Species Management Report and Plan ADF&G/DWC/SMR&P–2025–58

Muskox Management Report and Plan, Game Management Units 23 and 26A:

Report Period 1 July 2014–30 June 2019, and

Plan Period 1 July 2019–30 June 2024

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Alaska Department of Fish and Game Division of Wildlife Conservation

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Species management reports and plans provide information about species that are hunted or trapped and management actions, goals, recommendations for those species, and plans for data collection. Detailed information is prepared for each species every 5 years by the area management biologist for game management units in their areas, who also develops a plan for data collection and species management for the next 5 years. This type of report is not produced for species that are not managed for hunting or trapping or for areas where there is no current or anticipated activity. Unit reports are reviewed and approved for publication by regional management coordinators and are available to the public via the Alaska Department of Fish and Game's public website.

This species management report and plan was reviewed and approved for publication by Phillip Perry, Management Coordinator for Region V for the Division of Wildlife Conservation.

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Purpose of this Report

This report provides a record of survey and inventory management activities for muskox (*Ovibos moschatus)* in Game Management Units 23 and 26A for the 5 regulatory years 2014–2018 and plans for survey and inventory management activities in the next 5 regulatory years, 2019–2023. A regulatory year (RY) begins 1 July and ends 30 June (e.g., RY15 = 1 July 2015–30 June 2016). This report is produced primarily to provide agency staff with data and analysis to help guide and record agency efforts but is also provided to the public to inform it of wildlife management activities. In 2016 the Alaska Department of Fish and Game's (ADF&G, the department) Division of Wildlife Conservation (DWC) launched this 5-year report to more efficiently report on trends and to describe potential changes in data collection activities over the next 5 years. It replaces the muskox management report of survey and inventory activities that was previously produced every 2 years.

I. RY14–RY18 Management Report

Management Area

Unit 23 encompasses approximately 43,400 mi² of mainland in northwestern Alaska and covers the Kotzebue Sound, Chukchi Sea, and Arctic Ocean drainages, while Unit 26A encompasses approximately 53,200 mi^2 of mainland in Northern Alaska and covers the Arctic Ocean drainages lying west of the Itkillik River drainage (Fig. 1). Mainland terrain varies from rugged mountains and river valleys to flat coastal wetlands. Spruce forests characterize eastern portions of Unit 23, while western portions of Unit 23 and most of Unit 26A are treeless tundra with willow thickets along the riparian corridors. There are 17 communities within these 2 units with a total population of approximately 14,500 people.

This report covers the Cape Thompson muskox population. Muskoxen inhabiting the portion of Unit 23 between the Buckland and Goodhope rivers, also known as Unit 23 Southwest, are considered part of the Seward Peninsula muskox population and were a result of translocations near Teller in Unit 22D. Seward Peninsula Muskox Management Report and Plan, Game Management Unit 22 covers this population and includes information for Units 22 and 23 Southwest. Muskoxen occurring in Unit 26A along the border of Unit 26B are considered part of the Eastern North Slope muskox population, which are discussed in Muskox Management Report and Plan, Game Management Unit 26B and 26C Eastern North Slope.

Summary of Status, Trend, Management Activities, and History of Muskox in Units 23 and 26A

Muskoxen are indigenous to northwestern Alaska with historical records documenting the species as far west as Kivalina (Lent 1999). Remnants of muskox were also plentiful in the Colville River Delta near Wainwright (Allen 1913, Lent 1999), indicating a steady presence of muskox in the area prior to their extirpation. The last known muskoxen in Alaska were killed around 1858 (Allen 1913). In 1930, Congress appropriated funds to reestablish muskox in the state, and 31 individuals were captured from Greenland and transferred to Fairbanks (Paul

