Species Management Report and Plan ADF&G/DWC/SMR&P–2025–36

Furbearer Management Report and Plan, Game Management Units 21B, 21C, 21D, and 24:

Report Period 1 July 2017–30 June 2022, and

Plan Period 1 July 2022–30 June 2027

Glenn W. Stout

2025

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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Purpose of this Report

This report provides a record of survey and inventory management activities for furbearers in Units 21B, 21C, 21D, and 24 for the 5 regulatory years 2017–2021 and plans for survey and inventory management activities in the next 5 years, 2022–2026. A regulatory year (RY) begins 1 July and ends 30 June (e.g., RY21 = 1 July 2021–30 June 2022). 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 furbearer management report of survey and inventory activities that was previously produced every 3 years.

I. RY17–RY21 Management Report

Management Area

Units 21B, 21C, and 21D (25,083 mi^2 combined) are located in western Interior Alaska and encompass the Yukon River drainage upstream from Paimiut to the Tozitna River. It includes the Koyukuk River up to Dulbi Slough and the Nowitna River drainage. Unit 24 (26,068 mi^2) is also located in western Interior Alaska. It encompasses the Koyukuk River drainage upstream of the Dulbi River drainage and is further divided into 4 administrative units: Unit 24A (4,146 mi^2), Unit 24B (13,523 mi^2), Unit 24C (3,049 mi^2), and Unit 24D (5,350 mi^2).

Summary of Status, Trend, Management Activities, and History of Furbearers in Units 21B, 21C, 21D, and 24

Furbearers have traditionally been an important resource for food, clothing, and trade items in Units 21 (Robert 1984) and 24 (Marcotte and Haynes 1985). Historically, furbearer populations in these units have been sufficient to meet the needs of local people; however, they are subject to cycles of abundance and scarcity, primarily due to fluctuations in small mammal and gallinaceous bird populations. The numerous lakes, rivers, and streams in Units 21B, 21C, 21D, and 24 support abundant water-dependent furbearers such as beaver, mink, river otter, and muskrat. The following furbearer species found in these units are listed in order of their economic importance, from most to least: marten, wolf, beaver, lynx, wolverine, red fox, mink, river otter, and muskrat; coyote and arctic fox are rare. Weasel and red squirrel are common but not typically targeted by area trappers.

Management Direction

Existing Wildlife Management Plans

There are no other existing management plans for furbearers in Units 21B, 21C, 21D, and 24. Previous management directions were documented in the furbearer management reports of survey and inventory activities.

Goals

G1. Provide for sustained opportunity for harvesting and viewing furbearers.

Codified Objectives

Amounts Reasonably Necessary for Subsistence Uses

C1. Units 21B, 21C, 21D, and 24 have a positive finding for the customary and traditional uses of furbearers. The amounts reasonably necessary for subsistence (ANS) uses are 90% of the harvestable portion for each furbearer species.

Intensive Management

Not applicable.

Management Objectives

M1. Provide marten trappers with vital statistics on marten from their trapline.

Management Activities

1. Population Status and Trend

ACTIVITY 1.1. Monitor trends in marten harvest, assess annual age and sex structure, and assess reproductive performance using marten carcasses obtained from trappers (M1).

Data Needs

Martens are the most pursued furbearers in the Galena Management Area. Due to their high susceptibility to trapping, martens have a greater potential for overharvest than other furbearers. They are also a valuable species to monitor as an index to help understand microtine (prey) population trends and habitat quality for other furbearers. Martens are not required to be sealed in Units 21B, 21C, 21D, and 24; therefore, collecting marten carcasses from a consistent group of trappers will provide an index of annual harvest, age and sex composition of the harvest, pregnancy rate, fecundity rate, and blastocysts-to–adult-female ratios.

