

Deer Management Report and Plan, Game Management Unit 1C:

Report Period 1 July 2016–30 June 2021, and
Plan Period 1 July 2021–30 June 2026

Roy Churchwell



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Plan Period 1 July 2021–30 June 2026

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Species management reports and plans provide information about species that are hunted or trapped and management actions, goals, recommendations for those species, and plans for data collection. Detailed information is prepared for each species every 5 years by the area management biologist for game management units in their areas, who also develops a plan for data collection and species management for the next 5 years. This type of report is not produced for species that are not managed for hunting or trapping or for areas where there is no current or anticipated activity. Unit reports are reviewed and approved for publication by regional management coordinators and are available to the public via the Alaska Department of Fish and Game's public website.

This species management report and plan was reviewed and approved for publication by Richard Nelson, Management Coordinator for Region I for the Division of Wildlife Conservation.

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Cover Photo: ©2020 ADF&G. A Sitka black-tailed deer doe passing a trail camera in coastal grasses in the spring in Southeast Alaska.

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Purpose of this Report

This report provides a record of survey and inventory management activities for deer (*Odocoileus hemionus sitkensis*) in Game Management Unit 1C for the 5 regulatory years 2016–2020 and plans for survey and inventory management activities in the next 5 regulatory years, 2021–2025. A regulatory year (RY) begins 1 July and ends 30 June (e.g., RY16 = 1 July 2016–30 June 2017). 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 deer management report of survey and inventory activities that was previously produced every 2 years.

I. RY16–RY20 Management Report

Management Area

Unit 1C includes the mainland from Cape Fanshaw north to the latitude of Eldred Rock on both the east and west side of the Lynn Canal and out to the Pacific Ocean at Cape Fairweather (Fig. 1). Several islands are included in the unit, the largest being Douglas, Shelter, Lincoln, and Sullivan islands. Other landmarks include Port Houghton, Hobart Bay, Endicott Arm, Tracy Arm, Snettisham, Taku River, Berners Bay, most of the Chilkat Range, and most of Glacier Bay National Park & Preserve. The largest community is Juneau, with a population of 32,000 people (U.S. Census Bureau 2020). Included in that 32,000 are the areas of Douglas (pop. 5,500) and Auke Bay (pop. 5,200; Alaska DCCED [n.d.]). Another Unit 1C community is Gustavus (pop. 700; U.S. Census Bureau 2020).

Unit 1C is over 13,000 mi² and 200 miles from north to south. The economy of the region is based on tourism, fishing, and mining. Most of the residents in this unit are not subsistence qualified as Juneau is in a nonsubsistence area (5 AAC 99.015(a)(2)). Most of the unit is managed by the Tongass National Forest, including the Endicott River Wilderness (98,700 acres) and Tracy Arm-Fords Terror Wilderness (653,200 acres) that were designated as a provision of the Alaska National Interest Lands Conservation Act (ANILCA) legislation in 1980 (USDA [n.d.]). The other large land management unit is Glacier Bay National Park & Preserve, which was established in 1925 (USDOI 2020). Most of its 3.3 million acres are in Unit 1C.

Much of the Unit 1C mainland is comprised of glaciers, but between the icefields and the coast are upland alpine areas, alder (*Alnus* spp.), covered slopes, and coniferous rainforest. Sitka black-tailed deer (*Odocoileus hemionus sitkensis*) habitat in the unit consists primarily of productive uneven-aged old-growth forest. Sitka spruce (*Picea sitchensis*) and western hemlock (*Tsuga heterophylla*) are the dominant overstory species. Yellow cedar (*Callitropis nootkatensis*) occurs in wetter habitats and the primary deciduous species in the area, red alder (*Alnus rubra*), dominates early successional phases. Important understory plants include salmonberry (*Rubus spectabilis*), devil’s club (*Oplopanax horridus*), huckleberry (*Vaccinium* spp.), blueberry (*Vaccinium* spp.), and skunk cabbage (*Lysichiton americanus*). Average daily high temperatures

for the region are 30°F in January and 57°F in August (NOAA 2018a). Annual rainfall ranges from 28 to 85 inches (NOAA 2018b). The average annual snowfall is 95 inches and it falls mostly during November through March (NOAA 2018b; Fig. 2).

