DEER TRAILS

Issue 1 Spring 2009 News from the Alaska Department of Fish and Game

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Southeast wildlife newsletter revived!

The Alaska Department of Fish and Game, Division of Wildlife Conservation had for many years produced a regional newsletter, which had gone by the wayside. This first edition of "Deer Trails" is our attempt to revive the publication under a new name with a fresh face. This newsletter has been created to provide current wildlife news for interested readers throughout the Southeast region. While there are a variety of wildlife related issues and projects that we'd like to share with you, it seemed appropriate to begin this series with a newsletter focused on Sitka black-tailed deer, since a large number of households in Southeast Alaska use deer for food, recreation or cultural reasons.

We are mailing out copies to those of you who responded to our deer hunter surveys, and to also share the results of this past year's harvest surveys. We want to particularly thank those of you who responded to the deer harvest surveys, as your contributions of information are important to good deer management. This newsletter will be made available at all of the ADF&G area offices as well as over the counter at several locations where hunting licenses are sold.

In addition to the harvest surveys, there are a number of management related issues and current research projects underway that are highlighted in this publication. We hope you will find all of the articles to be of interest to you, and we look forward to hearing your input about topics you'd like to see addressed in future issues of this newsletter. Please send your ideas and feedback to: ADF&G Wildlife Education Specialist, Kristen Romanoff at kristen.romanoff@alaska.gov or by phone (907) 465-4292.

You may also want to check out the Department's online magazine, "Alaska Wildlife News" at www.wildife.alaska.gov. This monthly publication addresses wildlife related topics and highlights ADF&G staff and projects across the state.

Snapshots From the 6th Annual Deer Celebration

This educational event is held each year in Craig, Alaska on Prince of Wales Island. Blending culture and science, a wide variety of activities are offered to school groups from across the island. An evening feast with a keynote speaker and performances by local dancers finish out the day's celebration. The Craig Community Association coordinates this event in partnership with ADF&G, USFS Craig and Thorne Bay Ranger Districts, Alaska State Troopers, SE Regional Health Consortium and the U.S. Environmental Protection Agency.

Steve Bethune, ADF&G wildlife biologist, teaches students about firearm safety

Mason (left) and Reuben Hoppe (right) during Hunting Song

Matthew Macasaet uses bow in the Hunting Song

Larry Dickerson, USFS wildlife biologist and Lynn Dickerson teach predator/prey dynamics

Photos Courtesy of Jessi Dubray, Craig Community Association

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News about deer biology, management and current research projects in Southeast

Natural History of Deer in Southeast Alaska

Range and general description

The Sitka black-tailed deer- a subspecies of the mule deer- is endemic to and widely distributed along the narrow coastal band of northern British Columbia and Southeast Alaska. The natural range of Sitka black-tailed deer in both British Columbia and Southeast closely overlaps the distribution of the coastal temperate rainforest. It is the most common and widespread large mammal of the Alexander Archipelago in Southeast Alaska.

The Sitka blacked-tailed deer is smaller, stockier, and has a shorter face than other members of the black-tailed group. The reddish-brown summer coat is replaced by dark gray-brown in winter. Bucks average about 120 lb. (54 kg), while does average about 80 lb (36 kg). These small sturdy deer have relatively small, dark brown antlers. The number of antler points is not a reliable factor in aging deer, but in general, yearling black-tails have unbranched spikes. Normal adult antler development is three points (including eye guard) on each side.

Life history

Fawns are born in late spring, after a gestation period of six to seven months. Fawns from the previous year (yearlings) are left behind when a doe is ready to give birth. A doe will even drive the yearlings off by kicking them. For yearling males, this separation may be final. Yearling females often rejoin the doe within days or a week, once the fawns are born.

After the winter snow pack recedes, deer disperse; migratory deer move to high elevation alpine/subalpine habitats while resident deer remain at lower elevations throughout the forest. Summer and early fall are periods of active foraging as deer accumulate fat reserves which will help them through the winter and early spring. With the first heavy frost, deer in the higher alpine and subalpine descend to the upper forest.

The breeding season (or rut) peaks during late November. Breeding bucks spend little time foraging and by late November have used up much of their fat reserve. On the other hand, does generally enter December in prime condition. Does breed during their second year of life and continue producing fawns annually until they are 10 or 12 years old. Prime age does (5 to 10 years) typically produce two fawns annually. Reproductive success decreases rapidly beyond 10 or 12 years. By age 15, which is probably the maximum life expectancy, reproduction has essentially ceased.

Home range

Summer and winter home range areas average about 380 acres in Southeast Alaska. A radio-collared deer on Admiralty Island uses a home range of about 200 acres. Migratory deer have larger annual home ranges than resident deer. The average distance between summer and winter home ranges is fives miles for migratory deer and half a mile for resident deer. Movement of deer between watersheds appears to be minimal during winter.