Methods

Marten harvest, annual age and sex structure, and reproductive performance were assessed using martens purchased from trappers in the Galena Management Area and handled according to established methods (K. Nicholson, personal communication to Wildlife Biologist, ADF&G, Galena, 30 January 2019). Fresh, frozen carcasses received from trappers were thawed for these procedures and sorted by the month trapped if the trapper provided this information. Carcasses were then sorted by sex based on external genitalia. Age class was assigned based on the development of the sagittal crest, coalescence of temporal musculature, the gross size of the uterine horns, or all three (Poole et al. 1994). Department staff extracted reproductive tracts from adult females and used a water-filled syringe to flush each uterine horn with ≥3 mL of water. The water was injected through a 20-gauge needle inserted immediately below the ovary into a clean petri dish (Strickland and Douglas 1987). We counted all blastocysts occurring in the flushed solution using a 10x power dissecting scope. Trappers providing carcasses were interviewed to determine effort based on the number of traps set per month and drainages trapped, which were assigned by Universal Coding Units.

Because martens have delayed implantation, and mating occurs before the trapping season, we considered the pregnancy rates and mean count of blastocysts representative for that year (Flynn and Schumacher 2009, Poole et al. 1994). Additionally, because all reproductive tracts were flushed using the same methods, we assume the number of blastocysts missed would be consistent across samples, management areas, and years. We recognize that using blastocysts may potentially underestimate our fecundity estimates. The primary cause of reduced counts of blastocysts was disintegration caused by poor preservation of the carcasses (Strickland et al. 1982).

Two middle toes and the lower jaw, including both incisors, both canines, and the first two premolars, were collected from each carcass and stored in a loess solution (7% glycerol, 51% ethyl alcohol, and 42% water). When funding allowed, teeth were submitted for aging; the remaining samples were archived. Marten carcass data were recorded on a data form (Appendix A).

Results and Discussion

Marten carcasses were collected and processed in Units 21B, 21D, and 24 during RY17–RY21. The age and sex of these trapped martens indicated that the total juvenile-to-adult female harvest ratio was 4.5:1 (Table 1), which is slightly above the long-term average of 3.7:1. The population was possibly experiencing high recruitment, and harvest was at the appropriate level. The male-to-female harvest ratio, including both adult and juvenile martens, was approximately 1.5:1 (Table 1). This result was comparable to populations of marten trapped in other areas of Alaska (Strickland and Douglas 1987, Whitman 2001) and indicates that the harvest level was appropriate in Units 21B, 21D, and 24. Due to the possible sex-based differences in the vulnerability of martens to trapping, or a possible skewed age structure in the population (Flynn and Schumacher 2009), these ratios may not accurately reflect the actual sex ratio of the wild population (Buskirk and Lindstedt 1989).

The reproductive values of pregnant females are reported in Table 2. The average number of blastocysts, pregnancy rate, and fecundity rate varied little during RY17–RY21; however, the sample size of adult females may be too low to detect a trend in these parameters.

Table 1. Sex and age of trapper-harvested marten, Units 21B, 21D, and 24, Alaska, regulatory years 2017–2021.

Regulatory year	Male				Female				Total	Ratios	
	Adult	(%)	Juvenile	(%)	Adult	(%)	Juvenile	(%)		Total juvenile: adult female	Total male: total female
2017	153	(29)	155	(29)	53	(10)	165	(31)	526	6.0	1.2
2018	336	(36)	203	(22)	168	(18)	224	(24)	931	2.5	1.2
2019	56	(22)	104	(41)	17	(7)	77	(30)	254	10.6	1.5
2020	56	(26)	83	(39)	5	(2)	71	(33)	215	30.8	1.5
2021	20	(31)	21	(32)	5	(8)	18	(28)	64	7.8	1.5
Total	621	(31)	566	(28)	248	(12)	555	(28)	1,990	4.5	1.3

Table 2. Reproductive values of trapper-harvested adult female marten, Units 21B, 21D, and 24, Alaska, regulatory years 2017–2021.

