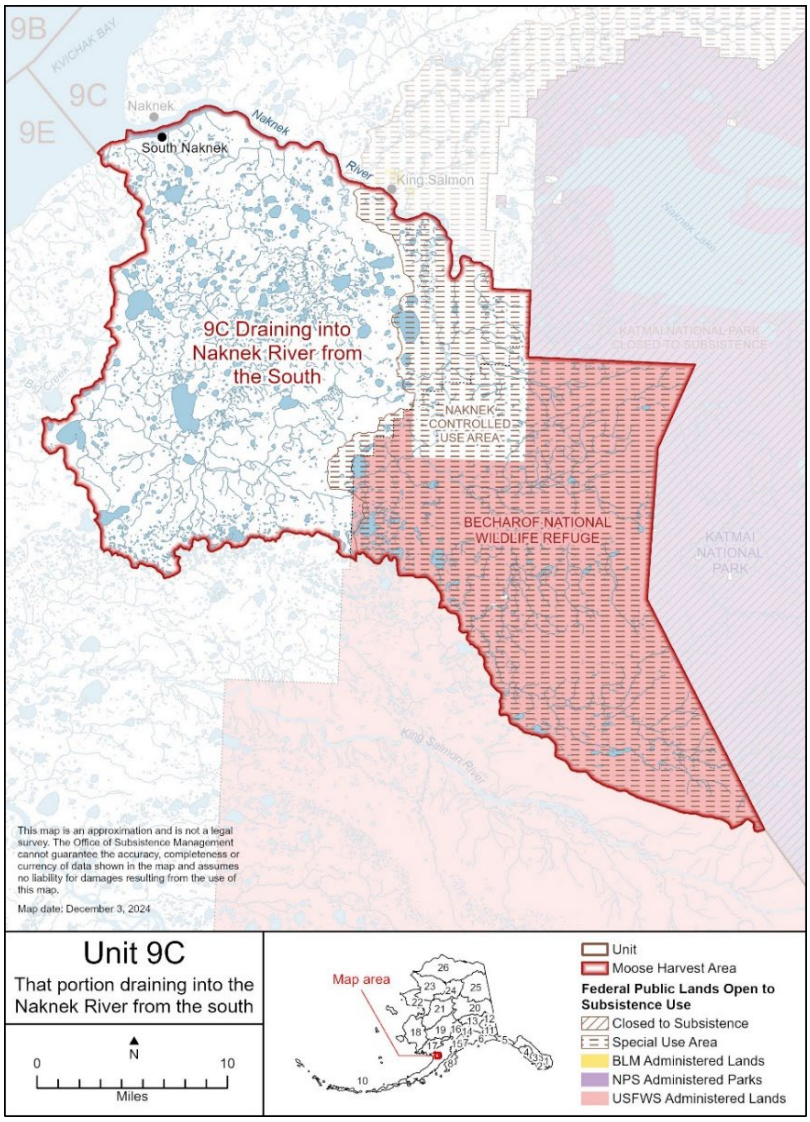
Draft Wildlife Closure Review
WCR26-05

ISSUE: Wildlife Closure Review WCR26-05 reviews the Federal public lands closure during December for the hunting of moose, except by federally qualified subsistence users hunting under these regulations in Unit 9C, south of the Naknek River drainage. It is the Federal Subsistence Board's (Board) policy that Federal public lands should be reopened when closures are no longer necessary, and that closures will be reviewed at least once every four years. The purpose of this review is to determine if these closures are still warranted.

Closure Location and Species: Unit 9C (South of Naknek River drainage) (**Map 1**)– Moose



Map 1. Unit 9C, south of the Naknek River drainage. The closure applies to the Federal public lands within this hunt area.

Closure Dates: December 1—31

Current Federal Regulations

Unit 9C—Moose

Unit 9C, that portion draining into the Naknek River from the south—1 bull by State registration permit.	*Aug. 20-Sept. 20*
Public lands are closed during December for the hunting of moose, except by federally qualified subsistence users hunting under these regulations	*Dec. 1-31*

Current State Regulations

Unit 9C−Moose

Unit 9C	*Residents: One bull by permit available online at http://hunt.alaska.gov or in person in King Salmon beginning Aug. 15*	*RM272*	*Sept. 1-25*
	OR		
	Residents: One antlered bull by permit available online at http://hunt.alaska.gov or in person in King Salmon beginning Nov. 14	*RM272*	*Dec. 1-Jan. 15*
	Nonresidents: One bull with 50-inch antlers or antlers with 3 or more brow tines on at least one side by permit available at http://hunt.alaska.gov or in person in King Salmon beginning Aug. 15	*RM282*	*Sept. 5-20*

Regulatory Year Initiated: 1992

Closure last reviewed: 2022—WCR22-05

Justification for Original Closure

Section 815(3) of ANILCA states:

> *Nothing in this title shall be construed as – (3) authorizing a restriction on the taking of fish and wildlife for nonsubsistence uses on public lands (other than national parks and monuments) unless necessary for the conservation of healthy populations of fish and wildlife, for the reasons set forth in section 816, to continue subsistence uses of such populations, or pursuant to other applicable law…*

In 1992, the Board adopted Proposal P92-45 with modification, addressing conservation concerns over the Unit 9C moose population. A primary issue was whether this population could withstand the continued harvest of cow moose. To protect the population and provide a priority for subsistence users in Unit 9C south of the Naknek River, a bulls-only harvest limit was established for the fall season, a quota of five antlerless moose was established for the December season, and Federal public lands were closed to moose hunting, except by federally qualified subsistence users during December (OSM 1992).

Council Recommendation for Original Closure

Although local residents desired an antlerless moose season, the Bristol Bay Subsistence Regional Advisory Council (Council) questioned whether the Unit 9C moose population could sustain a cow harvest. To protect the population and to provide a priority to federally qualified subsistence users, the Council believed that a bulls-only harvest limit should be established and that Federal public lands draining into the Naknek River from the south should be closed to non-federally qualified subsistence users. The Council believed that this would result in a greater number of bulls available for subsistence users and a larger cow base for population expansion in the future.

State Recommendation for Original Closure

The State recommended that the entire Naknek River drainage be closed to the taking of antlerless moose during the State's December season. Their recommendation was based on their concern for the population of moose north of the Naknek River in the King Salmon Creek drainage. The original recommendation from the State to close the antlerless season was presented in P92-46 but was addressed by the Board via its action on P92-45.

Extent of Federal Public Lands

Unit 9C is comprised of 85% Federal public lands and consists of 92% National Park Service (NPS) managed lands, 4% Bureau of Land Management (BLM) managed lands, and 4% U.S. Fish and Wildlife Service (USFWS) managed lands.

Unit 9C, that portion draining into the Naknek River from the south is comprised of 40% Federal public lands all of which are USFWS managed lands.

Customary and Traditional Use Determination

Rural residents of Units 9A, 9B, 9C, and 9E have a customary and traditional use determination for moose in Unit 9C.

