

## **Brown Bear Management Report and Plan, Game Management Unit 13:**

Report Period 1 July 2014–30 June 2019, and  
Plan Period 1 July 2019–30 June 2024

**Heidi L. Hatcher**



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Plan Period 1 July 2019–30 June 2024

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This species management report and plan was reviewed and approved for publication by Todd Rinaldi, Management Coordinator for the Division of Wildlife Conservation.

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**Cover Photo:** Shawn Conway, a former ADF&G wildlife technician, works as part of a team to deploy a radio collar and ear tag, and administer a tattoo on a chemically immobilized brown bear in Unit 13. ADF&G 2011.

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# Contents

Purpose of this Report.....	1
I. RY14–RY18 Management Report .....	1
Management Area.....	1
Summary of Status, Trend, Management Activities, and History of Brown Bears in Unit 13.....	1
Management Direction.....	3
Existing Wildlife Management Plans .....	3
Goals .....	3
Codified Objectives .....	3
Amounts Reasonably Necessary for Subsistence Uses .....	3
Intensive Management.....	3
Management Objectives.....	3
Management Activities .....	3
1. Population Status and Trend .....	3
2. Mortality-Harvest Monitoring and Regulations.....	4
3. Habitat Assessment-Enhancement.....	10
Nonregulatory Management Problems or Needs.....	10
Data Recording and Archiving .....	10
Agreements .....	10
Permitting.....	10
Conclusions and Management Recommendations .....	10
II. Project Review and RY19–RY23 Plan .....	11
Review of Management Direction .....	11
Management Direction.....	11
Goals .....	11
Codified Objectives .....	11
Amounts Reasonably Necessary for Subsistence Uses .....	11
Intensive Management.....	11
Management Objectives.....	11
Review of Management Activities.....	12
1. Population Status and Trend .....	12
2. Mortality-Harvest Monitoring .....	12
3. Habitat Assessment-Enhancement.....	12
Nonregulatory Management Problems or Needs.....	12
Data Recording and Archiving .....	12
Agreements .....	12
Permitting.....	12
References Cited.....	13

## List of Tables

Table 1. Brown bear harvest, Unit 13, regulatory years (RY) 2014–2018, Alaska.....	5
Table 2. Brown bear harvest by unit, Unit 13, regulatory years 2014–2018, Alaska.....	6
Table 3. Residency of successful brown bear hunters, Unit 13, regulatory years 2014–2018, Alaska. ....	7
Table 4. Brown bear harvest chronology by month, Unit 13, regulatory years (RY) 2014–2018, Alaska. ....	8
Table 5. Percentage of brown bear harvest by transportation used, Unit 13, regulatory years 2014–2018, Alaska. ....	9
Table 6. Human-caused brown bear mortality documented in Unit 13, regulatory years 2014– 2018, Alaska. ....	10

## **Purpose of this Report**

This report provides a record of survey and inventory management activities for brown bears in Unit 13 for the 5 regulatory years 2014–2018 and plans for survey and inventory management activities in the following 5 regulatory years, 2019–2023. A regulatory year (RY) begins 1 July and ends 30 June (e.g., RY14 = 1 July 2014–30 June 2015). 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 brown bear management report of survey and inventory activities that was previously produced every 2 years.