Regulatory year	No. adult females examined[a]	No. pregnant	Percent pregnant	No. blastocysts	Average blastocysts per pregnant female	Average fecundity
2017	42	17	40.5	47	2.8	1.12
2018	89	36	40.4	87	2.4	0.98
2019	17	11	64.7	19	1.7	1.12
2020	5	2	40.0	5	2.5	1.00
2021	5	1	20.0	4	4.0	0.80
Total	158	82	51.9	162	2.0	1.03

[a] Sample size differs from that of adult females reported in Table 1 in cases where an adult female was unsuitable for examination.

Recommendations for Activity 1.1.

We recommend continuing to collect marten carcasses to establish a long-term dataset that can provide an index for marten population trends and harvest patterns. Also, we need to expand the number of trappers participating in the marten carcass collection to maintain meaningful sample sizes.

2. Mortality–Harvest Monitoring and Regulations

ACTIVITY 2.1. Report annual harvest of species required by regulation to be sealed (lynx, wolverine, and river otter; C1)

Data Needs

Harvest data was not needed to achieve the management goals or evaluate codified objectives. The opportunity to harvest furbearers was not restricted because there were no concerns of overharvest affecting furbearer abundance or population sustainability. Regardless, tracking the harvest of those species required by regulation to be sealed may provide useful information for trappers, advisory committees, and the Board of Game (BOG, the board).

Methods

The total harvest for lynx, river otter, and wolverine by unit (21B, 21C, 21D, and 24) and cumulative harvest were queried from sealing data reported in the department's Wildlife Information Network (WinfoNet) server.

Season and Bag Limit

The seasons and bag limits for trapping and hunting are depicted in Tables 3 and 4.

Table 3. Trapping seasons and bag limits, Units 21B, 21C, 21D, and 24, Alaska, regulatory years 2017–2021.

Species	Season	Bag limit
Arctic fox	1 Nov–28 Feb	No limit
Beaver	1 Sep–10 Jun	No limit
Coyote	1 Nov–31 Mar	No limit
Lynx	1 Nov–28 Feb	No limit
Marten	1 Nov–28 Feb	No limit
Mink and weasel	1 Nov–28 Feb	No limit
Muskrat	1 Nov–10 Jun	No limit
Red fox	1 Nov–28 Feb	No limit
River otter	1 Nov–15 Apr	No limit
Wolverine	1 Nov–31 Mar	No limit

Table 4. Hunting seasons and bag limits, Units 21B, 21C, 21D, and 24, Alaska, regulatory years 2017–2021.

Species	Season	Bag limit
Arctic fox	1 Sep–15 Mar	2
Coyote	No closed season	No limit
Lynx	1 Nov–28 Feb	2
Red fox	1 Sep–15 Mar	10
Wolverine	1 Sep–31 Mar	1

Results and Discussion

Harvest by Hunters-Trappers

BEAVER

Since 2002, beaver harvest has been unknown, and effects on local populations are difficult to detect in Units 21B, 21C, 21D, and 24 because sealing is no longer required. Consequently, few data exist on the timing of harvest during RY17–RY21. Harvest is often for personal use, both as food and to make fur into garments; therefore, many pelts never enter the fur market and are not recorded through fur acquisition and export permits. Despite the lack of available information on harvest composition, it is likely that it has remained unchanged for many years. Traditionally, most beaver harvest occurred in the spring, although some trappers take beavers in early winter

because beaver carcasses are effective bait for other furbearer species (Hollis 2007). The RY17–RY21 average price for beaver was $13 (Fur Harvesters Auction Inc. 2014), offering little incentive for area trappers.

Lynx

Based on harvest data, lynx populations reached the low point of their 10-year cycle in RY13–RY14 and peaked in RY18 (Tables 5 and 6). Most harvest occurred from December through February (Table 6). The reason for the low harvest of kits during years of increasing population is unclear; it could be due to small sample size (i.e., low overall harvest or low trapping intensity on individual traplines) or a result of measurement error by sealers or fur handling methods. Pelt prices averaged $69 for lynx during RY17–RY21, which is comparable to previous years.

