Species Management Report and Plan ADF&G/DWC/SMR&P–2025–43

# Wolf Management Report and Plan, Game Management Units 12 and 20E:

Report Period 1 July 2015–30 June 2020, and

Plan Period 1 July 2020–30 June 2025

**Jeffrey A. Gross**



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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 Jason Caikoski, Management Coordinator for Region III for the Division of Wildlife Conservation.

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**Cover Photo:** Spring in Fortymile country, Unit 20E. ©2018 ADF&G. Photo by Doreen Parker McNeill.

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## Purpose of this Report

This report provides a record of survey and inventory management activities for wolf (*Canis lupus)* in Game Management Units 12 and 20E for the 5 regulatory years 2015–2019 and plans for survey and inventory management activities in the next 5 regulatory years, 2020–2024. 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 report more efficiently on trends and to describe potential changes in data collection activities over the next 5 years. It replaces the wolf management report of survey and inventory activities that was previously produced every 3 years.

# I. RY15–RY19 Management Report

## Management Area

Unit 12 encompasses 9,978 $mi^2$ in east-central Alaska. It is bounded by the Canada border on the east and is centered on 62° 34′ N latitude and 142° 7′ W longitude. Major river drainages within the unit include the Nabesna and Chisana, which combine to form the Tanana River. Unit 12 encompasses 9,975 $mi^2$, of which approximately 6,000–7,000 $mi^2$, or that portion at or below 6,000 ft in elevation, is generally used by wolves within the unit. Elevations within the unit range from 1,500 ft along the Tanana River to greater than 12,000 ft in the Wrangell, Nutzotin, and Mentasta mountains. Much of the northeastern portion of the unit (e.g., Tetlin National Wildlife Refuge) is dominated by lowland shrubs and sedge meadows, wetlands, mature black spruce (*Picea mariana*) and white spruce (*Picea glauca*) forests, and recently burned areas dominated by shrubs and early successional forest species. The western and southern portions of the unit include more mountainous areas dominated by spruce forest in the lowland valleys transitioning to shrub communities, subalpine and alpine tundra, and glaciated areas at the higher elevations.

Unit 20E encompasses 10,680 $mi^2$ in east-central Alaska and is bounded by the Canada border on the east and is centered on 64° 16′ N latitude, 142° 20′ W longitude. Major river drainages within the unit include the Fortymile, Charley, Ladue, and Seventymile. The unit was described in detail by Gasaway et al. (1992) and generally consists of hills with elevations ranging from 1,000–5,000 ft. However, more mountainous areas with elevations exceeding 6,000 ft are found in the northwestern portion of the unit, and lowland areas (2,000–2,500 ft, Mosquito Flats) are found in the southwestern portion of the unit. Vegetation types include lowland shrub and sedge meadows, mature black spruce forest, recently burned areas dominated by shrubs and early successional forest species, subalpine shrub, and alpine tundra.

The climate in Units 12 and 20E is typical of Interior Alaska, where temperatures frequently reach 80° F in summer and -40° F in winter.

# Summary of Status, Trend, Management Activities, and History of Wolves in Units 12 and 20E

Wolves occur throughout Units 12 and 20E. Primary prey species in this area are moose and caribou. Wolves are an important furbearer and big game species. Population surveys have only been conducted in the portions of these units within the Upper Yukon-Tanana Predation Control (UYTPC) Program Area since 2003 (Fig. 1).