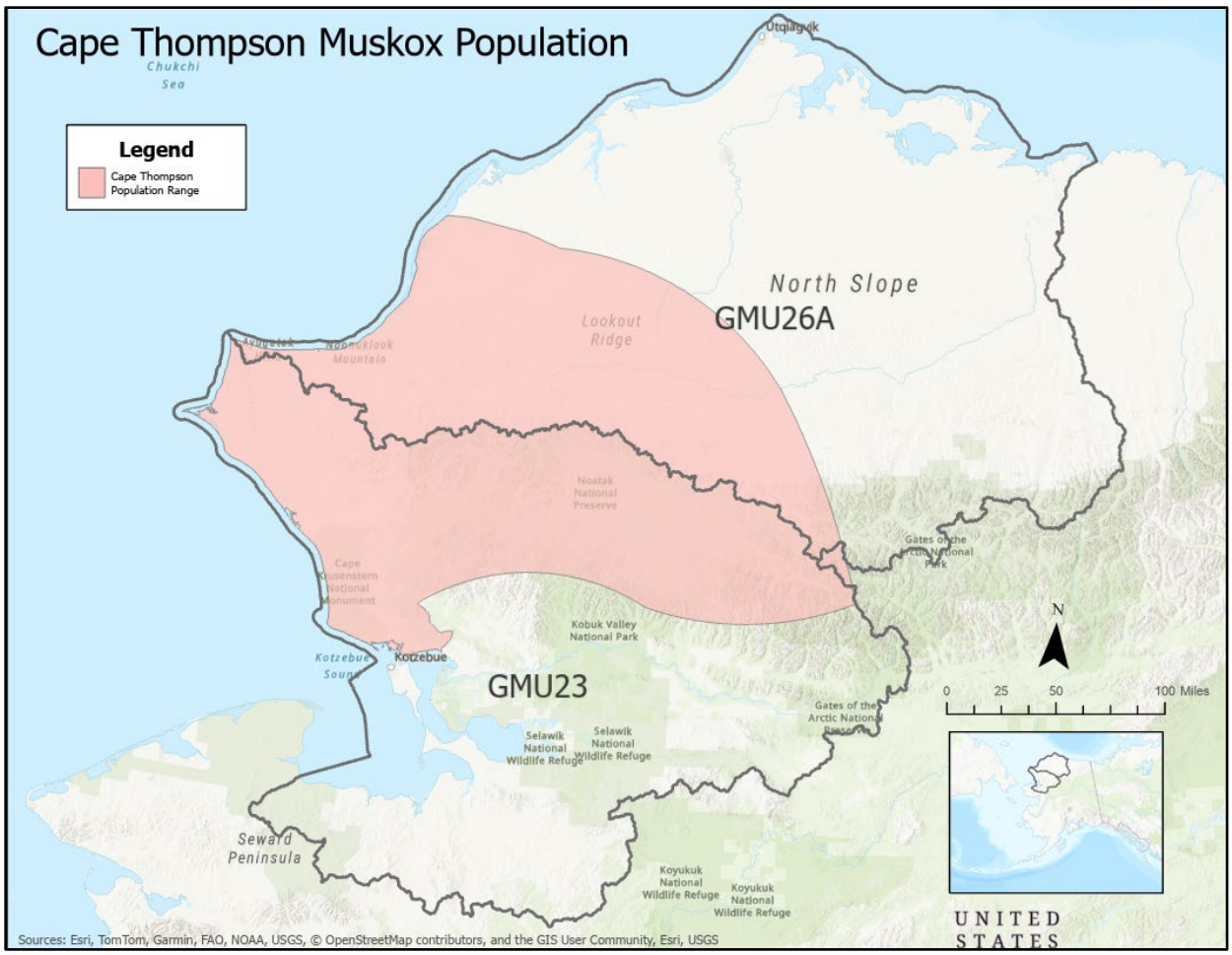

Figure 1. Game Management Units 23 and 26A including the range of the Cape Thompson muskox population, regulatory years 2014–2018, northwest Alaska.

2009). These muskoxen were subsequently moved to Nunivak Island in 1935 and 1936, where the population grew over the next several decades. This success led to the transplant of muskox back to historic locations across Alaska. In 1970, 36 muskoxen were released at Cape Thompson, and a second transplant in 1977 released another 34 to the same area.