River Otter

There was little local interest in river otters during the report period; although river otters were abundant in Units 21B, 21C, 21D, and 24, harvest was relatively low (Tables 5 and 6). During RY17–RY21, most harvest likely occurred when river otters were incidentally taken in beaver sets, and harvest levels were consistent with beaver trapping efforts. Prices for river otters were low, averaging $21 during RY17–RY21, which was comparable to those in previous years.

Wolverine

Wolverine harvest varied (Tables 5 and 6) during RY17–RY21 but was consistent with historic harvest. We estimated that the actual harvest may be higher by 10 animals per year (Table 5; Pamperin 2013) because furs used for subsistence purposes are seldom sealed. Total harvest was slightly higher in December, January, and February than in other months (Table 6). Prices averaged $248 during RY17–RY21, comparable to previous years.

Marten

Pelt prices for marten were low, averaging $53 during RY17–RY21. Many trappers reported reduced effort due to these low prices, as reflected by the declining number of carcasses submitted by trappers in RY19–RY21 (Table 2).

Other Species

Fox populations were high, but pelt prices were low, offering trappers little incentive to pursue this species. One Arctic fox was photographed in Galena in RY22, which is a rare occurrence. Coyotes were scarce, and very few were caught each year. Wolves were abundant, and their predation on coyotes may be keeping coyote numbers low. Mink occurred at low densities, and few trappers targeted them because the pelt prices for mink harvested in Interior Alaska were low. Increased trapping effort for marten probably resulted in an increased harvest of other species susceptible to marten sets, such as mink, ermine, and red squirrel.

Table 5. Lynx, river otter, and wolverine harvest, Units 21B, 21C, 21D, and Unit 24, Alaska, regulatory years 2017–2021.

		Reported harvest						Estimated harvest		Method of take				
		Sex			Age									
Species	Regulatory year	M	F	Unk	Juv[a]	Adults	Unk	Unreported	Illegal	Trap or snare	Shot	Unk	Total harvest	Successful trappers-hunters
Lynx	2017	–	–	–	20	120	1	0	0	141	0	0	141	24
	2018	–	–	–	9	147	14	0	0	147	18	5	170	31
	2019	–	–	–	7	148	4	0	0	153	6	0	159	20
	2020	–	–	–	2	127	20	0	0	123	23	3	149	37
	2021	–	–	–	1	43	2	0	0	43	3	0	46	17
River otter	2017	5	2	4	–	–	–	0	0	11	0	0	11	7
	2018	12	5	1	–	–	–	0	0	18	0	0	18	9
	2019	2	1	8	–	–	–	0	0	11	0	0	11	3
	2020	3	2	0	–	–	–	0	0	5	0	0	5	3
	2021	1	1	1	–	–	–	0	0	3	0	0	3	3
Wolverine	2017	21	17	6	–	–	–	10	0	37	5	1	44	24
	2018	27	13	7	–	–	–	10	0	40	2	0	47	23
	2019	22	7	3	–	–	–	10	0	27	4	1	32	17
	2020	39	24	7	–	–	–	10	0	68	2	0	70	21
	2021	22	11	4	–	–	–	10	0	33	2	2	37	17

Note: En dash indicates no data. *Unk* refers to unknown. *Juv* refers to juvenile.

[a] Juveniles are lynx <34" in length.

Table 6. Lynx, river otter, and wolverine harvest percent by month, Units 21B, 21C, 21D, and 24, Alaska, regulatory years 2017–2021.

		Harvest percent by month								
Species	Regulatory year	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	*n*
Lynx	2017	4	25	37	26	9	–	–	–	141
	2018	16	18	18	30	17	–	–	–	161
	2019	6	28	35	21	9	–	–	–	159
	2020	9	29	38	17	7	–	–	–	148
	2021	4	26	17	46	7	–	–	–	46
River otter	2017	9	0	64	18	9	0	–	–	11
	2018	50	6	6	11	22	6	–	–	18
	2019	27	18	36	0	9	9	–	–	11
	2020	0	0	80	20	0	0	–	–	5
	2021	0	33	0	0	33	33	–	–	3
Wolverine	2017	10	20	20	32	20	0	–	–	41
	2018	7	31	7	29	26	0	–	–	42
	2019	13	13	33	27	13	0	–	–	30
	2020	1	28	36	23	10	1	–	–	69
	2021	3	22	16	41	19	0	–	–	37

Note: En dash indicates no data.

