Species Management Report and Plan ADF&G/DWC/SMR&P–2023–16

Deer Management Report and Plan, Game Management Unit 2:

Report Period 1 July 2016–30 June 2021, and

Plan Period 1 July 2021–30 June 2026

Tessa Hasbrouck

2023

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 pay 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 Richard Nelson, Management Coordinator for Region I for the Division of Wildlife Conservation.

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Cover Photo: New clearcut in winter on Prince of Wales Island, Southeast, Alaska. ©2021 ADF&G. Photo by Tessa Hasbrouck.

Contents

List of Figures

List of Tables

Purpose of this Report

This report provides a record of survey and inventory management activities for Sitka black-tailed deer (*Odocoileus hemionus sitkensis*) in Game Management Unit 2 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., RY14 = 1 July 2014–30 June 2015). This report is produced primarily to provide agency staff with data and analysis to help guide and record agency efforts but is also provided to the public to inform it of wildlife management activities. In 2016 the Alaska Department of Fish and Game's (ADF&G, the department) Division of Wildlife Conservation (DWC) launched this 5-year report to report more efficiently on trends and to describe potential changes in data collection activities over the next 5 years. It replaces the deer management report of survey and inventory activities that was previously produced every 2 years.

I. RY16–RY20 Management Report

Management Area

Game Management Unit (Unit) 2 includes Prince of Wales Island (POW) and adjacent islands bounded by a line drawn from Dixon Entrance in the center of Clarence Strait, Kashevarof Passage, and Sumner Strait north to and including Warren Island (Fig. 1). The land area of POW is approximately 3,582 mi^2 (9,277 km^2) with extensive shoreline and marine influenced habitats. The total human population on POW fluctuates seasonally between 4,000 and 5,000 residents.

Unit 2 is a temperate rainforest with a mild, maritime climate which receives an average of 101.6 inches (2.6 m) of precipitation annually (NOAA 2022). Wind and landslide events are the primary source of disturbance (Harris 1989, Ott 1997). There is a high density of karst and cave features caused by the chemical weathering of limestone and marble bedrock (Baichtal and Swanston 1996) which impact the hydrology and ecology of the unit. Land cover consists of well-drained areas that have historically been old-growth forest which include Sitka spruce (*Picea sitchensis*), western hemlock (*Tsuga heterophylla*), red cedar (*Thuja plicata*), and Alaska yellow cedar (*Chamaecyparis nootkatensis*). On flatter terrain, as soil moisture increases, forest cover transitions to low-volume forest including shore pine (*Pinus contorta*), and eventually muskeg. Above approximately 2,000 ft (610 m) in elevation the forest transitions to a subalpine zone consisting of predominantly mountain hemlock (*Tsuga mertensiana*) and eventually consisting of isolated areas of alpine vegetation. In forested habitat, understory consists of shrubs and forbs dominated by blueberry (*Vaccinium spp.*), salal (*Gaultheria shallon*), devil's club (*Oplopanax horridus*), and western skunk cabbage (*Lysichiton americanus*).

Land ownership on Unit 2 is a mosaic of federal, state, and private owners. Eighty percent of the unit is Tongass National Forest lands managed by the U.S. Forest Service (USFS) for diverse opportunities including recreation, economic development, and subsistence activities (Southeast Alaska GIS Library 2019). USFS maintains Wilderness Areas (Karta River and South Prince of Wales), public use cabins, heritage sites, and the El Capitan Cave Interpretative site. Sealaska Corporation, the largest private landowner in the unit, primarily manages their lands for economic development (e.g., timber harvest) and hunting opportunities for shareholders. Other

Figure 1. Game Management Unit 2 boundaries, Southeast Alaska.

landowners include the State of Alaska, and Alaska Mental Health Trust Authority. These landowners have created the greatest density of harvested forest lands in Southeast Alaska. Prince of Wales Island has the highest amount of total productive forest in Southeast Alaska (USDA 2016). However, POW received the most substantial logging activity in the region since 1954, which resulted in a 94% reduction of contiguous high-volume forest (Albert and Schoen 2013). Contiguous forest has been reduced by 77.5% in the northern Prince of Wales biogeographical region since 1954 (Albert 2019). This logging activity reduced deer habitat in north central POW by 46% and in south POW by 18% (USDA 2016). Logging increases hunter and trapper access to previously inaccessible portions of the interior of Prince of Wales and other islands through the development of an extensive road system. This road system also degrades wildlife habitat.

Summary of Status, Trend, Management Activities, and History of Deer in Unit 2

Sitka black-tailed deer are a highly valued game species and are found throughout Unit 2 (Fig.1). Deer densities differ across the landscape depending on the habitat class (e.g., logged, managed lands; and unlogged lands; Brinkman et al. 2011) and geomorphic features (Shanley et al. 2021). Deer have a low rate of dispersal between watersheds (Colson et al. 2013), and therefore do not migrate to fill low density areas. Deer populations fluctuate primarily in response to severe winter weather (Klein and Olson 1960), habitat loss (McNay and Voller 1995), hunting pressure (Straugh and Rice 2002), predation by both wolf and black bear (Gilbert 2015), and disease.

Harvest is influenced by regulations, deer populations, number of hunters, hunter effort, and weather conditions. The actual deer harvest is larger than the reported deer harvest due to a lack of reporting. Hunters are required to report their deer harvest, but this requirement is not enforced; therefore, reporting rates vary by community throughout Southeast Alaska. The annual reported harvest is extrapolated every year and results are summarized after the season closes. ADF&G relies heavily on deer harvest and hunter effort as indices for overall deer population health. Therefore, accurate reporting is crucial for deer management in Unit 2.

Commercial logging has greatly altered forested habitat and human access in Unit 2, ADF&G estimates about 475 mi^2 (1,230 km^2) of forested deer habitat has been logged over the past 50 years, including over 40% of the old-growth forest once found in Unit 2. Logging associated road building in Unit 2 has created the highest density of roads in Southeast Alaska, with approximately 4,000 km (2,500 miles) of drivable roads on national forest land and native corporation lands. Clearcutting can result in a flush of shrub and forb growth and abundant forage for deer and other species. However, that forage is not accessible during periods with deep snow. After about 25 years the regenerating evergreen canopy closes, shading out understory vegetation. Due to historic and ongoing logging practices, Unit 2 was the focus of predator-prey and forest-regeneration research in Southeast Alaska. Goals of this research included understanding habitat changes, how road densities affect wolves and deer, and how hunting and trapping drive wolf population dynamics (Farmer et al. 2006, Person and Russell 2008, Gilbert et al. 2015, Roffler et al. 2016). During winter, deer select for low elevation and productive old-growth forest (McCoy and Gregovich 2021). Old-growth forests retain important winter forage (Schoen and Kirchhoff 1985) and provide snow interception for deer during winter

(Kirchhoff and Schoen 1987; Hanley et al. 2012). Population models estimate a 50–60% decline in deer carrying capacity by the end of the logging rotation in 2054; therefore, few areas are expected to meet projected hunter demand within road accessible areas and logged portions of Unit 2 (USFS 1989). USFS is spending some resources to look at second-growth management and is conducting precommercial thinning and other treatments for wildlife in some areas. The benefits to deer in these cases may be minimal at best (Farmer et al. 2006). Long-term consequences of habitat loss include the inability to provide for human subsistence needs and a general loss of deer hunting opportunities.