A portion of the Cape Thompson muskox population occupies a stable, core range between the mouth of the Noatak River and Corwin Bluff within approximately 20 mi of the Chukchi Sea. It also includes the lower 10 mi of the Agashashok River. The remainder of the Cape Thompson muskox population is scattered widely throughout the remainder of northwestern Unit 23 and southwestern Unit 26A.

From their reintroduction in 1970, the Cape Thompson muskox population within the core area grew approximately 8% annually through 1998 (Dau 2007). With the population experiencing sustained growth, the department sought to provide harvest opportunity, and in fall of 1997 the Board of Game (BOG) took up a proposal to determine whether there was customary and traditional use of muskox in northwestern Unit 23. In early 1998 the BOG reached a positive customary and traditional use determination for muskoxen in the area and a Tier II hunt was opened in RY00. Population growth within the core area slowed to 2% annually between 1998

and 2005 (Dau 2005, Hughes 2015) and decreased 4% annually between 2005 and 2018. However, between 2018 and 2019 the population estimate increased 54%, likely as a result of muskox movement back into the survey area. While population fluxes have occurred within the core area, abundance has remained relatively stable between 200 and 300 muskoxen.

Throughout the early 2000s, incidental muskox sightings outside of the core area became increasingly frequent, which prompted a population-wide survey in 2011. The survey included the core area and surrounding potential habitat both in Unit 23, north of the Kobuk River drainage, and in Unit 26A, south of and including the Colville River drainage (Westing 2011). A second population-wide survey was completed in 2016 and found that the population had remained stable.

Abundance, composition, and recruitment rates are estimated for the Cape Thompson core area annually. These same population metrics were estimated for the entire population in 2016 and are scheduled to be estimated every 4 years moving forward. The results of these surveys are used to establish harvest quotas for both the state Tier II muskox hunt (TX107) and the federal subsistence muskox hunts (FX2312 and FX2303).

Management Direction

Existing Wildlife Management Plans

The current management goals and objectives listed below were established in 2008 (Westing 2011).

Goals

G1. Allow for growth and expansion of muskoxen into historic ranges.

G2. Provide for subsistence hunting and eventually for recreational hunting on a sustained yield basis.

G3. Provide for nonconsumptive uses of muskoxen (e.g., viewing and photography).

Codified Objectives

Amounts Reasonably Necessary for Subsistence Uses

A positive customary and traditional use determination has been made for muskox in Unit 23 north and west of the Kobuk River drainage. The amount necessary for subsistence use is 18–22 muskoxen (5 AAC 99.025(a)(9)).

A positive customary and traditional use determination has been made for muskox in Units 26A and 26B west of the Dalton Highway. The amount necessary for subsistence use is 20 muskoxen (5 AAC 99.025(a)(9)). However, this refers to muskox in eastern Unit 26A, which are considered part of the Eastern North Slope muskox population. Please see the Units 26B and 26C management report for more information (Lenart 2021).

Intensive Management

There are no intensive management objectives for muskox in Units 23 or 26A.

MANAGEMENT OBJECTIVES

M1. Survey the Cape Thompson population at least once every 3 years.

M2. Assess population level range expansion.

M3. Monitor the sex and age composition of the Cape Thompson muskox population.

M4. Minimize effects of development (e.g., mines and roads), hunting, and tourism on muskoxen and their habitat.

MANAGEMENT ACTIVITIES

1. Population Status and Trend

ACTIVITY 1.1. Estimate population abundance and distribution.

Data Needs

Abundance estimates are the primary metric used to estimate the harvestable surplus, set harvest quotas, and provide recommendations for permit issuance. Additionally, population estimates are provided to regulatory boards and advisory committees to assist in decisions associated with regulatory changes and resource development.

Methods

Abundance surveys are scheduled to be completed annually within the core area and every 4–5 years within the expanded, rangewide area. Surveys are typically conducted in partnership with the U.S. National Park Service (NPS) between February and April, when daylight hours are increasing and snow coverage is still complete.