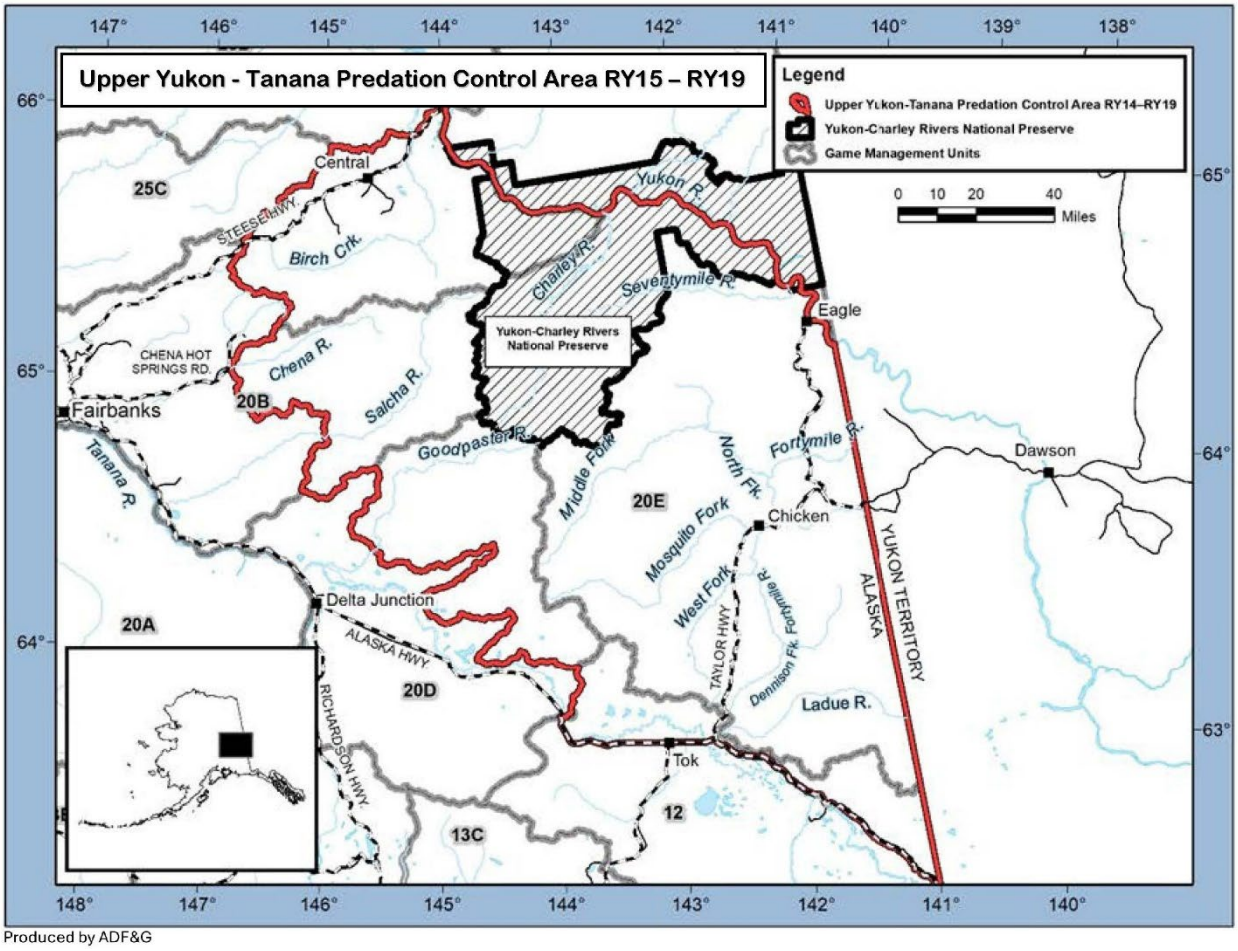


**Figure 1. Upper Yukon-Tanana Predator Control Program Area (18,750 mi$^2$), regulatory years 2015–2019, Interior Alaska.**

Wolf population reduction and regulations in Units 12 and 20E began in 2004 with the adoption of the UYTPC Area. Initially, the objective was to increase the moose population in the 2 units; in 2006 the UYTPC Area was expanded to include an additional objective: to increase the Fortymile caribou herd. During the report period (RY15–RY19), the UYTPC Area encompassed the portion of Unit 12 north of the Alaska Highway and all of Unit 20E. The Alaska Board of Game authorized the wolf predation control program within the UYTPC Area for 5-year periods in 2004, 2009, and 2014, and for a 6-year period in 2020. Wolf control under this program continued through RY17 and was conducted by permitted private citizens in coordination with and augmented by the department (ADF&G 2020). Wolf control was suspended in the UYTPC

Area in RY18, as part of a 9-year evaluation of the program conducted during RY15–RY23. This evaluation will review effects of wolf removal under this program on the Fortymile caribou herd and will document the recovery of the wolf population in the control area as part of the evaluation. As of RY20, the wolf population in the portions of Units 12 and 20E within the UYTPC Area was reduced from levels observed prior to the implementation of the predator control program; population trends outside this area are unknown.

# Management Direction

Wolves are an integral part of Interior Alaska's ecosystems. Compatible human uses for the species include both hunting and trapping (for personal use as well as the commercial sale of furs), photography, viewing, listening, and scientific and educational purposes (ADF&G 1976, ADF&G 2002). The aesthetic value of being aware of or observing wolves in their natural environment is also recognized as an important human use of wolves.

The department recognizes as well that integral to wolf management is the premise that wolf populations are renewable resources that can be harvested and manipulated to enhance human uses of other resources, such as caribou and moose. Management may also include both the manipulation of wolf population size and total protection of wolves from human influence.

## Existing Wildlife Management Plans

The operational plans for intensive management of the Fortymile caribou herd during RY15–RY19 and RY20–RY24 include a portion of Unit 12 and all Unit 20E (5 AAC 92.113). These operational plans include wolf control and are designed to increase caribou numbers for human harvest. To comply with regulatory requirements for intensive management programs, an annual intensive management report is submitted to the Board of Game, which provides an annual evaluation of the program.

## Goals

During RY15–RY19, the Units 12 and 20E wolf management goals were as follows:

G1. Ensure the long-term conservation of wolves throughout their historic range in Alaska in relation to their prey and habitat.

G2. Provide for the broadest possible range of human uses and values of wolves and their prey populations that meet wildlife conservation principles and reflect the public's interest.

G3. Increase public awareness and understanding of the uses, conservation, and management of wolves, their prey, and habitat in Alaska.

## CODIFIED OBJECTIVES

Amounts Reasonably Necessary for Subsistence Harvest

C1. Units 12 and 20E have a positive customary and traditional use finding for wolves, as determined by the Board of Game, with an amount necessary for subsistence set at 90 percent of the harvestable portion.

Intensive Management

C2. UYTPC Area: Maintain a population of at least 88–103 wolves annually after wolf control (including Unit 12 north of the Alaska Highway and all Unit 20E).

## MANAGEMENT OBJECTIVES

The management objectives for wolves in Units 12 and 20E were developed to align with the wolf population objectives for the UYTPC Area, which encompasses Unit 12 north of the Alaska Highway and all of Unit 20E.

M1. Maintain a population of at least 100 wolves in Unit 12.