## **I. RY14–RY18 Management Report**

### **Management Area**

Unit 13 encompasses 23,368 mi<sup>2</sup> and consists of the area west of the east bank of the Copper River and drained by all tributaries into the west bank of the Copper River from Miles Glacier, including the Slana River drainages north of Suslota Creek; the drainages into the Delta River upstream from Falls Creek and Black Rapids Glacier; the drainages into the Nenana River upstream from the southeast corner of Denali National Park; the drainage into the Susitna River upstream from its junction with the Chulitna River; the drainage into the east bank of the Chulitna River upstream to its confluence with the Tokositna River; the drainages of the Chulitna River (south of Denali National Park) upstream from its confluence with the Tokositna River; the drainages into the north bank of the Tokositna River upstream to the base of the Tokositna Glacier; the drainages into the Tokositna Glacier; the drainages into the east bank of the Susitna River between its confluences with the Talkeetna and Chulitna Rivers; the drainages into the north and east bank of the Talkeetna River, including the Talkeetna River to its confluence with Clear Creek, the eastside drainages of a line up the south bank of Clear Creek to the first unnamed creek on the south, then up that unnamed creek to Lake 4408, along the northeast shore of Lake 4408, then southeast in a straight line to the northernmost fork of the Chickaloon River; the drainages into the east bank of the Chickaloon River below the line from Lake 4408; and the drainages of the Matanuska River above its confluence with the Chickaloon River.

Maps describing the boundaries and special management areas in Unit 13 can be found at: <http://www.adfg.alaska.gov/index.cfm?adfg=maps.main>.

### **Summary of Status, Trend, Management Activities, and History of Brown Bears in Unit 13**

Brown bear harvest in Unit 13 has increased substantially since the early 1960s when the average annual take was only 39 bears. Average annual harvest steadily increased through the mid-1990s as regulations gradually liberalized. A spring season for brown bears was implemented beginning in 1980, and the bag limit was increased to 1 bear every year from 1983 to 1988 and

again beginning in 1996. In 1995, the Board of Game (BOG) established an objective to reduce the population of brown bears in Unit 13 by liberalizing harvest with the goal of improving survival of moose calves. Residents have been exempted from brown bear locking-tag requirements in Unit 13 outside Denali State Park since 1995, and the exemption was implemented within Denali State Park in 2013. In 2003, with the exception of Denali State Park, the Unit 13 brown bear hunting season was extended to year-round. Brown bear harvest stabilized from the mid-1990s through the mid-2010s. Harvest more recently has increased, which is likely associated with the allowance of brown bear harvest at bear-bait stations in Unit 13D beginning in 2013, and in the remainder of Unit 13 beginning in 2015. Bear-baiting activity in Unit 13 has increased substantially over the past decade.

Brown bear population data are available from a limited number of surveys conducted in limited portions of Unit 13. Estimates are described in terms of all bears (dependent cubs included), or independent bears (bears  $\geq 2$  years of age). During the late 1970s, an estimate of 1,500 brown bears was calculated based on field observations, hunter reports, and harvests. On the upper Susitna River (Unit 13E), a 1987 capture-mark-resight (CMR) estimate of 6.46 independent bears/1,000 km<sup>2</sup> was down from a 1979 removal-based estimate of 10.5 independent bears/1,000 km<sup>2</sup> (Ballard *et al.* 1982, Miller 1988). For the original Susitna Hydroelectric (Su-Hydro) study area on the border between Units 13A and 13E, CMR density estimates in 1985 and 1995 were 18.8 and 23.3 independent bears/1,000 km<sup>2</sup> (27.1 and 40.8 for all bears), respectively (Miller 1995). Extrapolations from density estimates in the upper Susitna River and Su-Hydro Project areas from 1979, 1985, and 1987 yielded a recalculated Unit 13 population estimate of 1,228 bears (Miller 1990). Following the 1995 Su-Hydro CMR survey, the unitwide estimate was again revised to 1,456 bears (Miller 1997).

To address the BOG directive of reducing the brown bear population in Unit 13, a baseline study was conducted in western Unit 13A in 1998 that determined a brown bear density estimate of 21.3 independent bears per 1,000 km<sup>2</sup> (27.5 all bears/1,000 km<sup>2</sup>), which represents 1,260 independent bears in Unit 13 if using the previously used area of 59,154 km<sup>2</sup> for Unit 13 brown bear estimates (Miller 1993, Testa *et al.* 1998).