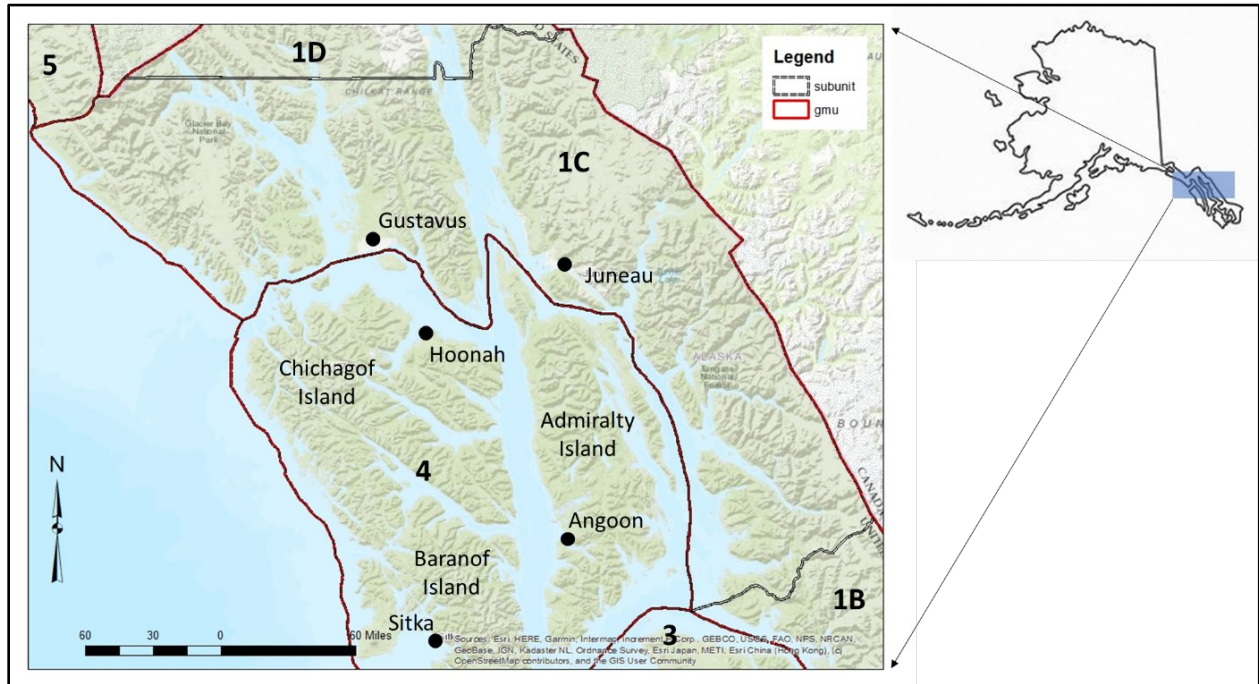


Figure 1. Map of Game Management Unit (GMU) 1C, Southeast Alaska.

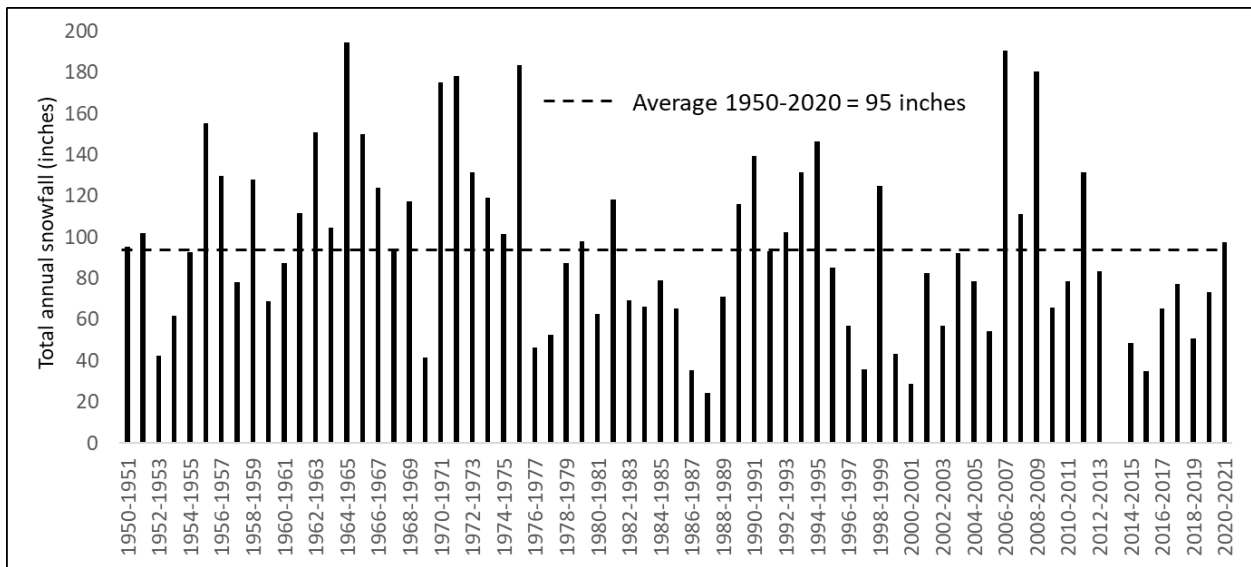


Figure 2. Annual winter snowfall measured at the Juneau International Airport, Alaska, 1950–2020 (NOAA 2022).

Summary of Status, Trend, Management Activities, and History of Deer in Unit 1C

Sitka black-tailed deer are indigenous to the mainland and islands of the Alexander Archipelago, south from Lynn Canal and Icy Straights, and have inhabited northern Southeast Alaska since their migration from southern refugia following the Pleistocene epoch (Klein 1965). A few successful transplants extended the Southeast Alaska deer range to Yakutat and Upper Lynn Canal (Sullivan Island) in 1951 and 1952 with varying success (Burriss and McKnight 1973). Deep snow keeps the number of deer on the mainland lower than on adjacent islands.

A 1963 population estimate suggested about 200,000 deer inhabited Southeast Alaska (Merriam 1963). The regionwide 1962 harvest was estimated at 10,500 deer. Severe winters in 1969 and 1971 resulted in high overwinter mortality and reduced deer numbers across the region (Olson 1979). ADF&G began hunter surveys in 1970 and continued annually through 2010. Those surveys evolved from telephone contacts of a few hunters to a mail-out survey of a random list of hunters beginning in 1980. In 2011, the department switched from a mail-out survey to a harvest ticket report that all hunters are required to turn in. Pellet-group counts (Kirchhoff and Pitcher 1988) began in Unit 1C in 1984 and have been conducted on Douglas, Lincoln, and Shelter islands on a nearly annual basis, but rarely on mainland locations.

Winter severity, primarily deep and persistent snow, appears to limit deer populations in Unit 1C. Deer densities were relatively high throughout the early to mid-1990s but declined substantially following the severe winter of 1998–1999. With very mild winters from 2000 through 2005, deer populations across the region rebounded again to high densities. However, the winters of 2006–2007 and 2007–2008 were severe with record snowfalls recorded in Juneau (Fig. 2). Substantial snow accumulated during November 2006, driving deer to beaches where they were vulnerable to hunters; consequently, a substantial increase in harvest was reported in 2006. In addition, during March 2007, the Southeast panhandle received snow day after day throughout the month, and by early April, snow was at extreme levels throughout the area. The snowpack restricted deer movements and led to a substantial deer die off across the region, including in Unit 1C. The severity of the 2006–2007 winter and associated deer mortality spurred the department to implement a doe closure in both Units 1C and 4 during December 2007 to protect female deer from further harvest.

