Species Management Report and Plan ADF&G/DWC/SMR&P–2021–19

Deer Management Report and Plan, Game Management Unit 3:

Report Period 1 July 2011–30 June 2016, and

Plan Period 1 July 2016–30 June 2021

Richard E. Lowell

2021

Alaska Department of Fish and Game Division of Wildlife Conservation

Deer Management Report and Plan, Game Management Unit 3:

Report Period 1 July 2011–30 June 2016, and

Plan Period 1 July 2016–30 June 2021

PREPARED BY:

Richard E. Lowell
Area Wildlife Biologist

APPROVED BY:

Richard L. Nelson
Management Coordinator

REVIEWED BY:

Thomas V. Schumacher
Regional Supervisor

W. Frank Robbins
Area Wildlife Biologist

PUBLISHED BY:

Sky M. Guritz
Technical Reports Editor

Alaska Department of Fish and Game
Division of Wildlife Conservation
PO Box 115526
Juneau, AK 99811

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 Richard L. Nelson, Management Coordinator for the Division of Wildlife Conservation.

Species management reports and plans are available via the Alaska Department of Fish and Game's public website (www.adfg.alaska.gov) or by contacting Alaska Department of Fish and Game's Division of Wildlife Conservation, PO Box 115526, Juneau, Alaska 99811-5526; phone: (907) 465-4190; email: dfg.dwc.publications@alaska.gov. The report may also be accessed through most libraries, via interlibrary loan from the Alaska State Library or the Alaska Resources Library and Information Services (www.arlis.org).

Please cite this document as follows:

Lowell, R. E. 2021. Deer management report and plan, Game Management Unit 3: 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-2021-19, Juneau.

Please contact the authors or the Division of Wildlife Conservation at (907) 465-4190 if you have questions about the content of this report.

Cover Photo: Sitka black-tailed deer bucks in typical Southeast Alaska alpine habitat. ©2012 ADF&G. Photo by Stephen Bethune.

Contents

List of Figures

List of Tables

Purpose of this Report

This report provides a record of survey and inventory management activities for deer in Unit 3 during the 5 regulatory years 2011–2015 and plans for survey and inventory management activities in the following 5 regulatory years, 2016–2020. A regulatory year (RY) runs from 1 July and through 30 June (e.g., RY14 = 1 July 2014–30 June 2015). This report is produced primarily to provide agency staff with data and analysis to help guide and record agency efforts but is also provided to the public to inform it of wildlife management activities. In 2016 the Alaska Department of Fish and Game's (ADF&G, the department) Division of Wildlife Conservation (DWC) launched this 5-year report to more efficiently report on trends and to describe potential changes in data collection activities over the next 5 years. It replaces the deer management report of survey and inventory activities that was previously produced every 2 years.

I. RY11–RY15 Management Report

Management Area

Game Management Unit 3 is in Southeast Alaska, also known as Alaska's Panhandle, and is part of the Region I management area. It covers an area of approximately 3,000 square miles on islands in the central portion of the Panhandle (Fig. 1). Kupreanof, Kuiu, Etolin, Wrangell, Mitkof, and Zarembo, in descending order, are the largest islands in the unit. Smaller islands include several near the mouth of the Stikine River such as Rynda, Kadin, and Sokolof islands. Sitka black-tailed deer are widespread throughout the unit and inhabit most of the Unit 3 islands.

Elevation within Unit 3 ranges from sea level to nearly 4,000 feet. Predominant vegetative communities occurring at low-moderate elevations (less than 1,500 feet) include areas of Sitka spruce (*Picea sitchensis*), western hemlock (*Tsuga heterophylla*) coniferous forest, mixed-conifer muskeg, and deciduous riparian forests. Mountain hemlock (*Tsuga mertensiana*) dominated forest comprises a subalpine timberline band occupying elevations between 1,500–2,500 feet.

Most land area in Unit 3 is within the Tongass National Forest and under federal ownership, with smaller parcels under tribal, state, and private ownership. This area has experienced a significant amount of logging activity since the 1950s. Initial access to most hunting areas is by water. However, in many areas, once hunters arrive, extensive networks of logging roads are used for additional access to hunting areas. The communities of Petersburg, Wrangell, and Kake are located in the unit and some hunters use local road systems to access hunting areas.

Due to low deer densities in Unit 3, seasons and bag limits are more restrictive for deer compared to other island-dominated management units in Region I particularly on the Lindenberg Peninsula as well as Mitkof, Woewodski, and Butterworth islands. In addition to Sitka black-tailed deer, moose, wolves, and black bears are also present and widely distributed throughout Unit 3. A small number of brown bears also occur on Mitkof, Woewodski, and Butterworth islands separated from the mainland by short water crossings.

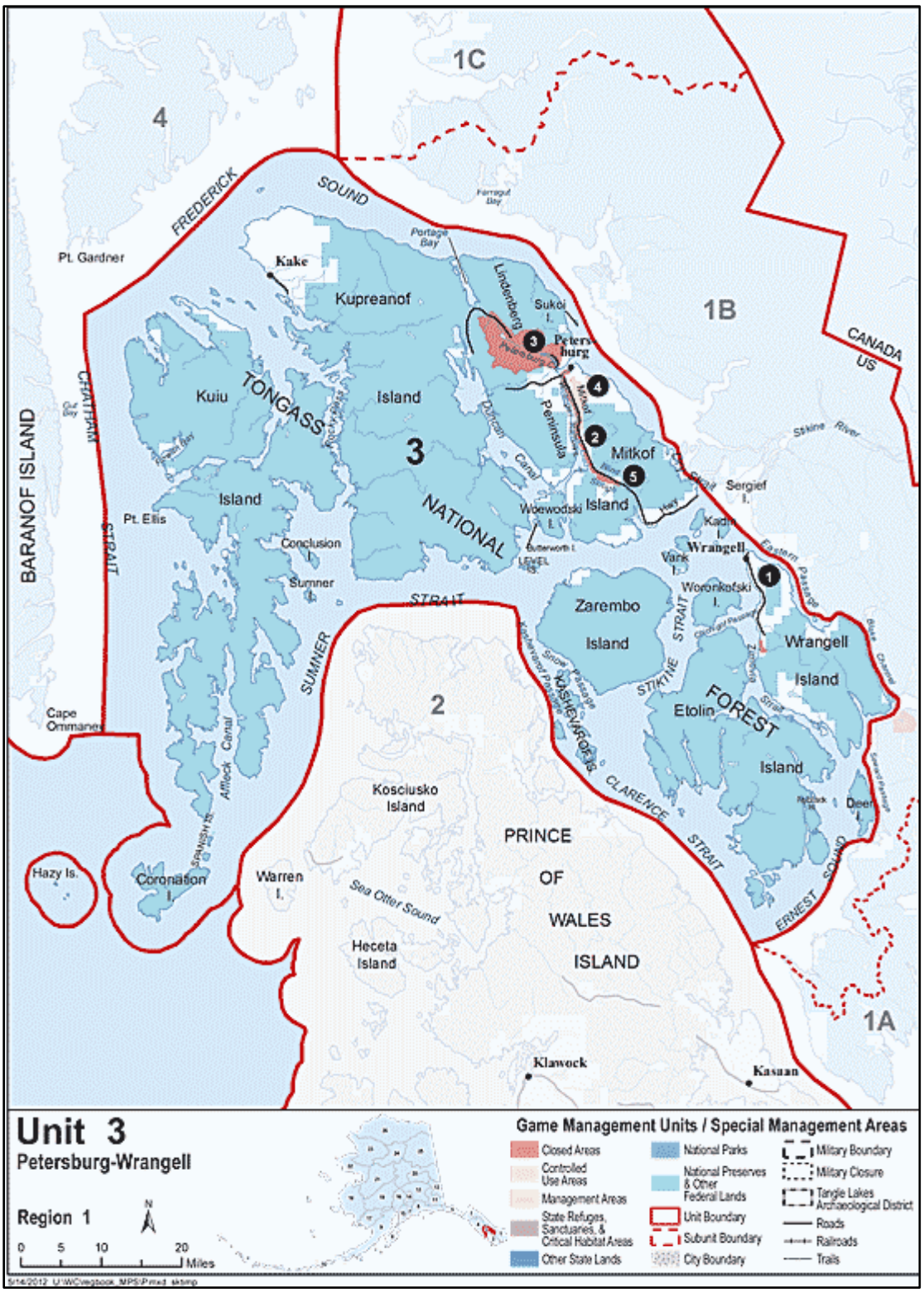

Figure 1. Map of Game Management Unit 3, Petersburg-Wrangell area, Southeast Alaska.