Abundance surveys during RY14–RY18 were conducted using distance sampling (as described in Buckland et al. 2001, 2004). Transects were spaced 3 or 4 mi apart for core area surveys and 4 mi apart for population-wide surveys. All survey transects were flown at approximately 1,000 ft above ground level and any muskoxen observed were enumerated and their GPS (Global Positioning System) location recorded. A detailed description of survey method and analysis can be found in Schmidt et al. (2010).

Additionally, any incidental sightings of muskox groups which occurred throughout Units 23 and 26A had their GPS location recorded to document further range expansion.

Results and Discussion

The Cape Thompson core area was sampled annually between 2015 and 2019, and a population-wide survey was completed in 2016. The abundance estimate in the core area ranged between a low of 194 muskoxen (95% confidence interval [CI] = 150–270) in 2017 and a high of 318

muskoxen (95% CI = 250–443; Table 1) in 2019. A population-wide estimate was first conducted in 2011 and used 4 mi transect spacing with a minimum count of 440 muskoxen and an abundance estimate of 576 muskoxen (95% CI = 445–773). A second population-wide survey was conducted during RY14–RY18, in 2016, with a minimum count of 379 muskoxen and an abundance estimate of 556 muskoxen (95% CI = 424–751). These population-wide estimates suggest that the overall abundance of the Cape Thompson population has remained relatively stable.

Table 1. Cape Thompson muskox population core area survey results, 2010–2019, northwest Alaska.

Year	Minimum count	Abundance estimate	Lower 95% CI[a]	Upper 95% CI[a]	Transect spacing (mi)
2010	296	–	–	–	–
2011	229	208	186	296	4
2012	228	220	170	301	3
2013	211	227	173	293	3
2014	184	247	177	365	4
2015	205	259	189	367	4
2016	181	220	174	289	4
2017	194	194	150	270	3
2018	181	207	159	297	3
2019	288	318	250	443	3

Note: Distance sampling was first applied in 2011. Prior to this, only minimum count data was collected.
[a] CI stands for confidence interval.

Recommendations for Activity 1.1

Distance sampling surveys should continue to be completed at regular intervals within both the core area and the population range. The rangewide population survey is extensive, and completion of the survey can be hindered by limited weather windows, daylight hours, and aircraft range. We recommend expanding intertransect spacing of rangewide surveys to 5 mi to help expedite survey completion and reduce expense, if this can be incorporated with minimal change to the relative precision of estimates.

ACTIVITY 1.2. Monitor the sex and age composition of the Cape Thompson muskox population.

Data Needs

Results of composition surveys are used in conjunction with abundance data to establish the harvestable surplus, set harvest quotas, and provide recommendations for permit issuance. Composition survey results also provide the proportion of short yearlings in the population, or recruitment rate, which is used to evaluate the status and trend of the population.

Methods

Groups of muskoxen observed during the abundance surveys were recorded using GPS coordinates. These coordinates were used to relocate the groups for the subsequent composition

survey. Any groups which were identified as bull-only during the abundance survey were classified by fixed-wing aircraft and incorporated into the composition survey. For groups of mixed age and sex, a Robinson R-44 helicopter was used to transport a team of 2 observers to the location for ground-based classification. Muskox were classified into the following age and sex classes: mature bull (≥4-years old); 3-year-old bull; 2-year-old bull; mature cow (≥4-years old); 3-year-old cow; 2-year-old cow; short yearlings (15 months); and calves. An effort was made to classify as many of the muskox groups as possible within the core area.

Results and Discussion

Spring composition surveys were conducted within the core area between 2015 and 2019. During RY14–RY18, average muskoxen ratios were as follows: short yearlings to cows were 24:100, mature bulls to cows were 40:100, and bulls to cows were 51:100. In 2016, an expanded population-wide survey was conducted with the following observed composition ratios: short yearlings to cows were 20:100, mature bulls to cows were 42:100, and bulls to cows were 55:100. Table 2 presents the composition results from within the core area only.

Table 2. Cape Thompson muskox composition within the core area, 2015–2019, northwest Alaska.