The highest deer densities in Unit 1C occur on the larger islands including Douglas, Lincoln, and Shelter, which also occasionally support wolves. Douglas Island is the only island in Unit 1C to have been documented to support substantial numbers of black bears; recently, wolf reports have increased. Wolves are also known to occur on the mainland but are rarely observed; however, they likely contribute to maintaining low densities of deer in these areas.

Logging has occurred historically in Unit 1C, including the extensively logged Homeshore and Couverden areas of the Tongass National Forest (1979–1992), on Goldbelt Inc. lands on the backside of Douglas Island, and in Hobart Bay (ADF&G 1991; Mackovjak 2010). Proposed road extensions on the North Douglas Highway will potentially affect the deer population and subsequently harvest by increasing hunter access, habitat loss, and the potential for motorized vehicle collisions.

Management Direction

EXISTING WILDLIFE MANAGEMENT PLANS

Region I developed a wildlife management plan in 1976 (ADF&G 1976) that included objectives and management strategies for deer populations throughout the region. That plan was never formally updated; however, a strategic plan for management of deer population objectives was developed to guide management through RY89 (ADF&G 1991).

Although the overall goals of the original plans are important, the management objectives and harvest management strategies have changed since the plan was written based on public comment, staff recommendations, and Alaska Board of Game actions. These periodic changes in management planning have been reported in the division's previous species management reports and plans. The plan portion of this report contains the current management plan for deer in Unit 1C.

GOALS

- Maintain a sustainable deer harvest.
- Provide an opportunity for nonconsumptive use (viewing and photography) of deer.
- Promote forest management practices that enhance deer habitat in Unit 1C.

CODIFIED OBJECTIVES

Amounts Reasonably Necessary for Subsistence Uses

The Board of Game has made a positive finding for customary and traditional use of deer in Unit 1C outside the Juneau Nonsubsistence Area and set 30–40 deer as the amount necessary for subsistence (5AAC 99.025(a)(5)). This amount necessary for subsistence has been consistently achieved.

Intensive Management

The Unit 1C management goal is to manage the deer population to achieve and maintain a population of 6,200 deer while supporting an annual harvest of 456 deer, according to the Alaska Board of Game at its fall 2000 meeting AS 16.05.255(i)(4)].

- Maintain population densities on Douglas, Lincoln, and Shelter islands at high levels as reflected by a mean pellet density of 2.0 pellet groups per plot.
- Monitor the deer harvest through general-season harvest ticket reports.
- Participate in annual deer-pellet surveys.

MANAGEMENT ACTIVITIES

1. Population Status and Trend

ACTIVITY 1.1. Traditional deer pellet-group surveys.

Data Needs

Formal population estimates are not available for Unit 1C deer. Population information is needed to determine if management objectives are being met. Deer-pellet surveys have been the primary method used by ADF&G to provide an index of general population trends.

Methods

Deer-pellet surveys were conducted annually along traditional straight-line transects (Kirchhoff and Pitcher 1988) from the Douglas Island road system and at Inner Point on the southwest side of Douglas Island. Additional surveys were conducted in alternating years between Shelter and Sullivan islands. Transects surveyed were previously established mostly in old-growth forest because of its importance as winter habitat for deer (Schoen and Kirchhoff 1990).

Results and Discussion

Deer-pellet surveys and harvest data are the only mechanisms currently used to monitor general trends in the Unit 1C deer population. Pellet densities on North Douglas Island averaged 0.86 groups per plot (range 0.77–1.19) during this report period (RY16–RY20; Table 1). Pellet surveys were not conducted at Inner Point in RY20 due to COVID precautions; however, surveys were completed for all other years of the report period. Management objectives of 2.0 groups per plot were not met for Douglas Island during this report period and averaged 1.04 groups per plot (range 0.85–1.16). Pellet densities on Douglas Island in general have been low during the report period, indicating that the deer population has likely been low throughout this period. This is likely due to heavy hunting pressure on the island in combination with increased predation due to wolves and possibly loss of winter habitat.

Counts were conducted on Shelter Island in RY17 and Sullivan Island in RY16 and RY18. The last surveys on these 2 islands indicated that the deer populations were doing well with >2.0 pellet-groups per plot. Other island and mainland transects were not counted during this reporting period.

Recommendations for Activity 1.1

Pellet-group transects are the most common method used to monitor deer population trends in specific watersheds throughout the unit and region. They are intended to document large changes (>30%) in deer density. The data also permit general comparisons of deer abundance among areas and years (McCoy 2017). Because winter severity can influence the results of pellet-group surveys, inferences about population trends based on year-to-year variations in observed pellet-group densities must be made with caution (Lowell 2013). Some managers have expressed that deer pellet-group surveys provide little useful management information about deer numbers or distribution. In the upcoming planning period, other methods of monitoring deer populations will be explored and pellet-count surveys will be discontinued.

Table 1. Deer pellet-group surveys, regulatory years 1986–2020, Unit 1C, Southeast Alaska.

Area	VCU ^a	Regulatory year	Groups per plot	Number of plots	95% CI ^b
Kensington	20	1993	0.00	180	–
Portland Island	27	1986	0.99	381	0.87–1.12
North Douglas	35	2011	1.21	253	1.02–1.39
		2012	1.56	306	1.38–1.75
		2013	0.83	242	0.69–0.97
		2014	1.04	323	0.83–1.25
		2015	0.77	328	0.64–0.90
		2016	0.77	328	0.64–0.90
		2017	0.98	318	0.84–1.13
		2018	0.82	257	0.64–1.01
		2019	1.19	196	0.95–1.43
		2020	0.57	265	0.41–0.74
Inner Point	36	2012	2.41	250	2.12–2.70
		2013	1.55	267	1.37–1.73
		2014	1.50	277	1.29–1.71
		2015	1.01	239	0.80–1.22
		2016	1.01	239	0.80–1.22
		2017	1.16	271	0.96–1.36
		2018	1.12	279	0.91–1.33
		2019	0.85	266	0.70–0.99
Rhine Creek	38	1996	0.31	108	0.14–0.47
Harbor Island	65	1986	1.76	262	1.53–2.00
Couverden	117	1992	0.35	350	0.27–0.44
Shelter Island	124	2006	1.10	321	0.97–1.41
		2007	1.05	321	0.90–1.21
		2008	0.71	250	0.57–0.84
		2009	1.27	325	1.10–1.44
		2010	1.86	333	1.66–2.07
		2012	2.14	294	1.89–2.39
		2017	2.75	352	2.45–3.04
Lincoln Island	124	1997	1.52	207	1.27–1.77
		2006	0.84	213	0.62–1.06
Sullivan Island	94	1989	1.39	250	1.17–1.62
		2011	1.47	206	1.24–1.70
		2015	1.08	310	0.91–1.26
		2016	1.08	310	0.91–1.26
		2018	2.09	271	1.79–2.39