Deer harvest peaked in 2015 (Hasbrouck 2020) and declined during RY16–RY20. Since 2015, both the number of hunters and total harvest have declined, whereas hunter effort (e.g., days per deer) has increased. Unit 2 local hunters are concerned that they have been unable to meet their subsistence needs and they commonly express frustrations regarding nonlocal hunting pressure, predator populations, and habitat loss. Local deer hunter frustrations caused the Federal Subsistence Board to institute a 2-deer bag limit on federal land for nonfederally qualified hunters in 2018.

Management Direction

Existing Wildlife Management Plans

- Strategic Plan for management of deer in Southeast Alaska, 1991–1995, population objectives (ADF&G 1991).

- Alaska wildlife management plans: A public proposal for the management of Alaska's wildlife: Southeastern Alaska (1976).

Goals

Provide the greatest opportunity to participate in hunting deer (ADF&G 1976).

Codified Objectives

Amounts Reasonably Necessary for Subsistence Uses

The Alaska Board of Game set the customary and traditional use finding (5 AAC 99.025) for deer harvest in Unit 2 at 1,500–1,600 deer.

Intensive Management

There was a positive finding for deer in Unit 2 (5 AAC 92.108). The Alaska Board of Game established a population objective of 71,000 deer and a harvest objective of 2,700 deer.

Management Objectives

Maintain populations with more than 45 deer per mi2 (17 per km2) of winter range, as determined by mean densities of 1.4 pellet groups per plot (Kirchhoff 1990).

MANAGEMENT ACTIVITIES

1. Population Status and Trend

ACTIVITY 1.1. Conduct deer pellet transects.

Data Needs

Assess the general population level to understand if harvest is additive or compensatory.

Methods

ADF&G and U.S. Forest Service (USFS) collaboratively monitored the deer population in Unit 2 by completing deer pellet transects. Annual pellet surveys (Kirchhoff and Pitcher 1988) were conducted during late April and early May in 5 different value comparison units (VCUs). VCUs are USFS's timber management units and are roughly equivalent to a watershed. Each VCU has 3 or 4 transects consisting of a straight line of 1 × 20-meter plots running uphill from the beach fringe along a compass bearing. The number of plots vary, depending on the distance from the beach to the alpine, and the persistence of snow during the survey. Most transects terminate at 1,500 feet elevation. Transects that do not reach the alpine terminate after 120 plots, or when snow cover is greater than 50% for 3 consecutive plots. MPGP is calculated for each VCU and averaged for all locations to obtain an average MPGP for informing unitwide inferences on deer abundance trends.

Deer pellets can give a general index of population level. Kirchhoff and Pitcher (1988) recommended the following: <1.00 mean pellet group/plot (MPGP) classified as a low-density population, 1.00–1.99 MPGP classified as a moderate-density population, and >2.00 MPGP classified as a high-density population. In general, 1.40 MPGP is a target index for DWC managers. ADF&G interprets pellet-group transect data cautiously because the survey is designed to indicate long-term deer trends and not necessarily to measure year-to-year changes in deer numbers or to estimate deer densities. Deer-pellet surveys generally can only detect large (±30%) changes in deer densities.

Results and Discussion

Due to scheduling conflicts, and COVID-19, few pellet surveys were completed during RY16–RY20. Pellet surveys were completed during RY18 and RY19. The VCUs studied were Red Bay (532), Sarkar (554), Thorne Lake (575), Snakey Lakes (578), and 12-Mile Arm (621; Table 1, Fig. 2). Thorne Lake was the only VCU that exceeded the "high deer density" threshold of 2.0 MPGP for both RY18 and RY19. The remaining VCUs were within the "moderate deer density" threshold. During RY18, all five VCUs exceeded the established MPGP goal (1.4). However, during RY19 Red Bay and Sarkar dipped below the established goal. RY18 and RY19 MPGP met management objectives in Thorne Lake, Snakey Lakes, and 12-Mile Arm. However, 1 year of reduced MPGP in Red Bay and Sarkar does not necessarily indicate a downward trend. The long-term, linear trend for all 5 VCUs indicates an increase in deer population (McCoy 2017). Further, the average MPGP for all VCUs in 2018 was 1.7, and the average MPGP for all VCUs in 2019 was 1.6.

Figure 2. Deer pellet survey transect locations as value comparison units (VCU) in Unit 2, Southeast Alaska.

Table 1. Deer pellet survey results during 2016–2020 in Unit 2, Southeast Alaska.

Location[a]	Year	Plots	MPGP[b]	95% Confidence interval
Red Bay (VCU 532)	2016	–	–	–
	2017	–	–	–
	2018	280	1.88	1.63–2.12
	2019	259	1.06	0.86–1.25
	2020	–	–	–
Sarkar (VCU 554)	2016	–	–	–
	2017	–	–	–
	2018	386	1.44	1.26–1.62
	2019	286	1.32	1.12–1.52
	2020	–	–	–
Snakey Lake (VCU 578)	2016	–	–	–
	2017	–	–	–
	2018	309	1.72	1.51–1.94
	2019	288	1.61	1.40–1.82
	2020	–	–	–
Thorne Lake (VCU 575)	2016	–	–	–
	2017	–	–	–
	2018	310	2.12	1.85–2.39
	2019	260	2.33	2.00–2.65
	2020	–	–	–
12 Mile Arm (VCU 621)	2016	–	–	–
	2017	–	–	–
	2018	316	1.57	1.37–1.78
	2019	–	–	–
	2020	–	–	–

[a] VCU stands for value comparison unit.
[b] Mean pellet groups per plot.