Summary of Status, Trend, Management Activities, and History of Deer in Unit 3

Deer populations on the Unit 3 islands have historically fluctuated with high and low extremes. Severe winter weather causes most population declines; and predation by wolves and bears and illegal hunting have extended the length of those declines resulting in prolonged periods of low deer density.

Winter weather is one of the main factors influencing deer numbers in Southeast Alaska. In the late 1960s and early 1970s, deer in Unit 3 experienced a series of severe winters that resulted in a significant population decline. The most recent significant population declines occurred as a result of a series of severe, deep-snow winters. From 2006–2009, the central Panhandle, including Unit 3, experienced 3 consecutive winters with well above average snowfall. During the winter of 2006–2007, the Petersburg and Wrangell areas broke all-time records for snowfall (229 inches for Petersburg, and 148 inches for Wrangell; NOAA 2010). The winter of 2008–2009 also resulted in above average snowpack, though not as severe as the 2 preceding winters. Heavy snow winters, such as those experienced during RY06–RY08, are thought to be primarily responsible for the most recent deer declines, while predation by wolves is suspected of forestalling recovery of the deer population.

Unit 3 has also experienced extensive habitat alterations due to clear-cut logging that exacerbate the effects of severe winters. Clear-cut logging removes productive old-growth stands that are important winter habitat for survival of deer. Productive old-growth stands are important to deer during heavy-snow winters because the dense canopy of large trees serves to intercept snowfall, thereby preventing forage plants from being covered by snow. Such stands also allow deer to move about the landscape without having to expend a great deal of energy. As more forest stands are removed by logging, deer are forced to winter among smaller remaining stands where they must compete more intensively for available forage while at the same time being made increasingly vulnerable to predation. Clear-cut logging has and will continue to reduce winter carrying capacity in Unit 3.

Regulatory history

During the early to mid-1960s deer numbers in Unit 3 appeared to be relatively stable. At that time, the deer season in this area spanned 1 August–15 December, with a bag limit of 4 deer. However, a series of severe winters in the late 1960s and early 1970s resulted in a significant population decline that led to restrictive regulations and bag limits. Beginning in 1970, Unit 3 was subdivided into 2 hunt areas (Mitkof Island and the remainder of Unit 3), with the bag limit on Mitkof reduced to 2 antlered deer. By 1973, the season in Unit 3 was further reduced to 2 months with a bag limit of just 1 antlered deer and was eventually closed altogether to deer hunting from 1975 through 1979. In 1980, the area south of Sumner Strait opened for hunting until 1987, when a limit of 1 antlered deer was permitted. In 1988, the Alaska Board of Game (board) increased the limit on Summer Straight to 2 antlered deer. In 1991, a registration permit hunt with a season between 15–31 October, and a 1 antlered deer bag limit was opened on parts of Mitkof, Kupreanof, Woewodski, and Butterworth islands, where the deer season had been

closed since 1975 (a 16-year closure). The registration permit was replaced with a harvest ticket requirement in 1995.

Since that time Unit 3 has been managed with seasons ranging from 2 weeks to 4 months, with a bag limit of 1–2 antlered deer. In spite of this male-only harvest, the deer population has remained relatively low when compared to neighboring islands, including Prince of Wales, Admiralty, Baranof, and Chichagof islands. Beginning with the 1993 hunt, the only part of Unit 3 closed to deer hunting was the area within the Petersburg and Kupreanof city limits which the board reopened in fall 2000.

At the fall 2002 Board of Game meeting, the board extended the season length and increased the bag limit for deer on the Lindenberg Peninsula, aligning the deer regulations on all of Kupreanof Island with the majority of Unit 3. In another action, the board established the Petersburg Management Area, an archery-only hunt area within the Petersburg city limits, and extended the archery-only deer season in this area by an additional 2 weeks.

As a result of declining pellet-group densities and low deer abundance in fall of 2012, the board adopted an ADF&G proposal to reduce the deer hunting season on the Lindenberg Peninsula from a 4-month season with a 2-buck bag limit, to a 2-week season with a 1-buck bag limit. As a result of this action, effective in RY13, the deer season and bag limit on Lindenberg Peninsula was once again aligned with that of Mitkof, Woewodski, and Butterworth islands as had previously been the case from RY93 to RY02. In the same action, the board amended the department's original proposal resulting in closure of the nonresident deer hunting season on Lindenberg.

Harvest history

Between RY97 and RY05, the estimated[1] annual Unit 3 deer harvest averaged 813 (range 552–961; Fig. 2). In RY05, the estimated unitwide harvest began decreasing, a trend that continued until reaching a low of 355 deer in RY08. The estimated unitwide harvest of 355 deer in RY08 was the lowest reported harvest since RY09 and well below the preceding 10-year average (RY98–RY07) of 763 deer. We believe the observed declines in estimated hunter harvest (Fig. 2) from RY04–RY08 and RY10–RY13 reflect actual declines in deer numbers. In RY09 the estimated harvest increased to 583 deer, and in 2010 increased again to 638 deer.

[1] Note that the Unit 3 deer harvest estimates and summary statistics cited here for RY97–RY10 may differ slightly from those cited in previous Unit 3 Deer Management Reports. Discrepancies between the deer harvest estimates provided in this document and those provided in previously cited documents are the result of a recently completed reanalysis and rectification of Region I deer hunter survey data and annual harvest estimates dating back to RY97.