Note: Pellet surveys were only conducted in the years that are listed. En dash indicates not applicable.

^a Value comparison units (VCUs) are U.S. Forest Service timber management units and are roughly equivalent to a watershed.

^b Confidence interval.

ACTIVITY 1.2. Aerial alpine deer surveys.

Data Needs

A reliable and cost-effective technique for assessing changes in deer abundance over both the short and long term is needed to aid deer harvest management, timber management, and wolf management programs in Southeast Alaska. Existing deer monitoring programs (harvest analyses and pellet-group surveys), and experimental monitoring programs (e.g., DNA mark–recapture deer pellet analysis) have major shortcomings that limit their usefulness for management, planning, and research.

Methods

The purpose of aerial alpine deer surveys is to determine if they can provide a better index to deer abundance than traditional pellet-group surveys in Unit 1C. We will use methods developed by R. Lowell (ADF&G) and P. Valkenburg (ADF&G, retired) in the Petersburg Area office as a framework to develop and implement appropriate survey methods in and around Juneau.

Routes focused on alpine areas on Douglas Island. Survey flights were conducted in a Super Cub or similar aircraft from 22 July through 14 August (however before 1 August on Douglas Island due to alpine deer hunters) and were consistent in length, ending at sunset. Evening surveys are preferred to morning surveys because evening surveys consistently resulted in more deer seen per survey hour and evening weather tended to be more predictable than morning weather, particularly because of early morning fog. Pilots and observers counted as many deer as possible while thoroughly covering established alpine survey areas. Unless deer abundance was high or very high, or deer were in difficult terrain, we attempted to classify 4 categories of deer seen: large buck, small buck, doe, and fawn. Replicate surveys with a goal of 4 surveys per survey area were conducted to account for variability in the number of deer observed during individual survey flights and to allow the department to eventually characterize the cause of variation in number of deer seen per survey hour. Ferry time, including travel time between mountain blocks within a survey area >2 minutes in duration will be deducted from survey time, so that only time spent actually searching for deer was included in the survey times. Deer per survey hour was previously selected as the standard metric for deer abundance.

Results and Discussion

One alpine survey was conducted in the fall of 2018, resulting in a high count of ~40 deer per hour of flight time. Although this method could be useful to get an idea of deer numbers on an island, it has been determined that it is not the best method currently available. Fish and Game biologists conducted one survey and do not plan to conduct regular surveys in the future.

Recommendations for Activity 1.2

Discontinue, to concentrate on other methods.

2. Mortality-Harvest Monitoring and Regulations

ACTIVITY 2.1. Analyze deer harvest data from mandatory deer hunt reports.

Data Needs

Hunt report data are required to determine if harvest objectives are being met. They provide information about the number of participants in the hunt, hunter effort and success, location of hunt and harvest, and modes of transport. Information collected about harvest trends can be indicative of population fluctuations.

Methods

Hunters in Unit 1C are required to obtain a general-season harvest ticket before entering the field. Each harvest ticket requires the hunter's demographic information and hunting license number. Harvest tickets also include a series of punch tickets that hunters must validate upon successful harvest of a deer, and a mail-in hunt report card. Note that hunt reports can also be completed online at www.hunt.alaska.gov for each hunt trip, regardless of success.

Harvest data are summarized by regulatory year (RY), which begins 1 July and ends 30 June. Since 2011, deer harvest data have been derived from mandatory hunt reports issued in conjunction with deer harvest tickets, rather than using the previous method of polling a random sample of hunters from each community. All deer hunters are now expected to report their hunting activities. Nonetheless, not all hunters submit the required hunt report. Therefore, to obtain total harvest estimates, the reported harvest must still be multiplied by an expansion factor to account for nonrespondents.

Once hunt reports have been submitted, reported hunt and harvest locations are coded for data entry. Hunters often provide vague hunt or harvest locations in which case an attempt is made to contact them for more precise location data. A cutoff date of 15 June has been established for receipt of hunt reports. Any hunt reports not submitted online or received by 15 June are excluded from analysis. Once all hunt and harvest locations have been coded and data entry is complete, the results are analyzed and summaries of total harvest, hunter residency and success, harvest chronology, and transportation methods are derived for each unit.

Season and Bag Limit

Area of Unit 1C	Season	Resident and nonresident hunters
Lincoln, Shelter, and Sullivan islands	1 August–31 December	4 deer; antlerless deer may be taken only from 15 September–31 December
Douglas Island	1 August–31 December	4 deer; up to 1 doe may be taken only from 15 September–31 December
Remainder	1 August–31 December	2 antlered deer

Results and Discussion

Harvest by Hunters

The average annual harvest of Unit 1C deer for the report period (RY16–RY20) was 291 deer (67% bucks; Table 2), which is well below our management objective. This is fewer than the previous report period (RY11–RY15), which was 376 deer. However, buck harvest was slightly higher in RY16–RY20, with 64% bucks in the RY11–RY15 harvest. The majority of the RY16–RY20 Unit 1C deer harvest was from Douglas Island (72%) due to its proximity to Juneau, extensive road system, and higher densities of deer.