Pellet surveys were not conducted in RY20 due to COVID-19. Due to the insensitive outputs of pellet-transect data, ADF&G decided to discontinue pellet surveys in most of Southeast Alaska after RY20. In lieu of pellet surveys, ADF&G and UAF are testing several camera-based methods in Units 1A, 1C, 2, and 3. After these projects are completed, ADF&G staff will determine if camera methods could be feasible for long-term deer monitoring in Unit 2.

A technique for estimating deer abundance developed on POW (Brinkman et al. 2011) identifies individual deer using fecal DNA and uses DNA-based mark and recapture techniques to estimate population trends in distinct watersheds (Brinkman et al. 2011). This technique is more informative than traditional deer pellet methods; however, laboratory costs are too high for ADF&G to implement this method in Unit 2.

Recommendations for Activity 1.1

Discontinue traditional (non-DNA methods) deer-pellet surveys.

ACTIVITY 1.2. Aerial alpine deer surveys.

Data Needs

Aerial alpine deer surveys provide an index of abundance to assess trends in deer abundance prior to hunting season.

Methods

ADF&G performed aerial surveys on northern POW (including Kosciusko Island) in 2016, 2017, 2018, and 2019, and on central POW in 2017, 2018, and 2019 (Fig. 3). Surveys were conducted via fixed-wing aircraft with 1 pilot and 1 observer searching for deer in alpine habitat during July and August. Temperature and cloud cover were recorded for the flight. The flight began 2 hours prior to sunset and terminated at sunset or when the entire alpine area had been observed. Each 2-person team recorded the location and classification (i.e., large buck, small buck, doe, fawn, unknown) of observed deer. ADF&G used deer per hour of survey time to determine trends in abundance.

Results and Discussion

Northern POW and central POW were surveyed 3–5 times most years during RY16–RY19. Neither area was surveyed in RY20 due to the COVID-19 pandemic and central POW was not surveyed in RY16. The number of deer observed per hour varied within years, between years, and between study areas (Fig. 4). Overall, more deer were observed per hour on central POW than northern POW. The data appears to indicate that deer per hour increased over time on central POW but decreased over time on northern POW (Fig. 4). However, ADF&G analyzed aerial survey data across the region and found that observer bias influenced measures of deer observed per hour of flight time (Daniel Eacker, Wildlife Biologist III, ADF&G, Douglas, Deer Aerial Surveys in the Alpine, unpublished report, 8 June 2020). Due to observer bias, results should be interpreted with caution.

During RY19, regionwide staff discussed the efficacy of these surveys and Unit 2 biologists decided to discontinue efforts to survey alpine deer due to the lack of an understanding of how deer seen per hour in the alpine relates to the overall deer population. More research is needed to 1) determine a sightability correction factor, and 2) understand the biological relationships between deer observed in alpine and the population. Note that a full understanding of these relationships is expected to take decades. In lieu of alpine surveys, ADF&G and University of Alaska Fairbanks (UAF) are testing camera-based methods in Units 1A, 1C, 2, and 3. After the end of those projects, biologists will determine if camera methods could be feasible for long-term deer monitoring in Unit 2.

Figure 3. Aerial alpine survey locations in Unit 2, Southeast Alaska.

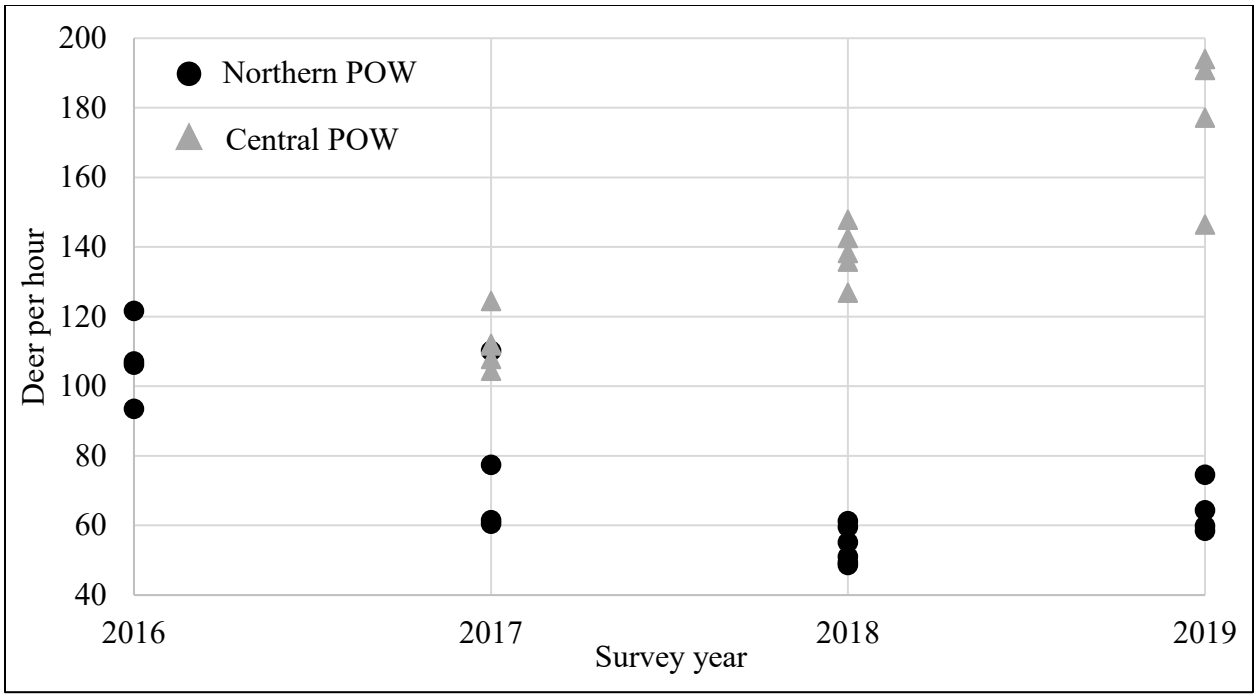

Figure 4. Number of deer surveyed per hour of flight observed during aerial alpine surveys on northern and central Prince of Wales (POW) Island, Southeast Alaska, 2016–2019. Central POW was not surveyed in 2016.

Recommendations for Activity 1.2

Discontinue alpine aerial surveys.

2. Mortality-Harvest Monitoring and Regulations

ACTIVITY 2.1. Quantify and analyze harvest data.

Data Needs

Harvest data supply a trend in abundance to determine the status of the Unit 2 deer population and to determine if objectives for amount reasonably necessary for subsistence uses and intensive management objectives are being met.

Methods

During RY16–RY20, all deer hunters were required to submit a hunt report detailing information from each hunting trip. Hunters recorded hunt location, number of days hunted, number of deer harvested, sex of the deer harvested, commercial services employed, method of take, and transportation type used to access the hunting location. Harvest data is statistically extrapolated to account for incomplete reporting.