In spring 2001, 2002, and 2003, line-transect surveys were completed in Unit 13E, resulting in a preliminary estimate of 32.3 independent bears/1,000 km<sup>2</sup>. The same line transect methodology was used in Units 13A and 13B in 2003 and 2004, with 16.3 independent bears/1,000 km<sup>2</sup> being estimated. Based on a CMR density survey done with collared bears from 2006 to 2011 in Unit 13A, there was a 25-40% reduction in brown bear densities compared to the 1998 baseline study, resulting in 13.0 independent bears/1,000 km<sup>2</sup> and 20.4 total bears/1,000 km<sup>2</sup> (Brockman *et al.* 2020). Brown bear population densities in Unit 13 declined on average by 4% annually for independent bears and 2% annually for the total number of bears between the 1998 and 2011 CMR surveys, and harvest rates were estimated to be greater than 8% annually. The protection of females and dependent offspring within the study population appears to be a sufficient safeguard to avoid a sharp decline in population numbers given current harvest rates, and evidence suggests that as brown bear populations decline in Unit 13, they may also become more productive, presenting another safeguard against overharvest.



# Management Direction

## EXISTING WILDLIFE MANAGEMENT PLANS

Management direction set in the brown bear management plans for the Nelchina Basin, Klutina Lake, and Paxson areas in Unit 13 have been modified through public comments, staff recommendations, and BOG actions over the years (ADF&G 1976). A record of these changes can be found in the division's previous species management reports. The plan portion (RY19–RY23) of this report contains the current management plan for brown bears in Unit 13.

## GOALS

- To provide the greatest opportunity to participate in hunting brown bears.
- To provide an opportunity to view, photograph, and enjoy brown bears.
- Increase public awareness of brown bear behavior to reduce adverse bear-human interactions.

## CODIFIED OBJECTIVES

### Amounts Reasonably Necessary for Subsistence Uses

The Alaska BOG made a negative finding for customary and traditional uses for brown bears in Unit 13.

### Intensive Management

Brown bears are not designated as an intensive management species in the state of Alaska. There is an active intensive management plan for moose in Unit 13, but the associated predator control program does not include bears, despite extensive documentation that brown bears can have a significant negative impact on neonate survival of moose in Unit 13.

## MANAGEMENT OBJECTIVES

- Reduce brown bear densities.
- Maintain a minimum unitwide population of 350 independent brown bears.

## MANAGEMENT ACTIVITIES

### 1. Population Status and Trend

There are not currently any activities incorporated into the Unit 13 brown bear management program for assessing population status or trends, although ongoing research projects throughout the years have provided population data to inform management decisions and direction.

## 2. Mortality-Harvest Monitoring and Regulations

ACTIVITY 2.1. Monitor and evaluate brown bear harvest through bear sealing data.

### *Data Needs*

Monitoring and analyzing annual harvest data is important to understand harvest composition as well as hunter metrics associated with successful harvests, which are instrumental for sustained yield management.

### *Methods*

Department representatives seal skulls and hides of harvested bears. Skulls are measured, sex is determined, a premolar tooth is extracted for aging, and hair-hide samples are collected by staff for genetic research. Sealing agents collect information on date, location of harvest, time spent afield, method of take, and method of transportation for successful hunters.

### *Seasons and Bag Limits*

Under state regulations both residents and nonresidents may harvest one bear every regulatory year with no closed season outside of Denali State Park. The season dates within Denali State Park are 10 August–15 June with a bag limit of one bear every regulatory year. Nonresidents must be accompanied by a guide and in possession of a big game locking-tag. All brown bears harvested in Unit 13 must be sealed within 30 days.

Brown bears may be harvested over registered bear bait stations throughout Unit 13, excluding lands within Denali State Park. Bear baiting season is 15 April–30 June. Bears may be taken at registered bait stations the same day a hunter has flown provided the hunter is at least 300 feet from the airplane, excluding bait stations located on National Park Service lands.

State hunting regulations do not apply within Denali National Park, but federally qualified subsistence hunters may harvest one brown bear within the park under federal subsistence regulations from 10 August to 31 May, and the bear must be sealed within 5 days of harvest.