Distribution and abundance

Sitka black-tailed deer are naturally distributed throughout most of Southeast south of Berner's Bay and Cape Spencer. Their range has been expanded by transplants and established populations now also exist near Yakutat (1934), Sullivan Island in Lynn Canal (1951-54), Prince William Sound (1916) and on Kodiak and Afongnak islands (1924-34). In Southeast, deer occur on most islands of the Archipelago, except offshore islands like Forrester, Hazy and St. Lazaria and most islands within Glacier Bay. Even many small islands (<200 acres) adjacent to larger islands often have transient deer populations.

Deer populations fluctuate dramatically throughout Southeast depending largely on the severity of the winters. Deer numbers are also vary greatly depending on habitat conditions, landscape features and the number of predators. Mainland populations of deer are generally lower than island population, because of more severe winter snow conditions and less productive forest habitat.

Predator-prey interactions

The major predators of deer in Southeast are wolves (*Canis lupus*), black bears (*Ursus americanus*) and brown bears (*Ursus arctos*), all of which occur throughout the Southeast mainland. Wolves prey mostly on adult and yearling deer, although fawns may be eaten. Bears mostly prey on fawns, particularly neonates (deer within a few days of birth). Based on data from 216 radio-collared deer on Prince of Wales, Heceta and Mitkof Islands, hunters kill approximately 10-15%, wolves kill 5-10% and black bears kill about 15-20% (mostly fawns) of the deer population annually. However, those rates of mortality combined with conservative estimates of reproduction indicate that deer populations would continue to grow despite losing more than half of the fawn population each year.

Certainly the numbers of wolves and bears relative to the number of deer are factors affecting predator-prey dynamics. However, weather conditions, habitat quality and landscape features also play roles that are often more important. For example, muskegs and logged watersheds usually contain small forested patches that attract deer during winters with snow. Deep snow hinders deer movement, and deer remain in those small patches making them more vulnerable to predation. During mild winters, deer may do well eating vegetation on the edges of forest patches where they can move about, enabling them to escape pursuit by wolves more easily. Consequently, winter weather conditions combine with landscape feautures and habitats to raise or lower the risk of predation regardless of how many wolves are present.

Significance to the region

The Sitka black-tailed deer is the most-pursued species of big game in Southeast Alaska. During the 20 years from 1987 to 2007, there has been an average annual harvest of 12,334 deer. Deer hunting is an important and highly valued recreational and food-gathering activity throughout most of Southeast where deer are abundant. Deer are also an important resource for subsistence hunting. Of 20 subsistence communities in Southeast, 90% of households, on average, harvested subsistence resources. Deer made up, on average, 23.6% of subsistence food in those households (USFS 1997; Kruse and Frazier 1988).

By Dave Person, ADF&G Biologist and Matt Kirchhoff, retired ADF&G Biologist, Photos by ADF&G Staff

