Species Management Report and Plan ADF&G/DWC/SMR&P–2025–51

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

Report Period 1 July 2018–30 June 2023, and

Plan Period 1 July 2023–30 June 2028

Charlotte L. Westing

2025

Alaska Department of Fish and Game Division of Wildlife Conservation

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Hunters are important founders of the modern wildlife conservation movement. They, along with trappers and sport shooters, provided funding for this publication through payment of federal taxes on firearms, ammunition, and archery equipment, and through state hunting license and tag fees. These taxes and fees fund the federal Wildlife Restoration Program and the State of Alaska's Fish and Game Fund, which provided funding for the work reported on in this publication.

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 Jeff Selinger, Management Coordinator for Region II, Division of Wildlife Conservation.

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This document, published in PDF format only, should be cited as:

Westing, C. L. 2025. Black bear management report and plan, Game Management Unit 6: Report period 1 July 2018–30 June 2023, and plan period 1 July 2023–30 June 2028. Alaska Department of Fish and Game, Species Management Report and Plan ADF&G/DWC/SMR&P-2025-51, Juneau.

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Purpose of this Report

This report provides a record of survey and inventory management activities for black bears (*Ursus americanus*) in Game Management Unit 6 for the 5 regulatory years 2018–2022 and plans for survey and inventory management activities in the next 5 regulatory years, 2023–2027. A regulatory year (RY) begins 1 July and ends 30 June (e.g., RY18 = 1 July 2018–30 June 2019). 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 black bear management report of survey and inventory activities that was previously produced every 3 years.

I. RY18–RY22 Management Report

Management Area

Unit 6 covers approximately 10,140 mi^2 of land, including Prince William Sound (PWS), the Copper River Delta, and the North Gulf Coast of Alaska (NGC; Fig. 1). It is divided into 4 administrative units (6A, 6B, 6C, and 6D), which are also referred to as units. The terrain in Unit 6 includes rugged mountains, old-growth forests, coastal wetlands, and muskeg meadows.

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

Black bears are common throughout Unit 6, except for Montague and Hinchinbrook islands, several smaller islands in the PWS, and Kayak and Middleton islands along the NGC. Density is probably highest in western PWS and lower in eastern PWS and along the NGC. Modafferi (1978) roughly estimated densities of 500, 230, and 300 bears per 1,000 km^2 (386 mi^2) in western PWS, eastern PWS, and along the NGC, respectively. Other density estimates for good habitat in PWS ranged from 400 to 10,000 bears per 1,000 km^2 (386 mi^2; Grauvogel 1967, McIlroy 1970, Modafferi 1982). Harvest data and incidental observations from guides, charters, and local hunters indicated that distribution and general abundance increased throughout Unit 6 during the 1990s to a high level, possibly in response to new salmon hatcheries established during the 1980s; however, none of these estimates were obtained using methods considered reliable for estimating bear population size or density. Since the early 2000s, stakeholders have expressed concern that the take of bears in the PWS may be too high. Since 2015, many of these same stakeholders have reported seeing a growing number of bears, including many sows with cubs.

Black bears in Unit 6 primarily eat vegetation in early spring. Foraging areas that contain early emergent vegetation, including coastal sedge meadows and avalanche chutes, are especially important for black bears. Their major foods include grasses, sedges, skunk cabbage, and horsetail. As summer progresses, their diets shift, and bears consume more fish, particularly salmon, of any species available. Berries are also very important in the summer and fall. Meat from terrestrial animals probably makes up comparatively little of the bear diet in the PWS.

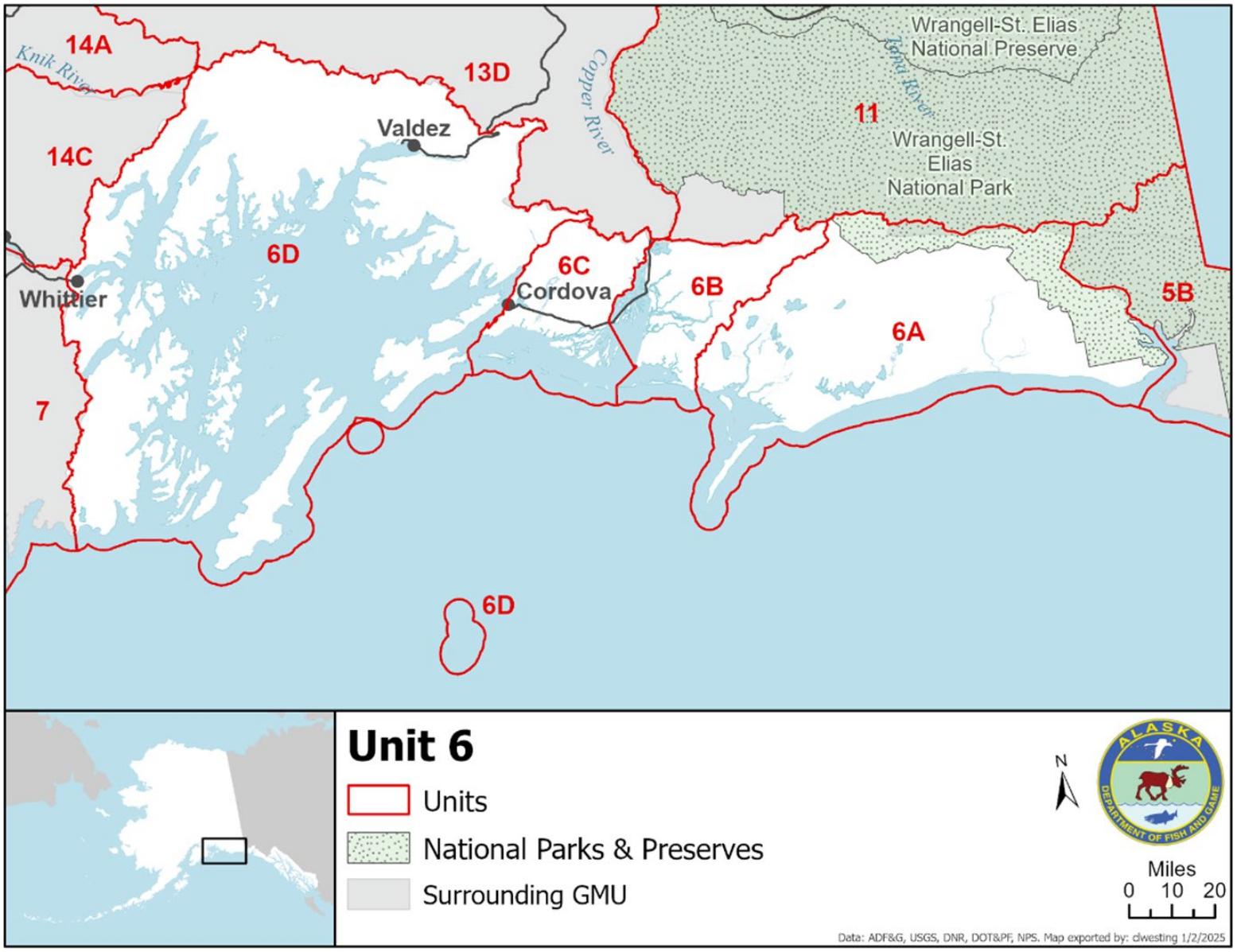

Figure 1. Unit 6 and its administrative units (game management units, GMU), Alaska, regulatory years 2018–2022.

In Unit 6, weather conditions can lead to fluctuations in food abundance that affect black bear populations. For example, reduced food availability can impact the age of first reproduction, pregnancy rates (if fall resources are insufficient), and cub mortality (Elowe and Dodge 1989, Eiler et al. 1989). Competition and predation by brown bears may also influence the distribution and abundance of black bears. The highest density of black bears in Unit 6 occurs in western PWS, where brown bears are absent.

