

Brown Bear Management Report and Plan, Game Management Unit 6:

Report Period 1 July 2014–30 June 2019, and

Plan Period 1 July 2019–30 June 2024

Charlotte Westing



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This species management report and plan was reviewed and approved for publication by Jeff Selinger, Management Coordinator 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 brown bear (*Ursus arctos*) in Game Management Unit 6 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., 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 report more efficiently 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 6 is approximately 10,140 mi² of land that includes the area of Prince William Sound, the Copper River Delta, and the North Gulf Coast of Alaska. Unit 6 is divided into 4 administrative units (Units 6A, 6B, 6C and 6D; Fig. 1). Terrain includes rugged mountains, old-growth forest, coastal wetlands, and muskeg meadows.

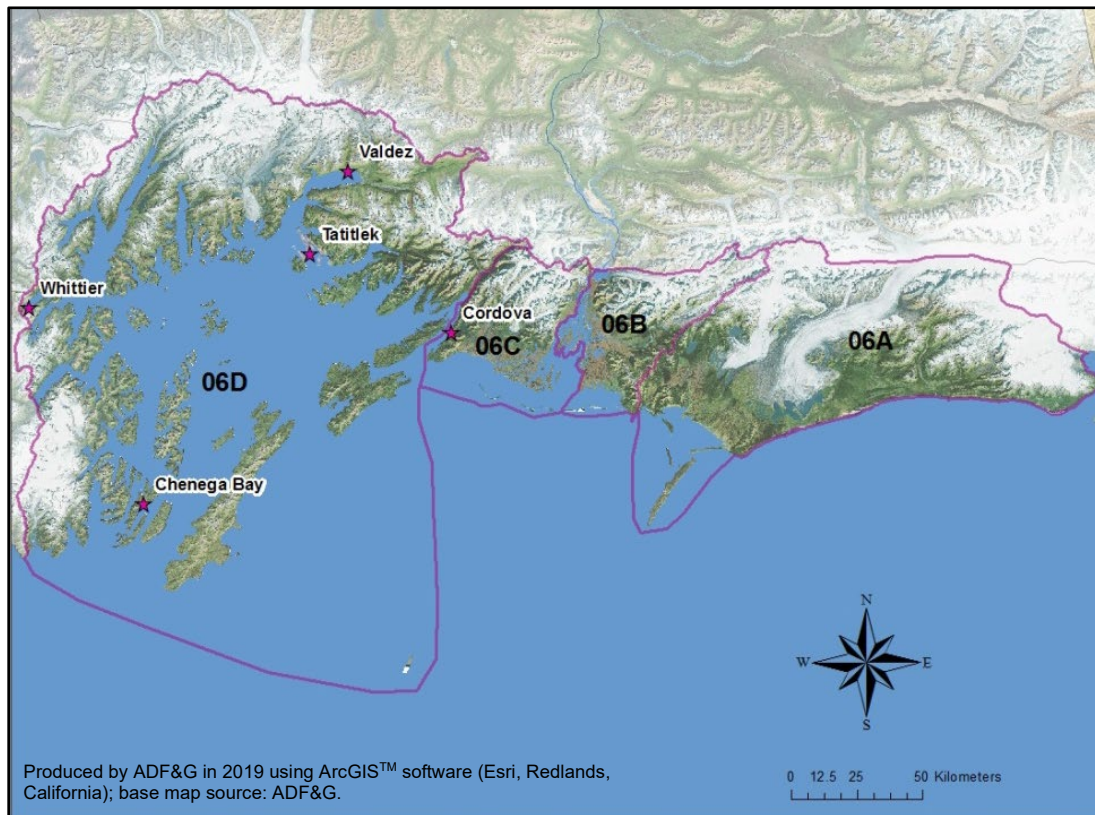


Figure 1. Game Management Unit 6 and its administrative units (subunits), Alaska.

Summary of Status, Trend, Management Activities, and History of Brown Bears in Unit 6

Brown bears inhabit most of Unit 6, with the exception of the islands and mainland of western Unit 6D and Middleton Island in the Gulf of Alaska. Brown bears are common on the mainland east of Columbia Glacier to Icy Bay, and on Hinchinbrook, Montague, Hawkins, and Kayak islands. Distribution in Unit 6D appears unchanged from that observed by Heller (1910). This distribution is largely influenced by the presence of salmon rich rivers and streams. The western portions of Unit 6D are dominated by rugged mountains and small streams that have variable wild salmon runs due to severe “wash-out” events.

As in other parts of the state, brown bears consume a wide variety of foods, including salmon, berries, grasses, sedges, cow parsnip, carrion, and roots. Bears undoubtedly prey upon Sitka black-tailed deer, which are an introduced species to Prince William Sound (Unit 6D.) However, this is believed to be only an opportunistic occurrence. Moose were introduced during 1949–1958 to the Copper River Delta and by the mid-1970s, had expanded east to Icy Bay (Paul 2009). This may have provided an additional food source for brown bears and may have influenced their numbers in Units 6A, 6B, and 6C.