M2. Reduce the fall population to no less than 60 wolves in Unit 20E.

## MANAGEMENT ACTIVITIES

1. Population Status and Trend

ACTIVITY 1.1. Develop annual minimum population estimates in Units 12 and 20E. Temporarily close aerial wolf control, wolf trapping, and wolf hunting in Units 12 or 20E if the population within either unit declines below the management objective for that unit (Objectives C2, M1, and M2).

*Data Needs*

Population estimates ensure that the minimum number of wolves remain within the range outlined by management objectives each year, after hunting and trapping seasons are over, and any wolf control is conducted (Objectives C2, M1, and M2).

*Methods*

Fall Population Estimates

RY15–RY18

Although unitwide fall population estimates for Units 12 and 20E were not developed during RY15–RY18, fall population estimates were developed for the UYTPC Area using 25 iterations of the PredPrey model (Version 1.5; McNay and DeLong 1998). These estimates were used to develop annual fall kill objectives for the UYTPC Program. Model inputs included population and harvest data for wolves, moose, and caribou in the UYTPC Area. Mathematical equations in

PredPrey, which define model functions, were taken from published predator-prey studies that had been conducted across North America (McNay and DeLong 1998). In addition, autumn estimates were refined each spring by adding the annual wolf harvest to late winter estimates. To determine a minimum population estimate and wolf removal rate within the UYTPC Area following annual control efforts, we subtracted all hunter-trapper harvest and wolf control take from the fall population estimate. This information was used to help evaluate annual program success. Fall estimates were not developed for individual units or used to evaluate unit-specific management objectives; therefore, fall population data for RY15–RY18 were not included in this report.

RY19

Although unitwide fall population estimates for Units 12 and 20E were not developed during RY19, a fall population estimate was developed for the UYTPC Area using results from a March 2020 intensive aerial wolf survey conducted by ADF&G and wolf removal data for RY19. Fall estimates were not developed for individual units or used to evaluate unit-specific management objectives; therefore, fall population data for RY19 were not included in this report.

Late-Winter Population Estimates

RY15–RY18

Although unitwide late-winter population estimates for Units 12 and 20E were not developed during RY15–RY18, population estimates were developed for the UYTPC Area during these years and aerial wolf surveys were conducted (February–April) in conjunction with the UYTPC Program during RY15–RY17, using reconnaissance-style survey techniques (Stephenson 1978; Gasaway et al. 1983) within and adjacent to the Fortymile caribou calving and postcalving range in the UYTPC Area, outside of the Yukon-Charley Rivers National Preserve (objectives C2, M1, and M2). The area surveyed (outside the Yukon-Charley Rivers National Preserve) encompasses approximately 194 $mi^2$ of northwest Unit 12 and approximately 4,194 $mi^2$ of western and northern Unit 20E.

Aerial surveys followed assumptions outlined by Becker et al. (1998). If assumptions were not met during a particular year, these counts no longer represented a census but were considered a minimum count of wolves in that survey area (Gardner and Pamperin 2014). During reconnaissance surveys, survey teams in fixed-wing aircraft and a helicopter made direct observations of wolves and counted tracks in assigned areas. Up to 7 planes and 1 helicopter were used each day that surveys were conducted.

We mapped all individual observations of wolves, wolf tracks, and kill sites by gathering information from aerial surveys, incidental sightings by department staff and local pilots, hunter and trapper interviews, and conversations with wolf control permittees. We also analyzed sealing documents, and the potential overlap among sightings to reduce the possibility of overestimating the number of packs (2 or more wolves together were considered a pack) or the number of wolves in a pack. We combined all information to estimate the number of wolves in the UYTPC Area where aerial surveys were conducted during RY15–RY17.

For RY15–RY18, to estimate fall wolf numbers, pack sizes, and territory boundaries in portions of the UTYPC Area and portions of Units 12 and 20E where aerial surveys were not completed, and to supplement aerial survey results (RY15–RY17 only), we used density estimates from wolf research in Interior Alaska and the Yukon (Gasaway et al. 1983, Boertje et al. 1996, McNay and DeLong 1998, Hayes et al. 2003) and anecdotal observations of department staff, area pilots, trappers and hunters. Information from sealing records and conversations with wolf hunters, trappers, and wolf control permittees were then used to estimate over-winter wolf removal, which was subtracted from the fall population estimate to determine a late-winter population estimate.

Lone Wolves

Lone (single) wolves are generally individuals dispersing from packs rather than wolves living a long-term solitary existence (Ballard et al. 1987, Adams et al. 2008). The number of lone wolves varies throughout the year. In Units 12 and 20E, lone wolves are most common during February–May, which is when most young wolves disperse (Adams et al. 2008, Gardner and Pamperin 2014). This transient component of the population is particularly important to include in the Units 12 and 20E minimum population estimates because more open territories are available to wolves in these units due to the removal of packs under the ongoing UYTPC Program, which encompasses northern Unit 12 and all Unit 20E. Based on results from other wolf control programs (Hayes et al. 2003), these transient wolves will settle all open areas in these units and must be considered to develop annual fall UYTPC Program wolf kill objectives, evaluate annual control efforts, and because the Units 12 and 20E minimum spring population objectives of at least 100 and 60 wolves in each unit, respectively, include lone wolves.