### *Results and Discussion*

#### Harvest by Hunters

Brown bear harvest in Unit 13 averaged 140 bears annually during this reporting period (Table 1), which is above the previous (RY09–RY13) 5-year average of 136 bears annually (range 120–159). The 5-year average of brown bears in Unit 13 increased steadily from 1961 through 1999 but has since remained relatively stable. Females represent 43% of harvest during RY14–RY18, which is standard for the history of brown bear harvest in Unit 13. Twelve percent of brown bears harvested during RY14–RY18 were reported as incidental take. Spring 2016 represented the first season in which brown bears could be taken over bait in all of Unit 13; since then, 25% of the harvest has occurred over bait.

**Table 1. Brown bear harvest, Unit 13, regulatory years (RY) 2014–2018, Alaska.**

	Harvest over bait		Harvest not over bait		Total harvest	% Female
	Total	% Female	Total	% Female		
RY14						
Fall 2014	0	0%	66	42%	66	42%
Spring 2015	14	21%	24	42%	38	34%
Total	14	21%	90	42%	104	39%
RY15						
Fall 2015	0	0%	63	44%	63	44%
Spring 2016	41	32%	49	41%	90	37%
Total	41	32%	112	43%	153	40%
RY16						
Fall 2016	0	0%	74	53%	74	53%
Spring 2017	36	28%	35	51%	71	39%
Total	36	28%	111 <sup>a</sup>	51%	147 <sup>a</sup>	46%
RY17						
Fall 2017	0	0%	84	45%	84	45%
Spring 2018	30	43%	33	39%	63	41%
Total	30	43%	118 <sup>a</sup>	44%	148 <sup>a</sup>	44%
RY18						
Fall 2018	0	0%	79	47%	79	47%
Spring 2019	41	44%	27	37%	68	41%
Total	41	44%	107 <sup>a</sup>	44%	148 <sup>a</sup>	44%

<sup>a</sup> Includes harvest with no date of kill specified.

During RY14–RY18, 700 brown bear skulls were sealed from Unit 13 harvest (400 males, 299 females, 1 unknown), of which 672 had complete skull measurements and 625 were aged via tooth cementum rings; male skulls averaged 21.4 inches (range 14.4–30.6 inches) and the average age of harvested males from which a tooth was collected during RY14–RY18 was between 5 and 6 years (range 1–26,  $n=356$ ). The average male skull size is consistent with historic averages, which remain fairly stable with a long-term average since RY61 of 21.4 inches. The average size of harvested female skulls sealed during RY14–RY18 was 19.9 inches (range 14.3–24.0 inches) and the average age of harvested females from which a tooth was collected was between 6 and 7 years (range 1–27,  $n=268$ ). The average female skull size was consistent with the long-term average of 19.8 inches, which represents fairly consistent 5-year averages for Unit 13 harvested female brown bears since RY61.

Brown bear harvest pressure is not equally dispersed across the spatial extent of Unit 13 (Table 2). During RY14–RY18, hunters in Unit 13E harvested 36.4% of the total brown bear harvest for Unit 13, averaging 51 bears annually. Unit 13D represents 21.1% of the total harvest, averaging 30 bears annually. Units 13A and 13B represent 16.1% and 18.3% of the Unit 13 harvest, respectively, averaging 23 bears in 13A and 26 bears in 13B annually. Unit 13C represents only 7.3% of the total harvest, averaging 10 bears annually. Less than 1% of the Unit 13 brown bear harvest has insufficient location information to assign to a specific subunit.

**Table 2. Brown bear harvest by unit, Unit 13, regulatory years 2014–2018, Alaska.**

Regulatory year	13A	13B	13C	13D	13E	13Z	Total
2014	11	14	9	24	45	1	104
2015	20	25	16	37	55	0	153
2016	33	26	11	32	44	1	147
2017	26	31	7	30	52	2	148
2018	23	32	8	25	59	1	148
Total	113	128	51	148	255	5	700

### Hunter Residency and Success

Nonresident hunters represented 30% of the Unit 13 brown bear harvest during RY14–RY18, whereas resident hunters represented 70% of the harvest, with 8% of the harvest by residents local to Unit 13 (Table 3). Residents hunted an average of 3.9 days while nonresidents hunted an average of 4.8 days. This difference is typical throughout the history of the Unit 13 brown bear harvest.