Brown bear numbers may have declined on Montague Island by the mid-1980s, based on anecdotal reports. These changes may have been related to years of high harvest between regulatory years 1962 and 1982. It is also important to note, however, that the landscape of Montague Island was substantially changed by the 1964 Good Friday Earthquake, which raised portions of the island by as much as 34 feet and dramatically altered salmon habitat. Changes were observed in both abundance and distribution, with some areas experiencing extirpations of subpopulations of pink and chum salmon (Spies 2006). Additionally, logging occurred in the 1960s and 1970s and may have impacted bear populations. The fall hunting season on Montague Island was closed in RY89 and the spring season closed in RY93. By the early 2000s track and den indices had improved (Table 1) and anecdotal reports suggested that the population had rebounded. The Board of Game reopened the Montague fall bear season (RB100) in RY01 in response to an increasing population and many complaints of bears pursuing deer hunters and associated gut piles in popular deer hunting areas. In RY09, a spring hunt (RB101) began on Montague Island.

Harvest is monitored by mandatory sealing that began in 1961. Total annual harvest increased substantially in the late 1980s and continued at a high level through RY92. Average annual kill in RY64–RY83 was 35 bears ($SD \pm 10.4$). However, harvest began to increase, and in RY84–RY03 the average yearly harvest was 47 bears ($SD \pm 12.1$). Between RY92 and RY97, the season dates in Unit 6D were modified 3 times to adjust harvest levels. From RY04 to RY13 harvest increased again with an average of 63 bears taken annually ($SD \pm 10.2$). All units (Units 6A, 6B, 6C, and 6D) showed increases during this time, but Unit 6A showed the largest increase. The increase in Unit 6A appears to be related to the increased activity by 1 guide. Fish runs have been consistent (R. Hoffman, Area Biologist, Commercial Fisheries, ADF&G Yakutat, personal communication) and do not appear responsible for the increase in the bear population.

Beginning in RY97 for resident hunters and in RY01 for all hunters, the Board of Game changed the bag limit for brown bears in Units 6A, 6B, and 6C from 1 bear every 4 years to 1 bear per year. Harvest was believed to be conservative, and bears were thought to be potentially preying upon moose calves to a limiting degree (Crowley 2001). In-unit sealing and abbreviated reporting period requirements were discontinued in RY05.

Based on habitat and fish abundance, densities for Unit 6 probably compare favorably to Miller's (1993) estimates from elsewhere in southern coastal Alaska. Hinchinbrook Island is likely within a high-density range (>175 bears/1,000 km²) that includes Kodiak Island, much of the Alaska Peninsula, and parts of Southeast Alaska. Montague Island is more likely to have a medium density (40–175 bears/1,000 km²) consistent with contiguous coastal habitat to the southeast and the northern Alaska Peninsula.

Logging activity may have reduced brown bear abundance and distribution in parts of Unit 6 (portions of Units 6A and 6D). Old-growth stands are important habitat for coastal bears (Schoen 1990; Schoen and Beier 1990; Schoen et al. 1986). Logging also provides access roads, increases human activity, and stimulates developments that increase bear-human interactions and lead to increased brown bear mortality (McLellan and Shackleton 1988; Smith and Van Daele 1989).

Extensive clearcutting of old-growth timber on private and state land in Unit 6A occurred between Icy Bay and Cape Yakataga, and continued north in the Yakataga and Duktoth river drainages between 1969 and 2008. In total, around 20,000 acres were logged, resulting in a 40-mile long clearcut. The last logging in the area occurred in 2007; since then, additional logging has not been considered economical. Logging may have increased hunter access to bears, or increased the displacement or conspicuousness of bears, but it is not known if the increased harvest in Unit 6A is related to logging.

The Exxon Valdez Oil Spill (EVOS) Trustee Council acquired or protected most lands scheduled for timber harvest in Unit 6D, thus removing the threat of continued, large-scale habitat loss in Prince William Sound (PWS).

Management Direction

EXISTING WILDLIFE MANAGEMENT PLANS

A formal plan for brown bear management in Unit 6 has not been developed.

GOALS

Manage brown bear populations to provide for sustained annual use by hunters and wildlife viewers.

CODIFIED OBJECTIVES

Amounts Reasonably Necessary for Subsistence Uses

Brown bears in Unit 6 have a negative customary and traditional use finding.

Intensive Management

Brown bears in Unit 6 have a negative intensive management finding.

MANAGEMENT OBJECTIVES

- Maintain seasons and bag limits that would provide for a unitwide 3-year average harvest of 35–65 bears, which will be considered within each calendar year.
- Manage for a 3-year average of less than 40% female bears.

MANAGEMENT ACTIVITIES

1. Population Status and Trend

ACTIVITY 1.1. Record observations of brown bears seen incidentally during other survey work and anecdotal reports from the public. Conduct “track and den surveys” when snow conditions are adequate.

Data Needs

Incidental observations and “track and den surveys” are insufficient for estimating the population or detecting changes that would trigger management action. Statistical estimates of brown bears derived from a sample-based estimator including a measure of the precision would be needed to detect change in the population.