Year	No. muskox	Mature bull-to-cow[a]	Short yearling-to-cow[a]	Proportion mature bulls	95% CI[b]	Proportion short yearlings	95% CI[b]
2015	259	37	17	17%	14–21%	8%	5–11%
2016	220	35	15	20%	17–22%	9%	7–11%
2017	194	59	31	27%	24–30%	14%	12–16%
2018	207	37	28	17%	12–23%	13%	9–19%
2019	318	34	28	16%	14–18%	13%	12–15%

[a] Ratios are 1:100.
[b] CI stands for confidence interval.

Proportions of short yearlings within the core area fluctuate annually but have generally remained in the low teens and track well with proportions observed in the neighboring Seward Peninsula population. Short yearling recruitment rates averaged 11% for this reporting period, and 16% for RY09–RY13. The proportion of mature bulls in the core population has also seen annual variation but has remained relatively stable with an average of 19% mature bulls this reporting period and a prior 5-year average of 18% mature bulls.

Recommendations for Activity 1.2

Composition surveys, both within the core area and population-wide, should continue at regular intervals with some modifications.

2. Mortality-Harvest Monitoring and Regulations

ACTIVITY 2.1. Monitor muskox harvest and reporting.

Data Needs

Annual harvest reporting is needed to ensure that populations are managed at a sustainable level. The data obtained through harvest reporting helps assess trends in harvest success, location, timing, and hunter effort.

Methods

Annual harvest reporting is monitored through the TX107 Tier II permit. Hunters are required to provide information on whether they harvested a muskox, the harvest date and location, means of travel to the hunt area, method of take, and number of days spent hunting. Harvest records are compiled in WinfoNet (ADF&G's Wildlife Information Network). Hunters who do not report on their permits within the required time frame (within 3 days if successful or by 30 March if unsuccessful) are contacted directly by the department.

Season and Bag Limit

Season and bag limits for muskox are provided in Table 3. Tier II subsistence hunt conditions are as follows:

- Subsistence is open to Alaska residents only.
- Tag fee is waived for subsistence hunting.
- One muskox permit is allowed per hunter per calendar year.
- A season will be closed by emergency order when quota is reached.
- Trophy destruction of skulls will be completed at the kill site, subject to permit conditions.
- Aircraft may not be used to transport muskox hunters, muskox, or muskox hunting gear.

In addition to the state Tier II hunt, 2 federal subsistence muskox hunts are also administered by NPS within Unit 23: FX2303 for Cape Krusenstern National Monument and FX2312 for federal lands north and west of the Kobuk River Drainage. Federal seasons match the Tier II hunt.

Results and Discussion

Harvest by Hunters

During RY14–RY18, harvest opportunity was only open under subsistence use within Unit 23 and administered through a state Tier II subsistence permit or federal subsistence permit. Annual harvestable quotas were established prior to the hunting season and permit allocation was divided between the 2 agencies. This report will only address permit issuance and harvest which occurred under the state Tier II hunt.

Table 3. Season and bag limits for muskox in Units 23 and 26A during regulatory years 2014–2018, northwest Alaska.

Unit	Bag limit	Resident open season (Subsistence and General hunts)	Nonresident open season
Units 22A and Unit 23, that portion south and west of the Kobuk River drainage and north and east of the Buckland River drainage	Not applicable	No open season	No open season
Units 22B, 22C, and 22D, and Unit 23 Southwest, that portion on the Seward Peninsula west of and including the Buckland River drainage	Not applicable	See Unit 22 report[a]	See Unit 22 report[a]
Unit 23, that portion north and west of the Noatak River drainage	1 bull by Tier II subsistence hunting permit only; up to 15 bulls may be taken	1 Aug–15 Mar (Subsistence hunt only)	No open season
Remainder of Unit 23	Not applicable	No open season	No open season
Units 26A and 26B, that portion west of the Dalton Highway	Not applicable	See Units 26B and 26C report[b]	See Units 26B and 26C report[b]

[a] Unit 22 report refers to *Seward Peninsula muskox management report and plan, Game Management Unit 22: Report period 1 July 2014–30 June 2019, and plan period 1 July 2019–30 June 2024*.
[b] Lenart 2021.