Regulatory History

As early as 1990, the Alaska Department of Fish and Game (ADF&G) had issued Emergency Orders closing the December antlerless moose hunt in all or parts of the Naknek River drainage in Unit 9C. These antlerless hunts were originally intended to prevent the moose population from outgrowing available habitat (OSM 1992). In 1992, in response to evidence that the moose population was relatively stable, several proposals were submitted to restrict or eliminate antlerless moose harvest in the Naknek River drainage. Proposal P92-45, submitted by ADF&G, proposed that the harvest limit be changed from 1 moose to 1 bull moose in the entire drainage. Proposal P92-47, submitted by the BLM, also proposed restricting harvest to one bull, but only in the portion of Unit 9C that drains into the Naknek River from the north. Proposal P92-46, submitted by the Alaska Peninsula/Becharof National Wildlife Refuge (Refuge), proposed a harvest limit of one bull for the Sept. 1 – 15 season, and the establishment of an antlerless moose quota of five for the Dec. 1 – 31 season. The Federal Subsistence Board (Board) rejected proposals P92-46 and P92-47 but adopted P92-45 with modification to incorporate some of the elements of the former two proposals. As a result of the Board's action, the Naknek drainage was divided into two hunt areas. For the area draining into the Naknek River from the north, harvest was restricted to one bull for both the Sept. 1—15 and the Dec. 1—31 seasons. Harvest during the December season required the use of a Federal registration permit. In the area draining into the Naknek River from the south, harvest was limited to one bull for the Sept. 1—15 season. For the Dec. 1—31 season, a quota of five antlerless moose was established, by Federal registration permit only. Additionally, Federal public lands in this hunt area were closed to moose hunting during December except by federally qualified subsistence users (OSM 2016a).

In 1993, Proposal P93-39 was submitted by the Office of Subsistence Management (OSM) to clarify the regulations resulting from the Board's action on P92-45. Ambiguous regulatory language had resulted in confusion about whether or not the antlered bull season would remain open once the antlerless quota was reached (OSM 1993). The Board adopted P93-39, clarifying that the antlered bull season would remain open even if the antlerless moose quota was reached (OSM 2016a).

In 1995, the Bristol Bay Native Association submitted Proposal P95-30. It requested that the fall moose season in the portion of 9C draining into the Naknek River from the south be extended from Sept. 1 – 15 to Aug. 20 – Sept. 15, and that a Federal registration permit be required for the August portion of the fall season. It also requested that the harvest limit be changed from one antlered bull to one bull for both the fall and winter seasons and that the allowance for the harvest of five antlerless moose be eliminated. Finally, it requested that the closure of Federal public lands to non-federally qualified subsistence users during the December season be rescinded (OSM 1995). The Board adopted

P95-30 with modification as recommended by the Council, which extended the fall season as proposed, and required the use of a Federal registration permit during August. This action did not result in changes to harvest limits or restrictions, nor did it address the closure (OSM 2016a).

However, harvest restrictions were addressed in 1998, when the Board considered Proposal P98-50. This proposal was submitted by the Alaska Peninsula/Becharof NWR and requested that the harvest limit of one antlered bull be changed to one bull in Units 9A, 9B, 9C in the Naknek River drainage, and 9E. This request addressed hunts that were more restrictive under Federal regulations than under State regulations (OSM 1998). With the Board's adoption of P98-50 (OSM 2016a), Federal and State harvest limits and restrictions for moose in Unit 9 were aligned.

In 2006, Proposal WP06-24, submitted by ADF&G, requested elimination of the December antlerless hunt in Unit 9C, citing a declining population and insufficient calf recruitment (OSM 2006). The Board adopted WP06-24 with modification as recommended by the Council, which resulted in elimination of antlerless hunt, but required a Federal registration permit for the entirety of the fall and winter seasons (OSM 2016a).

In 2008, Proposals WP08-30 and WP08-31, addressing moose in Units 9B and 9C, were submitted by the Council. Proposal WP08-30 requested a shorter moose season in Unit 9B while WP08-31 requested a closure of Federal public lands to non-federally qualified users in Units 9B and 9C (OSM 2008). The Council's support of WP08-30 was contingent upon adoption of WP08-31. After extensive discussion and input from the State of Alaska and the Council Chair, the proposals were deferred by the Board so a working group could be formed to identify other management options that would address conflicts in Unit 9 subunits (FSB 2008).

Based on the direction given by the Board, OSM provided funding for, and worked in cooperation with, ADF&G to initiate a Unit 9 Moose Working Group (Working Group). The Working Group was established to better understand the conflicts in the region and to develop management strategies and recommendations. Subsequently, the Council submitted a number of proposals (WP10-47, -48, -49, -50, -52) to address user conflicts. In May 2010, the Board considered those proposals, as well as proposals WP10-45 (deferred WP08-30) and WP10-46 (deferred WP08-31). The Board deferred all of these proposals, consistent with the recommendations of the Council, until the Working Group could finish its work (FSB 2010).

The Working Group discussed a number of management strategies and came to consensus on three recommendations (ADF&G 2010):

- Submit proposals to the Alaska Board of Game and the Federal Subsistence Board to create a registration permit for all moose hunts in Unit 9.
- Conduct educational outreach directed at local moose hunters.
- Offer educational trapping seminars in the Unit 9 villages.

To address the need for more data and better exchange of information between local residents and ADF&G, the Working Group proposed creating a registration permit hunt for moose throughout Unit

9. The requirements of this permit would increase information available to wildlife managers about the moose hunt through hunter reports. In addition, such a hunt would increase exchange of information between biologists and moose hunters during the permit distribution process. This hunt would also allow managers to redistribute hunting pressure to help reducing user conflict.

In March 2011, the Alaska Board of Game (BOG) adopted Proposal 14, which was submitted by the Working Group. The proposal requested the establishment of registration permit hunts for moose in Unit 9. At this meeting, the BOG also adopted Proposal 17, which extended the moose season five days in Units 9C and 9E (Alaska Board of Game 2011). In Unit 9C, this changed the end date from Sept. 15 to Sept. 20. Based on the actions of the BOG, the Council supported aligning, to the maximum extent possible, Federal regulations for moose hunting in Unit 9 with the changes made in State regulation (BBSRAC 2011).

In 2012, the Board addressed deferred Proposals WP10-45, -46, -47, -48, -50 and -52. WP10-45 requested a change to the moose season dates in a portion of Unit 9. Proposals WP10-46, WP10-49 and WP10-50 requested that portions of Unit 9 be closed to the taking of moose by non-federally qualified users. Proposals WP10-47, WP10-48 and WP10-52 requested that non-federally qualified users be restricted from hunting moose on Federal public lands in portions of Unit 9 within a two mile wide corridor on either side of waterways. All of the proposals were originally deferred by the Board during its May 2010 meeting, pending the outcome of the Unit 9 Moose Working Group process (OSM 2012). In 2012, the Board rejected Proposals WP10-46, -47, -48, -49, -50 and -52 and adopted Proposal WP10-45 with modification to require a State registration permit to harvest moose during the fall season in Unit 9 and to add an additional 5 days to the fall seasons in Units 9C and 9E (FSB 2012). In Unit 9C, this changed the season end date from Sept. 15 to Sept. 20, consistent with State regulation.