There is an established wolf pack on Douglas Island; the last minimum count of that pack was 7 wolves in RY20. Twelve wolves were harvested on Douglas Island during RY16–RY20. During RY16–RY18, there was a 3-wolf harvest cap for the island, but this was increased to 5 wolves at the January 2019 Board of Game meeting. Since the increase, only 1 wolf has been harvested, demonstrating how difficult wolf trapping can be.

Development on the island may also have impacts on the deer population. The City and Borough of Juneau has been moving forward with permitting development on the backside of Douglas Island for both residential housing and a golf course. An approximately 2.4-mile extension of the North Douglas Highway was completed in August 2017, which opened access to hunters, and subsequently deer habitat, that was previously difficult to access. These developments, along with other smaller developments around Douglas Island, are also likely to negatively impact the deer herd.

Deer harvest on Shelter Island and adjacent Lincoln Island averaged about 55 deer annually during RY16–RY20, which is slightly higher than the RY11–RY15 average annual harvest of 49 deer. These islands generally receive less hunting pressure than Douglas Island, but the previous management report (Sell 2020) suggested that harvest may increase as hunting success declines on Douglas Island, and this may have occurred.

The deer harvest for the Chilkat Peninsula and Sullivan Island averaged 12 deer annually taken during RY16–RY20 compared to 27 taken during RY11–RY15.

Other less-hunted areas, such as the mainland near Juneau, Holkam Bay, and Cape Fanshaw, represent a small percentage (5%) of the Unit 1C deer harvest. No data are available for the deer population in these mainland areas, but low harvest and a significant number of days afield required to harvest a mainland deer suggest low numbers.

Hunter Residency and Success

The overall success rate for Unit 1C deer hunters averaged 28% during the report period (RY16–RY20). As is generally the case, local residents of Unit 1C represented the largest group of both successful and unsuccessful hunters. During the report period, the overall success rate was 28% for local residents, 22% for nonlocal Alaska residents, and 26% for nonresidents (Table 3). The overall hunter success rate was the same (28%) during RY11–RY15 (Table 3).

Unitwide, hunters spent an average of 7.7 days hunting per deer in RY16–RY20, which is an improvement from the RY11–RY15 average of 8.1 days hunting per deer (Table 4). The average number of deer per hunter in RY16–RY20 was 0.4 deer, which was the same in RY11–RY15. Many of the RY16–RY20 winters were relatively mild, which probably contributed to the slight increase in hunters being able to find deer to harvest.

Table 2. Estimated annual deer harvest, regulatory years 2011–2020, Unit 1C, Southeast Alaska.

Regulatory year	Males	Females	Estimated total
2011	320	162	482
2012	257	113	370
2013	228	179	407
2014	176	103	279
2015	223	120	342
2016	234	94	328
2017	193	101	294
2018	155	75	230
2019	175	82	257
2020	212	134	346

Transport Methods

Similar to previous reporting periods, 58% of hunting trips in RY16–RY20 were conducted using highway vehicles for access; 25% used boats, 14% accessed hunting areas by walking, and approximately 1% used an airplane, all-terrain vehicle, or other mode of transportation (Table 5). Hunters most commonly used highway vehicles and foot access while hunting the east and north sides of Douglas Island as well as the mainland; boats were used for hunting on the west side of Douglas, plus on Shelter, Lincoln, and Sullivan islands. As previously noted, Douglas Island accounted for the majority of the Unit 1C deer harvest; many of the Douglas hunting areas are accessible by road.

Other Mortality

Winter mortality was minimal due to the mild winters during RY16–RY20. Numerous deer are killed by motor vehicle collisions annually on the Juneau and Douglas Island road systems. There has been an increase in wolf sightings around Douglas Island and the mainland of Juneau; however, the amount of predation by wolves during RY16–RY20 is unknown. Brown and black bears are also present in Unit 1C, but the extent of mortality on deer by these species has not been investigated. We have had several reports of papilloma on deer around Auke Lake in Juneau, although we do not have any recorded deaths from it. Illegal harvest of deer also likely occurs in Unit 1C; we do not know how prevalent it is, yet it is suspected to be low. We have no estimates of nonhunting mortality during RY16–RY20.

Table 3. Deer hunter residency and success, regulatory years 2011–2020, Unit 1C, Southeast Alaska.

Regulatory year	Successful						Unsuccessful						Total hunters
	Local ^a resident	Nonlocal resident	Nonresident	Unk	Total	%	Local ^a resident	Nonlocal resident	Nonresident	Unk	Total	%	
2011	283	28	2	1	314	37	472	44	27	3	546	63	860
2012	221	30	4	3	258	27	618	57	12	5	692	73	950
2013	245	25	2	2	274	28	621	63	31	7	722	72	996
2014	180	17	3	0	200	22	615	78	22	1	716	78	916
2015	206	20	9	1	236	30	499	52	9	2	562	70	798
2016	215	14	3	0	232	26	562	66	19	2	649	73	881
2017	185	23	3	0	211	25	530	71	14	0	615	74	826
2018	147	12	7	1	167	24	441	54	8	0	503	75	670
2019	163	17	8	0	188	28	432	32	17	0	481	71	669
2020	233	10	3	0	246	32	447	46	9	0	502	67	748

^a Resident of Unit 1C.**Table 4. Hunter effort and success, regulatory years 2011–2020, Unit 1C, Southeast Alaska.**

Regulatory year	Hunters	Days hunted	Deer killed	Deer/hunter	Days/deer
2011	860	2,977	482	0.6	6.2
2012	950	3,279	371	0.4	8.8
2013	996	3,399	409	0.4	8.3
2014	916	2,818	278	0.3	10.1
2015	798	2,394	342	0.4	7.0
2016	882	2,342	328	0.4	7.1
2017	825	2,337	294	0.4	8.0
2018	670	2,081	230	0.3	9.0
2019	668	1,863	257	0.4	7.3
2020	748	2,475	346	0.5	7.2

Table 5. Deer hunter days of effort by transport method, regulatory years 2011–2020, Unit 1C, Southeast Alaska.