Permit Hunts

During RY14–RY18 a total of 27 Tier II permits were issued. Trophy destruction was required to be completed before leaving the kill site for all muskoxen taken in Unit 23.

Hunter Residency and Success

RY14: There were 6 permits issued during RY14; 5 to Kotzebue residents and 1 to a Noatak resident. Two permit holders did not hunt during RY14. Of those who hunted, there was a 75% success rate.

RY15: There were 6 permits issued during RY15. All permits were issued to Kotzebue residents. One permit holder did not hunt. Of those who hunted, there was a 100% success rate.

RY16: There were 6 permits issued during RY16. All permits were issued to Kotzebue residents. All permit holders hunted, with a success rate of 83%.

RY17: There were 6 permits issued during RY17. All permits were issued to Kotzebue residents. Two permit holders did not hunt. Of those who hunted, there was a 75% success rate.

RY18: There were 3 permits issued during RY18. All permits were issued to Kotzebue residents. All permit holders hunted, with a 100% success rate.

Harvest Chronology

The muskox season was open annually from 1 August to 15 March. From RY14 to RY18 there were 5 (26%) muskox taken during the fall (August–October), and the remaining muskox (74%) were taken during winter (November–March).

Transport Methods

Hunters harvesting muskox during the fall all used boats to access the hunt area while those harvesting in the winter used snowmachines.

Other Mortality

Some level of illegal harvest likely occurs but is not easily quantifiable. Since 2003, the department has found or received reports of at least 16 muskoxen illegally killed and abandoned north of Rabbit Creek (Hughes 2015). Many residents of northwest Alaska have long resented the presence of muskoxen in areas where they traditionally hunt caribou, gather greens, and pick berries (Westing 2013).

Alaska Board of Game Actions and Emergency Orders

During their Arctic and Western meeting held in January 2014, BOG adopted a proposal to expand the hunt area of TX107 from the portion north and west of the Noatak River to the portion north and west of the Kobuk River drainage (5 AAC 85.050(a)(2); Fig. 2). At the same time, BOG modified the established customary and traditional use finding in 5 AAC 99.025(a)(9) to align with the extended hunt area.

There were no BOG actions taken regarding muskox during the winter 2017 Arctic and Western meeting.

No emergency orders were issued for muskox in Units 23 or 26A during RY14–RY18.

Recommendations for Activity 2.1

Muskox harvest and reporting should continue to be monitored through the Tier II TX107 permit and federal subsistence permits. Alternative hunt structures and exclusionary measures should also continue to be explored to mitigate human-muskox conflict in problem areas.