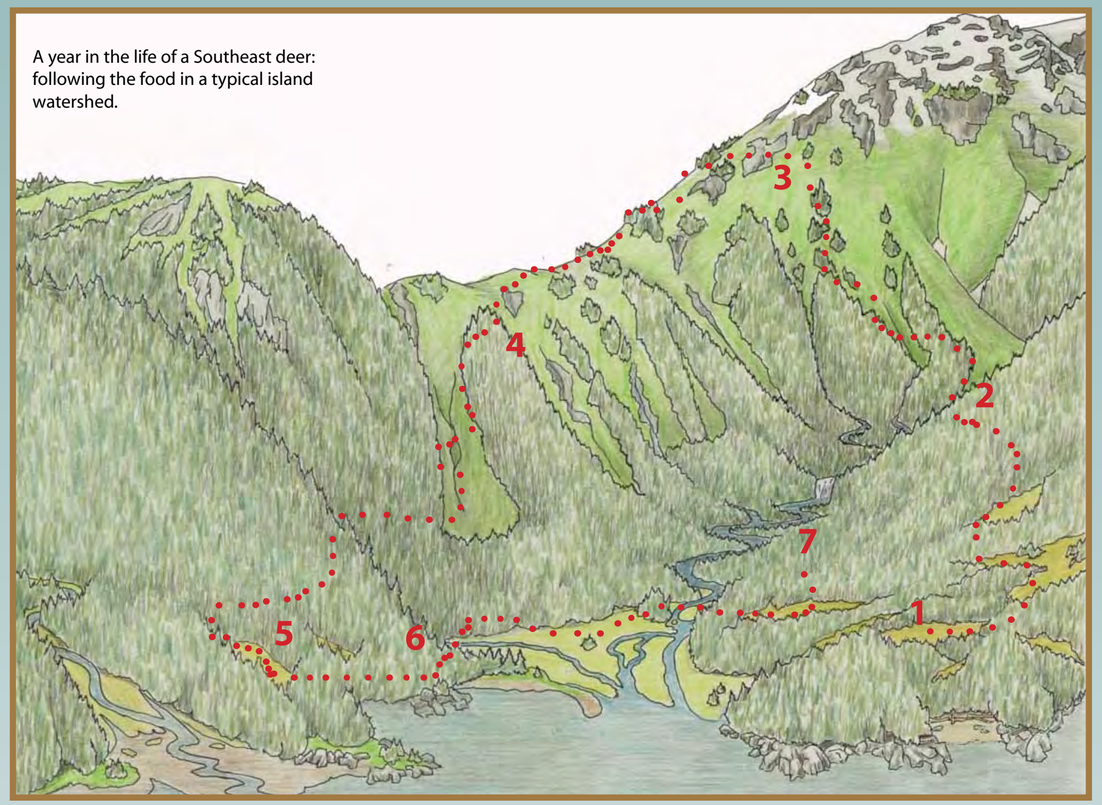

Illustration by Richard Carstensen

Annual Cycle of a Migratory Southeast Deer

1. FAWNING

In late May and early June, black-tailed does drop their fawns. During late spring, deer are scattered from sea level to 1,500 ft. in search of new plant growth. Deer use old-growth forest and increase their use of open-canopy stands, fens, tidal meadows, and young clearcuts at this time.

2. UPWARD MIGRATION

Throughout June, migratory deer continue to disperse off their winter ranges following the receding snow line on to upper forest slopes. Resident deer generally remain at lower elevations but use more forest openings for feeding.

3. SUBALPINE SUMMER RANGES

Migratory deer generally reach their ranges by the end of June or early July depending on weather and residual snowpack. On subalpine meadows between 1,800 and 3,000 ft., deer find abundant and nutritious herbaceous forage interspersed among stunted stands of Sitka spruce and mountain hemlock.

4. FALL MIGRATION

Following the first high-country frosts in mid to late September, forage plants die and migratory deer move into the upper elevation forests. Throughout the next month, many deer move down to lower elevations as snow accumulates in the high country.

5. THE RUT

The breeding season, or rut, begins in late October and continues through November. Deer are widely dispersed from sea level to 1,500 ft. Old-growth forests are important foraging habitats, but deer also make use of forest openings, and muskeg fringes during the rut.

6. WINTER RANGE

Deer distribution is most limited during winter. From December through March, deer in Southeast are generally confined to old-growth forest winter ranges below 1,000 ft. Southern exposures generally accumulate less snow and provide greater access to evergreen forbs such as bunchberry dogwood and trailing raspberry. Deer move up and down forested slopes following changes in the snow pack throughout the winter. During deep snows, medium and large-tree old growth hemlock spruce forests provide the best winter habitat.

7. SPRING SNOW MELT

Spring is a transition period as deer begin to expand their movements beyond the confines of their winter range in search of new plant growth. Wet, open-canopy forests with newly emergent skunk cabbage shoots are important foraging sites for deer in spring. Deer can also be seen foraging along upper beaches and young clearcuts during spring.

For more information about the natural history of other wildlife species in Alaska, check out ADF&G "Wildlife Notebook Series" online at www.wildlife.alaska.gov.

How Does Snow Effect Deer?

In Southeast Alaska, snow plays an important role influencing deer populations. Snow buries important foods such as herbs and shrubs that deer rely on to make it through the long winter months. Deer expend a lot of energy moving through snow, which restricts their ability to travel between important food patches during winter. In addition, deer trapped by deep snow may be at higher risk from predation by wolves and if snow forces deer onto beaches, they may be more vulnerable to hunters.

Biologists are keenly interested in knowing how much snow is required before deer experience serious hardship searching for and obtaining food. In one study, Dr. Kathy Parker and colleagues from Washington State University estimated the energy expended by deer as they traveled through different depths and densities of snow. Their findings indicated that snow depths greater than 10 inches forced the deer to exert so much energy that they were forced to significantly restrict movements to conserve energy.

Snow also can bury deer's food sources. A recent study conducted by Juneau biologists Kevin White, Grey Pendleton and Eran Hood examined how snow buried important winter forages for deer. They demonstrated that snow depths greater than 12 inches completely buried blueberry and huckleberry shrubs regardless of the height of the plant. In addition, shrubs taller than 12 inches were buried because the wet, heavy snow in Southeast Alaska accumulated on flexible stems causing them to bend down and be buried under the snow pack. Using a forage-based model developed by Dr. Tom Hanley and his colleagues, White and his team were able to predict the number of days deer could be sustained within a patch during a winter with snow. The result was that the capability of a patch of forest to support deer was reduced greatly when snow was deeper than 12 inches. The high cost of locomotion and the limited availability of food clearly demonstrate that snow depths greater than 12 inches can be very stressful for deer.

So what happens to deer when snow depths reach this winter stress threshold? It isn't all bad news. Both weather and animal smarts can help alleviate some of the impacts. The mix of snow and rain that typically occurs in Southeast Alaska sometimes creates crusts and dense snow pack that deer can at times walk across without sinking. Most importantly, deer, being crafty animals (as any hunter will attest), will select forested habitats that have the least amount of snow. This has been well documented by several studies conducted throughout Southeast Alaska over the last 30 years.