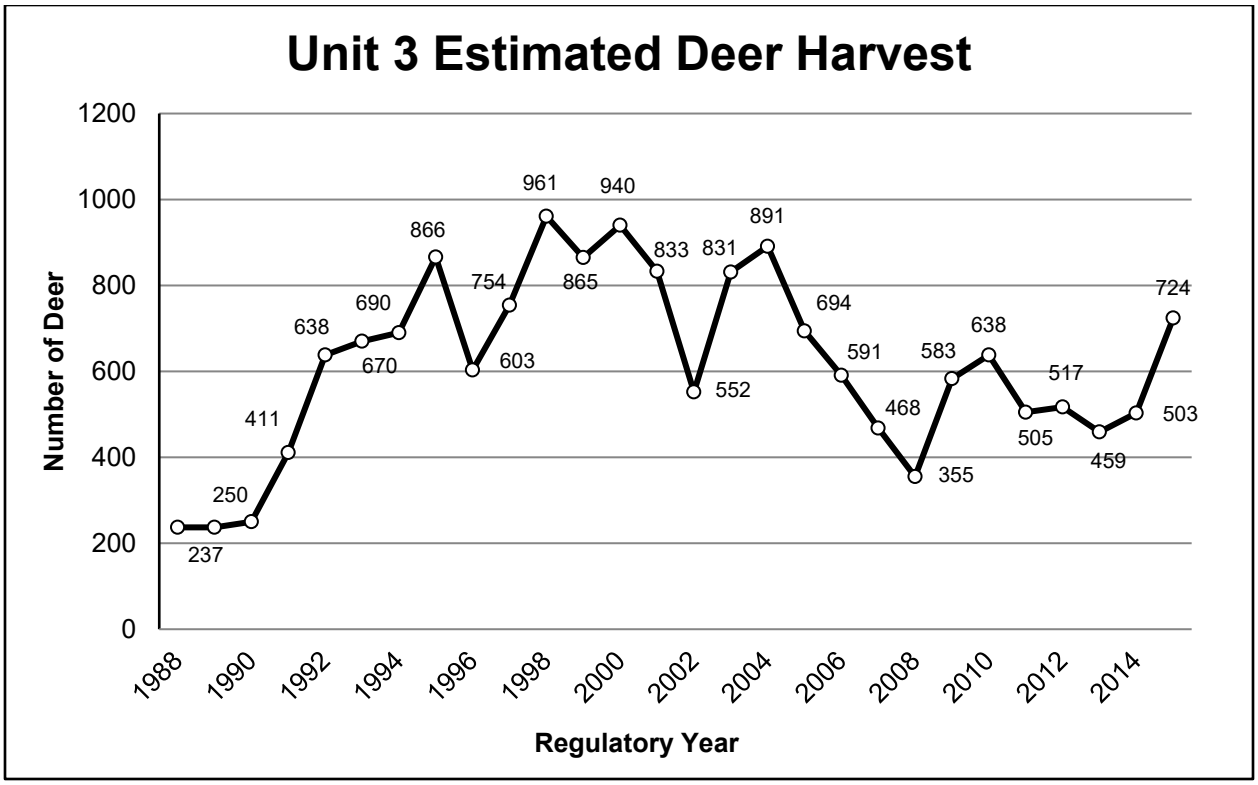

Figure 2. Estimated deer harvest, Unit 3 Southeast Alaska, regulatory years 1987–2015.

Management Direction

EXISTING WILDLIFE MANAGEMENT PLANS

Alaska Wildlife Management Plans, Southeastern Alaska, includes a deer management plan for Region I as a whole, and for the Missionary and Sherman peaks areas on Kupreanof Island in Unit 3 (ADF&G 1976). There is also a newer Strategic Plan for Management of deer in Southeast Alaska, 1991–1995 (ADF&G 1991). The deer management objectives and harvest management strategies have changed since the plan was written based on public comments, department recommendations, and board actions. These periodic changes in management planning have been reported in the division's previous periodic species management reports. The plan portion of this report contains the current management plan for deer in Unit 3.

GOALS

As established by the board during its fall 2000 meeting in response to the intensive management of game law (AS 16.05.255 (i)(4)), the management goal is to manage the Unit 3 deer population to achieve and maintain a population of 15,000 deer while maintaining an annual harvest of at least 900 deer.

CODIFIED OBJECTIVES

Amounts Reasonably Necessary for Subsistence Uses

The Amount Necessary for Subsistence (ANS) in Unit 3 (unitwide) was set by the board at 150–175 deer per year in 2000. The unitwide ANS has been consistently achieved.

Intensive Management (IM)

There was a positive finding for intensive management (5 AAC 92.106) for deer in Unit 1B by the board in 2000. The Unit 1B management goal is to maintain a population of 15,000 deer while supporting an annual harvest of 900 deer.

MANAGEMENT OBJECTIVES

- Increase deer populations on winter range (<1,500 ft elevation) to 32 deer/mi^2, measured by a mean pellet density of 1.0 pellet group/20 m^2 (22 yd^2) plot.
- Monitor deer densities using pellet-group surveys.
- Monitor harvest using hunt report cards issued in conjunction with deer harvest tickets.

MANAGEMENT ACTIVITIES

1. Population Status and Trend

Snow cover in the Petersburg area was well above average during the winters of 2006–2007, 2007–2008, and 2008–2009, including record breaking snowfall in 2006–2007 (NOAA 2010). Severe winter weather and predation by wolves are believed to be the primary factors contributing to the observed declines in the Unit 3 deer population and hunter harvest.

Relative winter deer densities are periodically measured with spring pellet-group transects in selected areas (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. Nonetheless, we believe the recent declines in pellet-group densities and the decline in the estimated unitwide harvest reflect actual declines in the unit's deer population.

ACTIVITY 1.1. Traditional pellet-group surveys.

Deer-pellet surveys have been conducted in Region 1 since 1981. Transects have been established in fixed locations within value comparison units (VCUs) for each game management unit (GMU). VCUs are U.S. Forest Service (USFS) timber management units and are roughly equivalent to a watershed. Each VCU usually has 3 transects. These transects traverse deer winter range from sea level to 1,500 feet in most cases, although some transects are flatter or more undulating and only traverse lower elevations. Transect locations were chosen based on a number of different considerations, including habitat characteristics, harvest pressure, management concerns, and accessibility. VCUs of higher management concern may be

monitored on a yearly basis, while others may only be surveyed every 2 or 3 years. Over time the monitoring of some VCUs has been abandoned in lieu of monitoring other VCUs, usually in relation to changes in management concern or habitat (such as logging).

Data Needs

Tracking trends in deer abundance in the coastal rainforest environment of Southeast Alaska presents many challenges. A reliable and cost-effective technique is needed for assessing changes in deer abundance over both the short and long term to aid deer harvest management, timber management, and wolf management programs in Southeast Alaska.

Methods

Pellet-group surveys were conducted along established transects (Kirchhoff and Pitcher 1988) during late April and early May at any of 6 sampling locations in Unit 3 (Table 1). Each VCU had 3 established transects consisting of a straight line of consecutive 1 × 20-meter (22-yard) plots running uphill from the beach fringe along a compass heading. Transects terminated either at 1,500 feet elevation or after 125 plots were sampled. Overall transect length, and the number of plots sampled varied by transect depending on topography, the distance from beach to 1,500 feet elevation, and the persistence of snow at higher elevations. A transect was terminated when snow cover approached 100% for 3 consecutive plots and persisted for the remainder of the transect.

Table 1. Estimated deer harvest, Unit 3 Southeast Alaska, regulatory years 2005–2015.

Regulatory year	Estimated legal harvest					Estimated illegal harvest[b]	Total
	M	(%)	F	(%)	Unknown	Total		
2005	694	(100)	0	–	0	694	8	694
2006	591	(100)	0	–	0	591	16	591
2007	468	(100)	0	–	0	468	0	468
2008[a]	355	(100)	0	–	0	355	5	355[b]
2009	583	(100)	0	–	0	583	4	583
2010	638	(100)	0	–	0	638	4	638
2011	505	(100)	0	–	0	505	–	505
2012	517	(100)	0	–	0	517	–	517
2013	459	(100)	0	–	0	459	–	459
2014	503	(100)	0	–	0	503	–	503
2015	723	(100)	0	–	0	723	–	723

[a] Deer harvest reports for the 2008 hunting season were not returned from residents of Kake and therefore are not included in estimates.
[b] After 2010 we no longer attempted to estimate illegal harvest.

Results and Discussion

Data were collected in 4 VCUs (Castle River, East Duncan Canal, Portage Bay, and Woewodski) to determine if pellet-group surveys were useful in tracking trends in deer abundance. These data

were compared to other methods such as harvest records (2000–2017), reports from hunters, alpine aerial deer surveys (2014–2017), and area biologists' observations.

The Castle River VCU was surveyed in 1997, 2007, and 2013, and mean number of pellet groups per plot declined from 1997 to 2007 following the severe winter of 2006–2007 but then remained low in the 2013 survey. The Castle River Unit was the only VCU located within the IM comparison area.