Regulatory year	Airplane	Boat	All-terrain vehicle	Foot	Highway vehicle	Other	Unknown
2011	10	297	3	207	409	8	31
2012	7	230	2	259	481	1	42
2013	1	336	2	185	508	1	48
2014	6	280	0	101	539	1	43
2015	6	239	5	98	488	0	26
2016	7	244	3	129	554	0	26
2017	6	184	6	139	532	0	17
2018	7	177	1	115	436	0	4
2019	4	171	1	96	451	0	3
2020	1	245	4	119	450	0	16

Alaska Board of Game Actions and Emergency Orders

There were two proposals at the January 2019 Board of Game meeting pertaining to deer, both of which focused on Douglas Island. The first proposal was to decrease the harvest of does, so only 1 doe could be harvested by a person in a given year; this proposal was accepted and passed. The second proposal was to remove the Douglas Island Management Area, which limits the harvest of wolves to an annual harvest of 3 wolves on Douglas Island. This proposal was amended to retain the Douglas Island Management Area, and allow the harvest of 5 wolves. The proposal passed as amended. There were no emergency orders pertaining to deer during RY16–RY20.

Recommendations for Activity 2.1

Continue to monitor total harvest for comparison with management objectives.

3. Habitat Assessment-Enhancement

ACTIVITY 3.1. Use GIS to assess current deer habitat capability (DHC) in Unit 1C to better determine population estimates.

Data Needs

The current intensive-management population and harvest objectives for Unit 1C deer were established in 2000 based in part on the unit’s estimated DHC during the mid- to late-1990s. Given the significant amount of habitat alterations from development that have occurred in the unit since the intensive-management population and harvest objectives were established, these objectives should be reevaluated and possibly modified in response reductions in deer DHC.

Methods

A landscape analysis of current deer habitat capability should be conducted using GIS technology and the U.S. Forest Service's Forage Resource Evaluation System for Habitat (FRESH) deer model (Hanley et al. 2012).

Results and Discussion

Exploration and development of this activity did not occur during this analysis period.

Recommendations for Activity 3.1

We are currently deciding if we want to further invest in the FRESH model, and may not continue Activity 3.1 in the future.

ACTIVITY 3.2. Assess deer habitat during deer-pellet surveys.

Data Needs

Winter habitat in the form of low elevation, high-volume old-growth forests is the most important habitat type for deer in Unit 1C. Deer habitat models were developed to estimate the capability of habitats in Southeast Alaska to support populations of Sitka black-tailed deer (Suring et al. 1992). The model provides an evaluation of habitat quality that is assumed to be related to long-term carrying capacity. The model focused on winter range because winter is assumed to be the most limiting season for Sitka black-tailed deer (Hanley and McKendrick 1985). Suring et al. (1992) determined that under low-snow, intermediate-snow, and deep-snow situations, deer carrying capacity is assumed to be 125 deer per mi² (0.5 deer per ha), 100 deer per mi² (0.4 deer per ha), and 50 deer per mi² (0.2 deer per ha), respectively, for habitats with the highest coefficients. No habitat assessment or habitat enhancement has occurred in Unit 1C since the model was developed.

Methods

Some habitat and food availability data were collected during pellet-count surveys in some years. For each end of a pellet transect, the nearest plant stem that was browsed by a deer was measured in length, and the number of branches on the stem were counted. The number of stems that deer fed on and whether stems were dead or alive was also recorded.

Results and Discussion

The habitat data from pellet-count transects were never analyzed and reported on due to a shortage of staff.

Recommendations for Activity 3.2

Modify. We recommend that some sort of habitat capability assessment or monitoring be completed within Unit 1C, and in Region I overall, to better determine deer habitat capacity and help set harvest objectives within each unit.

NONREGULATORY MANAGEMENT PROBLEMS OR NEEDS

None.

Data Recording and Archiving

All records and data analysis related to deer pellet-group transects, harvest tickets, and hunter reports are archived on network servers at the Region I headquarters office in Douglas.

Agreements

Currently there are no agreements with other agencies pertaining to deer management.

Permitting

No permits were needed to conduct deer management activities in Unit 1C during RY16–RY20.

Conclusions and Management Recommendations

Pellet surveys were conducted on the islands of Douglas, Shelter, and Sullivan during the RY16–RY20 report period. Douglas Island was surveyed annually due to roughly 70% of the deer harvest originating from that area. The other islands were surveyed less frequently due to variable marine weather and difficult field logistics. Only 2 transects in RY17 and RY18 (on Shelter and Sullivan islands) met the management objective of 2.0 pellet-groups per plot during the report period. Overall, the average density of deer pellets decreased during the reporting period, with the lowest values counted for Douglas Island in RY20. This could indicate a slight decline in the Douglas Island deer population, although there is no indication that there are population-level effects (Table 1).

While pellet-group surveys have historically been used to monitor deer population trends in specific watersheds throughout the region, they are only useful for documenting large changes ($\geq 30\%$) in deer density the year after changes in deer numbers have occurred, and only allow general comparisons of deer numbers from area to area in Southeast Alaska. The technique is generally considered of limited use for assessing small, short-term changes in deer density.

The harvest objective of 456 deer a year was not met during any year in RY16–RY20. A series of mild winters during the reporting period likely allowed deer to remain at higher elevations where they were less accessible to hunters. In years when deep snow accumulates at higher elevations, deer concentrate at lower elevations, which can result in higher harvest during the hunting season. Still, the current harvest objective has only been met during 4 of the past 24 years, indicating it may be set unrealistically high. Deer populations in Unit 1C are largely driven by winter severity and probably to a lesser degree by predation. There are no workable options for improving habitat. Predator numbers in areas where most people hunt are low, and under the current harvest strategy, populations recover in a few years following a severe winter.