Season and Bag Limit

The season for both resident and nonresident hunters is 1 August–31 December and the bag limit is 4 bucks. State regulations allowed hunters to harvest deer 1 August–31 December. However,

federal regulations allowed federally qualified hunters to harvest deer 24 July–31 January. Additionally, federal regulations prohibit nonfederally qualified hunters from harvesting deer on some federal lands during the first two weeks of August and limit nonfederally qualified hunters to 2 bucks on federal lands. Note that federally qualified hunters can harvest 5 deer per year under federal regulations.

Results and Discussion

Harvest by Hunters

The number of hunters and the number of harvested deer decreased throughout RY16–RY20 (Fig. 5). Harvest exceeded the harvest objective in RY16, but not during RY17–RY20. Total harvest decreased by 48%, and the number of hunters decreased by 38%. The number of deer per hunter remained stable throughout RY16–RY20. However, the number of days per deer (average number of days it takes to harvest 1 deer) increased from RY16 to RY20.

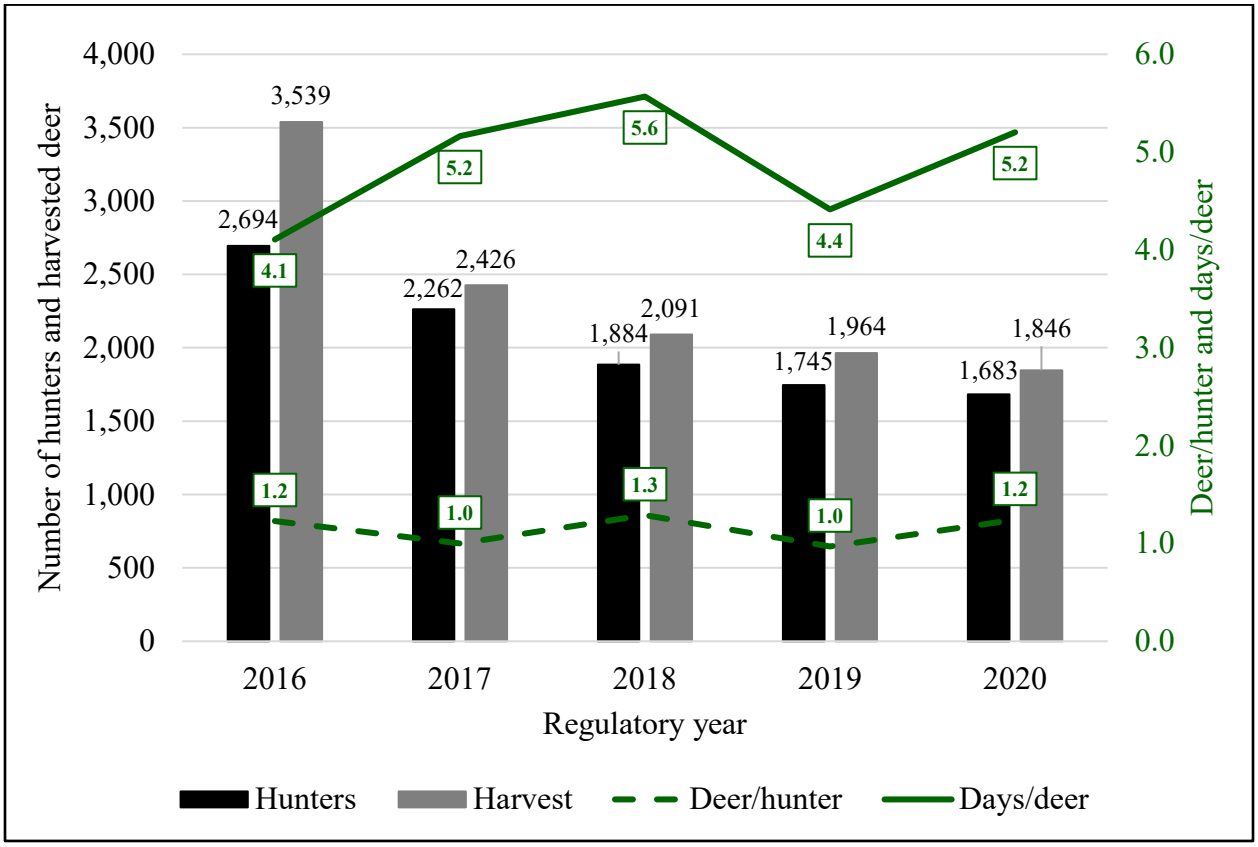

Figure 5. Unit 2 reported deer harvest and hunter effort, Southeast Alaska, regulatory years 2016–2020.

Federally qualified hunters outnumber nonfederally qualified hunters and harvest more deer than federally qualified hunters; however, both groups declined in participation and harvest throughout this reporting period (RY16–RY20). The number of federally qualified hunters decreased by 28% and the number of nonfederally qualified hunters decreased by 47% (Table 2).

Although federally qualified hunters harvested 40% fewer deer in RY20 than they did in RY16, their proportion of total harvest increased from 61% to 71%.

Table 2. Unit 2 deer harvest by federally qualified hunters and nonfederally qualified hunters, Southeast Alaska, regulatory years 2016–2020.

	Hunters					Harvest				
	Federally qualified		Nonfederally qualified			Federally qualified		Nonfederally qualified		
Regulatory year	No.	%	No.	%	Total hunters	No.	%	No.	%	Total harvest
2016	1,335	50	1,359	50	2,694	2,154	61	1,386	39	3,540
2017	1,142	50	1,121	50	2,263	1,530	63	896	37	2,426
2018	1,024	54	861	46	1,885	1,467	70	624	30	2,091
2019	965	55	781	45	1,746	1,269	65	694	35	1,963
2020	960	57	723	43	1,683	1,307	71	539	29	1,846

Federally qualified hunters can harvest 5 deer per year, and nonfederally qualified hunters can harvest 4 deer per year. Less than 3% of federally qualified hunters harvested 5 deer per year and less than 10% of hunters harvested 4 deer per year during RY16–RY20 (Fig. 6). The proportion of hunters who harvest 1 deer per year was stable throughout this reporting period.