The Council reviewed this closure during their winter 2016 meeting, voting to maintain status quo. Subsistence users had continued to express concerns over low moose densities and limited moose harvest in Unit 9C. As the status of the moose population was uncertain due to lack of biological data and surveys, a conservative approach was recommended by OSM and supported by the Council.

In 2015, the Alaska Peninsula/Becharof NWR submitted Emergency Special Action Request WSA15-01, requesting that a Federal permit be required for the fall 2015 season on Federal public lands within the Refuge. This request was submitted due to concern that the existing requirement for a State permit, with a later season opening date (Sept. 1 vs. Aug. 20), would result in confusion. Since there was already a Federal registration permit required for the December moose season in the affected portion of Unit 9C, the fall season dates could simply be added to that permit (OSM 2015). The Board approved WSA15-01 in March 2015 (OSM 2016a).

In 2016, WP16-22 submitted by the Alaska Peninsula Becharof NWR requested that a Federal registration permit be required to hunt moose in the portion of Unit 9C draining into the Naknek River from the south for the same reason given in WSA15-01. It also requested that a State registration permit be required for reporting purposes (OSM 2016b). The State agreed to print the Federal season dates on the State registration permit and, as a result, the Board adopted WP16-22 with modification to

require a State permit for both the fall and winter seasons (OSM 2016a).

The Board also considered Proposal WP16-24 in 2016. This proposal was submitted by Richard Wilson of Naknek and requested that Federal lands in Unit 9B and 9C be closed to moose harvest except by federally qualified subsistence users. This proposal was based on the belief that limiting harvest to local residents would be an appropriately conservative management approach, given the lack of current moose population estimates (OSM 2016c). The Board rejected this proposal, consistent with the recommendation of the Council. The Council stated the proposal did not meet the requirements necessary for a closure but they agreed that updated biological information for this moose population was needed (OSM 2016a).

In August 2020, the Board approved a revised closure policy, which stipulated that all closures will be reviewed every four years. The policy also specified that closures, similar to regulatory proposals, will be presented to the Councils for a recommendation and then to the Board for a final decision. Previously, closure reviews were presented to Councils who then decided whether to maintain the closure or to submit a regulatory proposal to modify or eliminate the closure.

In 2022, the BOG adopted State Proposal 204, which lengthened the moose seasons in Units 9B and 9C and aligned hunt areas in Unit 9C under State regulations. This regulation change added 20 days total to the Unit 9C moose season, five days at the end of the fall season and 15 days at the beginning of the winter season (Dec. 1—Jan. 15) (ADF&G 2022). The moose population had rebounded since the lows around 2010. The calf:cow and bull:cow ratios were above management objectives, indicating there were additional animals to harvest and no conservation concern (ADF&G 2022).

Also in 2022, the Board voted to maintain status quo on WCR22-05, which reviewed this closure. The Unit 9C moose density was low, and the population trend was uncertain. Maintaining the closure continued the meaningful subsistence priority. The conservative approach was to maintain the closure until population trend becomes more certain and the moose population increases.

Controlled Use Areas

The Naknek Controlled Use Area (CUA) is closed to the use of any motorized vehicle except an aircraft, boat, or snowmachine for hunting, including transportation of hunters, their hunting gear, and/or parts of game, from Aug. 1—Nov. 30 under State and Federal regulations. However, this does not apply to a motorized vehicle on the Naknek-King Salmon, Lake Camp and Rapids Camp roads and on the Pike Ridge and King Salmon Creek Trails, and on frozen surfaces of the Naknek River and Big Creek.

Biological Background

Since the early 20th century, moose on the Alaska Peninsula gradually expanded their range southwestward. This expansion was accompanied by a dramatic population increase until the 1960s, when the population peaked and then began to decline. Biologists believe that range damage from over-browsing led to the decline (Butler 2010). Even after a series of hunting restrictions and

improvements in range conditions, the moose population in some subunits declined as much as 60% from its peak in the 1960s. During the 1990s and early 2000s, the Unit 9 moose population was likely stable to declining (Crowley 2017). Brown bear predation on neonatal moose was thought to be the primary limiting factor of moose in Unit 9 (Butler 2010). Suitable habitat for moose in Unit 9 is relatively limited, consisting of boreal forest along river and stream corridors as well as subalpine slopes during snow-free months (Crowley 2017).

The current State population objectives for moose in Unit 9 (Crowley 2017) are to:

1. Maintain existing densities in areas with moderate (0.5–1.5 moose/ mi^2): Units 9A-9D or high (1.5–2.5 moose/ mi^2) densities: Unit 9E only
2. Increase low-density populations (where habitat conditions are not limiting) to 0.5 moose/ mi^2: Units 9A-9D
3. Maintain sex ratios of at least 25 bulls:100 cows in medium-to-high density populations (Unit 9E) and at least 40 bulls:100 cows in low-density areas (Units 9A-9D).

Assessment of moose population status and trends in Unit 9 is difficult for several reasons, including low moose density, and snow and weather conditions that are frequently inadequate for surveys. As a result, population estimates are not available for Unit 9C between 2000 and 2014 (Crowley 2017, Smith 2021, pers. comm.). Since 1991, the Refuge has conducted aerial surveys of moose in trend count areas (TCAs) within and adjacent to the portion of Unit 9C draining into the Naknek River from the south (closure area). The Big Creek Corridor TCA (68 mi^2) represents the main hunting area for the closure, while the Park Border TCA (132 mi^2) is adjacent to the closure area and located within Katmai National Park, which is closed to hunting. Since 2018, the Big Creek Corridor TCA and the Park Border TCA have been surveyed by the Refuge covering a total 221 mi^2. Prior to 2018, the Refuge surveyed a single, larger TCA that covered the Big Creek Corridor and most of the Park Border TCA, which is now called the historic Big Creek TCA (379 mi^2). The Refuge adjusted the survey areas in the presented data to facilitate comparison across years (Smith 2021, pers. comm.). Data limitations including no snow cover during the 2019 survey of the Park Border TCA and very poor survey conditions in 2018. These factors could have biased the data toward relatively more bulls and lower overall abundance compared to 2020 when survey conditions were excellent.

Between 1991 and 2023, estimated moose densities within the Refuge-surveyed TCAs averaged 0.38 moose/mi^2, ranging from 0.07-0.77 moose/mi^2. These densities correspond to an average 132 moose, ranging from 28-259 moose. In recent years (2015—2023), moose densities averaged 0.44 moose/mi^2, ranging from 0.27-0.77 moose/mi^2 (**Figure 1**). Since 2018 when the TCA areas changed, the moose density with the Big Creek Corridor TCA averaged 0.67 moose/mi^2, ranging from 0.37-0.88 moose/mi^2. The lowest estimate occurred in 2020 when survey conditions were ideal, indicating this moose population likely declined between 2019 and 2020. Possible causes of the decline include high winter mortality, increased harvest (Smith 2021, pers. comm.), and moose moving outside of the TCA.