Black bears exhibit sexual segregation during spring (Modafferi 1982). Modafferi (1982) found that male black bears in Unit 6D used beaches after emerging from their winter dens to feed on new sedges and grasses, which made them more vulnerable to harvest during this period. Females tended to remain away from beaches, instead favoring south-facing slopes and avalanche chutes that green up early in the season. In both Alaska (Schwartz et al. 1986) and Minnesota (Rogers 1987), den emergence correlated with weather conditions; however, in Alaska, it was a secondary correlate to Julian date.

Harvest monitoring of black bears in Unit 6 began in RY73 with mandatory sealing of hides. Before this requirement, annual harvest estimates ranged from "practically nil" (Robards 1954) to more than 100 bears during 1965 and 1966 (McIlroy 1970). Sealing records indicated an average annual take of 108 bears from RY73 (when sealing records began) to RY82. The annual harvest averaged 222 bears from RY83 to RY97 as interest in hunting in the PWS grew. An average of 460 bears was taken annually during RY98–RY07, with harvest peaking at 675 bears in RY07. Annual harvest declined by about 6% each year from RY07 until RY12, when it dropped 20% compared to RY11. Compared to the prior regulatory year, RY13 harvests declined by 44% and RY14 harvests declined by 46%. Harvest in RY15 (110 bears) represented a 12% decline from the previous year, the lowest harvest recorded since 1980. This harvest may have been impacted by an emergency order in Unit 6D. In RY16, the harvest began to increase.

A once-in-a-century weather event in RY11 exceeded records for snowfall and retention. Although snowfall in RY12 was not nearly as significant as in the previous year, spring arrived late that year. Spring conditions significantly influence the phenology of forage plants, which may, in turn, affect bear distribution and their availability to hunters. These conditions may also influence cub survival and production, with lingering effects, and may influence the availability of females for harvest. In Unit 6D, females averaged 24% of the total harvest each year between RY91 and RY10; however, females in the harvest averaged 41% in RY11, 46% in RY12, and 41% in RY13. During RY14–RY17, the proportion of females in the harvest declined to within the objectives.

Harvest tickets were required starting in RY09, which allowed for the determination of success rates in Unit 6D. Success declined from an annual average of 47% (RY09–RY12) to an annual average of 20% (RY13–RY17).

Most of the harvest in Unit 6 occurs in Unit 6D (75–90%). This is due to the high density of bears within proximity of a high-density human population. The Anton Anderson Memorial Tunnel (Whittier Road) opened to highway vehicles in June 2000 (RY99), allowing easier access for bear hunters in Unit 6D. Although the increasing trend in harvest began 4 years before Whittier Road opened, the number of hunters in Unit 6D has remained high due to the ease of access.

Hunting pressure may affect local populations. McIlroy (1970) reported a declining harvest, a declining hunter success rate, and an increasing number of hunter-days per harvested bear. These findings suggest that the black bear population in Valdez Arm (Unit 6D) was declining between 1966 and 1969. Relatively high hunter effort documented by Modafferi (1978) in the Whittier area in 1977 may have also resulted in a reduced population in western Unit 6D. Concern over the increase in black bear harvest in the PWS has led to a series of regulatory actions starting in 2003, including season date changes, limitations on bear baiting, and the prohibition of shooting from a boat.

Wildlife viewing is an industry of economic importance in the PWS. From mid-May to late August, wildlife viewing charters transport 600–700 people per day through the ports of Whittier and Valdez at a cost of $100–300 per person each day (Whittier and Valdez Chamber of Commerce figures, 2015, unpublished data). Charter operators identify bears as a species of interest on these trips.[1]

New management objectives for harvest (350–400 bears) were adopted to encompass a range instead of a minimum number of bears desired in the harvest (Westing 2014). Additionally, a new management objective was adopted for an acceptable percentage of females (<30% in Unit 6D).

The average male skull size in Unit 6D was less than 17 inches in most years during RY08–RY17 (7 out of 10 years) and above 17 inches in most years during RY93–RY07 (9 out of 15 years). Skull size objectives are not established for Units 6A, 6B, and 6C.

Management Direction

Existing Wildlife Management Plans

A formal plan for black bear management in Unit 6 has not been developed. In the absence of population estimates, a maximum allowable harvest (MAH) of 200 bears was established. The MAH serves as a guideline for management through previous harvest levels and their corresponding percentage of females. Success rates were also used as an indicator of population level. Directly estimating the population and developing appropriate harvest rates would be preferable to this technique, but it is currently not funded.

Goals

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

[1] This paragraph is based on a public meeting held in January 2015 in Valdez, which was attended by operators of Stan Stevens Cruises, as well as other personal communications with Auklet Charters, Discovery Charters, and Babkin Charters.

CODIFIED OBJECTIVES

Amounts Reasonably Necessary for Subsistence Uses

Black bears in Unit 6 have a positive customary and traditional use finding. The Board of Game set the amount reasonably necessary for subsistence uses at 80–120 black bears.

Intensive Management

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

MANAGEMENT OBJECTIVES

The management objective for Unit 6 (unitwide) black bears is to sustain a 3-year average annual harvest of 350–400 bears, composed of less than 30% females and with a minimum average male skull size of 17 inches. Nonconsumptive users should have a reasonable chance of seeing bears while wildlife viewing.

MANAGEMENT ACTIVITIES

1. Population Status and Trend

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

Data Needs

Incidental observations are insufficient for estimating the population or detecting changes that would trigger management action. Statistical estimates of black bears derived from a sample-based estimator, including a measure of the precision, would be needed to detect a change in the population. Nevertheless, anecdotal reports from the public and incidental observations can spark further investigation and lead to regulatory proposals that may impact management. It is important to document user reports and compile all data to document user perceptions.

Methods

GPS locations and characteristics were recorded for any black bears observed during aerial survey flights. Most observations occurred during fall goat surveys or spring moose twinning surveys when sightability was ideal. Anecdotal reports were recorded to the maximum level of detail available.

Results and Discussion

Incidental sightings from unrelated surveys must be considered very cautiously, as they can be influenced greatly by where and when areas were flown. For example, late-season surveys usually result in more bear observations. This was demonstrated in 2018 when 2 black bears were observed during the first survey of 6D-1a (RG242); the second survey, conducted more than 2 weeks later, found 18 black bears. Additionally, late-season surveys completed in 2016 in RG230 and RG231 observed 36 bears, but late-season surveys in 2018 produced only 7

observations. While these examples could reflect bear and cub abundance, it should also be noted that berries may have been dramatically less abundant (anecdotally and based on defense of life or property [DLP] kills); this means bears may have been distributed differently as they pursued food subsidies. In the RG248 survey in 2017 (19 September), 14 black bears were seen. In 2020 (15 September), 87 black bears were observed in RG248. In the last survey of RG231 (18 September 2018), 5 black bears were observed. In 2020, 13 black bears were observed in the same area and timeframe (14 September 2020).

Black bears observed per hour of survey time was calculated as an index of black bears observed per survey. In most years, 1.15–3.00 bears per hour were observed; however, in 2020, 16.9 bears were observed per hour of survey time. This may result from timing, surveys focusing on higher-density areas (since survey areas are on a rotating schedule), distribution, and bear abundance. While comparing numbers from year to year is difficult, these data will continue to be collected incidentally and evaluated for their usefulness.

Past stakeholders consistently reported that black bears in western PWS became more challenging to find for every purpose, including wildlife viewing and hunting. In contrast, stakeholders reported increasing numbers of bears during this reporting period (RY18–RY22).

Recommendations for Activity 1.1.

Continue.

2. Mortality-Harvest Monitoring and Regulations

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

Data Needs

Harvest and effort must be assessed to understand the potential impact of hunting on black bear populations.