Considering that hunter effort and success remain within historical ranges and that we have no workable options for increasing deer abundance in this unit, we should consider reducing the

harvest objective to a level that can be met during more years. Based on historical data, an annual harvest objective for Unit 1C in the range of 300–350 deer would be achievable in 89% of the years.

The City and Borough of Juneau and Goldbelt Inc. are currently working to complete a 3.5-mile extension of the North Douglas road system to Middle Point. The extent of additional hunter access and effect of winter habitat loss on deer will not be known until the next reporting period (RY21–RY25). However, the department should manage conservatively by adjusting the season and bag limits for deer on Douglas Island. Increasing reports of wolf presence on Douglas Island and the mainland will need to be monitored to determine what effect predation is having on the localized deer population.

II. Project Review and RY21–RY25 Plan

Review of Management Direction

MANAGEMENT DIRECTION

GOALS

- Provide sustained opportunity to participate in deer hunting.
- Provide an opportunity to view and photograph deer.
- Protect and maintain the deer population and deer habitat in Unit 1C.

CODIFIED OBJECTIVES

Amounts Reasonably Necessary for Subsistence Uses

The Board of Game has made a positive finding for customary and traditional use of deer in Unit 1C outside the Juneau Nonsubsistence Area and set 30–40 deer as the amount necessary for subsistence (5AAC 99.025(a)(5)). This amount is expected to be achieved.

Intensive Management

The Unit 1C management goal is to manage the deer population to achieve and maintain a population of 6,200 deer while supporting an annual harvest of 456 deer, according to the Alaska Board of Game at its fall 2000 meeting (AS 16.05.255(i)(4)).

MANAGEMENT OBJECTIVES

Management objectives for RY21–RY25 have been updated to the following:

- Monitor the deer harvest through general-season harvest ticket reports.
- Assess new methods (specifically, motion-sensor camera methods) to measure population indices that allow the monitoring of deer population trends.

REVIEW OF MANAGEMENT ACTIVITIES

1. Population Status and Trend

ACTIVITY 1.1. Motion-sensor camera methods.

Data Needs

Traditional pellet-count methods did not provide the level of accuracy needed, and other methods are showing promise at a reasonable cost and time commitment for deer management. The use of motion-sensor cameras and unmarked animal analysis methods, such as time-to-event and time-in-front-of-the-camera methods, will be investigated during RY21–RY25.

Methods

A 2-km hexagon-cell camera grid will be set up on Douglas Island in winter deer habitat under 1,000 ft. elevation. Sites will be selected using a stratified random selection method where the center of each grid will be used if it is in winter deer habitat. This should result in 12 to 15 camera locations on Douglas Island. Cameras will be serviced once annually, pictures will be downloaded, batteries replaced, and cameras will be tested to ensure that they are in good working condition. Staff will also process pictures and set up data for the Region I biometrician. The biometrician will then analyze these data and assist DWC biologists in determining the most appropriate method for camera monitoring in Southeast Alaska rainforests.

2. Mortality-Harvest Monitoring

ACTIVITY 2.1. Analyze deer-harvest data from mandatory deer hunt reports.

Data Needs

Hunt report data are required to determine if harvest objectives are being met. They provide information about the number of participants in the hunt, hunter effort and success, location of hunt and harvest, and modes of transport. Harvest trends can indicate population fluctuations which are used to inform management decisions.

Methods

Hunters in Unit 1C are required to obtain a general-season harvest ticket before entering the field. Each harvest ticket requires the hunter's demographic information and hunting license number. Harvest tickets also include a series of punch tickets that hunters must validate upon successful harvest of a deer, and a mail-in hunt report card that can also be completed online at www.hunt.alaska.gov for each trip hunters went on, regardless of success.

Harvest data are summarized by regulatory year (RY), which begins 1 July and ends 30 June. Since 2011, deer harvest data have been derived from mandatory hunt reports issued in

conjunction with deer harvest tickets. All deer hunters are expected to report their hunting activities. Nonetheless, not all hunters submit the required hunt report. Therefore, to obtain total harvest estimates, the reported harvest will be multiplied by an expansion factor to account for nonrespondents.

Once hunt reports have been submitted, reported hunt and harvest locations are coded for data entry. Hunters often provide vague hunt or harvest locations; in those cases, an attempt will be made to contact them for more precise location data. A cutoff date of 15 June has been established for receipt of hunt reports. Any hunt reports not submitted or received by 15 June will be excluded from analysis. Once all hunt and harvest locations have been coded and data entry is complete, the results will be analyzed, and summaries of total harvest, hunter residency and success, harvest chronology, and transportation methods will be derived for each unit.

3. Habitat Assessment-Enhancement

ACTIVITY 3.1. Use geographic information system (GIS) technology to assess current deer habitat capability (DHC) in Unit 1C to better determine population estimates. This is a new activity for RY21–RY25.

Data Needs

The current intensive-management population and harvest objectives for Unit 1C deer were established in 2000 based in part on the unit's estimated DHC during the mid- to late-1990s. These objectives should be reevaluated and possibly modified in response to reductions in deer DHC, given the significant amount of habitat alterations from development that have occurred in the unit since they were established.

Methods

A landscape analysis of current deer habitat capability should be conducted using GIS technology and the U.S. Forest Service's Forage Resource Evaluation System for Habitat (FRESH) deer model (Hanley et al. 2012).

To be implemented, these results would need to be reviewed and accepted by the Board of Game.

NONREGULATORY MANAGEMENT PROBLEMS OR NEEDS

Expansion of the North Douglas Highway has resulted in loss of winter habitat, has opened additional access for hunters, and is likely to have an effect on the harvest. The road now crosses one of our historical deer-pellet survey transects in 2 places. Winter habitat loss is likely to continue along the road corridor and has the potential to reduce the carrying capacity for deer in the area. An increasing number of wolf reports are likely to also impact deer in areas where deer are displaced from refugia on Douglas Island.

Data Recording and Archiving

All records and data analysis related to deer pellet-group transects, harvest tickets, and hunter reports are archived on network servers at the Region I headquarters office in Douglas.