The East Duncan VCU, located within the IM treatment area, was surveyed in 2002 and 2008, and then each year from 2011 to 2016. Mean pellet groups per plot declined from 2002 to 2008 and again from 2008 to 2011, reflecting the period of bad winters (2006–2007 through 2009–2010). From 2011 through 2016, mean pellet groups per plot remained low and stable, even though other indices of deer population abundance (harvest data, reports from hunters, and alpine aerial deer surveys) indicated that deer numbers were rapidly increasing on Kupreanof Island during a period of mild winters.

The Portage Bay VCU, located in both the IM treatment and comparison areas, was surveyed in 1998 and then each year during 2012–2016. Mean pellet groups per plot were higher in 2012 than in 1998, but the 13-year period without surveys was so long that the trend in deer numbers could have changed several times in the intervening period. The confidence interval of the 2012 survey was also wide. From 2013 to 2016 there was no trend in mean number of pellet groups per plot, although area biologists suspected that deer numbers were increasing.

The Woewodski VCU, south Mitkof Island, was the most consistently surveyed unit in GMU 3. It is located in the IM treatment area. It was surveyed almost every year from 1984 through 2016. From 2000 to 2008, mean number of pellet groups per plot was highly variable but ranged between 1.06 and 1.63, except during 2003 and 2005 when there were 0.50 and 0.82 pellet groups per plot, respectively. Mitkof Island, Kupreanof Island and likely most of the surrounding areas had severe winters (starting in 2006–2007) and declining deer numbers, but pellet groups per plot increased in 2007 and remained relatively high in 2008 even though we strongly suspected that deer numbers were already much lower than at any time since the early 1980s. Subsequently, from 2013 through 2016 when we suspected that deer numbers were rapidly increasing, mean pellet groups per plot were low and stable and confidence intervals overlapped in all years.

Based on the results of deer pellet-group surveys in Unit 3 and other areas of Southeast Alaska since the 1980s, we believe that pellet group surveys reflect only gross differences in deer abundance between island groups and provide little useful management information.

The interpretation of pellet-group data should be done with caution, as factors other than changes in deer population size can affect deer pellet-group density. Snowfall patterns influence the distribution and density of deer pellets from year to year. Snow persisting late into the spring at elevations below 1,500 feet can limit our ability to consistently survey the same elevation zone among years. In some years, not every transect in a VCU can be surveyed, which can influence pellet-density results among years. Furthermore, comparisons over time, or from area to area, are most valid when weather conditions are similar. Pellet groups decompose more rapidly with increasing precipitation and warmer temperatures, potentially confounding comparisons. There

are also weather-related differences in deer distribution from year to year. During mild winters, deer can access forage in a variety of habitats, including logged areas that have not yet entered the stem exclusion phase. However, in severe winters, deep snow buries forage and can impede deer movements. When evaluating deer-pellet data, winter severity and snowfall patterns, the number of plots sampled from year to year, the variability in pellet-group densities, and the length of time since the last survey should be considered (McCoy 2017).

Recommendations for Activity 1.1

We recommend that traditional pellet surveys be discontinued in GMU 3 because these data provide little useful management information about deer numbers or distribution. Also, because mean pellet groups per plot often initially increase when winters are severe and deer are declining and take several years to reflect a decline if they detect it at all, the information is not timely.

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 counts), 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

During 2013 and 2014, ADF&G conducted aerial alpine deer surveys in 5 areas in central Southeast Alaska. We experimented with both morning and evening surveys and established standard methods for conducting aerial surveys for deer in the alpine. We conducted surveys from 22 July through 14 August and designed them to be approximately 2 hours in duration, ending at sunset. We selected evening surveys in preference to morning surveys because evening surveys consistently resulted in more deer observed per survey hour, and evening weather tended to be more predictable than morning weather, particularly in the case 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, surveyors attempted to classify 4 categories of deer: 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 characterization of the cause of variation in number of deer seen per survey hour. Travel time, including time between mountain blocks within a survey area greater than 2 minutes in duration was deducted from the survey time. Deer per survey hour was selected as the standard metric for deer abundance.

In 2013 and 2014, while we were still developing the survey protocol, we conducted a total of 13 aerial alpine deer surveys with a Piper Super Cub during either the first 2 hours after sunrise (6 surveys) or the last 2 hours before sunset (7 surveys), and each survey was designed to be as

close to 2 hours in length as possible. Eight of the surveys were flown in the same survey area covering most of the alpine habitat on the Lindenberg Peninsula of Kupreanof Island. This area is a popular deer hunting area for Petersburg residents, and it has 5 mountain blocks of good alpine habitat dispersed across it.

Three of the surveys conducted in 2014 were exploratory in nature and included western Kupreanof Island, Kuiu Island, and northern Prince of Wales Island (POW; Kosciusko Islands). The Kuiu survey area is an area where deer numbers have been low for more than 30 years, and the POW/Kosciusko islands survey area is an area with moderate to high deer numbers. These exploratory 2-hour surveys were conducted in part to determine if sufficient alpine habitat exists in the area to be comparable with the Lindenberg Peninsula 2-hour surveys. Another reason these were conducted were to determine if the survey technique would work in areas with low and high deer densities.

We also experimented with surveys on southern Admiralty Island, including 1 survey in 2013 and another in 2014. Wolves are naturally absent from Admiralty Island, where deer numbers typically recover within a few years following severe, deep snow winters.

In 2015, we moved from the development and experimentation phase of alpine surveys to data collection and replication to determine deer numbers and causes of variation between surveys and between survey areas. We conducted 12 surveys in 4 survey areas (Lindenberg Peninsula, Western Kupreanof Island, Kuiu Island, and Southern Admiralty Island) and used 40 hours of flying time in Piper Super Cubs.

In 2016 we conducted an additional 14 surveys in the 5 survey areas that were surveyed in previous years. We greatly expanded these surveys in 2017 and conducted 35 surveys in 9 survey areas, including 4 new survey areas (Northeast Chichagof Island, Central Prince of Wales Island, Southern Etolin Island, and a portion of the mainland from LeConte Bay to Horn Cliffs). We planned to conduct at least 25 surveys in 2016, 5 repetitions in each of the 5 survey areas previously done, but we completed only 14 surveys.

Results and Discussion

On the Lindenberg Peninsula of Kupreanof Island, during 4 surveys flown in 2013, we observed an average of 17.9 deer/hour compared to 15.5 deer/hour for the 4 surveys in 2014. There was no difference in deer/hour between the 2 years (t-statistic (t) = 0.74, P-value (P) = 0.48, degrees of freedom (df) = 6), so we combined all surveys conducted in 2013 and 2014 (combined mean = 16.7 deer/hour ±4.51 Standard Error (SE)). These data suggested that if similar variance were observed in future surveys, a difference in means of about 8 deer/hour would be significant with 95% confidence. We detected a significant increase in deer observed per hour on the Lindenberg Peninsula between 2013–2014 and 2015 from 15 deer/hour to 30 deer/hour, t = -2.85, P = 0.03, df = 3, suggesting that deer were recovering well on the Lindenberg Peninsula. The upward trend in deer numbers in the Lindenberg survey area was observed between 2013 and 2014 and in 2015, and continued through 2016 and 2017 (Fig. 3).

Observed deer numbers in the Western Kupreanof comparison area were consistently lower than in the treatment area on the Lindenberg Peninsula and there was no significant trend in numbers of deer seen (Fig. 4); however, almost all mountains of the Western Kupreanof comparison area

are rather low in elevation, less than 2,500 ft, with relatively little alpine and more habitat that is best described as subalpine muskeg. Lack of alpine habitat in the Western Kupreanof survey area probably means that the survey area is not as attractive to deer as the other 8 survey areas in Southeast Alaska, and that it makes a poor comparison area for Lindenberg survey area.