Methods

Harvest information was gathered from sealing certificates, harvest tickets, and permit reports. Harvest densities were calculated as the number of bears harvested per kilometer, using the population zones utilized by Modafferi (1978) for density calculations.

Hides and skulls were sealed for all black bears in the reported harvest. The harvest included bears taken by licensed hunters and bears killed in DLP. Staff checked each hide for sex identifiers and measured skulls for total length and zygomatic width. Sealers recorded harvest date, days hunted, transportation used, and location of harvest within Uniform Coding Units (UCUs). UCUs are small, defined areas within Unit 6 that represent watersheds, islands, or island groups. Illegal kills were included when known. Unreported harvest could include wounding loss and bears taken by hunters that were not sealed (unknown illegal kills), and it has historically been thought to add 12% to the total reported harvest; however, numerous unquantifiable variables affect numbers from year to year. Tooth samples have been periodically collected in Unit 6 since sealing began; since RY04, these samples have been consistently

collected from bears harvested in Unit 6D to determine age. Harvest ticket data have been available since RY09 and can be used to evaluate effort in all units. In Unit 6D, effort data are available from the registration hunt RL065 that was implemented in RY15.

Season and Bag Limit

Across Unit 6, the bag limit was 1 bear, and seasons varied:

- Unit 6A: 20 August–30 June.
- Unit 6B: 20 August–30 June.
- Unit 6C: 1 September–30 June.
- Unit 6D: 10 September–10 June.

Results and Discussion

Harvest by Hunters

Harvest across the unit has increased steadily since RY15, when it was at its lowest point. In Units 6A and 6C, harvest increased at a faster rate in RY18, when there may have been a multispecies berry crop failure. The following year, harvest dropped back down. Food abundance may have changed the behavior and distribution of bears, making them more available for harvest. Most of this increase in harvest occurred in the fall when bears exhibit behavior consistent with hyperphagia (Table 1). Except for RY18, harvest in Units 6A, 6B, and 6C has remained stable at average levels.

Unit 6D, where more than 80% of the overall unit harvest occurs, has shown a steady increase in harvest since RY15. Harvest in RY18 and RY19 returned to levels consistent with those in the late 1990s (200–250 bears). In RY20, the harvest increased by 44% from the year prior. In RY21, the harvest stabilized with only 6% more than the previous year. In RY22, the harvest increased another 27% (441 bears total), matching the amount harvested in RY06 before it peaked in RY09–RY10 (Table 1).

Sex composition of the harvest varies between units (Table 1). Unit 6A has the lowest proportion of female harvest, with 100% males taken in all years since RY18. The highly selective nature of this harvest is likely due to nearly all participants using guides and the distance and expense required to hunt in that area.

Unit 6B experiences very little hunting pressure, especially since the closure of the Copper River Highway at Mile 34 in 2011. As a result, the percentage of females taken is highly volatile because of the small number of bears taken. Since RY18, only 1 female bear has been taken each year, except for in RY19 (Table 1).

Unit 6C experiences higher harvest pressure due to its proximity to Cordova and the presence of the Copper River Highway. The percent of females in the harvest ranged from 18% in RY19 to 34% in RY18 (Table 1). In most years, the harvest of females in Unit 6C is >30%. Despite >30% of the harvest being reported as “taken over bait,” Unit 6C appears to be subjected to less selective harvest.

Table 1. Black bear harvest by unit, Unit 6, Alaska, regulatory years 2018–2022.

		Fall harvest				Spring harvest				Total hunting harvest					Reported nonhunting				Total reported kill			
Unit	Regulatory year	M	F	Unk	Total	M	F	Unk	Total	M	% M	F	Unk	Total	M	F	Unk	Total	M	F	Unk	Total
6A	2018	11	3	0	14	5	0	0	5	16	84	3	0	19	2	0	0	2	18	3	0	21
	2019	0	0	0	0	2	0	0	2	2	100	0	0	2	0	0	0	0	2	0	0	2
	2020	0	0	0	0	12	0	0	12	12	100	0	0	12	1	0	0	1	13	0	0	13
	2021	0	0	0	0	14	0	0	14	14	100	0	0	14	0	0	0	0	14	0	0	14
	2022	2	0	0	2	4	0	0	4	6	100	0	0	6	0	0	0	0	6	0	0	6
6B	2018	1	0	0	1	1	1	0	2	2	67	1	0	3	0	0	0	0	2	1	0	3
	2019	0	0	0	0	2	0	0	2	2	100	0	0	2	0	0	0	0	2	0	0	2
	2020	0	1	0	1	4	0	0	4	4	80	1	0	5	0	0	0	0	4	1	0	5
	2021	1	0	0	1	0	1	0	1	1	50	1	0	2	0	0	0	0	1	1	0	2
	2022	0	0	0	0	3	1	0	4	3	75	1	0	4	0	0	0	0	3	1	0	4
6C	2018	11	3	0	14	10	8	0	18	21	66	11	0	32	9	7	2	18	30	18	2	50
	2019	3	0	0	3	11	3	0	14	14	82	3	0	17	1	0	2	3	15	3	2	20
	2020	2	0	0	2	11	3	0	14	13	81	3	0	16	0	0	0	0	13	3	0	16
	2021	0	1	0	1	11	4	0	15	11	69	5	0	16	1	0	0	1	12	5	0	17
	2022	2	3	0	5	8	2	0	10	10	67	5	0	15	5	1	0	6	15	6	0	21
6D	2018	28	12	2	42	123	32	0	155	151	77	44	2	197	4	3	2	9	155	47	4	206
	2019	18	13	0	31	178	20	0	198	196	86	33	0	229	0	0	1	1	196	33	1	230
	2020	9	7	0	16	272	41	0	313	281	85	48	0	329	4	1	1	6	285	49	1	335
	2021	12	10	1	23	287	37	1	325	299	86	47	2	348	1	0	0	1	300	47	2	349
	2022	43	12	0	55	284	101	1	386	327	74	113	1	441	11	3	1	15	338	116	2	459
Total	2018	51	18	2	71	139	41	0	180	190	76	59	2	251	15	10	4	29	205	69	6	280
	2019	21	13	0	34	193	23	0	216	214	86	36	0	250	1	0	3	4	215	36	3	254
	2020	11	8	0	19	299	44	0	343	310	86	52	0	362	5	1	1	7	315	53	1	369
	2021	13	11	1	25	312	42	1	355	325	86	53	2	380	2	0	0	2	327	53	2	382
	2022	47	15	0	62	299	104	1	404	346	74	119	1	466	16	4	1	21	362	123	2	487

Note: M refers to male, F refers to female, and unk refers to unknown.

Unit 6D harvest has predominantly focused on males, even as the harvest increases. Since 2014, the harvest of females has remained below the 30% objective (Fig. 2). During this reporting period, the lowest take of females was 14–15% in RY19–RY21 (Table 1). The highest observed take of females was 26% in RY22.