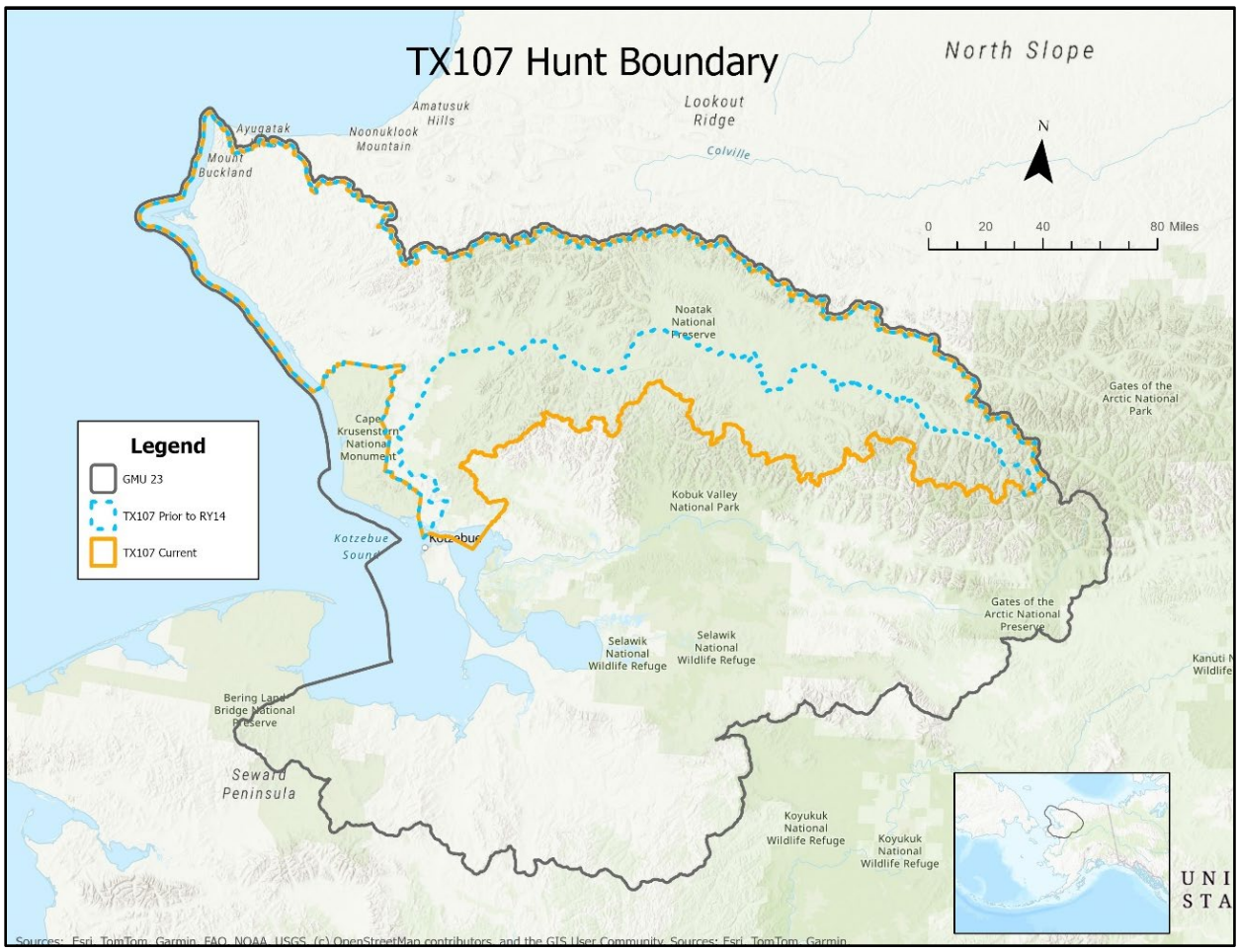

Figure 2. Expansion of the TX107 hunt area resulting from the winter 2014 Arctic and Western Board of Game meeting, northwest Alaska.

3. Habitat Assessment-Enhancement

There were no muskox habitat assessment or enhancement activities conducted in Units 23 or 26A during RY14–RY18.

NONREGULATORY MANAGEMENT PROBLEMS OR NEEDS

Since few individuals are permitted to harvest muskox within the units, there is relatively little opportunity for the public to appreciate their value as a local game species. Instead, muskoxen are often perceived as a nuisance or threat to safety. While department staff continue to provide information on best practices for muskox interactions and respond to public inquiries, we recommend using additional efforts and resources to help reframe the local perception of the species.

Data Recording and Archiving

Hardcopies of all original data are stored in the Kotzebue office. Electronic files are stored on the Kotzebue server (W:\Muskox).

Agreements

None.

Permitting

None.

Conclusions and Management Recommendations

Cape Thompson abundance and composition surveys were successfully completed in each of the reporting years, meeting the current management objectives of M1, M2, and M3, and should continue to be conducted on a regular basis. The next population-wide survey is scheduled for 2020. Incidental observations of muskox continue to be recorded outside of the traditionally sampled core area and support the need for ongoing monitoring of range expansion (M2). Harvests of muskoxen in the northwest portion of Unit 23 should continue to be cooperatively managed by the department and NPS to remain adaptive to changes in population abundance and distribution. A conservative harvest strategy of 2% on a stable or slowly declining population allows subsistence opportunity without posing a significant risk and should remain in place for this population.