Specifically, pioneering researchers Olof Wallmo, Matt Kirchhoff and John Schoen found that during winters with abundant snowfall, deer retreated to low elevation mature forest stands on southern exposures. Dense canopy cover shields the forest floor from deep snow, however, small gaps in the forest canopy allow sunlight to penetrate to the forest floor enabling forage plants to grow and provide deer with winter food. As a result, productive old-growth forest stands on southern slopes below 800 feet elevation are important for deer during snowy winters and should be protected from timber harvest or other development in areas where snowfall can exceed 12 inches.

Sometimes, however, when winter snowfall amounts are extreme (such as the winter of 2006/2007) snow depth can far exceed the winter stress threshold for deer, even in the thickest mature forests. This can be a severe problem for deer populations, particularly if the extreme conditions persist for more than a few months. Under those conditions deer have little choice but to hunker down near the bases of large trees, where snow depths are shallower or migrate to open beaches and live off fat supplies accumulated during summer and fall. They use up body fat and protein stores at relatively rapid rates and ultimately many may die of causes related to malnutrition. Fawns born the previous spring are particularly vulnerable to starvation during snowy winters, because food resources consumed during fall and summer are used up supporting growth rather than accumulating fat. During severe winters, deer mortality rates are elevated, and reproductive rates are depressed, due to poor spring body condition. Severe winters usually result in population declines.

As tragic as these winters can be, deer populations will usually return to previous levels. Fortunately, deer have a very high reproductive potential (early age at first reproduction, high pregnancy rates) and once favorable conditions return, deer populations are capable of rebounding within a few years, provided rates of predation and hunting pressure are not too high.

Upper left photo: Deer browsing on alder buds along the beach fringe of Chichagof Island after heavy snowfall in November 2007. Photo above: Doe with fawn, mid-summer on Prince of Wales Island.

By Kevin White, ADF&G Research Biologist
Photos by ADF&G Staff

Upcoming Deer Research on Chichagof Island

The Unit 4 deer population is recovering from the record-breaking winter of 2006-07. Doe hunting closures during the 2008 season were ordered in an effort to help protect the reproductive component of the herd. Doe closures were initiated in both the 2007 and 2008 seasons. Annually, a variety of deer and habitat surveys are conducted during late winter and early spring to assess deer condition and mortality on established beach–shoreline transects. Once completed, traditional pellet surveys follow in May. According to area managers and hunter reports, deer numbers have been rebounding in much of the unit. During the fall of 2008 hunters harvested more deer than the previous year, and reported the overall body condition of the deer was very good.

During the winter of 2006-07, locations within the unit hit hard by deep snow, deer mortality was high. One location hit particularly hard was northeast Chichagof Island. While habitat conditions showed good leader growth on plants that deer like to eat, such as huckleberry, fall 2008 surveys showed few deer around to utilize it. Consequently, the Department has developed a project for northeast Chichagof that will help biologists gather better information about deer.

The project is designed to provide detailed information on home range, movement patterns, and habitat use by Sitka black-tailed deer in specific Chichagof watersheds. The information gathered can also be applied to other locations in Southeast Alaska. Initially, up to thirty deer will be captured and fitted with GPS radio collars to obtain numerous animal locations per day throughout the entire year. In contrast to previous studies that used only VHF telemetry data, animal locations attained through this study will supply information needed to describe movement and habitat use patterns in great detail.

Analysis of the data will help biologists define movement patterns, describe areas of concentrated use, and determine habitat components important to deer. Results will be used to evaluate important landscape and habitat characteristics for deer, and to describe the influence that forest fragmentation as a result of logging has on deer movements and habitat use.

Initially, female deer will be targeted in the project so biologists can concentrate on the reproductive component of the population. Additionally, lower elevation (resident deer) and higher elevation (migratory deer) populations will be sampled to look at how home ranges and movement patterns overlap within watersheds. The Department anticipates beginning the work in mid-June and continuing through August 2009. The work will probably continue through 2011.

Photo on Top of Page: Sedated deer with collar, State wildlife biologists captured this yearling doe on northeast Chichagof Island in August 2008, and equipped her with a GPS/VHF tracking collar before her release. Wildlife managers are monitoring deer populations on Admiralty, Chichagof and Baranof Islands following two severe winters. Above Photo: Graduate student, Chris Farmer works with State wildlife biologists to place radio collar on deer on Heceta Island in 2001.

By Phil Mooney, ADF&G Area Biologist based in Sitka.

How Harvest Reporting Helps Hunters and Wildlife

or...why those deer hunt surveys are so important

You've bought your hunting license, you've shot your deer, it's wrapped and in the freezer and you think you're done. But wait--there's more?

You may still need to provide information about your hunt to ADF&G by completing a mailed survey. Not all deer hunters receive the survey, because a random sample of hunters is selected from each community annually. ADF&G has conducted these surveys since 1980 to quantify the Sitka black-tailed deer harvest in the region. Have you ever wondered why this information is so important?