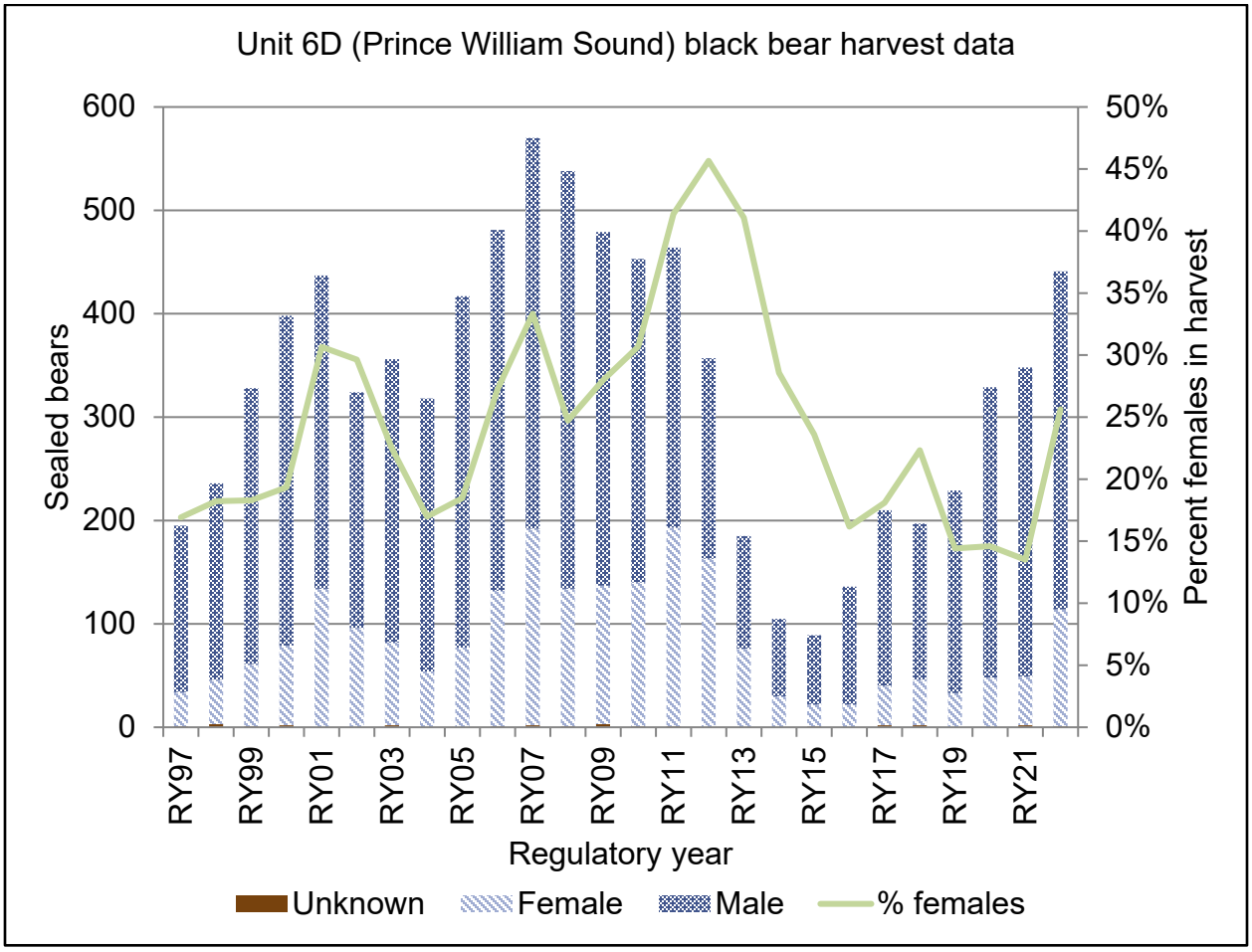

Figure 2. Harvest of black bears sealed from Unit 6D and percent of females in the harvest, Alaska, regulatory years 1997–2022.

Most bear harvest (80–95% since RY98) in Unit 6 came from the PWS (Unit 6D; Table 1). In all but 1 year (RY18) of this reporting period, Unit 6D made up >91% of the overall harvest in Unit 6. A few population zones, as defined in Modafferi (1978), show the most dramatic increase in harvest densities: Esther-Eaglek, Passage/Whittier, Knight Island, and PWS (Fig. 3, Fig. 4). Since RY16, these areas have once again shown the highest increases in harvest pressure. Harvest data related to population abundance must be interpreted cautiously because areas may receive harvest pressure that is disproportionate to resource availability. However, even before the effort for bears in the PWS increased, bears were considered more abundant in western PWS. Harvests during this reporting period have remained stable in all units except Unit 6D, where harvest has dramatically increased (Table 1). The harvest objective for Unit 6 was met in the last 3 years of this reporting period (RY20–RY22).

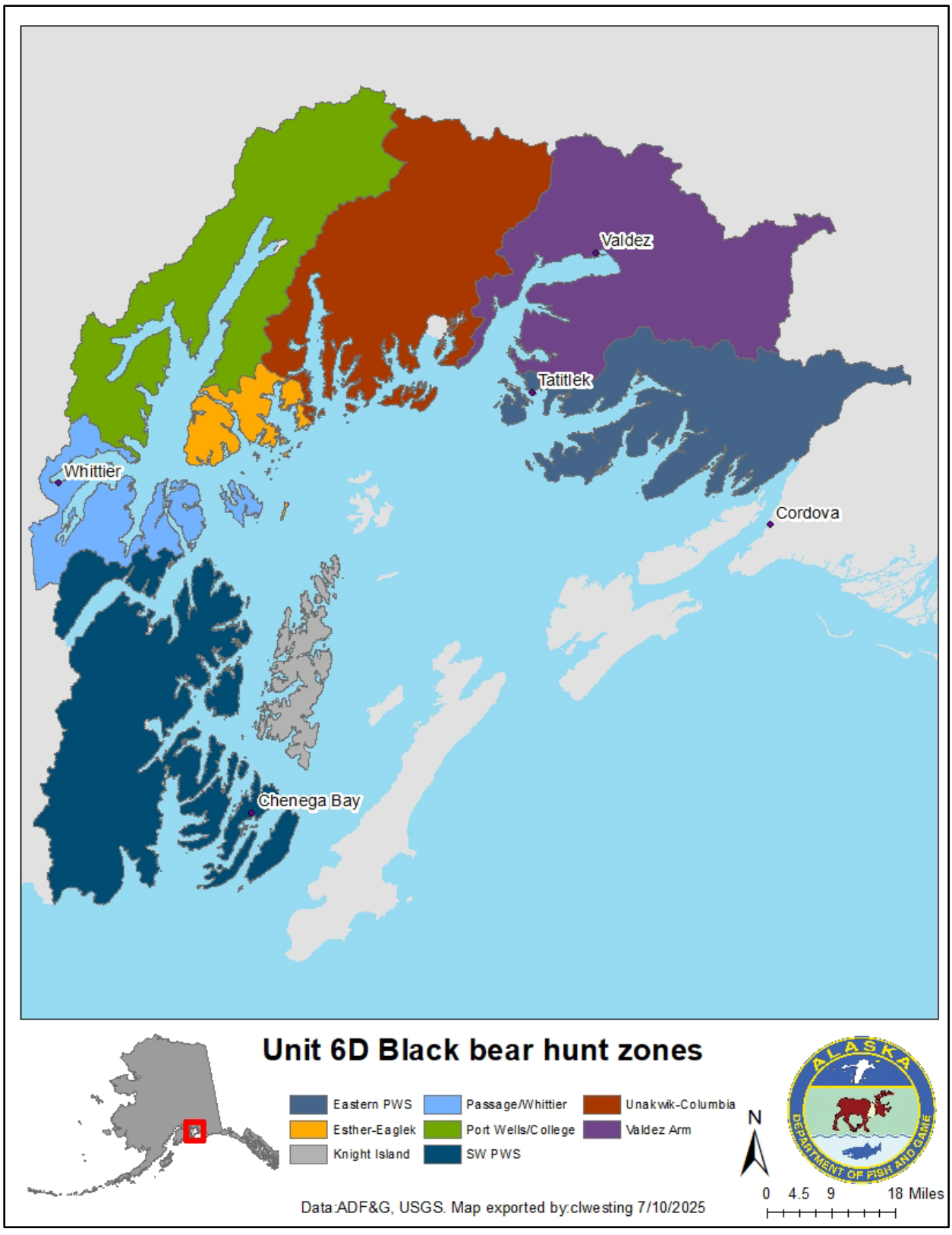

Figure 3. Map of black bear hunt zones, Unit 6D, Alaska, regulatory years 2018–2022. Hunt zone names match population zone names described by Modafferi (1978).