The Refuge also estimates bull:cow and calf:cow ratios from their aerial surveys of the TCAs. Between 1991 and 2023, bull:cow ratios averaged 46 bulls:100 cows, ranging from 23-82 bulls:100 cows. In recent years (2015-2020), bull:cow ratios have been relatively high, averaging 60 bulls:100 cows,

which is well above State management objectives (Woodruff 2024, pers. comm.). However, since p[2018, the bull:cow ratio in the Big Creek TCA has declined, with the 2022 and 2023 estimates below State management objectives. The higher bull:cow ratios in the Park Border TCA compared to the Big Creek Corridor TCA may be due to the prohibition of hunting in the Park Border TCA (**Figure 2**, Smith 2021, pers. comm.; Woodruff 2024, pers).

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 2012). Between 1991 and 2023, calf:cow ratios averaged 33 calves:100 cows, ranging from 12-92 calves:100 cows. In recent years (2015-2023), calf:cow ratios averaged 28 calves:100 cows, ranging from 24-40 calves:100 cows across all TCAs. These data suggest that the moose population within the closure area is stable. However, between 2018 and 2023, calf:cow ratios fluctuated greatly in the Big Creek Corridor TCA, ranging from 19-64 calves:100 cows (**Figure 3**) (Smith 2021, pers. comm).

Bear predation of calves appears to be a major source of mortality in the Unit 9C moose population, although wolves are also responsible for some of the moose mortality. Given high twinning rates, the moose population in Unit 9C seems to be limited by predation, which is consistent with a low density population in dynamic equilibrium (Crowley 2017).

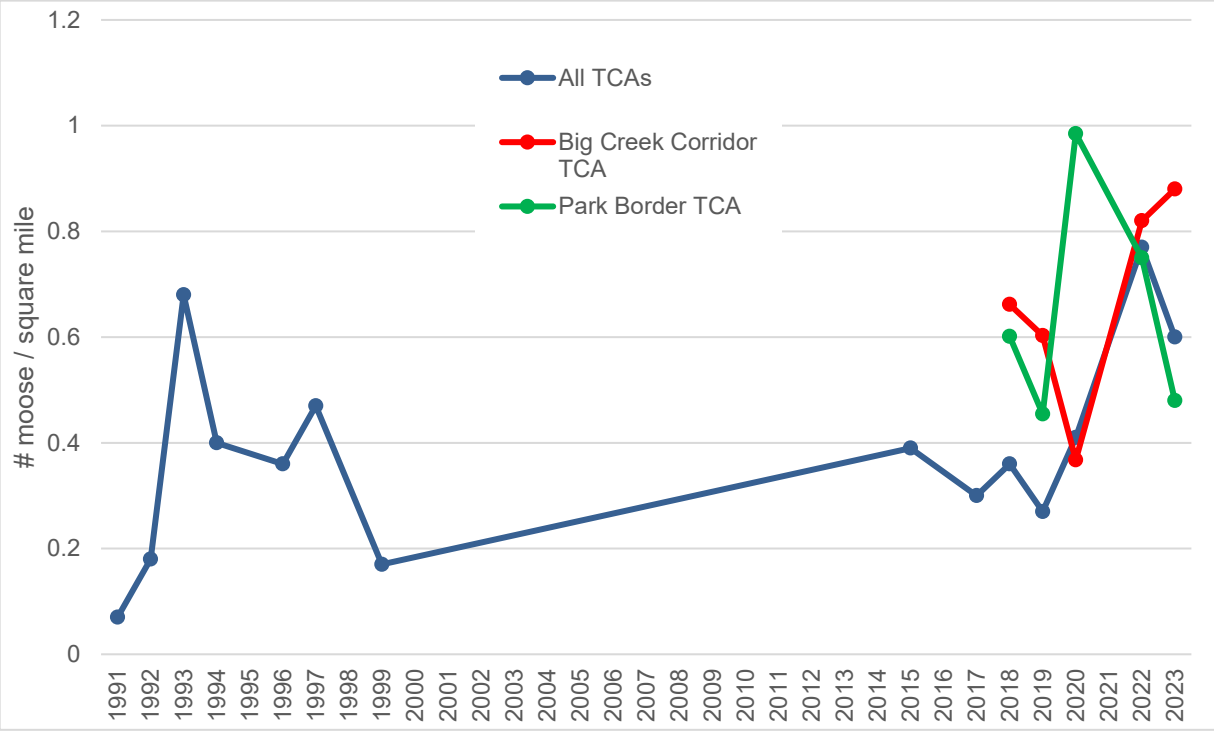


Figure 1. Moose Density Estimates. The "All TCAs" data set includes the historic Big Creek TCA from 1991-2017 and combines data from the Big Creek Corridor and Park Border TCAs from 2018-2023, accounting for differences in survey area sizes (Smith 2021, pers. comm.; Woodruff 2024, pers. comm.).