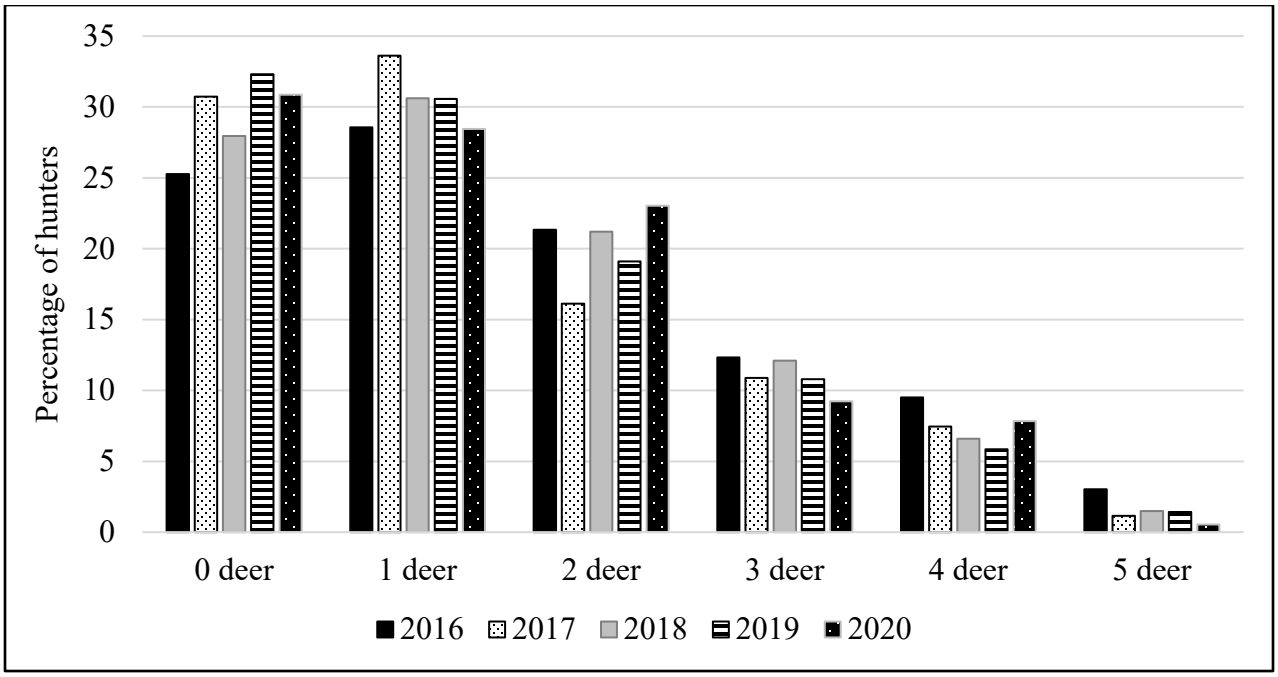

Figure 6. Percentage of federally qualified hunters who harvested 0 to 5 deer in Unit 2, Southeast Alaska, regulatory years 2016–2020.

Harvest is not ubiquitous across the landscape (Fig. 7). Fifty percent of deer were harvested on 20% of the land in Unit 2. The hunted land area is likely smaller because most people harvest big game close to road or river access (e.g., within 0.8 km [0.5 mi] of roads [Fuller 1990], or within

0.9 km [0.6 mi] of rivers [Johnson et al. 2016]). This area of larger harvest is closest to communities, indicating that areas furthest from communities have less hunting pressure.

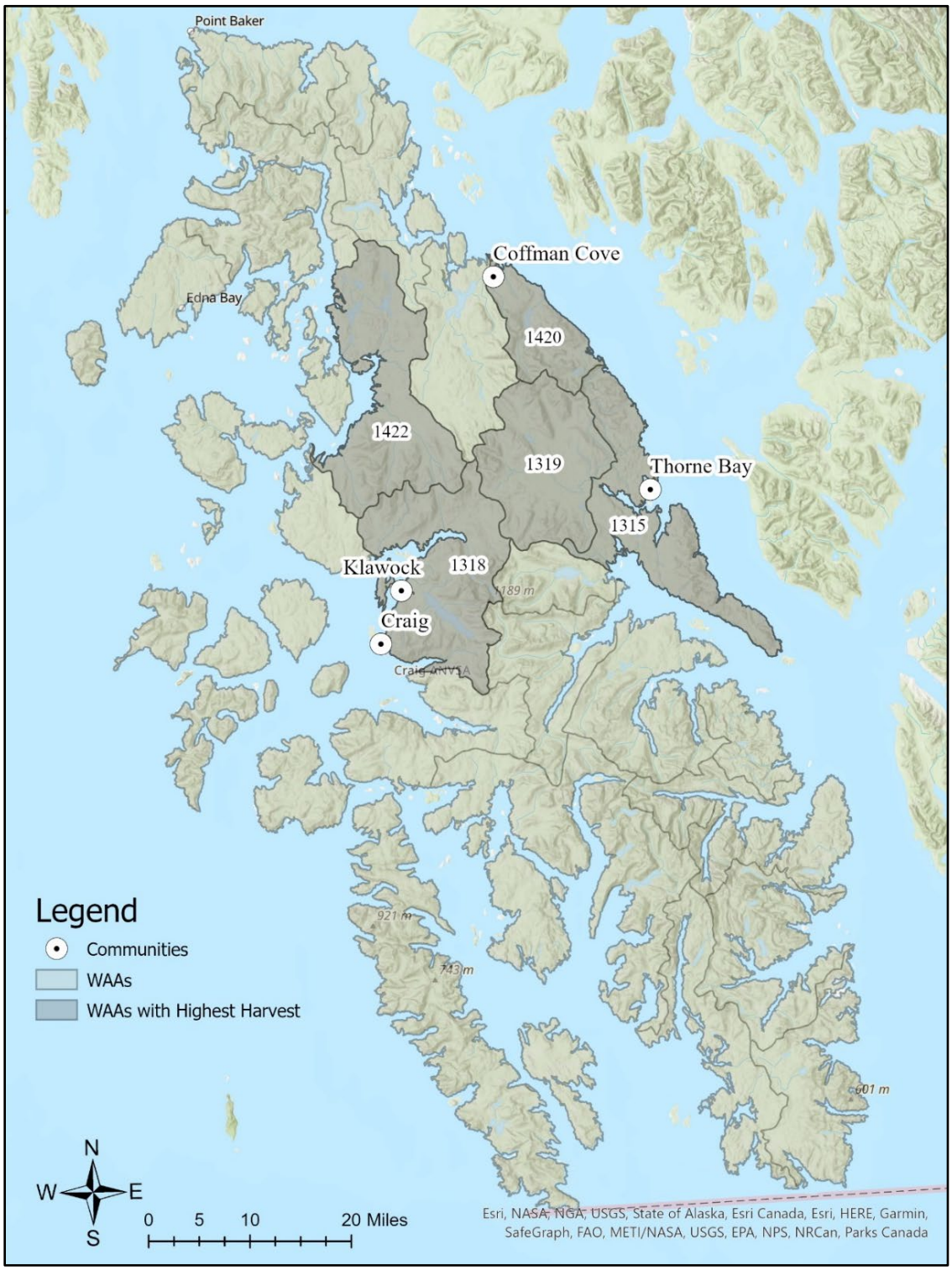

Figure 7. Wildlife analysis areas (WAAs) that constitute 50% of deer harvest in Unit 2, Southeast Alaska, regulatory years 2016–2020.