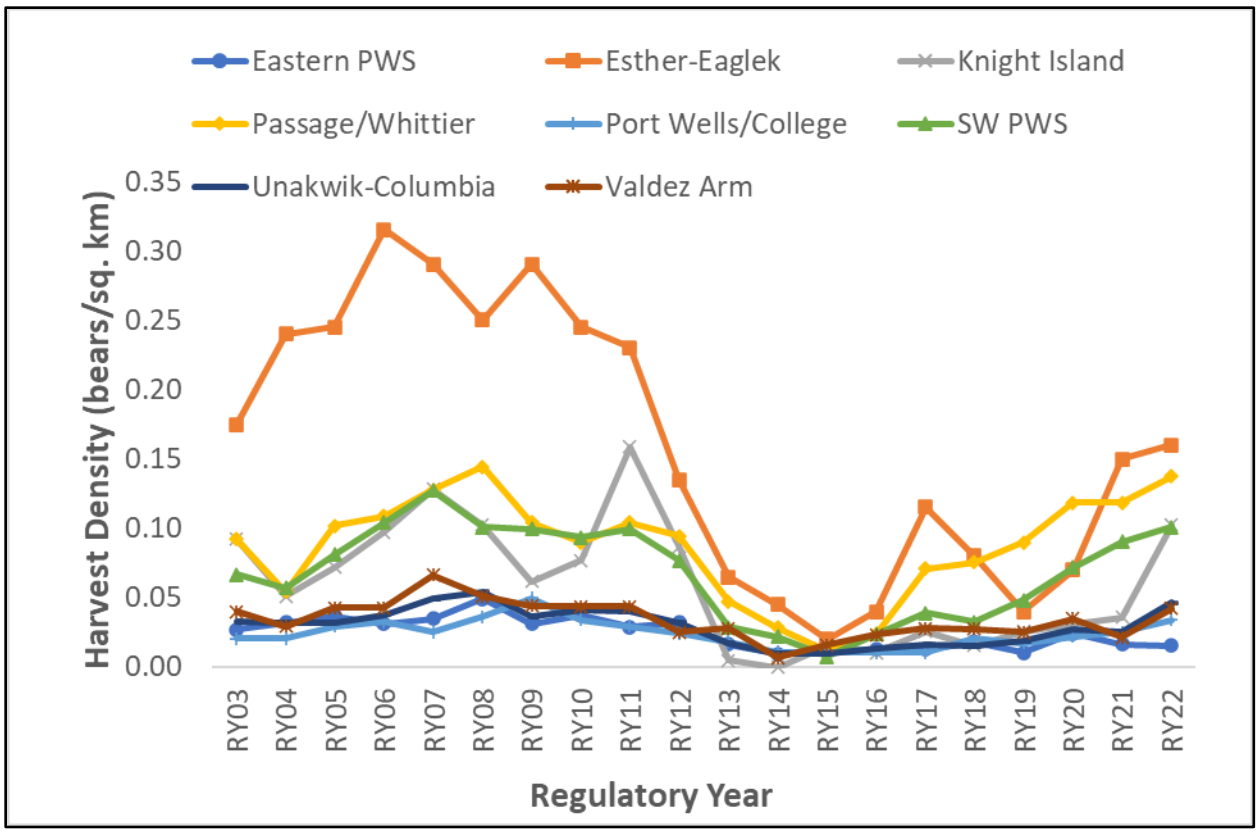

Figure 4. Harvest densities (sealed bears per square kilometer of estimated habitat) of black bears sealed from Unit 6D, Alaska, regulatory years 2003–2022. Hunt zone names match population zone names described by Modafferi (1978).

The mean skull size of all males harvested in Unit 6 varied from 16.73 to 17.51 inches during the reporting period. The largest male skulls came from Unit 6B (e.g., RY20 average = 18.36 inches), while the smallest were from Unit 6C (RY18 average = 15.91 inches). In all years of this reporting period, Units 6C or 6D had the lowest mean skull size compared to other units. During this reporting period, the minimum male skull size was below the objective in both Units 6C and 6D in RY18 and RY19. Because such a high proportion of the harvest occurs in Units 6C and 6D, the Unit 6 minimum male skull size was also below objectives during those years (Table 2).

During the reporting period, the average age of male bears in Unit 6D ranged from 5.15 years (RY19) to 6.64 years (RY21). The average age of females was also very low, ranging from 5.66 years (RY19) to 8.77 years (RY22). The average age for both males and females during the last 5 years of available age data (RY18–RY22) contains 3 of the lowest average ages for each sex since teeth collection began in 2004. It is unknown whether this drop in average age results from large age classes of bears or if it demonstrates that hunters are selecting less for large bears (Table 2).

Table 2. Black bear harvest mean skull size (length + width) for Unit 6 and mean age in years for Unit 6D, Alaska, regulatory years 2018–2022.

		Males				Females			
Unit	Regulatory year	Mean skull size (in)	*n*	Mean age	*n*	Mean skull size (in)	*n*	Mean age	*n*
6A	2018	17.30	18	–	–	15.90	3	–	–
	2019	17.91	2	–	–	–	0	–	–
	2020	17.85	13	–	–	–	0	–	–
	2021	18.56	13	–	–	–	0	–	–
	2022	17.44	6	–	–	–	0	–	–
6B	2018	17.66	2	–	–	15.81	0	–	–
	2019	18.19	2	–	–	–	0	–	–
	2020	18.36	4	–	–	15.75	1	–	–
	2021	18.69	1	–	–	16.13	1	–	–
	2022	17.90	3	–	–	14.44	1	–	–
6C	2018	15.91	24	–	–	15.03	16	–	–
	2019	16.93	15	–	–	15.25	3	–	–
	2020	16.70	13	–	–	15.46	3	–	–
	2021	17.09	12	–	–	15.67	4	–	–
	2022	17.25	14	–	–	16.00	4	–	–
6D	2018	16.78	152	5.97	145	15.72	48	8.43	40
	2019	16.81	192	5.15	173	15.40	33	5.66	29
	2020	17.22	279	5.71	260	15.74	47	8.43	47
	2021	17.48	288	6.61	235	15.27	44	6.41	39
	2022	17.03	326	6.31	328	15.71	111	8.77	110
Total	2018	16.73	196	–	–	15.57	68	–	–
	2019	16.85	211	–	–	15.39	36	–	–
	2020	17.24	309	–	–	15.72	51	–	–
	2021	17.51	314	–	–	15.32	49	–	–
	2022	17.06	349	–	–	15.71	116	–	–

Note: En dashes indicate no data available.

Permit Hunts

Harvest tickets have been required throughout Unit 6 since RY09. Additionally, in RY15, a registration permit hunt (RL065) began in Unit 6D. During this reporting period, effort in Unit 6D climbed steadily to its highest recorded value in RY22, with 1,088 hunters reported trying for a bear in Unit 6D (Table 3; Fig. 5). This is more than double the participation seen in RY16 when 528 hunters reported pursuing a bear. The low point in participation (RY15) may be partly attributed to increased awareness of population concerns and an emergency order closure that occurred that spring. The increase in hunters could indicate that the perception of the bear population status has changed. In RY15, based on harvest ticket reports and sealing data, success rates increased by 15% from their lowest point. Since RY20, success rates have been above 40%.

Table 3. Black bear harvest effort and success in Unit 6, Alaska, regulatory years 2013–2022.