Hunter Residency and Success

Of the 1,214 furbearers harvested in Units 21B, 21C, 21D, and 24 during RY17–RY21, 52 (less than 5%) were harvested by nonresidents.

Transport Methods

Snowmachines were the primary means of transportation, with 3–4 trappers (4–6%) using airplanes. A few individuals used highway vehicles or ATVs near Galena and Ruby, but their efforts were restricted due to limited road and trail systems. During the September season, a few beavers were harvested by people using boats.

Based on weather data reported at both Galena and Bettles, winter severity was mild during RY17–RY21, with average or lower-than-average temperatures and snowfall (NOAA [n.d.]). Overall, trapping conditions were favorable for most trappers, although some reported heavy snow accumulations in RY21.

Alaska Board of Game Actions and Emergency Orders

No actions or emergency orders occurred during RY17–RY21.

Recommendations for Activity 2.1

Continue monitoring age and sex ratios and reproductive success of marten carcasses from trapper-harvested marten. Develop a long-term dataset of these vital statistics to assess population trends and response to environmental effects. Continue monitoring harvest of sealed furbearers.

3. Habitat Assessment–Enhancement

No habitat assessment or enhancement activities occurred for furbearers in Units 21B, 21C, 21D, and 24 during RY17–RY21.

NONREGULATORY MANAGEMENT PROBLEMS OR NEEDS

Data Recording and Archiving

Harvest data is stored on an internal database housed on WinfoNet and archived under Harvest Information and Survey and Inventory Tools.

Agreements

None.

Permitting

None.

Conclusions and Management Recommendations

It is unknown whether the ANS objective (set at 90% of the harvestable portion for each furbearer species) was met because abundance estimates for any furbearer species were not obtained. The sustainable harvest rate for each furbearer species is unknown.

Opportunities for trapping remained available during the reporting period. Marten trappers were provided age, sex, and reproductive data on 1,991 marten carcasses they submitted. Biological samples from those carcasses were preserved and stored for aging when funding was available. Management Objective M1 was met. It is recommended that this management objective continue.

II. Project Review and RY22–RY26 Plan

Review of Management Direction

MANAGEMENT DIRECTION

No change.

GOALS

No change.

CODIFIED OBJECTIVES

Amounts Reasonably Necessary for Subsistence Uses

No change.

Intensive Management

Not applicable.

MANAGEMENT OBJECTIVES

No change.

REVIEW OF MANAGEMENT ACTIVITIES

1. Population Status and Trend

ACTIVITY 1.1. Monitor trends in marten harvest, assess annual age and sex structure, and assess reproductive performance using marten carcasses obtained from trappers (M1).

Data Needs

No change.

Methods

No change.

2. Mortality-Harvest Monitoring

ACTIVITY 2.1. Report annual harvest of species required by regulation to be sealed (lynx, wolverine, and river otter; C1).

Data Needs

No change.

Methods

No change.

3. Habitat Assessment-Enhancement

No habitat assessment or enhancement activities are expected for furbearers in Units 21B, 21C, 21D, and 24 during RY22–RY26. These activities are not currently needed to achieve the management goal or to evaluate the codified objective.

NONREGULATORY MANAGEMENT PROBLEMS OR NEEDS

Data Recording and Archiving

No change.

Agreements

None.

Permitting

None.

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Appendix A. Marten carcass data form, Interior Alaska, 2022.

Today's Date_____ Name_____ Trapper_____							
Accession # (GMU-RY-####)	**Date Harvested (MM/YY)**	**Sex (M : F)**	**Age (Ad : Juv)**	**# Blasto L**	**# Blasto R**	**tooth sample (X if yes)**	**Claw/hair sample (X if yes)**


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