Methods

Global Positioning System (GPS) locations and characteristics are recorded for any brown bears observed during aerial survey flights. Anecdotal reports are recorded to the maximum level of detail available. “Track and den surveys” during RY14–RY18 were only performed on Hinchinbrook Island due to budget limitations, competing survey priorities, and snow conditions. Surveys were timed with the peak emergence of brown bears from dens, which varied annually with snow conditions. An unknown proportion of bears wander the alpine regions of the islands for several days after emergence from dens, leaving easily observable tracks in the snow. Tracks, dens, and bears above 1,000 feet in elevation were tallied and linear density estimated per the following equation:

$$\text{linear density} = \frac{\left[\left(\frac{t}{2}\right) + d + b\right]}{m} \quad (1)$$

where t = the number of sets of tracks observed, d = the number of dens observed, b = the number of bears observed, and m = the number of linear miles searched. Observations per hour were also calculated as an additional index for comparison.

Results and Discussion

Based on linear density indices, the populations of Hinchinbrook Island and Montague Island may have improved from the late 1980s to the 2000s (Table 1). However, large gaps exist in the

data and observers changed at each major break in the data. Both islands are assumed to have populations of about 100 bears. Observations in some years appear to be biased by an abnormal number of tracks (Hinchinbrook RY08, RY16; and Montague RY07). While track counts are estimated conservatively, they are likely heavily influenced by snow age and the distribution of snow coverage. These surveys do not provide a reliable repeatable measure of population size. Additionally, years with adequate snow for conducting these surveys within the necessary timeline for den emergence have been increasingly rare.

Table 1. Unit 6 brown bear track and den counts regulatory years 1989–2018, Alaska.

Area	Regulatory year	Observations			Miles searched	Linear density index ^a	Observations per hour
		Tracks	Dens	Bears			
Hinchinbrook Island	1989	34	8	0	100	0.25	38.1
	1992	26	9	0	100	0.22	7.9
	2003	124	9	0	148	0.48	25.2
	2004	64	6	3	100	0.41	36.8
	2005	94	12	0	148	0.40	44.2
	2007	95	16	9	148	0.49	25.4
	2008	227	26	2	148	0.96	37.8
	2011	99	14	7	148	0.48	22.5
Montague Island	2016	33	4	10	148	0.21	16.6
	1989	10	4	0	165	0.05	9.0
	2000	58	3	0	210	0.15	18.0
	2001	80	3	0	210	0.21	23.0
	2002	134	1	0	210	0.32	27.0
	2003	74	7	0	163	0.27	31.0
	2004	154	2	1	210	0.38	38.0
	2005	166	2	3	210	0.42	38.0
	2007	221	7	10	210	0.61	26.0
	2008	98	7	4	210	0.29	18.0
	2009	163	5	1	210	0.42	28.0

^a The linear density index = $[(t/2) + d + b]/m$. Variables are defined as t = number of tracks observed, d = number of dens observed, b = number of bears observed, and m = number of miles surveyed.

Recommendations for Activity 1.1

Continue to collect anecdotal and incidental data on brown bears. Discontinue track and den surveys as a population index.

2. Mortality-Harvest Monitoring and Regulations

ACTIVITY 2.1. Monitor harvest through sealing records and effort from permit reports.

Data Needs

Harvest must be assessed to understand the potential impact of brown bear populations.

Methods

Harvest information was gathered from sealing certificates and permit reports. Harvest data are summarized by regulatory year (RY), which begins 1 July and ends 30 June (e.g., RY17 = 1 July 2017–30 June 2018).

Hides and skulls were sealed for all brown bears in the reported harvest. Harvest included bears taken by licensed hunters and bears killed in defense of life or property. Staff checked each hide for sex identifiers and took skull measurements for total length and zygomatic width. We recorded harvest date, days hunted, transportation used, and location of harvest within uniform coding units (UCUs). UCUs are small, defined areas within Unit 6 representing watersheds, islands, or island groups. Illegal kills were included when known. Unreported harvest could include wounding loss and bears taken by hunters and not sealed (unknown illegal kills), and has historically been estimated to be 12% of the overall total reported harvest. However, there are undoubtedly numerous unquantifiable variables affecting numbers from year to year. Tooth samples are collected to determine age. Unsuccessful hunters were not required to report except in the Montague Island registration hunts.