Area	Regulatory year	Hunted	Killed	Percent success
Unit 6A	2013	20	5	25
	2014	19	7	37
	2015	18	5	28
	2016	15	12	80
	2017	6	4	67
	2018	22	19	86
	2019	10	2	20
	2020	16	12	75
	2021	20	14	70
	2022	20	6	30
Unit 6B	2013	8	3	38
	2014	15	4	27
	2015	3	2	67
	2016	9	3	33
	2017	11	2	18
	2018	11	3	27
	2019	4	2	50
	2020	8	5	63
	2021	6	2	33
	2022	8	4	50
Unit 6C	2013	74	31	42
	2014	39	8	21
	2015	46	11	24
	2016	52	20	38
	2017	48	15	31
	2018	70	32	46
	2019	46	17	37
	2020	35	16	46
	2021	47	16	34
	2022	42	15	36
Unit 6D	2013	830	185	22
	2014	585	105	18
	2015	608	89	15
	2016	528	136	26
	2017	594	210	35
	2018	611	197	32
	2019	668	229	34
	2020	738	329	45
	2021	855	348	41
	2022	1,088	441	41

Note: Harvest ticket data was used for hunted data in Units 6A, 6B, and 6C for all years. It was used for hunted data in Unit 6D for RY13–RY14, while RL065 permit data was used for all other years. Kill data in all units comes from sealing data.

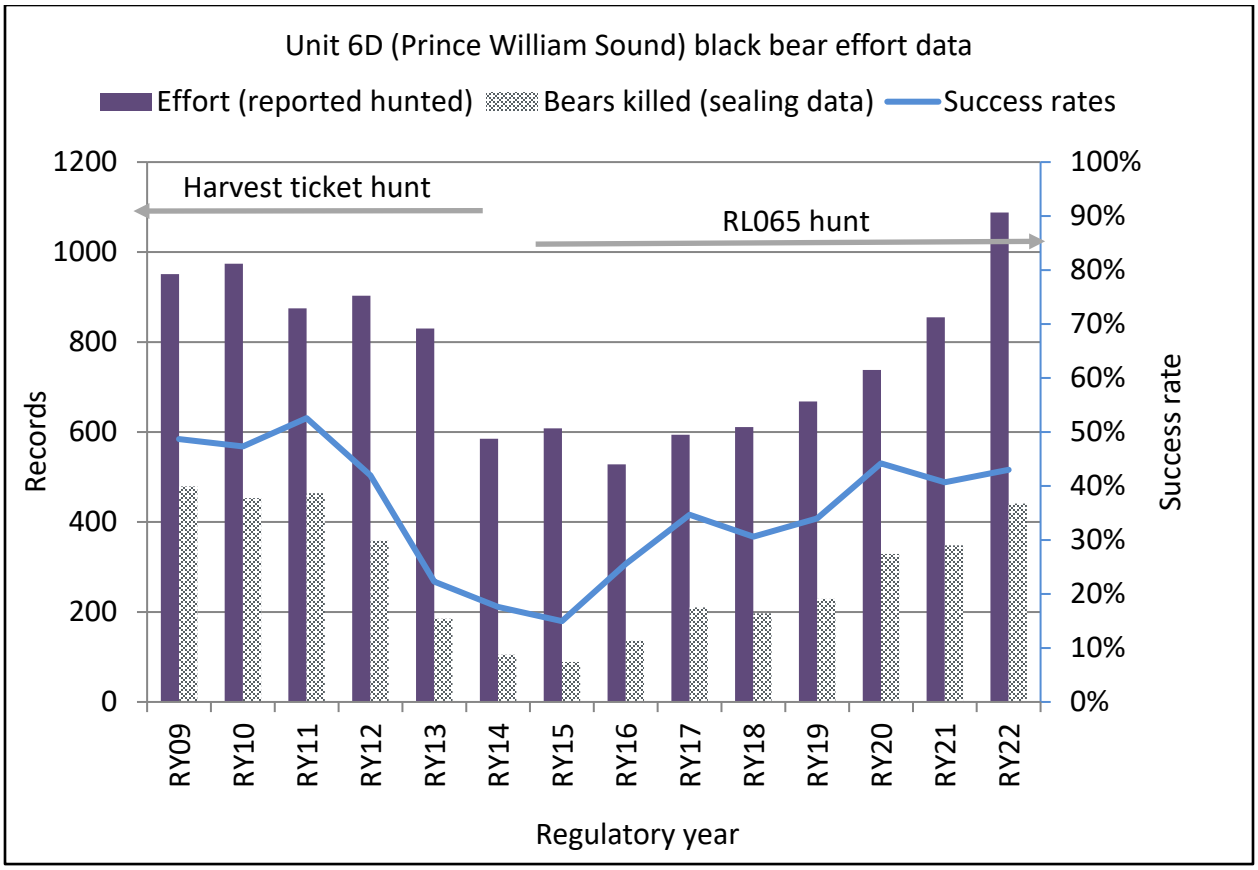

Figure 5. Black bear effort and success data from harvest tickets and RL065 hunt permits Unit 6D, Alaska, regulatory years 2009–2022.

The average number of days hunted by successful hunters in Unit 6D was between 3 and 4 days during RY99–RY08, which is 10 years before the harvest ticket requirement. From RY09 to RY17, the number of days hunted by all hunters was similar (3.35 days). In this reporting period (RY18–RY22), the average number of days hunted per unsuccessful hunter was 3.49, while the average number of days hunted per successful hunter was 3.04. The number of days hunted has slowly declined since RY15; however, it has only functionally changed from an average of 4 days to an average of 3 days when whole days are considered. Black bear baiting is a popular method of take in Unit 6C. The use of bait varies; for instance, 6% of hunters reported taking a bear over bait in RY18 and 53% in RY19. Some consider black bear baiting a technique that can lead to more selective harvest; in some regulatory years, the harvest of females was lower among baiters than nonbaiters,[2] while in other years, it was higher or the same. Baiters in Unit 6C took more females than nonbaiters in 2 of the 5 years of this reporting period.

Most bears in Unit 6D are taken using "spot and stalk" methods. The highest reported uses of bait during the reporting period were in RY18 and RY19, with 14% each year. The lowest reported use of bait during the same period was 5% in RY22. While residents of Unit 6 do not account for a large amount of harvest, they are the majority of the users who use a bait station in

[2] Nonbaiters used "spot and stalk" methods.

Unit 6D. This effort is largely focused on areas near Valdez that are accessible by road system. Baiters in Unit 6D took more females than nonbaiters in 3 of the 5 years of this reporting period.

Hunter Residency and Success

Nonresident hunters harvested most of the bears taken in Unit 6A during the reporting period (RY18–RY22). In Unit 6B, nonresident hunters accounted for most of the harvest; however, some years saw one or two participants who were either Unit 6 residents or nonlocal Alaska residents. In Unit 6C, ≥56% of the total black bear harvest was attributed to Unit 6 residents. Nonresidents and nonlocal Alaska residents were the second most predominant users in about half of the remaining years. In Unit 6D, nonlocal residents took an annual average of 65% of the bears harvested, ranging from 53% to 76% of the harvest during this reporting period. Nonresident hunters took an annual average of 28% of the bears in Unit 6D, ranging from 12% to 37% of the harvest during this reporting period (Table 4). These percentages are consistent with long-term trends since 1988.

Harvest Chronology

Most of the harvest in all areas of Unit 6 occurs in spring, specifically in May (Table 5). Considering all units (6A, 6B, 6C, and 6D) and all years of this reporting period (RY18–RY22), when $n > 10$, less than 25% of bears were taken in the fall in all years except RY18. Harvest in RY18 may have been abnormally high due to a natural food shortage. Anecdotal reports suggest that blueberries and salmonberries were both late and dramatically low in abundance. This situation may have led to bears being more available for harvest, either because of higher movement rates, larger home range sizes, or concentrations in areas of food subsidy (Baruch-Mordo et al. 2014, Laufenberg et al. 2018). Harvest of females is highest in the fall, and in some years and units, it exceeds 50%. Most fall harvest occurs in early September. Spring harvest in Unit 6D is always the highest in the second half of May (Table 5), most likely because of Memorial Day weekend. The period between the first half of May and the first half of June represents about 85% of the harvest for the regulatory year.