Land development associated with community infrastructure and natural resource extraction are regularly proposed within the range of the Cape Thompson population. Department staff seek to minimize disturbance to muskoxen and their habitat through permit application review and dialogue with the public, private entities, and other regulating agencies (M4). These discussions will continue to take place and recommendations for modification to development activities will evolve as the population fluxes in abundance and expands geographically.

II. Project Review and RY19–RY23 Plan

Review of Management Direction

Management Direction

No change from the RY14–RY18 management direction.

Goals

No change. Goals for RY19–RY23 will remain as follows:

G1. Allow for growth and expansion of muskoxen into historic ranges.

G2. Provide for subsistence hunting and eventually for recreational hunting of muskoxen on a sustained yield basis.

G3. Provide for nonconsumptive uses of muskoxen (e.g., viewing and photography).

CODIFIED OBJECTIVES

Amounts Reasonably Necessary for Subsistence Uses

No change from RY14–RY18.

Intensive Management

There are no intensive management objectives for muskox in Units 23 or 26A.

MANAGEMENT OBJECTIVES

The management objectives during RY19–RY23 will be as follows:

M1. Survey the Cape Thompson muskox population on a 4-year rotation (updated from RY14–RY18).

M2. Assess population level range expansion.

M3. Monitor the sex and age composition of the Cape Thompson muskoxen population.

M4. Minimize effects of development (e.g., mines and roads), hunting, and tourism on muskoxen and their habitat.

REVIEW OF MANAGEMENT ACTIVITIES

1. Population Status and Trend

ACTIVITY 1.1. Estimate population abundance and distribution.

Data Needs

No change from RY14–RY18.

Methods

Distance sampling (Buckland et al. 2001, 2004) should continue to be used to estimate muskox abundance for the Cape Thompson muskox population. Collaborative efforts with NPS will continue for annual or biannual abundance surveys within the core area, and population-wide surveys in the springs of 2020 and 2025. Biometric consultation will remain an integral component of each survey to maintain accuracy and improve efficiency.

Additionally, GPS coordinates will be recorded for any muskox observed during flights conducted throughout Units 23 and 26A to document further range expansion.

As budgets allow, GPS collaring of known-aged female muskox should be incorporated into herd monitoring for Units 23 and 26A to provide fine-scale movement and distribution data.

ACTIVITY 1.2. Monitor the sex and age composition of the Cape Thompson muskox population.

Data Needs

No change from RY14–RY18.

Methods

Aerial photography of muskox groups provides a lower-cost alternative for group composition compared to the current method of chartering helicopters to conduct ground-based observations. In RY19–RY23, department staff would like to examine the feasibility of using aerial photography to determine group composition in Units 23 and 26A. Department managers overseeing muskox populations in Unit 18 currently use a photocensus method to acquire both abundance and composition data. Initial trials in Units 23 and 26A will generally follow their established protocol (Jones 2015). Photocomposition flights would use a PA-12 or PA-18 type aircraft to complete low passes by each group while an observer takes digital photographs. These photographs would be analyzed on a computer to classify muskox into the following categories: mature bull (>3-years old), mature cow (>3-years old), 2-year-old muskox, yearlings, and calves. Feasibility of aerial composition surveys should be determined within the core area before this method is applied to a population-wide survey. During the first year of this experimental composition survey, both ground-based and aerial composition should be conducted to validate methodology and applicability.

2. Mortality-Harvest Monitoring

ACTIVITY 2.1. Monitor muskox harvest and reporting.

No change from RY14–RY18.

3. Habitat Assessment-Enhancement

No habitat assessment or enhancement activities are planned for RY17–RY21.

NONREGULATORY MANAGEMENT PROBLEMS OR NEEDS

Education and outreach should continue to be conducted as frequently as possible to help residents of Units 23 and 26A better understand muskox behavior, distribution, hunting opportunities, and value.

Data Recording and Archiving

Hard copies of all original data are stored in the Kotzebue office. Electronic files are stored on the Kotzebue server (W:\Muskox).

Agreements

None.

Permitting

None.

Acknowledgments

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