Season and Bag Limit

The following regulations were in effect during regulatory years 2014–2018:

Unit, area, and bag limits	Resident open season	Nonresident open season
Unit 6A, 6B, and 6C Residents and nonresidents: 1 bear every regulatory year	1 September–10 June (General hunt)	1 September–10 June (General hunt)
Unit 6D Montague Island Residents and nonresidents: 1 bear every 4 regulatory years by registration permit	15 October–31 December (RB100) 1 April–25 May (RB101)	15 October–31 December (RB100) 1 April–25 May (RB101)
Unit 6D Remainder Residents and nonresidents: 1 bear every 4 regulatory years	15 October–25 May (General hunt)	15 October–25 May (General hunt)

Results and Discussion

Harvest by Hunters

The average total harvest in Unit 6 during RY14 and RY18 was 46 bears ($SD \pm 5$; Table 2) which is less than the previous 10-year average of 60 bears (RY04–RY13, $SD \pm 10$). However, harvest in the last decade was abnormally high. The harvest of the last 2 years is similar to the previous norm; the average harvest from RY94–RY03 was 43 bears ($SD \pm 11$). Harvest levels varied by unit within Unit 6 (Table 2) and varied in how they compared to the previous 10-year

(RY04–RY13) harvest average and 20-year (RY94–RY13) harvest. In Unit 6A, average annual harvest for RY14–RY18 (17 bears) was lower than the 10-year average of 21 bears and the 20-year average of 19 bears. The average annual harvest for RY14–RY18 in Unit 6B of 6 bears was below the RY04–RY13 average of 10 bears and the RY94–RY13 average of 8 bears. The average annual harvest for RY14–RY18 (6 bears) in Unit 6C was comparable to the 10-year average of 8 bears and the 20-year average of 6 bears. The RY04–RY13 average annual harvest in Unit 6D (21 bears) was also comparable, with the 10- and 20-year averages at 24 and 21 bears, respectively.

In general, more bears are harvested in Unit 6D than in Units 6A, 6B, or 6C. However, in some years more bears were harvested in Unit 6A (Table 2). Unit 6A harvest may be more stable due to the high proportion of participants that are guided. Unit 6D has more participation by nonlocal Alaskans who hunt without a guide. Within Unit 6D, the mainland and eastern portion of PWS (not including the Valdez Arm) typically experience the highest bear harvests. Hinchinbrook Island experiences the second highest level of harvest. Harvest on Montague Island has increased and will likely stay at current levels due to land ownership and guide contracts.

Harvest of females can vary considerably from year to year and between units (Table 2). The proportion of females in the average harvest in all of Unit 6 during RY14–RY18 was 29%, which is slightly less than the RY04–RY13 average of 33%, and within the management objective. Units 6B and 6C are more likely to have proportionately high take of females; however, the overall harvest in each of these areas in most years is low. In Unit 6B for example, the average annual proportion of females in the RY09–RY18 harvest was 40% but the average annual harvest was 7 bears.

Unitwide skull size of harvested males was generally increasing until RY11 when average skull size in the harvest began decreasing. However, the 10-year average, 20-year average, and the average for this reporting period (Table 3) were all 24 inches. Skull size in Unit 6A has remained relatively constant but Units 6B and 6C increased until RY17 and RY18, when skull sizes decreased. Male skull size in the harvest decreased in Unit 6D after RY10. Female annual mean skull size has remained very stable, varying little from 21 inches. In Unit 6A the skull size of harvested females has increased over the preceding 20 years (since 1998).

The average age of harvested males increased over the 20-year period from 5.6 years in RY92 to 10.1 years in RY11 and has since declined to an average of 6.7 years during RY14–RY18. Most of this trend is driven by Unit 6D which makes up a large portion of the harvest (Table 3). Average age of females was relatively stable during RY14–RY18 (Table 3). Average female age fluctuated regularly between 6- and 7-years old.

Table 2. Unit 6 brown bear harvest during regulatory years 2014–2018, Alaska.

Unit	Regulatory year	Fall harvest				Spring harvest				Total hunting harvest					Reported nonhunting ^a				Total reported kill			
		M	F	Unk	Total	M	F	Unk	Total	M	%F	F	Unk	Total	M	F	Unk	Total	M	F	Unk	Total
6A	2014	1	3	0	4	5	2	0	7	6	45	5	0	11	0	0	0	0	6	5	0	11
	2015	7	4	0	11	7	3	0	10	14	33	7	0	21	0	0	0	0	14	7	0	21
	2016	13	1	0	14	6	0	0	6	19	5	1	0	20	0	0	0	0	19	1	0	20
	2017	8	3	0	11	3	0	0	3	11	21	3	0	14	0	0	0	0	11	3	0	14
	2018	8	6	0	14	3	1	0	4	11	39	7	0	18	1	0	0	1	12	7	0	19
6B	2014	0	1	0	1	1	0	0	1	1	50	1	0	2	0	0	0	0	1	1	0	2
	2015	1	1	0	2	2	0	0	2	3	25	1	0	4	0	0	0	0	3	1	0	4
	2016	2	2	0	4	1	0	0	1	3	40	2	0	5	0	0	0	0	3	2	0	5
	2017	3	0	0	3	2	0	0	2	5	0	0	0	5	0	0	0	0	5	0	0	5
	2018	8	4	0	12	0	0	0	0	8	33	4	0	12	0	0	0	0	8	4	0	12
6C	2014	2	0	0	2	4	0	0	4	6	0	0	0	6	1	0	0	1	7	0	0	7
	2015	2	1	0	3	0	0	0	0	2	33	1	0	3	0	0	0	0	2	1	0	3
	2016	1	1	0	2	0	4	0	4	1	83	5	0	6	0	0	0	0	1	5	0	6
	2017	3	0	0	3	0	0	0	0	3	0	0	0	3	1	0	0	1	4	0	0	4
	2018	2	2	0	4	0	0	0	0	2	50	2	0	4	0	2	2	4	2	4	2	8
6D	2014	1	1	0	2	11	7	0	18	12	40	8	0	20	1	1	1	3	13	9	1	23
	2015	2	0	0	2	13	3	0	16	15	17	3	0	18	0	1	0	1	15	4	0	19
	2016	1	1	0	2	9	4	0	13	10	33	5	0	15	0	1	0	1	10	6	0	16
	2017	2	1	0	3	14	6	0	20	16	30	7	0	23	1	2	1	4	17	9	1	27
	2018	3	2	0	5	11	3	0	14	14	26	5	0	19	0	1	0	1	14	6	0	20
Unit 6 total	2014	4	5	0	9	21	9	0	30	25	36	14	0	39	2	1	1	4	27	15	1	43
	2015	12	6	0	18	22	6	0	28	34	26	12	0	46	0	1	0	1	34	13	0	47
	2016	17	5	0	22	16	8	0	24	33	28	13	0	46	0	1	0	1	33	14	0	47
	2017	16	4	0	20	19	6	0	25	35	22	10	0	45	2	2	1	5	37	12	1	50
	2018	21	14	0	35	14	4	0	18	35	34	18	0	53	1	3	2	6	36	21	2	59