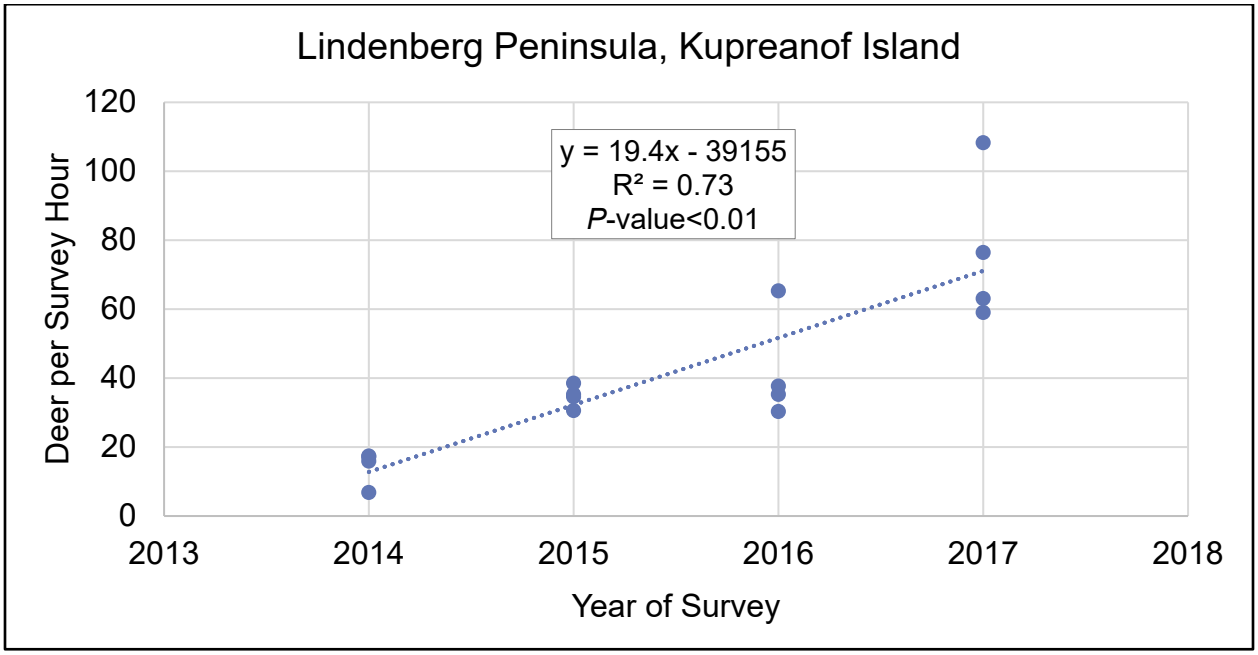

Figure 3. Trend in deer observed/hour, Lindenberg Peninsula, 2014–2017, Unit 3, Southeast Alaska.

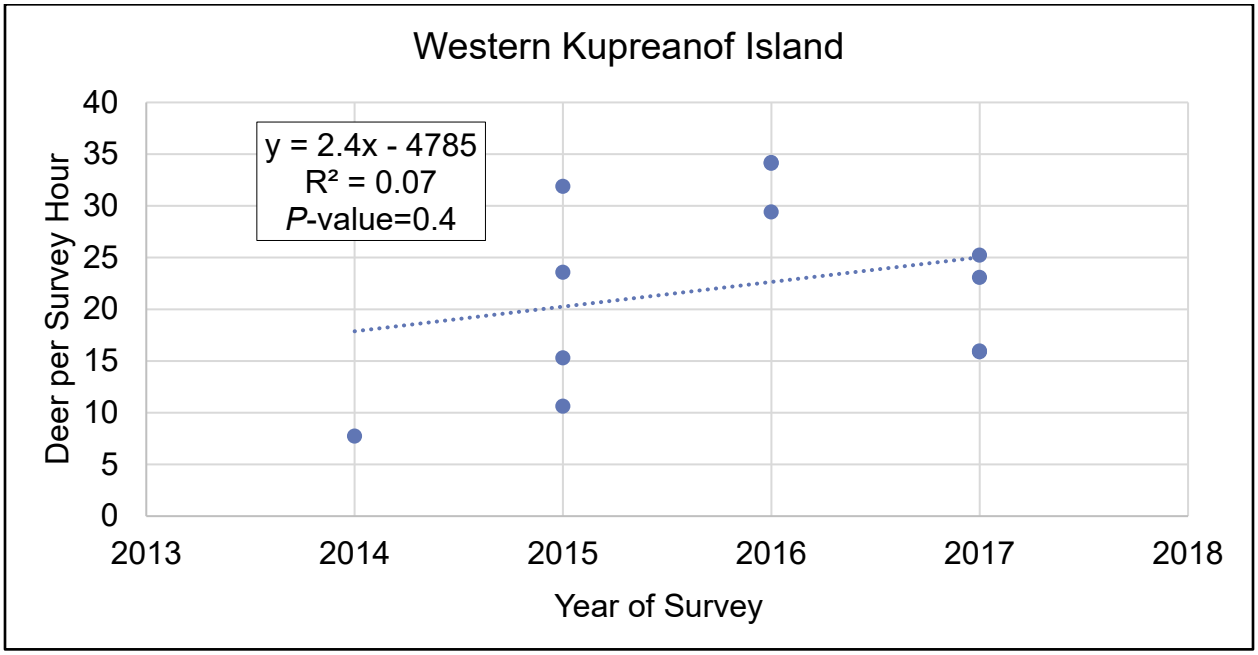

Figure 4. Trend in deer observed/hour, Western Kupreanof Island, Unit 3, Southeast Alaska, 2014–2017.

The 3 surveys conducted on northern Kuiu Island appeared to confirm anecdotal reports that deer numbers on the island continue to be low. However, the first 2 surveys conducted on Kuiu in 2014 were morning surveys and the one 2015 evening survey was terminated 98 minutes prior to sunset, so it was not conducted according to the standardized survey protocol. We were finally able to survey Kuiu Island thoroughly using the standardized protocol in 2017. Although deer numbers were found to be low compared with all other alpine aerial survey areas, there are more deer on the island than the initial nonstandardized surveys reflected (Fig. 5).