Transport Methods

During this reporting period, most successful hunters in Unit 6 used boats for transportation. Airplanes provided most of the transportation in Units 6A and 6B. Highway vehicles and 3- or 4-wheelers were most used in Unit 6C, where a road system exists. Many hunters accessed bears in Unit 6D using the Valdez area road system; however, boats were the primary mode of transportation used in this unit (Table 6).

Other Mortality

In RY18, 16 black bears were killed in DLP, the highest number ever recorded in Unit 6. That year, agency personnel killed an additional 9 bears and 4 more bears were killed in vehicle collisions. A standard amount of kill in any of these categories is 0–3 bears per year, which occurred during RY19–RY21. RY22 was another year with high "nonhunting" mortality (21 bears killed). During that year, 8 bears were killed in DLP, 3 were killed in vehicle collisions, and 10 were killed by agency personnel. This increased mortality may indicate natural food scarcity and bears relying on communities for food subsidies (Baruch-Mordo et al. 2014,

Table 4. Residency of successful black bear hunters in Unit 6, Alaska, regulatory years 2018–2022.

		Unit 6 resident		Nonlocal Alaska resident		Nonresident		
Unit	Regulatory year	Number	(%)	Number	(%)	Number	(%)	Total successful hunters[a]
6A	2018	0	(0)	2	(11)	17	(89)	19
	2019	0	(0)	2	(100)	0	(0)	2
	2020	0	(0)	0	(0)	12	(100)	12
	2021	0	(0)	0	(0)	14	(100)	14
	2022	0	(0)	4	(67)	2	(33)	6
6B	2018	1	(33)	1	(33)	1	(33)	3
	2019	1	(50)	0	(0)	1	(50)	2
	2020	0	(0)	2	(40)	3	(60)	5
	2021	0	(0)	0	(0)	2	(100)	2
	2022	0	(0)	0	(0)	4	(100)	4
6C	2018	18	(56)	5	(16)	9	(28)	32
	2019	12	(71)	2	(12)	3	(18)	17
	2020	9	(56)	5	(31)	2	(13)	16
	2021	10	(63)	4	(25)	2	(13)	16
	2022	10	(67)	1	(7)	3	(20)	15
6D	2018	9	(5)	135	(69)	51	(26)	197
	2019	29	(13)	173	(76)	27	(12)	229
	2020	32	(10)	175	(53)	122	(37)	329
	2021	11	(3)	219	(63)	118	(34)	348
	2022	18	(4)	281	(64)	141	(32)	441
Total	2018	28	(11)	143	(57)	78	(31)	251
	2019	42	(17)	177	(71)	31	(12)	250
	2020	41	(11)	184	(51)	139	(38)	364
	2021	21	(6)	223	(59)	136	(36)	380
	2022	28	(6)	286	(61)	150	(32)	466

[a] Total includes hunters with unknown residency and unit.

Table 5. Chronology of black bear harvest by percent, Unit 6, Alaska, regulatory years 2018–2022.

		Harvest periods[a]											
		Aug %	Sep %		Oct %		Apr %		May %		Jun %		
Unit	Regulatory year	16–31	1–15	16–30	1–15	16–31	1–15	16–30	1–15	16–31	1–15	16–30	*n*
6A	2018	11	26	21	5	5	0	5	11	5	5	0	19
	2019	0	0	0	0	0	0	0	100	0	0	0	2
	2020	0	0	0	0	0	0	0	8	58	33	0	12
	2021	0	0	0	0	0	0	0	29	36	36	0	14
	2022	17	0	0	17	0	0	0	0	50	17	0	6
6B	2018	0	0	33	0	0	0	0	33	33	0	0	3
	2019	0	0	0	0	0	0	0	0	50	50	0	2
	2020	0	0	20	0	0	0	0	40	40	0	0	5
	2021	50	0	0	0	0	0	0	50	0	0	0	2
	2022	0	0	0	0	0	0	0	25	75	0	0	4
6C	2018	0	16	3	23	0	0	0	23	29	3	3	31
	2019	0	0	12	6	0	0	0	29	35	18	0	17
	2020	0	0	13	0	0	0	0	50	19	13	6	16
	2021	0	0	6	0	0	0	0	25	38	31	0	16
	2022	0	13	7	13	0	0	0	7	53	7	0	15
6D	2018	0	8	8	6	0	0	2	11	44	22	0	197
	2019	0	5	5	3	0	0	1	25	38	22	0	229
	2020	0	2	2	1	0	0	0	22	52	21	0	329
	2021	0	1	3	2	1	0	1	20	55	17	0	348
	2022	0	6	5	1	0	0	1	16	45	25	0	441
Total	2018	1	10	8	8	0	0	2	12	39	18	0	250
	2019	0	5	5	4	0	0	1	26	38	22	0	250
	2020	0	1	2	1	0	0	0	23	51	21	0	362
	2021	0	1	3	2	1	0	1	21	53	18	0	380
	2022	0	6	5	2	0	0	1	16	46	24	0	466

[a] Includes nonhunting mortality and harvest from closed months. Fewer than 2 bears are taken in any year in months not included in the table. Percentages may not total to 100% due to rounding or because a bear was taken in a month not represented in the table.

Table 6. Transport method used to harvest black bear by percent, Unit 6, Alaska, regulatory years 2018–2022.

		Percent of harvest							
Unit	Regulatory year	Airplane	Horse	Boat	3- or 4-wheeler[a]	Snow machine	Highway vehicle	Unknown[b]	*n*
6A	2018	84	0	0	11	0	0	5	19
	2019	100	0	0	0	0	0	0	2
	2020	100	0	0	0	0	0	0	12
	2021	64	0	0	36	0	0	0	14
	2022	50	0	17	33	0	0	0	6
6B	2018	0	0	0	33	0	67	0	3
	2019	50	0	0	0	0	0	50	2
	2020	80	0	20	0	0	0	0	5
	2021	100	0	0	0	0	0	0	2
	2022	25	0	50	25	0	0	0	4
6C	2018	0	0	19	19	0	53	9	32
	2019	0	0	18	30	0	47	6	17
	2020	0	0	6	25	0	63	6	16
	2021	0	0	6	38	0	50	6	16
	2022	0	0	13	33	0	33	20	15
6D	2018	3	0	87	4	0	6	1	194
	2019	1	0	86	6	0	5	1	228
	2020	1	0	91	4	0	4	0	326
	2021	1	0	96	0	0	2	0	348
	2022	1	0	91	3	0	4	0	441
Total	2018	8	0	70	7	0	13	2	248
	2019	2	0	80	8	0	8	2	249
	2020	6	0	83	5	0	6	1	359
	2021	4	0	88	3	0	4	1	380
	2022	2	0	88	4	0	5	1	466

[a] Includes other off-road vehicles.
[b] Includes uncategorized transportation and "foot."

Laufenberg et al. 2018). Most of these bears were taken in proximity to communities (e.g., Cordova, Whittier, and Valdez). Wounding loss is unknown and could be high for bears relative to other species.

Alaska Board of Game Actions and Emergency Orders

No regulatory changes or emergency order closures occurred during RY18–RY22.

Recommendations for Activity 2.1

Continue to monitor harvest data and mortality data as time and budget allow.

ACTIVITY 2.2. Assess the prevalence of captured bears in the harvest.

Data Needs

Improving our understanding of both natural and human-caused mortality can help set appropriate harvest levels.