^a Nonhunting kills include agency take, vehicle collisions, and bears killed in defense of life or property.

Table 3. Unit 6 brown bear harvest mean skull size (length plus width), regulatory years 2014–2018, and mean age (years), Alaska.

Unit	Regulatory year	Males				Females			
		Skull (in)	n (skull)	Age	n (age)	Skull (in)	n (skull)	Age	n (age)
6A	2014	24.0	6	8.0	6	22.8	4	11.2	5
	2015	24.8	13	6.9	13	21.9	7	7.1	7
	2016	23.9	18	6.5	19	23.3	1	13.0	1
	2017	24.1	10	5.3	9	20.6	1	3.3	3
	2018	24.0	11	–	–	21.5	6	–	–
6B	2014	23.4	1	5.0	1	21.1	1	1.0	–
	2015	21.9	3	2.5	2	18.1	1	1.0	1
	2016	23.2	3	3.7	3	20.6	2	4.5	2
	2017	22.6	5	3.0	3	–	–	–	–
	2018	22.4	7	–	–	20.4	4	–	–
6C	2014	25.0	7	11.0	6	–	–	–	–
	2015	24.9	2	9.0	2	23.4	1	9.0	1
	2016	25.8	1	4.0	1	21.8	5	5.4	5
	2017	22.5	4	3.3	3	–	–	–	–
	2018	21.2	2	–	–	19.5	4	–	–
6D	2014	23.4	13	6.5	11	20.7	9	4.9	8
	2015	23.6	15	8.4	14	20.9	4	4.0	3
	2016	23.7	10	8.2	9	21.8	6	7.0	5
	2017	23.7	17	9.0	1	20.5	9	2.0	1
	2018	24.1	14	–	–	21.6	6	–	–
Unit 6 combined	2014	23.9	27	8.1	24	21.3	14	7.3	13
	2015	24.0	33	7.4	31	21.4	13	6.0	12
	2016	23.9	32	6.6	32	21.7	14	6.5	13
	2017	23.5	36	4.8	16	20.5	10	3.0	4
	2018	23.6	34	–	–	20.9	20	–	–

Note: En dashes indicate no data.

Permit Hunts

The number of permits issued for the fall bear hunt on Montague Island (RB100) grew to a peak of 108 permits in RY07 and has since declined (Table 4). In fall of RY18, 42 permits were issued, the second lowest on record. Many of these permits are acquired by deer hunters that want the option of legally harvesting a bear if one makes them uncomfortable while deer hunting; they are not targeting bear. This is demonstrated by the more than 50% of hunters in most years indicating they did not hunt bears and the correspondingly low success rate (5% average for RY14–RY18). The RY09–RY18 average fall harvest was 4 bears.

In contrast, hunters acquiring a permit to hunt on Montague Island in the spring hunt (RB101) are likely making a more concerted effort to hunt bears. Since the hunt’s inception in RY09, an

Table 4. Montague Island brown bear permit hunt participation and harvest, regulatory years 2001–2018, Unit 6, Alaska.