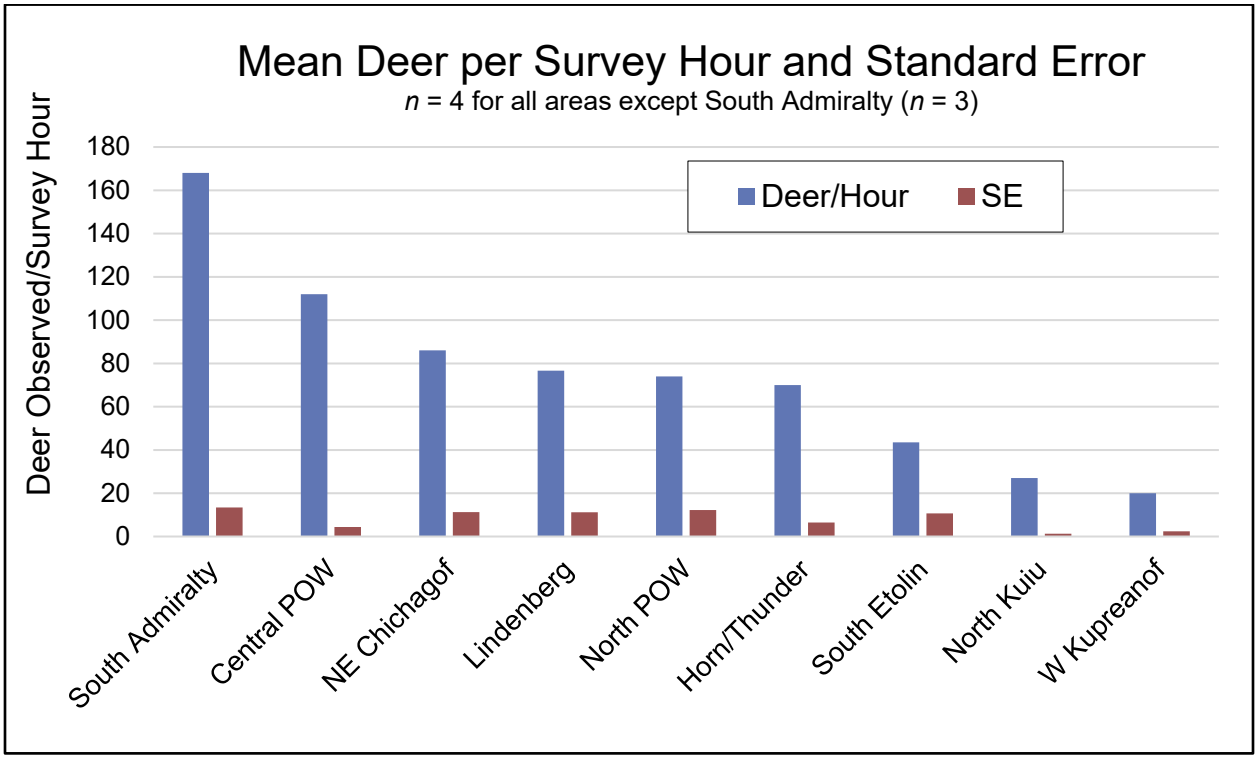

Figure 5. Deer observed/hour for 9 survey areas in Southeast Alaska, 2017.

Deer numbers observed in the Southern Admiralty Island survey area were consistently higher than in any other survey areas (Fig. 5). Reports from hunters indicate that deer numbers were high and increasing on Admiralty Island. During 2016 and 2017, we saw at least 5 individual white deer, including 1 large white buck. White deer were not seen in any other survey areas, although there has been an occasional report of white deer on Chichagof and Baranof Islands.

We found easily observed differences in the amount and apparent quality of alpine deer habitat in all survey areas. The best and most extensive alpine habitat particularly favored by deer appeared to be on the Lindenberg Peninsula and Kuiu Island, and of all survey areas these appeared to have the most comparable alpine habitat. Southern Admiralty, although it has the highest terrain of all survey areas, is rocky (granite) and relatively steep compared to Lindenberg and Kuiu islands. The northern Prince of Wales Island (POW)/Kosciusko Island survey area is also rocky (limestone) with stunted trees extending to the top of many mountains. Only 3 small mountains with suitable alpine deer habitat are present in this survey area, including 2 on northern POW and 1 on Kosciusko, and most deer were seen in these locations.

In view of the observable differences in habitat, comparing deer numbers in the Lindenberg (IM treatment area) survey area to deer numbers in the western Kupreanof (IM comparison area) is not justified. However, it may be useful to compare trends within those areas. The low observed variance on the Lindenberg survey area suggests that before and after comparisons will likely have enough statistical power to detect differences in means of about 8 deer/hour. In 2015, we surveyed both the Lindenberg and West Kupreanof survey areas with 4 replicates each and still found the within area variation in deer per hour to be relatively low (SE = 4.9 on Lindenberg Peninsula, and SE = 4.5 on western Kupreanof).

Although we obtained 3 replicate surveys on Admiralty in 2015, all surveys were terminated 38–75 minutes before sunset, which is too long to be useful for analysis of variance. The 1 survey conducted on Kuiu in 2015 was terminated 98 minutes before sunset.

The Lindenberg and Horn/Thunder deer survey estimates in 2017 provide a strong indication that the deer population has recovered from the hard winters that occurred during 2006–2010. This is the most apparent on the Lindenberg Peninsula of Kupreanof Island and on the adjacent mainland in Unit 1B. On northern Prince of Wales Island, and northeast Chichagof Island, deer are at higher densities most years compared to Units 3 or 1B. Deer estimates track well with harvest data from these areas (Fig. 1).

The deer surveys on Kuiu Island indicate that deer population may be recovering from the ongoing reported population decline that had been occurring since the mid-1970s after very severe winters in the early 1970s (Fig. 5). Deer survey counts from the alpine aerial surveys on Kuiu Island were still the lowest of the true alpine survey areas.

Alpine aerial surveys return faster results, before hunting season, with more useful information compared to pellet group surveys. To confirm these findings, alpine aerial surveys should be conducted through the next period of severe winters to determine how quickly the technique will detect declines in deer populations.

Deer in alpine areas may be influenced by temperature and weather that follows extensive periods of rain. We collected information on temperature at 3,000 feet elevation and noted whether surveys were conducted immediately following rainy periods. We plan to analyze the data from 2013 through 2017 using regression modeling to determine which covariates may influence deer numbers observed in aerial alpine surveys.

In addition to their potential value as an index of deer numbers, we found that alpine deer surveys may also serve as an index to black bear numbers. This would be possible if suitable areas of alpine habitat were available, and surveys were conducted before 25 July. Timing is important because black bears appear to abruptly abandon alpine habitat in favor of stream bottoms when salmon become available.

Recommendations for Activity 1.2

We recommend continuing Activity 1.2 to conduct aerial alpine surveys in the Lindenberg Peninsula, Western Kupreanof Island, Kuiu Island, and Horn/Thunder survey areas. If severe winters occur, aerial alpine survey effort should be increased to determine if these surveys detect declines in deer numbers.

A logistic regression model should be developed to explore the influence of environmental, pilot/aircraft, and other covariates on deer/survey hour. Such a model could have the potential to provide correction factors for annual surveys to improve tracking of deer abundance.

A research project should be initiated to determine how far deer move from alpine areas where they are being surveyed.

2. Mortality-Harvest Monitoring and Regulations

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

Prior to 2011, we estimated Unit 3 harvest data from a regional questionnaire, mailed to a random sample of 33% of deer harvest ticket holders. However, since 2011, deer harvest data have been derived from mandatory hunt reports issued in conjunction with deer harvest tickets.

Data Needs

With a positive customary and traditional finding, an established ANS, and an IM harvest objective, the Unit 3 deer harvest must be assessed annually to evaluate achievement with these objectives.

Methods

Since 2011, deer harvest data have been derived from mandatory hunt reports issued in conjunction with deer harvest tickets, rather than by 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, in order to obtain total harvest estimates the reported harvest must still be multiplied by an expansion factor to account for those that did not respond.

Mandatory hunt reports often provide vague hunt or harvest locations on in which case an attempt is made to contact them for more precise location data. A cutoff date of 15 June was established for receipt of hunt reports. Any hunt reports that were not submitted by 15 June were excluded from analysis. Summaries of total harvest, hunter residency and success, harvest chronology, and transportation methods were derived for each unit.