**Table 3. Residency of successful brown bear hunters, Unit 13, regulatory years 2014–2018, Alaska.**

Regulatory year	Local resident <sup>a</sup>		Nonlocal resident		Nonresident	
	Harvest	Percent of total	Harvest	Percent of total	Harvest	Percent of total
2014	8	8%	65	63%	31	30%
2015	10	7%	98	64%	45	29%
2016	15	10%	88	60%	44	30%
2017	13	9%	87	59%	48	32%
2018	11	7%	93	63%	44	30%
Total	57	8%	431	62%	212	30%

<sup>a</sup> Local resident represents residents of Unit 13.

### Harvest Chronology

The majority of brown bear harvest in Unit 13 occurs in August–September, when most hunters are also pursuing caribou and moose (Table 4). The proportion of harvest that occurs in June has increased since regulations have allowed the take of brown bears over bait in Unit 13.

**Table 4. Brown bear harvest chronology by month, Unit 13, regulatory years (RY) 2014–2018, Alaska.**

RY	July		August		September		October		November		December– March		April		May		June		<i>n</i>
	Harvest	% of Total	Harvest	% of Total	Harvest	% of Total	Harvest	% of Total	Harvest	% of Total	Harvest	% of Total	Harvest	% of Total	Harvest	% of Total	Harvest	% of Total	
2014	5	5%	28	27%	31	30%	2	2%	0	0%	0	0%	9	9%	13	13%	16	15%	104
2015	7	5%	20	13%	34	22%	2	1%	0	0%	0	0%	14	9%	30	20%	46	30%	153
2016	2	1%	26	18%	43	30%	3	2%	0	0%	1	0%	6	4%	19	13%	45	31%	145
2017	9	6%	20	14%	48	33%	7	5%	0	0%	0	0%	12	8%	17	12%	34	23%	147
2018	6	4%	25	17%	40	27%	7	5%	1	0%	1	0%	6	4%	21	14%	39	27%	146

## Transport Methods

All-terrain vehicles (ATV) represent the most commonly used transportation for successful brown bear hunters, followed by fairly equal use of airplanes, boats, and highway vehicles (Table 5). Snowmachines are fairly consistently used annually for early spring bear harvest when snow allows access to bears emerging from dens.

**Table 5. Percentage of brown bear harvest by transportation used, Unit 13, regulatory years 2014–2018, Alaska.**

Regulatory year	Airplane	Horse	Boat	ATV <sup>a</sup>	Snow-machine	ORV <sup>b</sup>	Highway vehicle	Foot	Other	Airboat	<i>n</i> <sup>c</sup>
2014	25%	1%	14%	32%	8%	3%	9%	8%	1%	2%	102
2015	16%	0%	13%	34%	8%	7%	19%	5%	0%	0%	151
2016	16%	1%	9%	39%	4%	8%	13%	10%	1%	0%	147
2017	21%	0%	14%	34%	7%	8%	9%	5%	2%	1%	147
2018	10%	1%	17%	41%	5%	8%	10%	8%	0%	1%	146

<sup>a</sup> ATV stands for all-terrain vehicle.

<sup>b</sup> ORV stands for off-road vehicle.

<sup>c</sup> Includes only harvests with method of transportation reported.

### *Other Mortality*

Brown bear mortality occurring in defense of life or property (DLP) averages less than 2 bears per year in Unit 13 (Table 6). During RY14–RY18, one bear was removed through agency action and one bear was salvaged and sealed after a vehicle collision. These levels of reported human-caused mortality outside the regular harvest are consistent with recent years in Unit 13, as are the percentage of females included in these mortalities. Actual numbers of human-caused mortality outside the regular harvest are likely higher, as some bears are likely shot or wounded and not recovered or reported. Limited observations suggest that brown bear predation may be another source of measurable brown bear mortality, but additional research would be necessary to quantify this level of mortality and its effects on population dynamics.