Hunt	Regulatory year	No. of permits issued	Percent of permits that did not hunt	Percent success	No. Males	Percent Male	No. Females	Percent Female	Unknown	Total harvest	Hunt quota
Fall RB100	2001	58	50	14	3	75	1	25	0	4	5
	2002	37	30	8	0	0	2	100	0	2	5
	2003	75	25	0	0	–	0	–	0	0	5
	2004	77	30	9	3	60	2	40	0	5	5
	2005	91	32	2	1	100	0	0	0	1	5
	2006	81	53	5	2	100	0	0	0	2	5
	2007	108	59	2	0	0	1	100	0	1	5
	2008	75	41	9	2	50	2	50	0	4	5
	2009	92	47	0	0	–	0	–	0	0	–
	2010	92	58	5	2	100	0	0	0	2	–
	2011	81	62	3	0	0	1	100	0	1	–
	2012	86	47	2	1	100	0	0	0	1	–
	2013	72	58	0	0	–	0	–	0	0	–
	2014	89	56	5	1	50	1	50	0	2	–
	2015	84	61	0	0	–	0	–	0	0	–
	2016	95	71	4	0	0	1	100	0	1	–
	2017	89	63	3	1	100	0	–	0	1	–
	2018	42	62	13	2	100	0	–	0	2	–
Spring RB101	2009	33	55	40	5	83	1	17	0	6	–
	2010	30	43	35	4	67	2	33	0	6	–
	2011	30	37	42	8	100	0	0	0	8	–
	2012	39	59	13	2	100	0	0	0	2	–
	2013	29	76	14	0	0	1	100	0	1	–
	2014	38	76	5	2	100	0	0	0	2	–
	2015	40	70	0	3	100	0	0	0	3	–
	2016	24	67	4	3	100	0	0	0	3	–
	2017	37	41	3	2	100	0	0	0	2	–
	2018	26	58	13	3	60	2	40	0	5	–

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Table 4. Page 2 of 2.

Hunt	Regulatory year	No. of permits issued	Percent of permits that did not hunt	Percent success	No. Males	Percent Male	No. Females	Percent Female	Unknown	Total harvest	Hunt quota
Combined	2009	125	49	9	5	83	1	17	0	6	5
	2010	122	54	14	6	75	2	25	0	8	5
	2011	111	55	18	8	89	1	11	0	9	5
	2012	125	50	5	3	100	0	0	0	3	5
	2013	101	63	3	0	0	1	100	0	1	5
	2014	127	62	8	3	75	1	25	0	4	5
	2015	124	64	7	3	100	0	0	0	3	5
	2016	119	70	11	3	75	1	25	0	4	5
	2017	126	56	5	3	100	0	0	0	3	5
	2018	68	60	26	5	71	2	29	0	7	5

Note: En dash indicates no data.

average of 33 permits were issued annually. Though 58% of permit holders reported that they did not hunt (Table 4), 11% of those who did hunt succeeded in harvesting a bear (Table 4). Combined average annual harvest (RY14–RY18) was approximately 4 bears; the annual maximum allowable harvest (MAH) is 5 bears. During RY14–RY18, the combined harvest exceeded the maximum allowable harvest in 1 of the 5 years. The average length of a bear hunt in Unit 6 is about 4 days. In Units 6A, 6B, and 6D the average was between 4 and 5 days this reporting period as well as for the 10 and 20 years prior. Unit 6C, hunters on average were in the field 3 days.

Hunter Residency and Success

Nonresidents take most of the brown bears harvested in Unit 6. During this reporting period (RY14–RY18), they took 65% of the harvest (Table 5). Nearly all who hunt in Unit 6A are nonresidents (86% during RY14–RY18). Local residents take a small percentage (14% during RY14–RY18) of the harvest in Unit 6 and hunt primarily in Units 6B and 6C. Nonlocal Alaska residents most commonly pursue bears in Unit 6D. Unitwide, harvest by nonlocal Alaska residents comprised 21% of the total for this reporting period.

Table 5. Unit 6 brown bear successful hunter residency, regulatory years 2014–2018, Alaska.

Unit	Regulatory year	Unit 6 resident		Nonlocal Alaska resident		Nonresident		Total successful hunters
		Number	(%)	Number	(%)	Number	(%)	
6A	2014	0	(0)	0	(0)	11	(100)	11
	2015	0	(0)	3	(14)	18	(86)	21
	2016	2	(10)	1	(5)	17	(85)	20
	2017	1	(7)	4	(29)	9	(64)	14
	2018	0	(0)	1	(6)	17	(94)	18
6B	2014	1	(50)	0	(0)	1	(50)	2
	2015	2	(50)	0	(0)	2	(50)	4
	2016	0	(0)	0	(0)	5	(100)	5
	2017	1	(20)	2	(40)	2	(40)	5
	2018	4	(33)	1	(8)	7	(58)	12
6C	2014	2	(33)	0	(0)	4	(67)	6
	2015	2	(67)	0	(0)	1	(33)	3
	2016	2	(33)	2	(33)	2	(33)	6
	2017	2	(67)	0	(0)	1	(33)	3
	2018	3	(75)	1	(25)	0	(0)	4
6D	2014	3	(15)	8	(40)	9	(45)	20
	2015	0	(0)	6	(33)	12	(67)	18
	2016	1	(7)	6	(40)	8	(53)	15
	2017	4	(17)	7	(30)	12	(52)	23
	2018	1	(5)	7	(37)	11	(58)	19

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Table 5. Page 2 of 2.