Seasons and Bag Limits

Area description	Bag limit	Resident	Nonresident
Regulatory years 2010–2013			
Mitkof Island, the Petersburg Management Area (archery-only)	2 bucks	15 Oct–15 Dec	15 Oct–15 Dec
Remainder of Mitkof Island, Woewodski and Butterworth islands	1 buck	15 Oct–31 Oct	15 Oct–31 Oct
Remainder of Unit 3	2 bucks	1 Aug–30 Nov	1 Aug–30 Nov
Regulatory years 2014–2015			
Mitkof Island, the Petersburg Management Area (archery-only)	2 bucks	15 Oct–15 Dec	15 Oct–15 Dec
Remainder of Mitkof Island, Woewodski and Butterworth islands	1 buck	15 Oct–31 Oct	15 Oct–31 Oct
That portion of Kupreanof Island on the Lindenberg Peninsula east of the Portage Bay – Duncan Canal Portage	1 buck	15 Oct–31 Oct	No open season
Remainder of Unit 3	2 bucks	1 Aug–30 Nov	1 Aug–30 Nov

Results and Discussion

Harvest by Hunters

During this report period, the estimated deer harvest in Unit 3 average 541 deer per year ranging from a low of 459 in RY13 to a high of 723 in RY15. The average annual harvest during the RY06–RY10 was slightly lower with 527 deer per year and with a range of between 335 and 638 deer per year (Table 1).

The number of deer hunters averaged 797 hunters per year with a range of 697–889 in Unit 3 during RY11–RY15. This was slightly more than RY06–RY10, which had an average of 744 deer harvested per year and a range of between 612 and 1,051 deer per year. The 889 hunters that pursued deer in RY15 represent the greatest effort in the unit since RY06 (Table 2).

Of the Unit 3 islands, the highest deer harvest during the report period was on Zarembo Island which averaged 216 deer per year, followed by Etolin Island which averaged 98 deer per year, and Kupreanof Island which averaged 70 deer per year.

Table 2. Unit 3 deer hunter residency and success, Southeast Alaska, regulatory years 2005–2015.

	Successful						Unsuccessful						
Regulatory year	Local resident[a]	Nonlocal resident	Nonresident	Unknown	Total	(%)	Local resident[a]	Nonlocal resident	Nonresident	Unknown	Total	(%)	Total hunters
2005	398	53	5	2	458	(52)	350	59	16		425	(48)	883
2006	312	65	35		412	(39)	596	34	9		639	(61)	1051
2007	277	27	0		304	(42)	349	63	15		427	(58)	731
2008	197	30	5		232	(38)	321	31	27		379	(62)	611[b]
2009	211	26	6		243	(40)	334	21	7	7	369	(60)	612
2010	284	69	13		366	(51)	281	43	7	16	347	(49)	713
2011	315	39	9		363	(52)	272	43	18	1	334	(48)	697
2012	316	31	12	4	363	(45)	361	54	30	6	451	(55)	814
2013	277	53	5	3	338	(42)	353	80	33	2	468	(58)	806
2014	309	36	12		357	(46)	326	69	25		420	(54)	777
2015	459	43	8		510	(57)	316	45	18		379	(43)	889

[a] Residents of Units 1B, 3, Meyers Chuck, Point Baker, and Port Protection.
[b] Deer harvest survey reports for the 2008 hunting season were not returned from residents of Kake.

Hunter Residency and Success

The overall success rate for Unit 3 deer hunters averaged 48% during this report period, ranging from a low of 42% in RY13 to a high of 57% in RY15. As is generally the case, local residents represented the largest group of both successful and unsuccessful hunters. During the report period, the overall success rate for local residents was 51%, nonlocal Alaska residents was 41%, while nonresidents had an overall success rate of 27% (Table 2). Deer populations are greater and seasons and bag limits more liberal in other nearby units, therefore, those areas tend to attract more nonlocal residents and nonresident hunters.

Harvest Chronology

While harvest chronology can vary somewhat from year to year, generally the months with the highest to lowest harvest, respectively, are November, October, August, and September (Table 3).

Table 3. Unit 3 deer percentage of harvest by month, Southeast Alaska, regulatory years 2005–2015.

Regulatory year	Harvest periods										Total deer[a]
	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	Unknown	
2005	16	5	32	37	0	0	0	0	0	10	695
2006	22	6	32	36	0	0	0	0	0	4	591
2007	13	6	22	55	0	0	0	0	0	4	467
2008	24	12	20	38	1	0	0	0	0	6	356[b]
2009	13	6	15	60	0	0	0	0	0	6	585
2010	15	9	24	44	2	0	0	0	0	5	639
2011	16	9	20	51	2	0	0	0	0	2	506
2012	16	6	19	56	2	0	0	0	0	1	518
2013	12	7	26	52	1	0	0	0	0	1	458
2014	15	8	25	50	0	0	0	0	0	1	503
2015	17	4	35	43	0	0	0	0	0	0	723

[a] May not equal harvest table due to rounding or incomplete reporting.
[b] Deer harvest reports for the 2008 hunting season were not returned from residents of Kake.

Transport Methods

As a result of decades of forest management activities all the major islands in Unit 3 have extensive road systems that provide highway vehicle and 4-wheeler access. During RY11, most Unit 3 deer hunters reported using highway vehicles to access their deer hunting areas, followed by boats, and then 4-wheelers; except in RY11, where 48% of hunter effort was by boat which was more than highway vehicles (27%) that year (Table 4).

Table 4. Unit 3 deer hunter percentage days of effort by transport method, regulatory years 2005–2015, Southeast Alaska.

Regulatory year	Airplane	Boat	3- or 4-wheeler	Foot	Highway vehicle	ORV[a]	Other	Unknown	Days of effort
2005	2	34	5	2	57	0	0	0	3,596
2006	2	25	1	1	70	0	0	0	6,661
2007	0	43	2	1	49	0	0	4	3,532
2008[b]	2	44	0	5	47	0	0	3	3,180[b]
2009	1	47	0	1	50	0	0	0	2,798
2010	0	33	0	3	55	7	0	1	3,834
2011	1	48	9	5	27	2	0	7	3,104
2012	2	35	10	5	43	3	0	0	4,003
2013	3	32	9	3	46	4	1	2	4,523
2014	1	35	9	2	49	1	0	1	3,512
2015	2	28	6	3	54	6	0	1	4,638

Note: Transport is reported in the hunter mail survey reports as "total number of hunting trips by method." It has been changed here to "days of effort."

[a] Off-road vehicle (ORV).

[b] Deer harvest reports were not submitted from residents of Kake in 2008.

Other Mortality

In addition to mortality resulting from legal hunting, other sources of deer mortality include predation by wolves and bears, poaching, deer-vehicle collisions, injury, accidents, and other natural causes (e.g., starvation). Poaching of deer undoubtedly occurs in Unit 3, but it is not known how prevalent it is. We have no estimates of nonhunting mortality during this report period.

Alaska Board of Game Actions and Emergency Orders

No emergency orders were issued regarding deer hunting in Unit 3 during this report period.

Recommendations for Activity 2.1

Continue.

3. Habitat Assessment-Enhancement

No attempt has been made to assess or enhance habitat in Unit 3 specifically for deer during this report period.

NONREGULATORY MANAGEMENT PROBLEMS OR NEEDS

Federally qualified residents of Petersburg, Wrangell, and Kake can hunt under either state or federal subsistence hunting regulations. Under the federal designated hunter provision, federally qualified users can harvest deer on behalf of an unlimited number of qualified beneficiaries. Unlike the state proxy hunting system, the federal designated hunter program has no age or disability requirements for beneficiaries. As a result of this provision, the state's individual bag

limits are somewhat ineffective, making season length the most effective tool for limiting harvest to within sustainable limits.

Data Recording and Archiving

- Records and data analysis related to deer pellet-group surveys are archived on network servers in the Douglas, Region I office.
- Data derived from deer hunt reports, including annual harvest summaries are archived electronically in ADF&G's Wildlife Information Network database (WinfoNet).
- Aerial alpine survey data and records are stored electronically on the Petersburg area biologist's desktop computer hard drive and backed up on the network server.