To estimate the wolf population during RY15–RY17 within the portion of the UTYPC Area surveyed, I increased the estimates by 10% to account for lone wolves. Although estimating lone wolves is difficult and shortcomings with doing so are identified by Burch et al. (2005) and Adams et al. (2008), I continued to include lone wolves when developing the Units 12 and 20E minimum wolf population estimates in order to compare them with the UYTPC Program estimates.

RY19

In March 2020, an intensive aerial wolf survey was conducted by ADF&G in the UYTPC Area (objectives C2, M1, and M2), including portions of Units 12 and 20E, using reconnaissance-style survey techniques (Stephenson 1978; Gasaway et al. 1983; and Danny Caudill, Research Biologist, ADF&G, Fairbanks, personal communication, 2023).

Unit 12 and 20E Minimum Population Estimate

To estimate Units 12 and 20E annual minimum wolf population size after wolf control (RY15–RY17) and hunter-trapper harvest, we used unit-specific data from the UYTPC Program wolf surveys (RY15–RY17), or department wolf population surveys (RY19), supplemented with information from fall population models, density estimates from wolf research in Interior Alaska and the Yukon (Gasaway et al. 1983, Boertje et al. 1996, McNay and DeLong 1998, Hayes et al. 2003), sealing records, and anecdotal information from wolf hunters, trappers, and wolf control permittees in areas that were not surveyed. If a unitwide population estimate fell below a unit-

specific minimum population objective, an emergency order was issued to limit further reductions and allow for wolf numbers to increase above minimum objectives.

*Results and Discussion*

The UYTPC Area

Aerial wolf surveys were conducted in conjunction with the UYTPC Program during RY15 (7–10 March 2016), RY16 (2 March–12 April 2017) and RY17 (5–16 March 2018).

Up to 7 fixed-wing planes and 1 helicopter were used each day when surveys were conducted, with a total of 251.9, 653.3 and 326.7 hours flown by the aircraft during RY15, RY16 and RY17, respectively. Not all the time was spent searching for wolves, as the primary purpose of the efforts was to remove wolves from the control area. Therefore, much of the flight time was spent on logistical support (transporting fuel, supplies, wolves, etc.), circling packs while waiting for the helicopter to arrive (to remove wolves), climbing to altitude to communicate with other aircraft, and removing wolves. Total hours spent searching for wolves was not tracked, but in general, the majority of total time flown during each year was dedicated to searching for wolves.

For further detail on fall population estimates developed for the UYTPC Program, see the DWC's RY15–RY19 Upper Yukon-Tanana intensive management annual activity reports (February 2016 through February 2020) to the Board of Game, and the *Operational Plan for Intensive Management of the Fortymile Caribou Herd in Game Management Units 12, 20B, 20D, 20E, and 25C During Regulatory Years 2020–2025*: https://www.adfg.alaska.gov/static/research/programs/intensivemanagement/pdfs/2020_2026_uytpcp_operational_plan.pdf.

Unit 12

RY15–RY19

No wolf surveys have been conducted in Unit 12 since RY03 outside the areas surveyed for the UYTPC Program, which went into effect in RY04. Results of the RY03 survey are described by Bentzen (2009). The most recent Unit 12 estimate was developed in spring 2008 when Tok ADF&G staff estimated the Unit 12 wolf population to be 179–192 wolves (18.1–19.4 wolves/1,000 $mi^2$, 7–7.5 wolves/1,000 $km^2$) in 31 packs after accounting for all wolves removed by hunting, trapping, and wolf control activities (Bentzen 2012). This estimate was based on a combination of hunting and trapping harvest reports; observations by ADF&G biologists; and previous estimates for northwestern Unit 12 (Gardner 2003), the Chisana area (Hollis 2006), and the UYTPC Area (Gross 2009). The estimate also includes an estimate of an additional 10% for single and dispersing wolves. Although there were insufficient survey data to develop accurate annual unitwide population estimates, after analysis of all available population and harvest data during RY15–RY19, there is little indication that the number of packs (28–32 packs) or average fall pack size (7.0–7.4 wolves) in Unit 12 have changed appreciably since RY03. The one exception is a small portion of northwest Unit 12 where several packs were reduced in some years by wolf control that began in RY04. Therefore, the Unit 12 wolf population is assumed to have remained well above the minimum objective of 100 wolves during RY15–RY19.

Unit 20E

RY15–RY18

Prior to the March 2020 survey, the most recent unitwide population survey in Unit 20E was conducted in RY09. Based on results from that RY09 survey, supplemental information from ADF&G staff, area pilot and trapper observations, harvest reports, and National Park Service radiocollar data, Tok ADF&G staff estimated the fall 2009 population to be 173–190 wolves in 30 packs, including 16–17 (10%) single wolves not associated with packs (Bentzen 2012).

There were insufficient survey data to develop accurate annual unitwide population estimates during RY15–RY18; however, analysis of all available information during the reporting period allowed us to develop adequate minimum population estimates to conclude that the management objective of at least 60 wolves in Unit 20E was met each year during RY15–RY18. Following annual control efforts during RY15–RY18, the majority of the remaining wolf population in Unit 20E was located in the eastern portion of the unit. There is little indication that the number of packs (approximately 15) and average pack size (7.0–7.4 wolves) in eastern Unit 20E has changed appreciably since RY03, prior to wolf control activities that began in RY04.