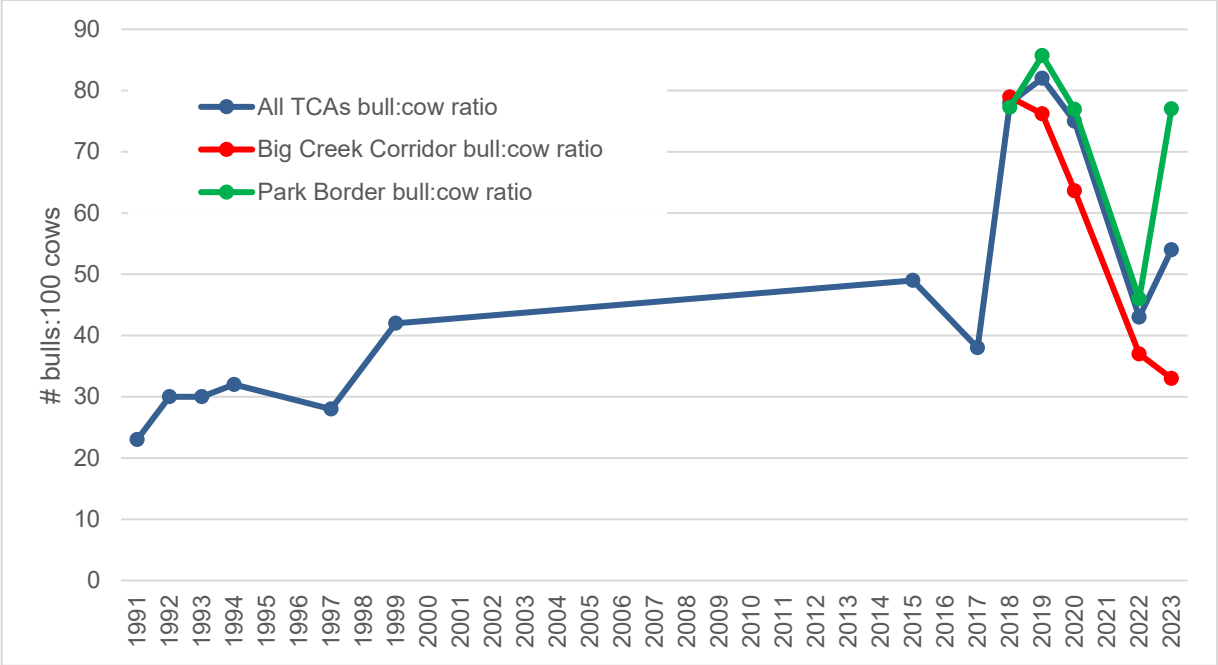


Figure 2. Bull:cow ratios. The "All TCAs" data set includes the historic Big Creek TCA from 1991-2017 and combines data from the Big Creek Corridor and Park Border TCAs from 2018-2023, accounting for differences in survey area sizes (Smith 2021, pers. comm.; Woodruff 2024, pers. comm.).

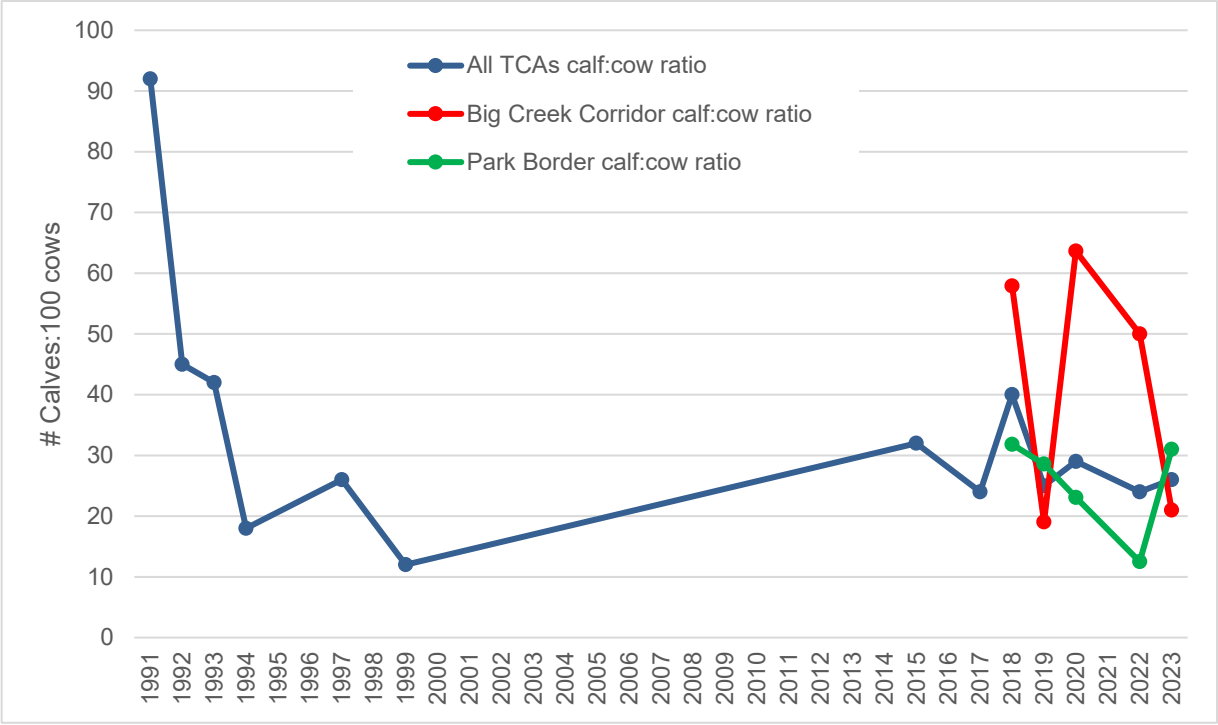


Figure 3. Calf:cow ratios. The "All TCAs" data includes the historic Big Creek TCA from 1991-2017 and combines data from the Big Creek Corridor and Park Border TCAs from 2018-2023, accounting for differences in survey area sizes (Smith 2021, pers. comm; Woodruff 2024, pers. comm.).

Cultural Knowledge and Traditional Practices

Community Background

Twenty-four communities are included in the customary and traditional use determination for moose on Federal public lands in Unit 9C and are federally qualified subsistence users. The population is diverse including Dena'ina Athabascan, Yup'ik, Alutiiq, and Aleut people indigenous to the area plus newer arrivals participating in the commercial salmon fishing industry, the sport hunting and fishing industry, trade, transportation, and government. The population in 2020 was estimated at 3,464 people based on the U.S. Census (VanStone 1984, ADCCED 2024).

Three communities adjacent to the hunting area, King Salmon, Naknek, and South Naknek, together comprise the Bristol Bay Borough, the transportation hub of eastern Bristol Bay. It was incorporated as the state's first borough in 1962. The Borough encompasses the Naknek River. These three communities are the closest in proximity to the hunt area and are the focus of this section. Other communities also use the hunt area but to a lesser extent. The population of the three communities peaked in 1990 at 1,407 people and decreased to 844 people in 2020 (**Table 1**). In the 1990s, the presence of military personnel at King Salmon was substantially reduced resulting in a drop in the population. Additionally, the school closed at South Naknek in the 1990s, and students are flown daily to Naknek, leading some to move to Naknek (Jones and Cunningham 2020).

Table 1. The population of Bristol Bay Borough communities (ADCCED 2024).

Community	1960	1970	1980	1990	2000	2010	2020
King Salmon	227	202	545	696	442	374	307
Naknek	249	178	318	575	678	544	470
South Naknek	142	154	145	136	137	79	67
Total	618	534	1,008	1,407	1,257	997	844

While employment in government, transportation, and services has increased, commercial salmon fishing is less of a factor in the cash economies of the communities since the 1970s. Commercial permit ownership has decreased by about 40% (Morris 1985, Holen et al. 2010, ADCCED 2024, CFEC 2024).

Caribou are less abundant than in the 1990s and families are relying on moose more than in the past (ADF&G 2024a). Caribou were among the most important subsistence resources for these Alaska Peninsula communities (Fall 1993, Holen et al. 2010). The Northern Alaska Peninsula caribou herd last peaked in about 1984, and harvest seasons were closed from 2005 through 2015. Residents of eligible communities have reported their harvests on household surveys since 1983. Communities' overall harvest of caribou and per person harvest in pounds of edible weight have generally decreased since the 1990s.