An information tool for biologists

Harvest information lets ADF&G biologists know how many people hunted and how many animals were removed from a specific population. They also learn the number of adult males and adult females that were harvested. This information--gathered and compared year-after-year-is a valuable and cost-effective tool for determining if a game population is increasing, decreasing or staying the same.

Why we need your hunt report- even if your hunt wasn't successful or you didn't hunt at all

If the number of reported animals harvested decreases, it could mean that the local game population has decreased. But what if the harvest numbers are lower because few people hunted that year? Having complete information from all hunters helps managers and policy makers make sure that regulations are in line with what the game population is doing. Deer survey results in summarized form are used by the Alaska Board of Game and the Federal Subsistence Board to set seasons and bag limits, and make other hunting regulations such as allocations to communities. In addition, the U.S. Forest Service uses the summarized data to help make decisions about what areas will be logged.

Whether it's a harvest report card, a permit report card or a survey--your hunt report provides valuable information on game populations.

When biologists have enough information to determine that game populations are healthy and abundant, they can be more confident in recommending more liberal bag limits and seasons.

Why we ask how you got to your hunt site and how long you hunted

Knowing where people hunted, how long they hunted, how they got to their hunt area, and if they were successful, helps biologists determine which areas are getting pressure from hunters. It also helps them assess the relative abundance of the game population in those areas. This information is confidential.

Understanding the difference between a harvest card and a mail survey

Harvest report cards are attached to the harvest ticket for many big game species, and you are required to complete and return them--even if you don't hunt or weren't successful. This is especially critical when there are lower numbers of animals, and harvest quotas need to be enforced to protect the population. However, for some hunts, such as deer, where seasons are long or populations large, hunters may instead be mailed a harvest survey to complete.

More Information can mean more hunting

We mail out surveys to approximately 30% of hunters that harvest deer each year. If you receive a survey in the mail, please take the time to complete the survey and mail it in or drop it off at your nearest ADF&G office. We ask for information about the specific location of each hunting trip - the bay, shore, stream drainage, and island or mainland area where you hunted. The more detailed the information you provide, the more confident we can be about what deer hunting areas are important to each community. Your responses are confidential. **Thank you in advance for your help in managing wildlife in Southeast Alaska.**

The Southeast Alaska Deer Hunter Survey: What Do The Surveys Tell Us About The 2007-2008 Season?

Who receives the survey?

Near the end of deer hunting season each year, ADF&G puts together a mailing address file of all those who picked up deer harvest tickets. Over 2,500 deer hunters, roughly 30% of total hunters, receive a survey in the mail. Of those who received a survey this past year, 61% completed a survey.

In addition to our mail-out survey, ADF&G collaborated with the U.S. Forest Service to intensively gather hunt information from individuals who hunted in Game Management Unit (GMU) 2. There was greater follow-up with this mailing, resulting in 84% of GMU 2 hunters completing the survey. The regional survey follows a stratified random sampling protocol that assures that the harvest characteristics of all communities, regardless of size, are reflected in the results. ADF&G then uses statistical tools to estimate total deer harvest and effort for all of Region I. Biologists are then able to look at this data and look for trends in harvest over time, as well as the amount of effort it takes hunters in certain areas to harvest a deer.

The overall picture for Southeast

Deer harvest patterns and hunter effort varies across the region, largely in relation to deer densities and accessibility. Traditionally more deer are harvested in fewer days of hunting in GMU 4 (ABC Islands, Admiralty, Baranof, Chichagof) than in other parts of the Region. This is due in part to greater opportunity for harvest due to regulations that allow the taking of does as well as bucks, and bag limits that reach four deer in most parts of this unit. In addition, there is a federal subsistence hunting season that goes till the end of January in parts of this unit, and allows certain federally qualified hunters reach a total bag limit of six deer. These liberal seasons and bag limits are supportable because of the high deer density on these islands, which in turn are dependent on good habitat, mild winters, and the absence of wolves and black bears that are known to prey on deer or deer fawns. The combination of these factors allows Unit 4 to produce high numbers of deer. But, as we have seen recently, a severe winter can change things in a hurry. Although deer numbers are usually high in GMU 4, those populations are often close to the biological carrying capacity by predators, such as wolves and black bears.

When ADF&G began tallying the deer harvest survey data from the fall 2007 season, we detected sharp changes in many of our harvest indices. For one, the overall harvest declined dramatically from 2006, while the amount of effort it took hunters to bag a deer increased just as dramatically. This was somewhat expected given the heavy November snows of 2006 that led to a high deer harvest. Deer abundance going into the winter of 2006 was exremely high due to a number of mild winters leading up to that time. The heavy snows in early November concentrated deer on the beaches where hunters were able to harvest them with minimal effort. This was followed by a severe winter that led to a high deer die-off in many areas of northern Southeast Alaska. The harvest in other areas of Southeast didn't see a dramatic decrease in harvest from 2006 to 2007. Unit 2 (Prince of Wales Island) actually recorded an increase in harvest. This unit as well as many other areas in southern Southeast received higher than normal snowfall during winter 2006-2007. Snow reached depths greater than 30 inches in many areas and persisted well into May. Deer were stressed, but the winter range conditions were better compared to GMU 4, because of lower deer numbers prior to the onset of winter owing to predation. As a result, mortality of deer was higher than normal, but not as severe as for deer in GMU 4.