RY19

There were also insufficient survey data to develop an accurate fall unitwide population estimate in RY19. However, during 4–6 and 11–15 March 2020, an intensive aerial wolf survey was conducted by ADF&G research staff in 91% (17,150 $mi^2$) of the UYTPC Area, which encompassed 89% (9,480 $mi^2$) of Unit 20E, using reconnaissance-style survey techniques (Stephenson 1978; Gasaway et al. 1983; and Danny Caudill, Research Biologist, ADF&G, Fairbanks, personal communication, 2023).

The estimated number of wolves in the 17,150-$mi^2$ portion of the UYTPC Area surveyed was 358–393 wolves (density = 20.9–22.9 wolves/1,000 $mi^2$), including an estimated 189–204 wolves (density = 19.9–21.5 wolves/1,000 $mi^2$) in the 9,480-$mi^2$ portion of Unit 20E (Danny Caudill, Research Biologist, ADF&G, Fairbanks, unpublished data, 2023). Assuming there was a similar density of wolves (density = 19.9–21.5 wolves/1,000 $mi^2$) in the 1,200-$mi^2$ portion of Unit 20E not surveyed, there were an additional 24–26 wolves in Unit 20E outside the survey area, for a unitwide population estimate of 213–230 wolves in Unit 20E. This estimate was above the management objective of at least 60 wolves in Unit 20E.

*Recommendations for Activity 1.1*

Continue as funding allows. Population estimates ensure that the minimum number of wolves remain each year after wolf control has been conducted, and hunting and trapping seasons are over (Objectives C2, M1, and M2).

2. Mortality-Harvest Monitoring and Regulations

ACTIVITY 2.1 Monitor harvest and trapper effort through sealing records, and interviews with trappers and control permittees during years with active wolf control (Objectives C2, M1, and M2).

*Data Needs*

Fur sealing data from ADF&G's Wildlife Information Network (WinfoNet) database are reviewed annually to assess harvest and predation-control take (during years with active wolf control). This information is used for intensive management and annual reports to the Board of Game, and to address objectives C2, M1, and M2.

*Methods*

Wolves harvested by hunters, trappers, and control permittees (during years with active wolf control) were sealed to monitor harvest. Harvest data were archived in WinfoNet and are reported by regulatory year. Information recorded for each wolf included date of kill, name of person harvesting wolf, location, method of take, transportation, sex of the wolf, color of the pelt, and number of wolves thought to be in the pack.

*Seasons and Bag Limits*

Hunting and trapping regulations were aligned in Units 12 and 20E during RY15–RY19. Hunting regulation book numbers 56, 57, 58, 59, and 60 list wolf hunting regulations and Alaska Trapping Regulation book numbers 56, 57, 58, 59, and 60 list wolf trapping regulations during these years.

| Regulation type | Regulatory year | Bag limits | Seasons |
|---|---|---|---|
| Hunting | RY15–RY19 | 10 wolves | 10 Aug–31 May |
| Trapping[1] | RY15–RY19 | No limit | 15 Oct–30 Apr |

[1] Traps and snares less than 3/32 inches in diameter are not permitted during October and April.

Current wolf hunting regulations for Units 12 and 20E can be found on the ADF&G website at: https://www.adfg.alaska.gov/index.cfm?adfg=wildliferegulations.hunting.

*Results and Discussion*

Hunter-Trapper Harvest and Wolf Control Permittee Take

During RY15–RY19, 233 wolves (range = 24–63 per year) in Unit 12 and 242 wolves (range = 32–67 per year) in Unit 20E were reported as harvested by hunters, trappers, and wolf control permittees (Table 1). Of these, control permittees took 49 wolves: 7 in Unit 12 and 42 in Unit 20E (Table 1). Annual wolf harvests varied among years. These oscillations were likely not related to fluctuations in wolf numbers, but rather to other annual factors that affected how effective trappers and control permittees were in taking wolves (e.g., weather, snow conditions, caribou distribution, and intensive management participation).

Hunter-Trapper Residency and Success

Areawide, the number of successful hunters and trappers during RY15–RY19 ranged from 11 to 20 per year in Unit 12, and 11 to 22 per year in Unit 20E, with a total harvest of 226 wolves in Unit 12 and 200 wolves in Unit 20E (Tables 2a and 2b). Most of the wolf harvest (about 94%) was taken by residents in both Units 12 and 20E (Tables 2a and 2b).

Harvest Chronology

During RY15–RY19, 42 and 34 percent of the reported wolf harvest and aerial wolf take in Units 12 and 20E, respectively, occurred during February–March (Tables 3a and 3b). Winter wolf harvest and take by aerial control were dependent on adequate snow cover that typically improves by mid-December. Furthermore, adequate sunlight, which is best during late January through March, is necessary to efficiently track wolves. Even though wolf trapping season and control activities can occur through April, few trappers and control permittees participate because of deteriorating snow conditions and wolf pelt quality. August and September wolf harvests are typically incidental to other big game hunts.

Method of Take and Transport Methods

Excluding same-day-airborne removal conducted during predation control, snaring remained the primary method of take in both Units 12 and 20E (Table 1). Snowmachine (55%) was the most common transportation method used, followed by airplane (19%), to take wolves in Units 12 and 20E by hunters and trappers (Table 4).