Agreements

ADF&G and the U.S. Fish and Wildlife Service, Office of Subsistence Management have agreed to management both state and federal deer hunting in Unit 3 using state harvest tickets and concurrent season dates and bag limits.

Permitting

None.

Conclusions and Management Recommendations

With the possible exception of a few small islands, Unit 3 deer continue to exist largely at levels well below carrying capacity. In RY05, the estimated unitwide harvest began a decreasing trend that continued until reaching a low of 355 deer in RY08. The estimated harvest of 355 deer in RY08 was the lowest reported Unit 3 deer harvest since RY90 and well below the preceding 10-year average (RY98–RY07) of 763 deer. The estimated unitwide deer harvest rebounded to 638 in RY10 before declining again to 459 in RY13. The harvest increased to 503 in RY14, and further increased to 724 in RY15 indicating that the Unit 3 deer population, aided by a series of mild winters, is now increasing.

Factors potentially contributing to earlier declines in the Unit 3 deer population and harvest include a series of deep-snow winters (RY06–RY08), predation by wolves and bears, and continued reductions in deer carrying capacity resulting from the harvest of productive old-growth stands that are important for overwinter survival, and second-growth stands entering stem exclusion. Increased road densities associated with forest management activities have improved hunter access making deer more vulnerable to human-caused mortality where deer home ranges intersect roads.

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 (±30%) in deer density years after changes in deer numbers have occurred, and only allow general comparisons of deer numbers from area to area within Southeast Alaska. The technique

is generally considered of limited use for assessing small, short-term changes in deer density. In the late-summer of 2013 and 2014, we experimented with aerial alpine deer surveys in an effort to develop a more reliable method of accurately assessing relatively small, short-term (1–2 years) changes in deer abundance. Research is needed to further evaluate deer population trends in Unit 3 and to evaluate the respective roles weather, predation, and clear-cut logging play in influencing deer populations.

II. Project Review and RY16–RY20 Plan

Review of Management Direction

MANAGEMENT DIRECTION

GOALS

The management goal is to manage the Unit 3 deer population to achieve and maintain a population of 15,000 deer while maintaining an annual harvest of at least 900 deer.

CODIFIED OBJECTIVES

Amount Reasonably Necessary for Subsistence Uses

The unitwide amount necessary for subsistence (ANS) in Unit 3 was set by the board at 150–175 deer per year in 2000. The unitwide ANS has been consistently achieved.

Intensive Management

There was a positive finding for intensive management (5 AAC 92.106) for deer in Unit 3 by the board in 2000. The Unit 1B management goal is to maintain a population of 15,000 deer while supporting an annual harvest of 900 deer.

MANAGEMENT OBJECTIVES

- Increase deer populations on winter range lower than 1,500 ft elevation to 32 deer/mi^2, measured by a mean pellet density of 1.0 pellet group/20 m^2 (22 yd^2) plot.
- Monitor deer densities using pellet-group surveys.
- Monitor deer harvest using mandatory hunt report cards issued in conjunction with deer harvest tickets.

REVIEW OF MANAGEMENT ACTIVITIES

1. Population Status and Trend

ACTIVITY 1.1. Traditional pellet-group surveys.

Data Needs

No change from RY11–RY15 report.

Methods

No change from report.

ACTIVITY 1.2. Alpine deer surveys.

Data Needs

No change from RY11–RY15 report.

Methods

The aerial alpine deer surveys initiated in 2012 should be continued. At least 4 replicate surveys in the Lindenberg survey area, and at least 4 replicate surveys in all other survey areas should be conducted to further characterize the variability of observed mean deer per hour in areas with high, medium, and low deer densities. For consistency, all surveys should be conducted during the last 2 hours of the day with the survey ending at approximately sunset. Areas that have been identified by area biologists as being important to survey include, from north to south: Northeast Chichagof Island, Southern Admiralty Island, Kuiu Island, Western Kupreanof Island, Lindenberg Peninsula of Kupreanof Island, Horn Cliffs and Thunder Mountain, northern Prince of Wales Island, central Prince of Wales Island, and southern Etolin Island.

2. Mortality-Harvest Monitoring

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

Data Needs

No change from RY11–RY15 report.

Methods

The usefulness of information obtained from hunt harvest reports could be improved by increasing hunter response rates which are currently around 66%, and by conducting follow-up surveys of nonresponders to evaluate the effects of bias regarding unreported hunts.

3. Habitat Assessment-Enhancement

ACTIVITY 3.1. Use GIS to assess current deer habitat capability (DHC) in Unit 3 and quantify reductions in DHC resulting from decades of forest management activities.

Data Needs

The Unit 3 landscape has been altered considerably by decades of forest management which has caused a reduction of deer habitat in the unit. Logging-related reductions in south facing high-volume old-growth forests, which are important for deer overwinter survival and regeneration of second-growth stands have likely contributed to the recent decline in deer population abundance. As a result, timber harvest poses the most serious long-term threat to deer habitat.

Methods

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

NONREGULATORY MANAGEMENT PROBLEMS OR NEEDS

Data Recording and Archiving

- Electronic copies of harvest ticket overlays are stored electronically in WinfoNet.
- Hunt reports are retained in the Petersburg area office in hard copy and stored electronically in WinfoNet.
- Harvest data and summary statistics are stored electronically in WinfoNet.
- Data related to aerial alpine surveys are stored electronically on area biologist desktop computer and backed up on the network server; H:relowell (\\dfg.alaska.local\home\Petersburg).

Agreements

No change from RY11–RY15 report.

Permitting

None.

Acknowledgements

Brad Scotton, Mark Keech, Douglas Larsen, and Patrick Valkenburg safely piloted alpine survey flights. Special thanks to David Benitz, Stephen Bethune (ADF&G), Vera Goudima (ADF&G), Greg Einarson, Chris Ford (ADF&G), Patrick Fowler (ADF&G), Tina Laird, David Randrup,

Stephanie Sell (ADF&G), Ryan Scott (ADF&G), Sable Scotton, Toby Valkenburg, and Hilary Wood (ADF&G) who acted as observers and data recorders during alpine survey flights.

References

Alaska Department of Fish and Game (ADF&G). 1976. Alaska wildlife management plans: Southeastern Alaska. Draft proposal; subsequently approved by Alaska Board of Game. Federal Aid in Wildlife Restoration, Project W-17-R, Juneau.

ADF&G. 1991. Strategic plan for management of deer in Southeast Alaska, 1991–1995, population objectives. Division of Wildlife Conservation, Juneau.

Alaska Department of Fish and Game. 2012. Feasibility assessment for increasing sustainable harvest of Sitka black-tailed deer in a portion of Game Management Unit 3. Division of Wildlife Conservation, Juneau.

Alaska Department of Fish and Game. 2013. Operational plan for intensive management of Sitka black-tailed deer in a portion of Game Management Unit 3. Division of Wildlife Conservation, Juneau.

Hanley, T. A., D. E. Spalinger, K. J. Mock, O. L. Weaver, and G. M. Harris. 2012. Forage resource evaluation system for habitat—deer: An interactive deer habitat model. U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station, Gen. Tech. Rep. PNW-GTR-858, Portland, Oregon.

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.

McCoy, K. 2017. Sitka black-tailed deer pellet-group surveys in Southeast Alaska, 2016 report. Alaska Department of Fish and Game, Division of Wildlife Conservation, Wildlife Management Report ADF&G/DWC/WMR-2017-2, Juneau.

National Oceanic and Atmospheric Administration (NOAA). 2010. National Weather Service, Alaska. Alaska Climate Database. https://www.ncdc.noaa.gov/climate-information/statistical-weather-and-climate-information (Accessed January 2010).


ALASKA
DEPARTMENT OF FISH AND GAME