Hunter Residency and Success

Harvest data was also explored by examining hunter residency (i.e., Ketchikan hunters, local hunters, nonlocal hunters, nonresident hunters, and unknown residency hunters). Hunter participation from every residency category steadily decreased from RY16 to RY20 (Table 3). Ketchikan hunters had the biggest decline during the RY16–RY20 reporting period. In RY20 there were 53% fewer Ketchikan residents hunting deer in Unit 2, and those hunters harvested 70% fewer deer in RY20 than they did in RY16. Local hunters had the smallest change within this reporting period with a 20% decrease in the number of hunters and a 36% decrease in total harvest.

Table 3. Total number of hunters and total harvest by Ketchikan, local, nonlocal, nonresident, and unknown residencies in Unit 2, Southeast Alaska, regulatory years 2016–2020.

	Ketchikan		Local		Nonlocal		Nonresident		Unknown residency	
Regulatory year	Total hunters	Total harvest	Total hunters	Total harvest	Total hunters	Total harvest	Total hunters	Total harvest	Total hunters	Total harvest
2016	679	853	1,080	1,865	539	570	375	229	21	22
2017	633	592	1,000	1,365	359	326	269	139	1	3
2018	417	364	911	1,321	325	300	227	105	5	1
2019	406	390	898	1,198	263	255	177	121	2	0
2020	316	259	865	1,189	291	277	203	108	7	13
% Difference[1]	−53%	−70%	−20%	−36%	−46%	−51%	−46%	−53%	−66%	−40%

[1] Indicates percent difference from RY16 to RY20.

Harvest Chronology

Most Unit 2 deer are harvested during August, October, and November (Fig. 8). Many early season (July and August) hunters target alpine or high elevation muskeg habitats. November harvest coincides with deer rut. Therefore, in November people are more likely to attempt to hunt and are also more likely to be successful.

Transport Methods

Hunters preferred highway vehicles for hunting deer on the vast road system in Unit 2 (Fig. 9). In other parts of Alaska, people use ATVs and other offroad vehicles to access hunting grounds that are not road accessible. Although hunters indicated that they used 3- or 4-wheelers in Unit 2, it is highly likely that these vehicles were used predominantly on the road system and therefore these modes of transportation were lumped with highway vehicles for this analysis. On average, during this reporting period (RY16–RY20), 24% of hunters used boats to access hunting areas and 68% of hunters used highway vehicles.

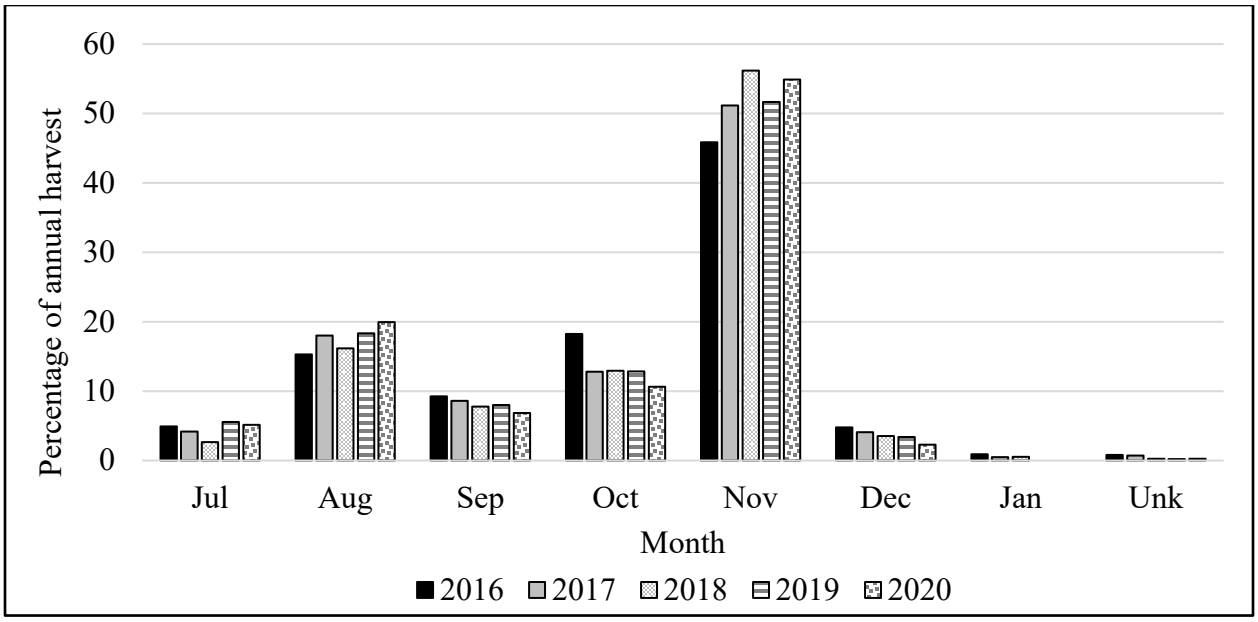

Figure 8. Unit 2 deer harvest chronology by month for regulatory years 2016–2020, Southeast Alaska.