Deer harvest by GMU correlates strongly with hunter effort. Generally, there is a consistent relationship between hunter effort and success, but in GMU 4 few days are usually required for the deer harvested. However, in 2007 the pattern of deer harvested/hunter days was more similar to GMU 2. Fewer deer were harvested per hunter in 2007 than 2006 for all GMUs. In GMUs 4 and 1C, this was the lowest number of deer per hunter in over a decade. In contrast, GMU 2 had the fewest days to harvest a deer and the highest number of deer harvested per hunter.

Historic snow levels

Throughout 1995-2006, winter conditions in Southeast Alaska were mild across Southeast Alaska. In northern Southeast near Juneau, only one out of 11 of those winters had greater than average annual snowfall. At Annette Island south of Ketchikan this trend held true with above average snowfall in only two out of the 11 winters. Consequently deer populations flourished in many areas, especially those in northern Southeast Alaska.

It is important to recognize that very severe winters have occurred in Southeast in the past (early 1970s & early 1980s) with severe consequences for not only deer, but other wildlife populations. Snowfall recorded during the 2006-2007 winter at the Juneau Airport was the highest recorded between 1956-present, and had devastating affects on deer in many portions of northern Southeast Alaska. This was followed by a second winter of above average snowfall in 2007-2008, but it was not nearly as severe as the previous year. In contrast, snowfall recorded at Annette Island during the winters of 2006-2007 and 2007-2008 was above average for that area, but never reached the severety of those experienced during the early 1970's. It is notable that the average snowfall of high snow years in the southern part of the region is generally below the average snowfall of northern Southeast Alaska.

Hunter participation is key

We thank all of those who have helped in the past or who will assist us in the years to come. Results of the survey provide important information for management of deer populations and hunting opportunities. In addition to harvest, survey responses tell us what hunting areas are important to each community.

By Karin McCoy, ADF&G Biologist/Deer Management Coordinator and Neil Barten, ADF&G Management Coordinator
Photo by ADF&G Staff

Deer Pellet Survey:

Judging Population Trends from Droppings

Spring is survey time

On a sunny spring day in Southeast Alaska, a skiff noses up to a rocky beach on Douglas Island near Juneau and two biologists quickly jump out. The island is popular with deer hunters, and the biologists are hoping to learn how the island's deer population fared the winter.

Each spring for more than twenty years, state wildlife and U.S. Forest Service biologists and technicians have come to this same area to walk a transect line about a mile long, stretching from the beach to the subalpine. The biologists are looking for deer pellets or droppings, tell-tale evidence of deer.

One biologist clips on a slim twenty meter-long cable, takes a compass bearing and heads due north into the woods. The cable represents a straight line and when the second biologist sees the end of the cable he yells, "Stop!" As he walks the length of the line to catch up to his partner, he counts every group of deer pellets in a swath one meter wide. The first "pull" contains six pellet groups, the second four, the third eight. The biologists systematically climb 1,500-feet upslope. Patches of snow appear, and the transect ends at the 75th pull, just at the point where the melting winter snow blankets the forest floor.

Survey teams cover a lot of ground

Two miles south, another team has run a similar transect. Next week, the teams will work about fifteen miles north on Shelter Island. Pellet surveys are also done on Prince of Wales Island, many of the other islands and some mainland areas in Southeast Alaska, and further north and west in Prince William Sound and on Kodiak Island.

The pellet surveys don't provide precise numbers about the deer population, but they offer insight into the relative numbers of deer in the areas. "The transects are really trend indicators, so they give a sense for whether populations are up, down or stable," said state wildlife biologist Doug Larsen.

Pellet numbers are correlated with the deer

Larsen said the pellet transects in Southeast are based on a research project done in the 1980s. A dozen deer were captured, radio collared and released on Portland Island, a small island in Stephens Passage near Juneau. "There was a known number of deer on the island and it was possible to correlate the counts on the pellet transects with the deer. It came out to roughly one pellet group per plot on average – about 32 deer per sq. mile," Larsen said. "So you can extrapolate that to get an idea of how many deer are in a watershed or along a transect. It gives you a sense for numbers."

Biologist Dale Rabe, who helps coordinate wildlife management in Southeast Alaska, said the principle is premised on the fact that deer defecate with great regularity, twelve times per day on average. Considering that as a constant, and how long the pellets persist in environment, it's possible to take information on number of pellet groups and relate that back to the size of the deer herd in that particular area. Rabe is quick to point out that this is not hard-and-fast science.