Subsistence Moose Hunting

Bristol Bay Borough communities hunt for moose along tributaries north and south of the Naknek River, as well as in other areas such as along the Alagnak and Kvichak rivers. Bristol Bay Borough hunters accessing Federal public lands of the Becharof National Wildlife Refuge, the focus of this closure review, primarily travel along Big Creek, a tributary of the Naknek River, with boats, off-road vehicles (ORVs, 4-wheelers), and snowmachines (Fall 1993, Holen et al. 2011).

Years with lower harvest estimates likely reflect adverse weather conditions for safe travel and lack of available bull moose rather than a lack of desire for moose. Many environmental factors combine to affect hunting effort and success.

Most moose harvested in this area of the Becharof Refuge are harvested in September when hunters travel in boats along the Big Creek corridor. Hunters may be prevented from taking long or frequent hunting trips when September weather is rainy and wet. Many hunters rely on spotting moose from their boats while traveling along Big Creek, and heavy rainfall may cause moose to keep away from riverbeds where high waters flood their feeding habitat. The winter season in December and January benefits those who were not successful in September. (Charnley 1983; Holen et al. 2011; YKDSRAC 2019a, 2019b, 2021; BBSRAC 2023).

Harvesting a moose in December and January is generally related to good travel conditions as well, along with lack of competition from sport hunters. The December/January State season is closed to nonresidents of the state. Only hunters who did not harvest a moose in September can participate in the winter season. Residents use ORVs when the tundra and creeks are frozen until there is enough snow to use snowmachines. Stream ice must be thick enough to travel on safely. Lack of snow curtails snowmachine travel and enables moose to easily run. When winter temperatures warm to above freezing, ice and snowmelt also make travel difficult. Sometimes hunters see only cow moose, which are illegal to harvest (Charnley 1983, Holen 2010). Hunting in January may be preferred when rivers are more likely to be frozen and hunters can cover more area. The Alaska Board of Game extended the moose season to January 15 in 2022 (ADF&G 2022).

People focus winter hunting for moose on river corridors because, as mentioned above, even healthy moose populations in this area are at low densities and limited by habitat. Moose habitat is limited to relatively narrow riparian habitat and boreal forest along river and stream corridors, extending upwards into subalpine slopes during snow-free months (Crowley 2017).

The Division of Subsistence at ADF&G documents the harvest of wild resources through periodic household interviews. The harvest of moose is summarized in **Table 2**. Bristol Bay Borough residents have consistently harvested moose for subsistence based on these surveys (ADF&G 2024a).

Table 2. The estimated harvest of moose for one year study periods based on household harvest surveys in Bristol Bay Borough communities (CI 95%, lower harvest estimate is the lower bound of the estimate or the reported harvest, whichever is larger; source: ADF&G 2024a).

Community	Study year	Number of households interview	Percentage of households using moose	Estimated harvest	Lower estimate	Upper estimate	Per person harvest (in pounds of edible weight)
King Salmon	1983	43	35%	17	6	31	25
	1994	37	70%	27	13	41	39
	1995	26	70%	23	7	39	30
	1996	32	65%	12	4	21	17
	2007	48	33%	9	8	10	20
Naknek	1983	52	33%	7	3	13	10
	1994	59	54%	50	26	74	49
	1995	41	39%	44	25	63	44
	1996	43	44%	28	14	42	30
	2007	75	48%	11	9	13	11
South Naknek	1983	21	19%	5	2	10	18
	1992	35	63%	5	4	7	19
	1994	25	40%	2	1	4	6
	1995	31	51%	2	2	4	9
	1996	35	32%	1	1	2	4
	2007	21	29%	0	0	0	0

Harvest History

Alaska resident moose harvest in Units 9B and 9C occurs by registration permit RM272. This permit has been used under State regulations since 2011, under Federal regulations for the fall moose season since 2012, and under Federal regulations for both the fall and winter moose seasons since 2016. Between 2012 and 2015, a Federal registration permit was used for the winter season. Non-resident moose harvest in Units 9B and 9C occurs by registration permit RM282. While reported moose harvest can be parsed out by subunit, it is not possible to differentiate it by hunt area. Therefore, the number of moose reported harvested only within the closure area is not available, although reported moose harvest within all of Unit 9C provides some insights. Of note, the Naknek CUA restricts use of some motorized vehicles during the fall (see Regulatory History section).

Between 2000 and 2023, total reported moose harvest in Unit 9C averaged 29 moose, ranging from 16-43 moose reported per year (**Figure 4**). Over the same time period, harvest by local users, defined as those with a customary and traditional use determination, accounted for 58% of the Unit 9C reported moose harvest on average, ranging from 36%-84% per year. The total number of hunters averaged 109 hunters, ranging from 85-133 hunters per year. The total number of hunters that are Unit 9C residents averaged 66 hunters, ranging from 54-83 hunters per year. Overall success rates averaged 29% during this time period, ranging from 27%-32%, with the highest success rate occurring in 2023 (ADF&G 2012024b).

Approximately 90% of moose harvest in Unit 9 occurs during the fall. Winter weather conditions and winter season restrictions make accessing this area difficult (ADF&G 2022). Harvest by local hunters depends, in part, on winter snowmachine access and weather conditions (Crowley 2017). While data is limited, the winter hunt in Unit 9C has not been heavily utilized, including within the closure area. Since 2016, when the State registration permit became the requirement for the Federal fall and winter season, a total of 29 moose having been harvested during winter seasons. The December harvest has averaged 3.25 moose per year, ranging from 1-6 moose per year. There have only been two moose harvested in January since 2022 when the State season was extended (**Table 3**) (ADF&G 2024b).