Unit	Regulatory year	Unit 6 resident		Nonlocal Alaska resident		Nonresident		Total successful hunters
		Number	(%)	Number	(%)	Number	(%)	
Unit 6 total	2014	6	(15)	8	(21)	25	(64)	39
	2015	4	(9)	9	(20)	33	(72)	46
	2016	5	(11)	9	(20)	32	(70)	46
	2017	8	(18)	13	(29)	24	(53)	45
	2018	8	(15)	10	(19)	35	(66)	53

Harvest Chronology

From a unitwide perspective, in most years harvest is rather evenly distributed between the spring and the fall. During RY14–RY18, 4 out of 5 years had higher harvest in the spring (although in 2 years, it was nearly 50:50) and 1 year had higher harvest in the fall. However, seasonal harvest varies among units. Most harvest in Unit 6A takes place in the fall by hunters pursuing moose or goats. Conversely, most harvest in Unit 6D takes place in the spring. In Units 6B and 6C harvest is evenly distributed between the fall and spring. Peak brown bear harvests typically occurred during September and May during RY14–RY18 (Table 6).

Transport Methods

Airplanes and boats were the most important methods of transportation overall in Unit 6 (Table 7). Typically, Unit 6A is almost entirely accessed by plane. In Unit 6B, airplanes are most commonly used but highway vehicles was also popular. In Unit 6C, highway vehicles, 4-wheelers/ORVs and boats are predominant because of road and boat launch access. In Unit 6D, boats and to a lesser degree, aircraft are important because of the sheltered waters of PWS. These patterns were consistent throughout this reporting period as well as the last 5 years (Table 7).

Other Mortality

There were 14 bears killed in defense of life or property during RY14–RY18 (Table 2). One bear was killed in Unit 6A, 4 in Unit 6C, and the remaining 9 in Unit 6D. The majority of these occurred in or near the communities of Valdez or Cordova. The hobby of raising poultry has increased in popularity and electric fences are a necessity to prevent losses to bears and subsequent defense of life or property (DLP) killings. ADF&G continues to develop educational materials and offer a fence lending program. The number of bears killed illegally or wounded and not retrieved is unknown. One bear in Valdez was initially reported as DLP but was determined to be invalid and therefore an illegal kill. Two additional mortalities can be assumed in Unit 6C because 2 cubs of the year that were associated with a DLP sow certainly died following her killing. These cubs could not be resighted for capture or humane killing upon return to the kill site.

Alaska Board of Game Actions and Emergency Orders

No regulatory changes or emergency orders occurred during RY14–RY18.

Table 6. Unit 6 brown bear harvest chronology percent by harvest period, regulatory years 2014–2018, Alaska.

Unit	Regulatory year	Harvest periods											<i>n</i>
		September		October		November		April		May		June	
		1–15	16–30	1–15	16–31	1–15	16–30	1–15	16–30	1–15	16–31	1–15	
6A	2014	36	0	0	0	0	0	0	0	18	36	9	11
	2015	33	19	0	0	0	0	0	0	10	29	10	21
	2016	25	30	5	10	0	0	0	5	5	15	5	20
	2017	43	29	7	0	0	0	0	0	14	7	0	14
	2018	56	11	11	0	0	0	0	0	6	11	6	18
6B	2014	50	0	0	0	0	0	0	0	0	50	0	2
	2015	0	0	50	0	0	0	0	0	25	25	0	4
	2016	40	40	0	0	0	0	0	0	0	20	0	5
	2017	40	20	0	0	0	0	0	0	0	40	0	5
	2018	75	0	25	0	0	0	0	0	0	0	0	12
6C	2014	33	0	0	0	0	0	0	0	17	50	0	6
	2015	67	0	33	0	0	0	0	0	0	0	0	3
	2016	33	0	0	0	0	0	0	0	50	17	0	6
	2017	0	0	33	67	0	0	0	0	0	0	0	3
	2018	75	25	0	0	0	0	0	0	0	0	0	4
6D	2014	0	0	0	10	0	0	0	0	35	55	0	20
	2015	0	0	0	11	0	0	0	0	50	39	0	18
	2016	0	0	7	7	0	0	0	0	20	67	0	15
	2017	0	0	9	4	0	0	0	0	22	57	9	23
	2018	0	0	11	11	5	0	0	0	42	32	0	19
Unit 6 Total	2014	18	0	0	5	0	0	0	0	26	49	3	39
	2015	20	9	7	4	0	0	0	0	26	30	4	46
	2016	20	17	4	7	0	0	0	2	15	33	2	46
	2017	18	11	9	7	0	0	0	0	16	36	4	45
	2018	42	6	13	4	2	0	0	0	17	15	2	53

Table 7. Unit 6 brown bear harvest percent by transport method, regulatory years 2014–2018, Alaska.