"There are confounding effects – deer that migrate, deer that are killed, young that are born – so the population isn't staying the same, but the pellets persist through the time period when population could be changing," Rabe said. "That adds some complexity." Moreover, snowy winters force deer to remain in forested winter range longer than mild winters. Therefore, pellet counts may be higher in a particular year, because of a longer snowy winter, and not because the deer population has increased.

In some drier areas in the western United States, pellet groups may last three years, Rabe said. "Here it's so wet they have a short persistence. On Prince of Wales Island, during a rainy period, they may be gone in a month," he said. The key is making comparisons in the same area. "You are comparing apples to apples, doing the same transects in same location, year after year, and comparing results from one year to next to get a relative idea of changes in population," Rabe said. "So if pellets are up 30 percent, the population is probably up."

Biologists consider anecdotal evidence as well as the pellet surveys when estimating deer populations trends. Reports from hunters, harvest data and general sightings along highways all contribute to the picture.

By Riley Woodford, ADF&G Writer and Editor
Photos by ADF&G Staff

A New Tool for Estimating Population Size and Sex Ratios of Deer in Southeast Alaska:

DNA from Fecal Pellets

How many deer are out there?

Hypothetically speaking, what impact would hunters have on the deer population if they harvested 20,000 deer each year in southeast Alaska? If Southeast Alaska sustains a deer population of roughly 500,000 deer, one could argue that hunters' influence on the region's deer population is relatively weak. However, if Southeast Alaska only contained 100,000 deer, one could argue that a hunter harvest of 20,000 deer has a signficant impact on deer numbers. The point of this hypothetical situation is that for researchers and managers to understand how hunters, wolves, bears, harsh winters and other mortality factors affect deer, we first need to have a good understanding of the number of deer in the forest, and how these numbers change with the presence of each mortality factor.

From the time deer harvest was first regulated in Alaska, wildlife managers have been without reliable data on the size of deer populations. Because more than 70% of households in Southeast Alaska use deer for food, recreation, or cultural reasons, maintaining healthy deer populations and harvest opportunities is critically important to the people of this region. This task can be very challenging without the tools needed to assess population trends of deer.

New research tools

Over the past 4 years, the U.S. Forest Service has funded researchers from UAF and ADF&G who have developed a new tool to estimate deer density in southeast Alaska. Because population survey techniques used in other parts of Alaska (i.e., aerial surveys) do not work in the thickly-forested environment of a temperate coastal rainforest, researchers had to be creative and design a new method.

The solution to the problem was found in DNA on deer fecal pellets. Using new genetic techniques, DNA extracted from the surface of deer pellets can be used to identify individual deer. If the deer pellets are relatively fresh (within 2 weeks old), the quality of the DNA is usually sufficient enough to distinguish one deer from all the other deer in the forest. Using a strict sampling design that utilizes trails created by deer, researchers can estimate the number of deer within an area of the forest. If enough areas are sampled, this new genetic technique may be used to determine population sizes of deer on entire island or island groups.

Research success on Prince of Wales Island

Recently, this new technique was used successfully to estimate deer density in three watersheds on Prince of Wales Island, Alaska. Preliminary data suggests that deer densities in these watersheds were roughly 35 deer/mi^2 in 2006 and declined to around 20 deer/mi^2 in 2008. The decline was due to consecutive harsh winters, which southeast Alaska hasn't experienced for decades. Analysis of all data is almost completed, and estimates will be confirmed by early Spring 2009. Future research may provide insight into how quickly deer can recover from harsh winters and advance knowledge on the influence of other factors (predation, land use) that influence survival.

In addition to identifying individual deer, DNA from fecal pellets also can be used to identify the sex of a deer. Thus, estimates of sex ratio will be available in areas where genetic sampling was employed. Preliminary data on sex ratios of deer was consistent in all 3 watersheds on Prince of Wales Island, and findings suggested that roughly 30% of the deer in these areas were males.

For hunters whom are skeptical of these numbers, it is important to mention is that DNA doesn't provide information on age of the deer. Hence, 30% males does not equate to 30% mature bucks. In a deer population where the harvest is skewed toward males (which it was in the 3 watersheds investigated), the age structure of males is likely skewed toward young deer (mostly fawns and yearlings). Considering this, only 1 out of every 4 or 5 males may be a mature buck (>2 years old). If 1 of every 3 deer is a male, and 1 out of every 4 males is mature, then roughly 8% of the deer population would be a mature buck.

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Photos by Todd Brinkman

Want to know more about this research? A full report of the findings of this study will be available summer 2009.

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Landscape Changes May Challenge Popular Strategies For Hunting Deer

When intensive logging occurs where harvesting wild game is an important cultural practice, food source and recreational activity, it is important to understand how landscape changes caused by logging affect the availability of wild game.