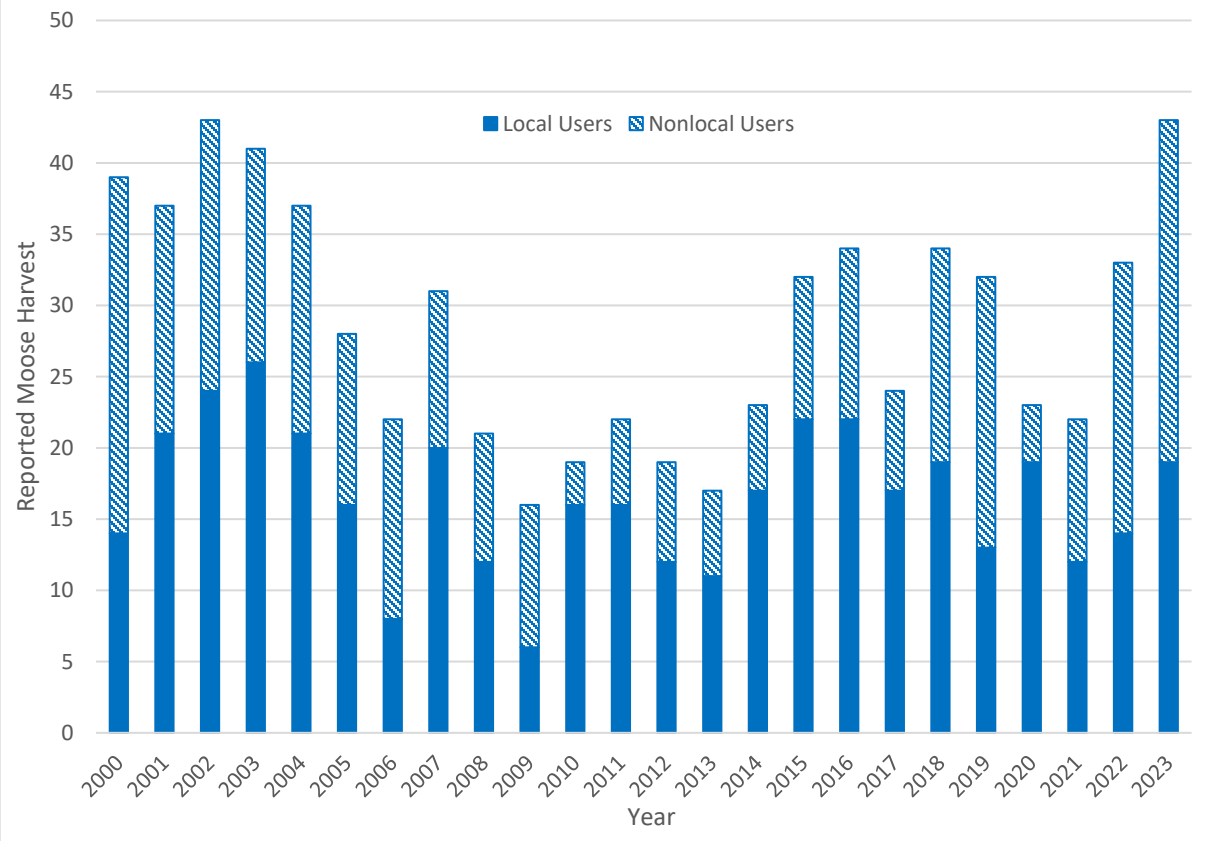


Figure 4. Unit 9C reported moose harvest by local and nonlocal users (non-local Alaska residents and non-residents), 2000 – 2023. Local users are defined as those with a customary and traditional use determination (ADF&G 2016, 2021, 2024b; OSM 2016a, 2021).

Table 3. All Unit 9C reported moose harvested from 2016 – 2023. Total harvest is broken down to show fall season, December, and January harvest numbers (ADF&G 2024b).

	Total	Fall Harvest	December Harvest	January Harvest
2016	35	31	4	-
2017	24	20	4	-
2018	34	30	4	-
2019	32	29	2	1
2020	29	28	1	-
2021	22	20	2	-
2022	33	29	3	1
2023	43	36	6	1

Alternative(s) Considered

One alternative considered was to extend the fall and winter moose seasons in Unit 9C, draining into the Naknek River from the South to Aug. 20 – Sept. 25 and Dec. 1-Jan. 15, respectively to align with the State moose season closing dates in Unit 9C. However, this alternative is beyond the scope of a closure review. The Council may consider submitting a proposal to effect this season extension during the next call for Federal wildlife proposal in early 2025.

Another alternative considered is to extend the closure to January 15 to correspond with the entire winter moose season under State regulations. The BOG extended the winter moose season in Unit 9C under State regulations in 2022. As the Federal lands closure is only for December, State hunters may now hunt moose within the closure area for 15 days in early January.

Effects

If this closure is rescinded, non-federally qualified users would be able to harvest moose on Federal public lands within that portion of Unit 9C draining into the Naknek River from the south during December. This could reduce the Federal subsistence priority. It may also result in increased moose harvest, although increases are expected to be small since 90% of moose harvest in this area occurs during the fall. Since 2016, only 29 moose total have been harvested in Unit 9C during the winter season. While the 2022 and 2023 moose density estimates within the closure area are above State management objectives for moderate density moose populations (0.5 moose/mi^2), this low-density moose population fluctuates within a dynamic equilibrium. Additionally, while Unit 9C bull:cow ratios are above management objectives and could sustain additional bull harvest (ADF&G 2022), localized estimates of bull:cow ratios within the closure area are below State management objectives and have been declining since 2018 (**Figure 2**). Calf:cow ratios indicate a stable population.

OSM PRELIMINARY CONCLUSION

☐ **Retain the Status Quo**
☒ **Rescind the Closure**
☐ **Modify the Closure to**
☐ **Defer Decision on the Closure or Take No Action**

Justification

Moose densities in all of Unit 9C are within management objectives, with high bull:cow ratios, and calf:cow ratios indicative of a stable population. The State season was extended by 20 days total in 2022, indicating no conservation concerns. Any increase in harvest is expected to be minimal, as 90% of harvest in Unit 9C has occurred during the fall season, and winter conditions make this area difficult to access.

While bull:cow ratios within the closure area were below management objectives in 2022 and 2023, ratios in the adjacent TCA were very high, and bull harvest is much more likely during the fall when Federal lands are open to State hunts. Conservation concerns do not warrant maintaining the closure, although OSM looks forward to hearing from the Bristol Bay Council on local conditions, knowledge and continuation of subsistence uses at their winter 2025 meeting.

LITERATURE CITED

ADCCED. 2024. Community on-line database. <http://www.commerce.state.ak.us/dca/commdb/CF_BLOCK.cfm>. Div. of Community and Regional Affairs, Alaska Department of Commerce, Community, and Economic Development. Juneau, AK.

ADF&G. 2010. Unit 9 Moose Working Group April 28 – 29, 2010 meeting summary, final report. ADF&G. Anchorage, AK.

ADF&G. 2016. General Harvest Reports. https://secure.wildlife.alaska.gov/index.cfm?fuseaction=harvestreports.main. Retrieved: August 18, 2016.

ADF&G. 2021. General Harvest Reports. https://secure.wildlife.alaska.gov/index.cfm?fuseaction=harvestreports.main. Retrieved: May 13, 2021.

ADF&G. 2022. Proposal 204. Pages 301-305 *in* Alaska Board of Game Staff Comments Central/Southwest Region Proposals Alaska Board of Game Meeting Wasilla, Alaska January 21-29, 2022. 204. January 21–27, 2022 in Wasilla, AK. 356 pp.

ADF&G. 2024a. Community Subsistence Information System. Online database, http://www.adfg.alaska.gov/sb/CSIS/, accessed May 29. ADF&G, Div. of Subsistence, Anchorage, AK.

ADF&G. 2024b. General Harvest Reports. https://secure.wildlife.alaska.gov/index.cfm?fuseaction=harvest.lookup. Retrieved: September 23, 2024.

Alaska Board of Game. 2011. Alaska Board of Game Meeting Summary, March 4 – 10, 2011. ADF&G. Juneau, AK. http://www.adfg.alaska.gov/index.cfm?adfg=gameboard.meetinginfo&date=03-04-2011&meeting=wasilla. Retrieved: August 18, 2016.

BBSRAC. 2011. Transcripts of the Bristol Bay Subsistence Regional Advisory Council proceedings. March 10, 2011. Naknek, AK. Office of Subsistence Management, USFWS. Anchorage, AK.