*Alaska Board of Game Actions and Emergency Orders*

In March 2014, the Board of Game modified and reauthorized the UYTPC implementation plan in portions of Units 12, 20B, 20D, and 25C and all of Unit 20E for 6 years (RY14–RY19) beginning 1 July 2014. This plan allowed aerial wolf control by private permittees and the department within the 18,750-mi$^2$ control area. The objectives of this plan include maintaining a population of at least 88 to 103 wolves annually after wolf control (including Unit 12 north of the Alaska Highway and all Unit 20E).

In March 2020, the Board of Game reauthorized the UYTPC implementation plan in portions of Units 12, 20B, 20D, and 25C and all of Unit 20E for an additional 6 years (RY20–RY25) beginning 1 July 2020. This plan retained the same wolf control area and objectives as the previous plan.

Also in March 2020, the Board of Game changed the closing date for the wolf hunting season in Units 12 and 20E from 31 May to 30 April.

No emergency orders were issued to modify the wolf trapping or hunting regulations in Units 12 or 20E during RY15–RY19.

**Table 1. Wolf harvest and take method, Units 12 and 20E, regulatory years 2015–2019, Interior Alaska.**

| Regulatory year | Unit 12 | | | | | | Unit 20E | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Shoot | Trap | Snare | SDA[a] MW303 | Other | Total | Shoot | Trap | Snare | SDA[a] MW303 | SDA[a] ADF&G | Other | Total |
| 2015 | 10 | 5 | 25 | 5 | 0 | 45 | 8 | 8 | 17 | 21 | 9 | 0 | 63 |
| 2016 | 13 | 24 | 21 | 1 | 0 | 59 | 10 | 7 | 26 | 9 | 43 | 0 | 96 |
| 2017 | 9 | 10 | 35 | 1 | 8 | 63 | 11 | 13 | 31 | 12 | 32 | 0 | 97 |
| 2018 | 6 | 9 | 27 | 0 | 0 | 42 | 7 | 6 | 19 | 0 | 0 | 0 | 32 |
| 2019 | 6 | 17 | 1 | 0 | 0 | 24 | 14 | 5 | 18 | 0 | 0 | 0 | 37 |
| Total | 44 | 65 | 109 | 7 | 8 | 233 | 50 | 39 | 111 | 42 | 84 | 0 | 326 |

[a] SDA stands for the same-day airborne aerial wolf control method associated with predation control programs in Units 12 and 20E.

**Table 2a. Unit 12 wolf harvest success by residency and sex, regulatory years 2015–2019, Interior Alaska.**

| | Reported harvest | | | | | | | Residency | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Male | | Female | | Unknown | | | | | | | |
| Regulatory year | No. | % | No. | % | No. | % | Total | Non-resident | Resident | Unknown | No. of successful trappers | No. of successful hunters |
| 2015 | 24 | 60 | 16 | 40 | 0 | 0 | 40 | 4 | 36 | 0 | 10 | 7 |
| 2016 | 32 | 55 | 23 | 40 | 3 | 5 | 58 | 4 | 54 | 0 | 15 | 5 |
| 2017 | 36 | 58 | 26 | 42 | 0 | 0 | 62 | 1 | 61 | 0 | 15 | 5 |
| 2018 | 23 | 55 | 17 | 40 | 2 | 5 | 42 | 5 | 37 | 0 | 12 | 5 |
| 2019 | 12 | 50 | 9 | 38 | 3 | 12 | 24 | 1 | 23 | 0 | 7 | 4 |
| Total | 127 | 56 | 91 | 40 | 8 | 4 | 226 | 15 | 211 | 0 | 59 | 26 |

*Note*: Percentage values are rounded to the nearest whole number.

**Table 2b. Unit 20E wolf harvest success by residency and sex, regulatory years 2015–2019, Interior Alaska.**

| | Reported harvest | | | | | | | Residency | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Male | | Female | | Unknown | | | | | | | |
| Regulatory year | No. | % | No. | % | No. | % | Total | Non-resident | Resident | Unknown | No. of successful trappers | No. of successful hunters |
| 2015 | 11 | 33 | 20 | 61 | 2 | 6 | 33 | 0 | 33 | 0 | 6 | 8 |
| 2016 | 19 | 44 | 23 | 54 | 1 | 2 | 43 | 1 | 42 | 0 | 7 | 9 |
| 2017 | 32 | 58 | 22 | 40 | 1 | 2 | 55 | 3 | 52 | 0 | 8 | 8 |
| 2018 | 14 | 44 | 16 | 50 | 2 | 6 | 32 | 1 | 31 | 0 | 6 | 5 |
| 2019 | 20 | 54 | 15 | 41 | 2 | 5 | 37 | 5 | 32 | 0 | 9 | 13 |
| Total | 96 | 48 | 96 | 48 | 8 | 4 | 200 | 10 | 190 | 0 | 36 | 43 |

*Note*: Percentage values are rounded to the nearest whole number.