Agreements

Currently there are no agreements with other agencies pertaining to deer management.

Permitting

No permits are expected in this period.

References Cited

- Alaska Department of Commerce, Community and Economic Development (Alaska DCCED). [n.d.]. Open data [web page]. Division of Community and Regional Affairs, Juneau. <https://dcra-cdo-dcced.opendata.arcgis.com> (Accessed 1 December 2022).
- Alaska Department of Fish and Game. 1976. Alaska wildlife management plans: A public proposal for the management of Alaska's wildlife: Southeastern Alaska. Draft proposal subsequently approved by the Alaska Board of Game. Division of Game, Federal Aid in Wildlife Restoration Project W-17-R, Juneau.
- Alaska Department of Fish and Game. 1991. Strategic plan for management of deer in Southeast Alaska, 1991–1995, population objectives. Division of Wildlife Conservation, Juneau.
- Burris, O. E., and D. E. McKnight. 1973. Game transplants in Alaska. Alaska Department of Fish and Game, Division of Game, Wildlife Technical Bulletin No. 4, Juneau.
- Hanley, T. A., and J. D. McKendrick. 1985. Potential nutritional limitations for black-tailed deer in a spruce-hemlock forest, Southeastern Alaska. *Journal of Wildlife Management* 49: 103–114.
- Hanley, T. A., D. E. Spalinger, K. J. Mock, O. L. Weaver, G. M. Harris. 2012. Forage resource evaluation system for habitat–deer: An interactive deer habitat model. General Technical Report, PNW-GTR-858.
- Kirchhoff, M. D., and K. W. Pitcher. 1988. Deer pellet-group surveys in Southeast Alaska 1981–1987. Alaska Department of Fish and Game, Division of Game, Research Final Report, Federal Aid in Wildlife Restoration, Job 2.9, Douglas.
- Klein, D. R. 1965. Postglacial distribution patterns of mammals in the southern coastal regions of Alaska. *Arctic Institute of North America* 18(1):7–20.
- Lowell, R. E. 2013. Unit 3 deer management report. Pages 48–62 [In] P. Harper, editor. Deer management report of survey and inventory activities 1 July 2010–30 June 2012. Alaska Department of Fish and Game, species management report. ADF&G/DWC/SMR-2013-1, Juneau.
- Mackovjak, J. 2010. Tongass timber: A history of logging and timber utilization in Southeast Alaska. Forest History Society, Durham, North Carolina.

- McCoy, K. 2017. Sitka black-tailed deer pellet-group surveys in Southeast Alaska, 2016 report. Alaska Department of Fish and Game, Wildlife Management Report ADF&G/DWC/WMR-2017-2, Juneau.
- Merriam, H. R. 1963. Sitka black-tailed deer report. Alaska Department of Fish and Game, Division of Game, Annual Project Segment Report 1 July 1962–30 June 1963, Federal Aid in Wildlife Restoration Project W-6-R-4, Juneau.
- National Oceanic and Atmospheric Administration (NOAA). 2018a. NOWData–NOAA online weather data [online database]. National Weather Service Forecast Office, Juneau, Alaska. <https://w2.weather.gov/climate/xmacis.php?wfo=ajk> (Accessed July 2020).
- National Oceanic and Atmospheric Administration (NOAA). 2018b. Comparative climatic data for the United States through 2018. National Oceanic and Atmospheric Administration, National Environmental Satellite Data and Information Service, National Centers for Environmental Information, Asheville, North Carolina. <https://www.ncei.noaa.gov/products/land-based-station/comparative-climatic-data> (Accessed July 2020)
- National Oceanic and Atmospheric Administration (NOAA). 2022. NOWData–NOAA online weather data [online database]. National Weather Service Forecast Office, Juneau. <https://www.weather.gov/wrh/climate?wfo=ajk> (Accessed March 2022).
- Olson, S. T. 1979. The life and times of the Sitka black-tailed deer in Southeast Alaska. Pages 160–168 [In] O. C. Wallmo and J. W. Schoen, editors. Sitka black-tailed deer: Proceedings of a conference in Juneau, Alaska [n.d.]. U.S. Department of Agriculture, Forest Service, Alaska Region, in cooperation with Alaska Department of Fish and Game.
- Schoen, J. W., and M. D. Kirchhoff. 1990. Seasonal habitat use by Sitka black-tailed deer on Admiralty Island, Alaska. *Journal of Wildlife Management* 54: 371–378.
- Sell, S. 2020. Deer management report and plan, Game Management Unit 1C: Report period 1 July 2011–30 June 2016 and plan period 1 July 2016–30 June 2021. Alaska Department of Fish and Game, Species Management Report and Plan ADF&G/DWC/SMR&P-2020-8, Juneau.
- Suring, L. H., E. J. Degayner, R. W. Flynn, M. D. Kirchhoff, J. W. Schoen, and L. C. Shea. 1992. Habitat capability model for Sitka black-tailed deer in Southeast Alaska: Winter habitat. Version 6.5 April 1992. U.S. Department of Agriculture, Forest Service, Region 10, Juneau.
- U.S. Census Bureau. 2020. City and town population totals: 2010–2019, annual estimates of the resident population for incorporated places: April 1, 2010, to July 1, 2019, Alaska [web page]. Washington, D.C. <https://www.census.gov/data/tables/time-series/demo/popest/2010s-total-cities-and-towns.html> (Accessed July 2020).
- U.S. Department of Agriculture (USDA). [n.d.]. Wilderness [web page]. Tongass National Forest. U.S. Forest Service. <https://www.fs.usda.gov/detail/tongass/specialplaces/?cid=stelprdb5393510> (Accessed October 2019).

U.S. Department of the Interior (USDOI). 2020. Glacier Bay National Park & Preserve 2020 Fact Sheet. National Park Service, Gustavus.
<https://www.nps.gov/glba/learn/management/upload/2020-GLBA-Fact-Sheet-508-2021.pdf> (Accessed July 2020).