BBSRAC. 2023. Minutes of the Bristol Bay Subsistence Regional Advisory Council proceedings. March 8, 2023. Naknek, AK. Office of Subsistence Management, USFWS. Anchorage, AK.

Butler, L.G. 2010. Unit 9 moose management report. Pages 116–123 *in* P. Harper, editor. Moose management report of survey and inventory activities 1 July 2007 – 30 June 2009. ADF&G. Project 1.0. Juneau, AK.

CFEC. 2024. Permits, Custom Lists. On-line database. https://www.cfec.state.ak.us/, accessed September 1, 2024. Commercial Fisheries Entry Commission, Juneau, AK.

Susan Charnley. 1983. Moose hunting in two Central Kuskokwim communities: Chuathbaluk and Sleetmute. ADF&G Division of Subsistence, Technical Paper No. 76.

Crowley, D. W. 2017. Moose management report and plan, Game Management Unit 9: Report period 1 July 2010–30 June 2015 and plan period 1 July 2015–30 June 2020. Alaska Department of Fish and Game, Species Management Report and Plan ADF&G/DWC/SMR&P-2017-5, Juneau, AK.

FSB. 2008. Transcripts of the Federal Subsistence Board proceedings. April 30, 2008. Office of Subsistence Management, USFWS, Anchorage, AK.

FSB. 2010. Transcripts of the Federal Subsistence Board proceedings. May 20, 2010. Office of Subsistence Management, USFWS. Anchorage, AK.

FSB. 2012. Transcripts of the Federal Subsistence Board proceedings. January 19, 2012. Office of Subsistence Management, USFWS. Anchorage, AK.

Holen, D., J., T. M. Krieg, and T. Lemons. 2011. Subsistence harvests and uses of wild resources in King Salmon, Naknek, and South Naknek, Alaska, 2007. Alaska Department of Fish and Game, Division of Subsistence. Technical Paper No. 360, Anchorage, AK.

Jones, B. and M. Cunningham. 2020. The harvest and use of salmon by residents of King Salmon, Naknek, and South Naknek, Alaska, 2017 and 2018. ADF&G, Div. of Subsistence Tech. Paper No. 470. Anchorage, AK.

Morris. J.M. 1985. The use of fish and wildlife resources by residents of the Bristol Bay Borough, Alaska. ADF&G, Div. of Subsistence Tech. Paper No. 123. Juneau, AK.

OSM. 1992. Staff Analysis P92-45. Pages 200 – 201 *in* Federal Subsistence Board Meeting Materials April 6 – 10, 1992. Office of Subsistence Management, USFWS. Anchorage, AK. 966 pages.

OSM. 1993. Staff Analysis P93-39. Pages 329 – 334 *in* Federal Subsistence Board Meeting Materials April 5 – 8, 1993. Office of Subsistence Management, USFWS. Anchorage, AK. 622 pages.

OSM. 1995. Staff Analysis P95-30. Pages 219 - 224 *in* Federal Subsistence Board Meeting Materials April 10 – 14 1995. Office of Subsistence Management, USFWS. Anchorage, AK. 398 pages.

OSM. 1998. Staff Analysis P98-50. Pages 634-641 *in* Federal Subsistence Board Meeting Materials May 4 – 8, 1998. Office of Subsistence Management, USFWS. Anchorage, AK.

OSM. 2006. Staff Analysis P06-24. Pages 254-261 *in* Federal Subsistence Board Meeting Materials May 16 – 18, 2006. Office of Subsistence Management, USFWS. Anchorage, AK. 578 pages.

OSM. 2008. Staff Analysis P08-30/31. Pages 445-460 *in* Federal Subsistence Board Meeting Materials April 29 – May 1, 2008. Office of Subsistence Management, USFWS. Anchorage, AK. 598 pages.

OSM. 2012. Staff Analysis P10-45/46/47/48/49/50/52. Pages 527-552 *in* Federal Subsistence Board Meeting Materials January 17 – 20, 2012. Office of Subsistence Management, USFWS. Anchorage, AK.1020 pages.

OSM. 2015. Staff Analysis WSA15-01. Office of Subsistence Management, USFWS. Anchorage, AK.

OSM. 2016a. Alaska Federal Subsistence Program Database. https://ifw7asm-orcldb.fws.gov:8090/apex/f?p=MENU:101:4818053586714257. Retrieved: August 17, 2016.

OSM. 2016b. Staff Analysis WP16-22. Pages 555-566 *in* Federal Subsistence Board Meeting Materials April 12 – 14, 2016. Office of Subsistence Management, USFWS. Anchorage, AK. 945 pages.

OSM. 2016c. Staff Analysis WP16-24. Pages 149-165 *in* Federal Subsistence Board Meeting Materials April 12 – 14, 2016. Office of Subsistence Management, USFWS. Anchorage, AK. 945 pages.

OSM. 2021. Alaska Federal Subsistence Program Database. https://ifw7asm-orcldb.fws.gov:8090/apex/f?p=MENU:101:4818053586714257. Retrieved: May 13, 2021.

Sill, L.A., L. Hutchinson-Scarbrough, D. Koster. 2022. The harvest and use of wild resources in Egegik, Pilot Point, and Ugashik, 2014. ADF&G, Div. of Subsistence Tech. Paper No. 487. Anchorage, AK. 326 pages.

Smith, W. 2021. Supervisory Biologist. Alaska Peninsula and Becharof National Wildlife Refuge. U.S. Fish and Wildlife Service. King Salmon, AK. Personal communication: e-mail.

Stout, G.W. 2012. Unit 21D moose. Pages 496-533 *in* P. Harper, editor. Moose management report of survey and inventory activities 1 July 2009-30 June 2011. Alaska Department of Fish and Game. Species management report, ADF&G/SMR/DWC-2012-5, Juneau, AK, USA.

VanStone, J. 1984. Mainland Southwest Alaska Eskimo. Pages 224-242 *in* Handbook for North American Indians: Arctic. Smithsonian Institution. Washington DC.

Woodruff, B. 2024. Big Game Mammals Biologist, Alaska Peninsula and Becharof National Refuge. U.S. Fish and Wildlife Service. King Salmon, AK. Personal communication: email.

YKDSRAC. 2019a. Transcripts of the Yukon-Kuskokwim Delta Subsistence Regional Advisory Council proceedings March 12, 2019, in Bethel AK. Office of Subsistence Management, USFWS. Anchorage, AK.

YKDSRAC. 2019b. Transcripts of the Yukon-Kuskokwim Delta Subsistence Regional Advisory Council proceedings November 6, 2019, in Bethel AK. Office of Subsistence Management, USFWS. Anchorage, AK.

YKDSRAC. 2021. Transcripts of the Yukon-Kuskokwim Delta Subsistence Regional Advisory Council proceedings October 6, 2021, by teleconference. Office of Subsistence Management, USFWS. Anchorage, AK.