**Table 3a. Unit 12 wolf hunting and trapping harvest, and aerial wolf control take chronology by month, regulatory years 2015–2019, Interior Alaska.**

| Regulatory year | Aug | | Sep | | Oct | | Nov | | Dec | | Jan | | Feb | | Mar | | Apr | | May | | Unk/other | | Total harvest |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % | |
| 2015 | 1 | 3 | 6 | 15 | 0 | 0 | 0 | 0 | 6 | 15 | 9 | 23 | 8 | 20 | 10 | 25 | 0 | 0 | 0 | 0 | 0 | 0 | 40 |
| 2016 | 2 | 3 | 6 | 10 | 0 | 0 | 4 | 7 | 9 | 16 | 11 | 19 | 15 | 26 | 10 | 17 | 1 | 2 | 0 | 0 | 0 | 0 | 58 |
| 2017 | 1 | 2 | 4 | 6 | 0 | 0 | 1 | 2 | 6 | 10 | 28 | 45 | 14 | 23 | 6 | 10 | 2 | 3 | 0 | 0 | 0 | 0 | 62 |
| 2018 | 1 | 2 | 3 | 7 | 0 | 0 | 1 | 2 | 2 | 5 | 6 | 14 | 20 | 48 | 9 | 21 | 0 | 0 | 0 | 0 | 0 | 0 | 42 |
| 2019 | 2 | 8 | 4 | 17 | 0 | 0 | 6 | 25 | 2 | 8 | 6 | 25 | 0 | 0 | 4 | 17 | 0 | 0 | 0 | 0 | 0 | 0 | 24 |
| Total | 7 | 3 | 23 | 10 | 0 | 0 | 12 | 5 | 25 | 11 | 60 | 27 | 57 | 25 | 39 | 17 | 3 | 1 | 0 | 0 | 0 | 0 | 226 |

*Note*: Percentage values are rounded to the nearest whole number.

**Table 3b. Unit 20E wolf hunting and trapping harvest, and aerial wolf control take chronology by month, regulatory years 2015–2019, Interior Alaska.**

| Regulatory year | Aug | | Sep | | Oct | | Nov | | Dec | | Jan | | Feb | | Mar | | Apr | | May | | Unk/other | | Total harvest |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % | |
| 2015 | 1 | 3 | 7 | 21 | 0 | 0 | 5 | 15 | 2 | 6 | 4 | 12 | 2 | 6 | 6 | 18 | 5 | 15 | 0 | 0 | 1 | 3 | 33 |
| 2016 | 4 | 9 | 4 | 9 | 0 | 0 | 5 | 12 | 3 | 7 | 9 | 21 | 8 | 19 | 8 | 19 | 2 | 5 | 0 | 0 | 0 | 0 | 43 |
| 2017 | 4 | 7 | 5 | 9 | 0 | 0 | 8 | 15 | 9 | 16 | 11 | 20 | 16 | 29 | 2 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 55 |
| 2018 | 1 | 3 | 5 | 16 | 0 | 0 | 1 | 3 | 2 | 6 | 5 | 16 | 4 | 13 | 14 | 44 | 0 | 0 | 0 | 0 | 0 | 0 | 32 |
| 2019 | 2 | 5 | 12 | 32 | 0 | 0 | 2 | 5 | 6 | 16 | 7 | 19 | 3 | 8 | 4 | 11 | 0 | 0 | 0 | 0 | 1 | 3 | 37 |
| Total | 12 | 6 | 33 | 17 | 0 | 0 | 21 | 11 | 22 | 11 | 36 | 18 | 33 | 17 | 34 | 17 | 7 | 4 | 0 | 0 | 2 | 1 | 200 |

*Note*: Percentage values are rounded to the nearest whole number.

**Table 4. Hunting and trapping harvest by transport method, Units 12 and 20E, regulatory years 2015–2019, Interior Alaska.**

| | Unit 12 | | | | | | | | | Unit 20E | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Aircraft | | Snow-machine | | Ski/ snowshoe | | Other[a] | | | Aircraft | | Snow-machine | | Ski/ snowshoe | | Other[a] | | |
| Regulatory year | No. | % | No. | % | No. | % | No. | % | Total | No. | % | No. | % | No. | % | No. | % | Total |
| 2015 | 17 | 43 | 15 | 38 | 1 | 3 | 7 | 18 | 40 | 1 | 3 | 17 | 52 | 0 | 0 | 15 | 45 | 33 |
| 2016 | 4 | 7 | 31 | 53 | 5 | 9 | 18 | 31 | 58 | 3 | 7 | 27 | 63 | 1 | 2 | 12 | 28 | 43 |
| 2017 | 9 | 15 | 30 | 48 | 0 | 0 | 23 | 37 | 62 | 6 | 11 | 42 | 76 | 1 | 2 | 6 | 11 | 55 |
| 2018 | 18 | 43 | 20 | 48 | 0 | 0 | 4 | 10 | 42 | 3 | 9 | 25 | 78 | 2 | 6 | 2 | 6 | 32 |
| 2019 | 8 | 33 | 11 | 46 | 0 | 0 | 5 | 21 | 24 | 10 | 27 | 16 | 43 | 0 | 0 | 11 | 30 | 37 |
| Total | 56 | 25 | 107 | 47 | 6 | 3 | 57 | 25 | 226 | 23 | 12 | 127 | 64 | 4 | 2 | 46 | 23 | 200 |

*Note*: Percentage values are rounded to the nearest whole number.

[a] Other includes the following transport methods: boats, 3- and 4-wheelers, off-road vehicles, highway vehicles, and other unreported methods.

*Recommendations for Activity 2.1*

Continue. Wolf sealing data should be reviewed annually to assess harvest and predation control take. This information is used for intensive management and annual reports to the Board of Game, and to address objectives C2, M1 and M2.

3. Habitat Assessment-Enhancement

None.