**Table 6. Human-caused brown bear mortality documented in Unit 13, regulatory years 2014–2018, Alaska.**

Regulatory year	Agency kill	DLP <sup>a</sup>	Vehicle collision	<i>n</i>	Percent Female
2014	1	2	0	3	0%
2015	0	3	0	3	67%
2016	0	0	0	0	0%
2017	0	1	0	1	100%
2018	0	2	1	3	100%

<sup>a</sup> DLP stands for defense of life or property.

*Alaska Board of Game Actions and Emergency Orders*

Prior to RY14–RY18, the harvest of brown bears over bait was permitted only in Unit 13D. Beginning in RY15 (spring 2016), harvest of brown bears over bait was allowed in all Unit 13 units, excluding lands within Denali State Park.

*Recommendations for Activity 2.1*

Continue.

3. Habitat Assessment-Enhancement

No activities for brown bear habitat assessment or enhancement are included in the Unit 13 brown bear management program.

**NONREGULATORY MANAGEMENT PROBLEMS OR NEEDS**

Data Recording and Archiving

State brown bear sealing data is stored on an internal server (<http://winfonet.alaska.gov/>).

Agreements

Not applicable.

Permitting

None.

**Conclusions and Management Recommendations**

The long-term management objective for Unit 13 brown bears was to reduce the population. Additional research initiated in 2019 will develop new brown bear density estimates for a portion of Unit 13A in 2022, which will be used to ascertain bear densities in relation to previous



densities obtained in 1998 and 2011. This research effort will determine if the long-term management objective has been achieved. Additionally, new information suggests that the proportion of older females in the overall Unit 13 harvest may give insight into overall population trends, and this metric will be analyzed for future reports (Brockman *et al.* 2020).

Given steady harvest numbers and the assumption of a slowly declining population, it is recommended to maintain current management direction until an updated brown bear density estimate can be determined for Unit 13. Further liberalization of brown bear regulations to increase harvest pressure is not recommended at this time. Unit 13 brown bear research and harvest levels suggest that brown bears may be sustainably harvested at levels much higher than previously believed, but additional data is necessary to determine long-term effects of high harvest levels on the population.

## **II. Project Review and RY19–RY23 Plan**

### **Review of Management Direction**

#### **MANAGEMENT DIRECTION**

No change from RY14–RY18.

#### **GOALS**

No change from RY14–RY18.

#### **CODIFIED OBJECTIVES**

No change from RY14–RY18.

#### Amounts Reasonably Necessary for Subsistence Uses

No change from RY14–RY18.

#### Intensive Management

No change from RY14–RY18.

#### **MANAGEMENT OBJECTIVES**

No change from RY14–RY18.

## **REVIEW OF MANAGEMENT ACTIVITIES**

### 1. Population Status and Trend

A research effort to replicate the 1998 and 2011 CMR density surveys is underway, with a scheduled CMR survey effort for spring 2022. Additional research efforts were implemented in 2020 to develop brown bear density estimates in Unit 13 based on noninvasive genetic CMR methods. Brown bear research efforts should continue roughly every decade to monitor the long-term trajectory of the population as regulations affecting harvest levels change over time. In addition, the proportion of older females in the overall harvest will be analyzed over subsequent reporting periods as an interim sign of population trends.

### 2. Mortality-Harvest Monitoring

ACTIVITY 2.1. Monitor and evaluate brown bear harvest through bear sealing data.

No change from RY14–RY18.

#### *Data Needs*

No change from RY14–RY18.

#### *Methods*

No change from RY14–RY18.

### 3. Habitat Assessment-Enhancement

No change from RY14–RY18.

## **NONREGULATORY MANAGEMENT PROBLEMS OR NEEDS**

### Data Recording and Archiving

No change from RY14-RY18.

### Agreements

No change from RY14–RY18.

### Permitting

No change from RY14–RY18.

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