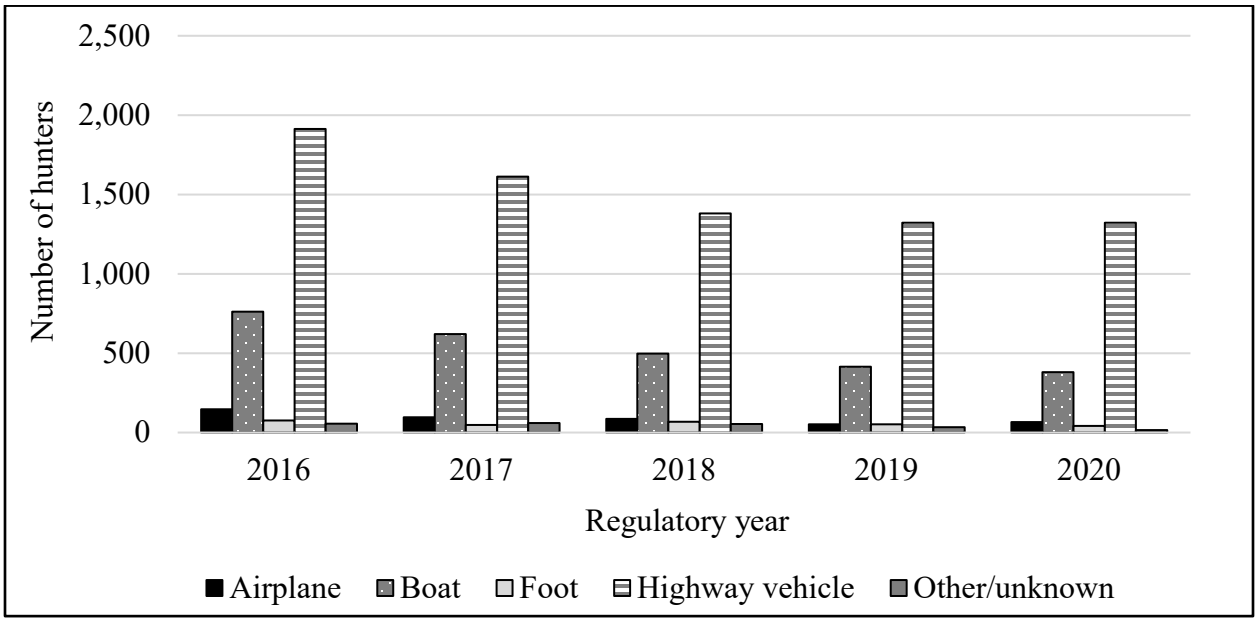

Figure 9. Unit 2 hunter transportation methods, Southeast Alaska, regulatory years 2016–2020. Highway vehicles also include 3- or 4-wheelers and offroad vehicles. Other/unknown includes horse or dog team, snowmachine, and unknown.

Other Mortality

Because this was identified as a high priority, there was an extensive effort to increase deer harvest reporting in Unit 2 to quantify the actual number of deer killed each year more accurately. However, anecdotal reports from hunters and public testimony during an extensive multi-agency Unit 2 deer planning effort during 2004 (Unit 2 Deer Planning Subcommittee

2005) suggest that even with the best efforts to improve deer harvest reporting in Unit 2, hunt reports continue to significantly underestimate the actual number of deer harvested.

Prior to extensive road paving on the island, deer-vehicle collision estimates were low (10–25 deer per year) and were not considered a significant source of Unit 2 mortality. However, the collision risk increased in 2003 because of extensive new POW highway paving projects, which now extend from Craig to Coffman Cove and east to Thorne Bay. Higher vehicle speeds, as well as erosion-control grass planted near new roads is an attractive food source for deer and has likely increased deer-vehicle collisions since this change occurred in 2003. Unfortunately, few deer collisions are reported, and the current level of vehicle-caused mortality is unknown.

Additionally, predation is a contributing factor to the deer population. Wolves subsist on many different prey items but are highly reliant on deer in Unit 2 (Roffler et al. 2021, Massey et al. 2021). Black bears also rely on deer as a food resource, especially fawns within the first 2 weeks following gestation (Gilbert 2015).

Recommendations for Activity 2.1

Continue collecting hunter harvest data and work to increase compliance with reporting requirements.

3. Habitat Assessment-Enhancement

Habitat was altered during RY15–RY19 through timber sales and precommercial thinning practices. In 2015, USFS issued the first young-growth timber sale on POW. In 2016, USFS created a plan to a transition away from old-growth logging practices. However, the lasting legacy of previous timber harvest will continue to have negative impacts on wildlife populations. Approximately, 360,000 acres of old-growth forest has been harvested on Prince of Wales. Approximately 169,000 acres are currently in the stem-exclusion stage and another 115,000 acres are close to this stage (The Nature Conservancy 2018). The stem-exclusion stage provides poor quality deer habitat, as well as poor quality hunting conditions. Access to preferred hunting locations is as important for successful harvest as having abundant deer densities (Brinkman et al. 2009), and therefore habitat changes may play a detrimental role in hunters' ability to locate deer.

Precommercial thinning can help alleviate concerns with stem exclusion. Precommercial thinning was performed in some stands (proportion is unknown) and USFS has attempted to add a wildlife component to thinning prescriptions. However, slash associated with thinning practices remains an unresolved issue. Slash creates barriers to wildlife (especially deer, the primary prey of wolves in Unit 2), and due to the additional operating cost, slash is seldom removed. These barriers may last 20–25 years, after which canopy closure again results in loss of understory plants. Extensive clear-cut logging causes thick second-growth stands that last for 150–200 years and lower carrying capacity for deer, and subsequently wolf (Brinkman et al. 2011, Alaback 1982). UAF conducted research on relationships between slash presence and deer populations in Unit 2 during this reporting period (RY16–RY20). Results are not yet available.

NONREGULATORY MANAGEMENT PROBLEMS OR NEEDS

Alaska Department of Fish and Game believes Unit 2 has one of the highest illegal and unreported harvests in the region. During 2020, law enforcement issued 27 deer hunting-related citations in 12 days between Ketchikan (Unit 1A) and Prince of Wales. These citations included taking game with artificial light, illuminating deer, shooting from a road, and hunting without deer tags (McDaniel 2020). Unreported harvest has previously been estimated to be equal to the Unit 2 reported harvest; these estimates are based on anecdotal reports, interviews with law enforcement personnel, public testimony, and deer research on POW (Person 2010).

Due to perceived competition between user groups (i.e., federally-qualified and nonfederally-qualified hunters), federal hunting regulations provide greater opportunity to federally qualified hunters in Unit 2 compared to nonfederally qualified hunters including 54 days when only federally qualified users are eligible to hunt on federal land, an either-sex season, a higher bag limit, and a season that extends through January. Additionally, federal regulations reduced the bag limit from 4 deer to 2 deer for nonfederally qualified hunters on federal lands. These regulations have caused nonfederally qualified hunters, primarily Ketchikan residents, to pursue deer hunting opportunities in other locations. This shift in hunting locations may partially be causing the reduction in hunters and harvested deer. ADF&G does not have the authority to change regulations (state or federal); however, we will continue to provide input to federal agencies on sustainable deer management and provide data to inform regulatory decisions.