### NONREGULATORY MANAGEMENT PROBLEMS OR NEEDS

Hair loss caused by genetic follicular dysplasia and lice are a problem for wolves in portions of Units 12 and 20E. No cost-effective tools are known to treat these problems, so they are likely to persist. Wolf pelts with poor fur quality have little value, but during RY15–RY19 hunters and trappers were still inclined to take these wolves to 1) remove lice-infected individuals from the population, 2) remove predators from the population in the belief that a public service is being rendered, and 3) take advantage of whatever value such wolves might have. Depending on the degree of hair loss, some wolf hides may still have some fur value, and most wolf skulls and teeth also have some monetary value.

Data Recording and Archiving

- Wolf harvest (fur sealing) data are archived in ADF&G's WinfoNet database.
- Electronic data and files such as survey memoranda and reports are stored in the WinfoNet Data Archive. Project title: Tok Wolf Management Program. Primary region: Region III.
- Hard copies of data and files such as survey memos and reports are located in the ADF&G Tok office.

Agreements

None.

Permitting

None.

## Conclusions and Management Recommendations

ADF&G area management staff achieved our management goal to provide a sustained opportunity to participate in hunting and trapping wolves. We met the management objectives of maintaining a population of at least 100 wolves in Unit 12, and 60 wolves in Unit 20E during RY15–RY19 (M1 and M2). No changes are recommended to the approach of monitoring annual harvest through sealing records and interviews with trappers and control permittees.

# II. Project Review and RY20–RY24 Plan

## Review of Management Direction

### MANAGEMENT DIRECTION

Management direction will remain the same as during RY15–RY19.

### GOALS

The Units 12 and 20E wolf management goals for RY20–RY24 are unchanged from RY15–RY19:

G1. Ensure the long-term conservation of wolves throughout their historic range in Alaska in relation to their prey and habitat.

G2. Provide for the broadest possible range of human uses and values of wolves and their prey populations that meet wildlife conservation principles and reflect the public's interest.

G3. Increase public awareness and understanding of the uses, conservation, and management of wolves, their prey, and habitat in Alaska.

### CODIFIED OBJECTIVES

Amounts Reasonably Necessary for Subsistence Harvest

C1. Units 12 and 20E have a positive customary and traditional use finding for wolves, as determined by the Board of Game, with an amount necessary for subsistence set at 90 percent of the harvestable portion.

Intensive Management

C2. UYTPC Area: Maintain a population of at least 88–103 wolves annually after wolf control (including Unit 12 north of the Alaska Highway and all of Unit 20E).

### MANAGEMENT OBJECTIVES

The management objective for wolves in Units 12 and 20E was developed to align with the wolf population objectives for the UYTPC Area, which encompasses Unit 12 north of the Alaska Highway and all of Unit 20E. Management objective M2 was reworded to match the wording used for M1, but the intent of M2 is unchanged.

M1. Maintain a population of at least 100 wolves in Unit 12.

M2. Maintain a population of at least 60 wolves in Unit 20E.

## REVIEW OF MANAGEMENT ACTIVITIES

1. Population Status and Trend

ACTIVITY 1.1. Develop annual minimum population estimates in Units 12 and 20E. Temporarily close aerial wolf control (if active), wolf trapping, and wolf hunting in Unit 12 or 20E if the population within either unit declines below the unit management objective (Objectives C2, M1, and M2).

*Data Needs*

No change from RY15–RY19.

*Methods*

No change from RY15–RY19.

2. Mortality-Harvest Monitoring and Regulations

ACTIVITY 2.1. Monitor harvest and trapper effort through sealing records, trapper interviews, and trapper questionnaires (Objectives C2, M1, and M2).

*Data Needs*

No change from RY15–RY19.

*Methods*

No change from RY15–RY19.

3. Habitat Assessment and Enhancement

No habitat assessment or enhancement activities are planned for wolf in Units 12 and 20E.

4. Public Participation and Outreach

ACTIVITY 4.1. Provide information to state and federal regulatory processes and the public on wolf management in Units 12 and 20E.

*Data Needs*

In order for those who engage in the regulatory processes to understand management and biology of wolves in Units 12 and 20E, especially in the UYTPC Area, it is important for ADF&G staff to communicate and coordinate with Fish and Game Advisory Committees, the Board of Game, Federal Regional Advisory Councils, and the Fortymile Caribou Harvest Management Coalition about wolf management and biology; and also to review and analyze regulation proposals for the Board of Game and the Federal Subsistence Board.

Increasing public awareness of wolf population trends; effects on moose and caribou populations; and management directions through trapper education clinics, newsletters,

brochures, news releases, and other documents will provide the public with valuable information to make informed decisions when participating in these regulatory processes. The annual intensive management report submitted to the Board of Game will allow for compliance with regulatory requirements for intensive management programs by providing an annual evaluation of the UYTPC Program.

*Methods*

ADF&G area management staff will attend meetings of Fish and Game Advisory Committees, the Board of Game, Federal Regional Advisory Councils, and the Fortymile Caribou Harvest Management Coalition to provide information about wolf biology and management in Units 12 and 20E, and review and analyze regulation proposals for the Board of Game and the Federal Subsistence Board.

### NONREGULATORY MANAGEMENT PROBLEMS OR NEEDS

Hair loss on wolves, caused by genetic follicular dysplasia and lice, will continue to be monitored in portions of Units 12 and 20E.

Data Recording and Archiving

No change from RY15–RY19.

Agreements

None.

Permitting

None.

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