Methods

Black bears were captured between June 2016 and July 2018 as part of a habitat usage study conducted cooperatively by ADF&G and the U.S. Forest Service (USFS). Black bears were captured on Esther Island during 2016, on Knight Island during 2017, and on both islands during 2018. Bears were captured using M-15 bucket snare sets and Aldrich sets baited in the 2 weeks prior to trapping efforts. During this study, 96 unique bears were handled and 53 bears received a radio collar.

Marked bears were assumed to be alive unless harvested. In one case, a radio collar went unaccounted for 2 days after the season opened, leading us to assume it was dead. Harvested marked bears were identified by lip tattoos, ear tags, the presence of a radio collar, or any combination of these identifiers. In all cases, the hunter claimed they could not identify the bear as a marked animal before killing it.

We did not document any bears leaving the Knight Island complex; therefore, only bears harvested on Knight Island were considered to have the potential to be marked bears. No bears captured on Esther Island left the island during hunting season. However, a male that was given ear tags as a subadult was harvested in Eaglek Bay. We consider the Esther and Eaglek areas to potentially contain marked bears.

Results and Discussion

Harvest of marked bears was highly variable. When considering sex, island, and year, there were often no marked bears taken; however, in 3 years between RY16 and RY22, ≥20% of the marked males on Esther Island were harvested (Table 7).

Marked bears made up a high proportion of the overall harvest in some years. While there were some years with zero marked bears taken, in RY17 and RY19, 60% of the harvest on Knight Island consisted of marked bears (Table 8). Estimating the population using these measures is

Table 7. Availability and harvest of marked black bears in Unit 6D, Alaska, regulatory years 2016–2022.

	Esther Island						Knight Island					
	Females			Males			Females			Males		
Regulatory year	Available	Harvested	% harvested	Available	Harvested	% harvested	Available	Harvested	% harvested	Available	Harvested	% harvested
2016	15	0	0%	10	2	20%	–	–	–	–	–	–
2017	15	1	7%	7	2	29%	15	1	7%	16	2	13%
2018	23	0	0%	16	0	0%	19	0	0%	24	0	0%
2019	23	0	0%	15	0	0%	19	0	0%	24	3	13%
2020	23	0	0%	15	1	7%	19	0	0%	21	1	5%
2021	23	0	0%	13	3	23%	19	0	0%	20	1	5%
2022	23	0	0%	13	3	23%	19	0	0%	18	2	11%

Note: En dashes indicate no data available.

Table 8. Percent of harvest composed of marked black bears in Unit 6D, Alaska, regulatory years 2016–2022.

	Area	
Regulatory year	Esther-Eaglek	Knight Island
2016	25%	0%
2017	13%	60%
2018	0%	0%
2019	0%	60%
2020	7%	17%
2021	3%	29%
2022	9%	10%

impossible due to the cessation of captures and the inability to determine if bears truly remain in the population as they age. Nevertheless, it is valuable to consider the harvest metric.

Recommendations for Activity 2.2.

Continue to monitor harvest data for marked bears.

3. Habitat Assessment-Enhancement

No habitat assessment or enhancement activities occurred for black bears in Unit 6 during RY18–RY22.

NONREGULATORY MANAGEMENT PROBLEMS OR NEEDS

Efforts continue to educate the public about the importance of securing attractants from bears in urban settings 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 was stored on an internal database housed on the server, WinfoNet (Wildlife Information Network).
- Research datasheets are entered, scanned, and stored on the Cordova ADF&G server (O:\DWC\Black bear).
- Original datasheets are stored in file folders located in the Cordova area biologist's office.
- Historical survey notes and data sheets are digitized and scanned for permanent storage on the file server.

Agreements

ADF&G and the USFS Chugach National Forest have a cooperative agreement that allows for financial support and the sharing of harvest and research data from the Prince William Sound Cooperative Black Bear Study.

Permitting

None.

Conclusions and Management Recommendations

Black bear populations and harvests in Unit 6, except for in Unit 6D, were lower during RY18–RY22 compared to prior years, but they are probably at acceptable levels. The overall harvest stayed within the objective range (350–400 bears) during the last 3 years of the reporting period. The objective of a minimum average male skull size of >17 inches was met in Units 6A and 6B each year of the reporting period. This male skull size objective was met for 3 years of the

reporting period in Unit 6C and 2 years of the reporting period in Unit 6D. The objective of a harvest composed of less than 30% females was met unitwide and in Units 6A and 6D in all years of the reporting period; it was met in 2 years of the reporting period in Unit 6B and 3 years of the reporting period in Unit 6C. Wildlife viewing opportunities were likely very good across the entire unit. No changes or management actions are recommended for Units 6A, 6B, and 6C.

In 2015, registration hunt RL065 was implemented. Setting an appropriate harvest level with minimal population data is difficult. Initially, an MAH of 200 bears was set. This number was chosen as a recovery measure and is based on the harvest rate before the opening of the Anton Anderson Memorial Tunnel. However, since the implementation of RL065, the MAH has gradually risen to 400 bears as harvest increased. Success rates and the percentage of females taken have improved and are interpreted as signs of improved population status. As these measures continue to improve, an increased MAH will be implemented.

Population estimation techniques that use genetics to estimate the population and harvest rates are being developed. Teeth from harvested bears will continue to be collected to determine age structure of the harvest. Additionally, genetic samples have been collected and archived and are being taken from newly sealed bears.

II. Project Review and RY23–RY27 Plan

Review of Management Direction

Management Direction

An MAH has been set in the absence of population estimates, using previous harvest levels and corresponding percent take of females as a guideline, along with success rates as an indicator of population level. While directly estimating the population and developing appropriate harvest rates would be preferable to this technique, it is currently not funded. The MAH will be set based on harvest, sex composition of the harvest, and success rates.

Goals

No change from RY18–RY22.

Codified Objectives

Amounts Reasonably Necessary for Subsistence Uses

No change from RY18–RY22.

Intensive Management

No change from RY18–RY22.

MANAGEMENT OBJECTIVES

The management objective for Unit 6D black bears is to sustain a 3-year average annual harvest of 350–400 bears, composed of less than 30% females and with a minimum male average skull size of 17 inches. Nonconsumptive users should have a reasonable chance of seeing bears while wildlife viewing.

REVIEW OF MANAGEMENT ACTIVITIES

1. Population Status and Trend

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

Data Needs

A demographic study, a population estimate, or a density estimate is essential in providing meaningful data to better understand population size and habitat use; however, no future captures or further studies are currently planned due to budget and staffing limitations. In the meantime, continued collection of anecdotal reports from the public and incidental observations can spark further investigation and lead to regulatory proposals that may impact management. It is important to document user reports and compile all data to document user perceptions.

Methods

No change from methods in the RY18–RY22 report.

2. Mortality-Harvest Monitoring

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

Data Needs

A demographic study, population estimate, or density estimate is essential for providing meaningful data to determine appropriate levels of harvest.

Methods

No change from methods in the RY18–RY22 report.

ACTIVITY 2.2. Assess the prevalence of captured bears in the harvest.

Data Needs

A demographic study, population estimate, or density estimate is essential for providing meaningful data to determine appropriate levels of harvest; however, no future captures or further studies are currently planned due to budget and staffing limitations.

Methods

No change from methods in the RY18–RY22 report.

3. Habitat Assessment-Enhancement

No activities for black bear habitat assessment or enhancement are planned in Unit 6 during RY23–RY27.

NONREGULATORY MANAGEMENT PROBLEMS OR NEEDS

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

Data Recording and Archiving

No change from RY18–RY22.

Agreements

No change from RY18–RY22.

Permitting

None.

Acknowledgments

Funding for the Prince William Sound Cooperative Black Bear Study primarily comes from the USFS Chugach National Forest Subsistence Program.

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