Unit	Regulatory year	Percent of harvest								<i>n</i>
		Airplane	Boat	Airboat	3- or 4-wheeler	Snow-machine	ORV ^a	Highway Vehicle	Unknown	
6A	2014	55	9	0	18	0	0	0	18	11
	2015	81	14	0	5	0	0	0	0	21
	2016	75	10	0	15	0	0	0	0	20
	2017	50	21	0	21	0	0	7	0	14
	2018	67	0	0	33	0	0	0	0	18
6B	2014	0	0	0	0	0	0	50	50	2
	2015	25	0	0	0	0	0	50	25	4
	2016	100	0	0	0	0	0	0	0	5
	2017	40	0	20	0	0	0	40	0	5
	2018	67	8	8	0	0	0	17	0	12
6C	2014	33	0	0	33	0	0	0	33	3
	2015	33	0	33	33	0	0	0	0	3
	2016	0	50	0	33	0	17	0	0	6
	2017	33	0	0	0	0	0	67	0	3
	2018	0	0	0	0	0	0	75	25	4
6D	2014	10	90	0	0	0	0	0	0	20
	2015	22	72	0	0	0	0	0	6	18
	2016	27	73	0	0	0	0	0	0	15
	2017	22	70	0	0	0	0	4	4	23
	2018	26	68	0	0	0	0	5	0	19
Unit 6	2014	25	53	0	8	0	0	3	11	36
Total	2015	50	35	2	4	0	0	4	4	46
	2016	52	35	0	11	0	2	0	0	46
	2017	33	42	2	7	0	0	13	2	45
	2018	47	26	2	11	0	0	11	2	53

^a Off-road vehicle (ORV).

Recommendations for Activity 2.1

Continue to monitor harvest data and mortality data as possible.

3. Habitat Assessment-Enhancement

There were no habitat assessment or enhancement projects for brown bears in Unit 6 during RY14–RY18.

NONREGULATORY MANAGEMENT PROBLEMS OR NEEDS

Fish waste related to sport fishing is consistently a challenge to preventing problems from food-habituated bears. Additional measures should be taken to educate anglers on proper conduct.

Efforts continue to educate the public on the importance of securing attractants in urban settings from bears to prevent DLP kills. Outreach materials are widely distributed and are being explored in different mediums including social media.

Data Recording and Archiving

- Harvest data are stored on an internal database housed on a server (<http://winfonet.alaska.gov/index.cfm>).
- Research datasheets are entered, scanned, and stored on the Cordova ADF&G server (O:\DWC\brown bear).
- Original datasheets are stored in file folders located in the Cordova area biologist's office.
- Historical survey notes and data sheets are being digitized and scanned for permanent storage on the file server.

Agreements

None.

Permitting

None.

Conclusions and Management Recommendations

Brown bear population numbers were probably stable during RY14–RY18. New survey techniques should be assessed for estimating the population and determining the maximum acceptable level of harvest. In the meantime, brown bear track and den surveys should continue on Montague and Hinchinbrook islands as only an anecdotal measure of abundance, distribution, and snow conditions.

Changes in permitting for guided hunts on private land will probably influence the harvest on Montague Island and make it more likely that MAH will be reached. Harvest on Montague Island should be held to levels within MAH at least on a 3-year rolling average.

II. Project Review and RY19–RY23 Plan

Review of Management Direction

MANAGEMENT DIRECTION

Currently, tools to assess the status of brown bear populations and the sustainability of harvest are not funded. To assess the achievement of management goals, techniques to assess them should receive money.

GOALS

Manage brown bear populations to provide for sustained annual use by hunters and wildlife viewers.

CODIFIED OBJECTIVES

Amounts Reasonably Necessary for Subsistence Uses

Brown bears in Unit 6 have a negative customary and traditional use finding.

Intensive Management

Brown bears in Unit 6 have a negative intensive management finding.

MANAGEMENT OBJECTIVES

- Maintain seasons and bag limits that would provide for a unitwide 3-year average harvest of 35–65 bears, which will be considered within each the calendar year.
- Manage for a 3-year average of less than 40% female bears.

REVIEW OF MANAGEMENT ACTIVITIES

1. Population Status and Trend

ACTIVITY 1.1. Record observations of brown bears seen incidentally during other survey work and anecdotal reports from the public.

Data Needs

No change from the RY14–RY18 report.

Methods

No change from the RY14–RY18 report.

2. Mortality-Harvest Monitoring

ACTIVITY 2.1. Monitor harvest through sealing records and effort from permit and harvest ticket reports.

Data Needs

No change from the RY14–RY18 report.

Methods

No change from the RY14–RY18 report.

3. Habitat Assessment-Enhancement

No activities are planned for RY19–RY23.

NONREGULATORY MANAGEMENT PROBLEMS OR NEEDS

Efforts should continue to educate the public on the importance of securing attractants in urban settings from bears to prevent DLP kills. Outreach materials will continue to be developed in different mediums including social media.

Data Recording and Archiving

- Harvest data are stored on an internal database housed on a server (<http://winfonet.alaska.gov/index.cfm>).
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- Historical survey notes and data sheets are being digitized and scanned for permanent storage on the file server.

Agreements

None.

Permitting

None.

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