Beginning in 2019, ADF&G collaborated with The Nature Conservancy, USFS, Natural Resources Conservation Service, University of Alaska Fairbanks, Tribal entities, and POW locals to set up a public event to talk about Unit 2 deer. The POW deer summit gathered people to discuss deer biology, management, research, and regulations in response to concerns about declines in harvest. The objectives of the summit were to 1) bring together scientists, land and wildlife managers, hunters, and community members to learn more about factors that influence deer populations, and 2) collectively identify the next steps that can be taken to improve understanding of the issue and support long-term healthy deer populations. The summit will occur in October 2022 and will be an opportunity to discuss factors that influence deer populations in Unit 2.

Data Recording and Archiving

Deer harvest data are stored on an internal database, ADF&G's Wildlife Information Network (WinfoNet). Datasheets and survey summaries are stored on the Ketchikan server.

Agreements

No agreements were needed to complete this work.

Permitting

No permits were required during RY16–RY20.

Conclusions and Management Recommendations

Managing Sitka black-tailed deer in Unit 2 remains a challenge. The Board of Game established a Unit 2 population objective (71,000 deer). Currently there is no feasible method for estimating the entire Unit 2 deer population. ADF&G does not know if the population objective established by BOG is being met. BOG also established a harvest objective of 2,700 deer for Unit 2. This objective was met in RY16, but not in the subsequent 4 regulatory years. Both deer harvest and the total number of hunters declined during the RY16–RY20 reporting period. However, the amount reasonably necessary for subsistence uses was met in all 5 years of the RY16–RY20 period. The combination of reduced habitat quality, robust predator populations, unreported harvest, road access, and dual state and federal management yield complex management issues.

Pellet-transect surveys and aerial alpine surveys are being discontinued to pursue camera-based methods. ADF&G conducted pellet transects in Unit 2 from 1985 to 2020 and aerial alpine surveys from 2016 to 2020. Pellet transects are insensitive to small-to-moderate population changes and are highly variable based on various parameters (e.g., snow fall, green-up phenology). Aerial alpine surveys are currently difficult to interpret and require a significant amount of work to determine their relationship to the unitwide deer population. This lack of sensitivity and unknown relationship to the unitwide population are the reason that these activities were discontinued. Camera-based methods are being implemented and tested in Region I to assess their usefulness and feasibility in determining trends in abundance. DWC biologists will be assessing whether camera-based methods are feasible in Unit 2 for long-term monitoring of the Sitka black-tailed deer population.

II. Project Review and RY21–RY25 Plan

Review of Management Direction

Management Direction

As defined in the Alaska wildlife management plans (ADF&G 1976), the primary goal for deer management in Unit 2 is to provide the greatest opportunity to participate in hunting deer. During RY16–RY20, the number of hunters and harvested deer declined in Unit 2, and hunter effort (i.e., days per deer) increased. However, Unit 2 deer harvest remains larger than other units in Region I, except Unit 4. The Southeast Alaska Subsistence Regional Advisory Council (RAC) and the local public raised concerns of reduced harvest and competition with nonlocal hunters which resulted in changes to federal regulations that reduced hunting opportunity for nonfederally qualified hunters. This was accomplished by decreasing the bag limit from 4 to 2 bucks on federal land. Local hunters and their RAC representatives were concerned that reduced harvest is caused by a reduced deer population. However, deer-pellet and aerial surveys indicated stable or increasing deer populations in most of Unit 2. The department reviewed the efficacy and quality of these 2 indices during this RY16–RY20 reporting period and decided to replace them with more cutting-edge technology and methods. These methods are being analyzed in other units, and DWC biologists will determine if they are appropriate for Unit 2. ADF&G will continue to provide the greatest opportunity to participate in hunting deer for all user groups and continue to develop methods for monitoring the deer population.

GOALS

Provide the greatest opportunity to participate in hunting deer (ADF&G 1976).

CODIFIED OBJECTIVES

Amounts Reasonably Necessary for Subsistence Uses

The Alaska Board of Game (BOG, board) set the customary and traditional use finding (5 AAC 99.025) for deer harvest in Unit 2 at 1,500–1,600 deer.

Intensive Management

There was a positive finding for deer in Unit 2 (5 AAC 92.108). The Alaska Board of Game established a population objective of 71,000 deer and a harvest objective of 2,700 deer.

MANAGEMENT OBJECTIVES

The following objective has been updated from the RY16–RY20 period:

Maintain a population that can sustain a bag limit of at least 4 bucks. If harsh winters occur, or other factors suggest a decrease in the population, submit a proposal to BOG to reduce the bag limit for deer to allow the population to rise while still allowing for some harvest.

REVIEW OF MANAGEMENT ACTIVITIES

1. Population Status and Trend

ACTIVITY 1.1 Assess camera-based methods for monitoring trends in abundance.

Data Needs

Because traditional pellet-count methods did not provide the level of accuracy needed for management, it is necessary to explore other methods. Therefore, camera-based methods will be assessed for their value in analyzing trends in deer abundance and population dynamics.

Methods

ADF&G is analyzing 2 separate camera-based methods in Southeast Alaska. One project is using cameras to assess deer abundance, sex ratios, and fawning rates on Douglas, Mitkof, and Gravina islands using the random encounter and staying time (REST) method (Nakashima et al. 2018). The second project will help assess the utility of the REST method in Southeast Alaska by using fecal DNA, collared does, and camera grids to assess deer abundance on Mitkof Island, and will not be used for long-term monitoring. Additionally, the University of Alaska Fairbanks (UAF) is assessing wolf, deer, and black bear populations in Units 1A, 1C, 2, and 3 with a large-scale camera grid. UAF will then analyze several different statistical methods including space to event (STE) and time to event (TTE; Moeller et al. 2018, Loonam et al. 2020). All 3 projects should be

completed by the end of this planning period (RY21–RY25). DWC biologists will then assess whether these methods are feasible and effective for monitoring deer in Unit 2.

2. Mortality-Harvest Monitoring

ACTIVITY 2.1 Quantify and analyze harvest data.

Data Needs

No change from the RY16–RY20 report section.

Methods

No change from the RY16–RY20 report section.

3. Habitat Assessment-Enhancement

ADF&G will comment on projects that alter habitat to suggest mitigation efforts for maintaining a harvestable surplus of deer.

NONREGULATORY MANAGEMENT PROBLEMS OR NEEDS

Data Recording and Archiving

Deer harvest data are stored on an internal database, ADF&G's Wildlife Information Network (WinfoNet). Datasheets and survey summaries are stored on the Ketchikan server.

Agreements

No agreements are anticipated.

Permitting

No permits are needed to conduct management activities during RY21–RY25.

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