During 2004 and 2005, researchers from the University of Alaska Fairbanks collaborated with ADF&G and the US Forest Service to assess the influence of extensive industrial logging on the availability of wild game. Researchers drew on local knowledge and ecological science to evaluate the relationship between forest change and harvest opportunities of Sitka black-tailed deer on Prince of Wales Island, Alaska. This investigation is important because venison is the most significant terrestrial source of meat to both indigenous and non-indigenous residents. Deer are also the most important subsistence and sport hunting big-game species in Southeast Alaska. More difficult to quantify, but equally important, is the cultural significance of hunting, harvesting, sharing, and consuming deer.

Interviews with local hunters

To collect information, a set of open-ended and quantifiable questions was used to guide face-to-face interviews with 88 residents (31 Native, 57 non-Native) on Prince of Wales island and two off-island communities. Interview participants had an average of 20 years of experience hunting deer on Prince of Wales Island. The interview served to collect hunter perceptions and knowledge of three main areas: 1) deer hunting patterns 2) deer population trends and 3) deer habitat and access. Off-island communities of Ketchikan and Saxmon, Alaska were included in the study, because many residents of those communities hunt deer on Prince of Wales and depend on the resource. A couple of key objectives of these interviews was to determine how harvest opportunities of wildlife changed over time in intensively logged landscapes with: 1) changes in access to hunting areas and 2) changes in forest age structure as the logged stands transition from clearcuts to second-growth forest.

Located in the southern tip of southeast Alaska, Prince of Wales Island is the third largest island in the United States. Prior to the mid-1900s, boats were used primarily to hunt deer along shorelines in conjunction with marine harvesting activities. However, this began to change during the 1950s and 1960s with the arrival of industrial-scale logging. Between 1954 and 2005, approximately 20 percent of Prince of Wales Island was logged and an extensive road network (~2,500 miles) was constructed to support timber extraction. With these changes, many hunters shifted from using boats to access hunting areas to a strategy relying on the use of vehicles. In addition, clearcuts became one of the most popular habitats for hunting deer.

Hunting opportunities affected by age of clearcut forests

Hunters indicated that deer harvest opportunities in a clearcut depended on the age of the clearcut or the stage of succession. On average, hunters reported that hunting was best in a two-year-old clearcut, and hunt quality began to decline after about a decade after cutting. Looking at harvest activity since 1950, the area of clearcut forest at a desirable stage for hunting (0-8 years old) peaked in the 1970s and has declined rapidly since the mid 1990s. During 1973-2006, the area of clear-cuts less than 9 years old declined 86%. Eighty-six percent of hunters reported that clearcuts eventually become unhuntable and that this occurred at a median of 12 years after a clearcut. As of 2006, the area of clearcuts greater than 12 years old (poor hunting) was 25 times greater than the area of clearcut forest less than 8 years of age (good hunting).

Seven percent of hunters believed that a second-growth forest could eventually be hunted again with proper management such as thinning. Many hunters (64%) said thinned habitat decreased the quality of the hunt. They avoided those areas because of a lack of deer, low visibility, and difficulty of walking through recently thinned habitat. During the thinning process, the canopy is opened; however, thinned trees are left on the ground where they fall, resulting in thick timber debris 3-6 feet in height. The remaining hunters (36%) reported that thinning had increased the quality of hunting in those areas, or they believed thinning would improve the quality of their hunt in the future. Forty-nine percent of hunters believed second-growth forest could never be hunted again regardless of management. In contrast, 44 of hunters believed that second-growth forest could be hunted again roughly 40 years after a clearcut, but the quality of the hunt in those areas would be inferior to most other habitat types.

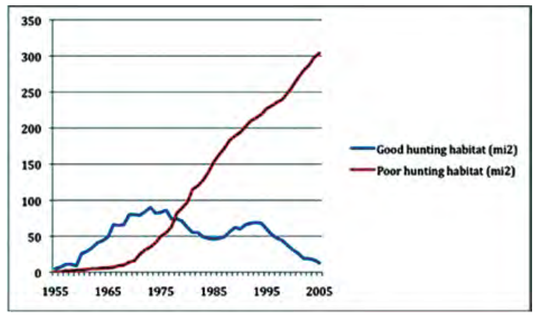

Figure 1. With high logging activity from 1965-1995, large areas of preferable hunting habitat (clearcuts 0-8 years old) were sustained on public land. With the decline of logging activity and the natural transition of clearcut forest into second-growth forest the area of undesirable habitat for deer hunting (clearcut forest >12 years old) continues to increase.

Boom and bust cycle

The changes that have occurred on Prince of Wales created two novel social-ecological trends that function at large spatial (landscape) and temporal (time) scales. The first change in dynamics was the expanded deer harvest opportunities initiated by a boom in commercial logging that rapidly changed the forest structure. The second change in dynamics began as clearcuts transitioned into an undesirable habitat for hunting. The impact of this ecological change on hunting opportunities was obscured until logging activity declined. With the collapse of commercial logging the clearcuts become too old to be hunted greatly exceeds the rate that new clearcuts are created. Currently, the harvest strategies used by almost three generations of subsistence hunters are becoming less efficient, and hunters are spending more effort to harvest deer.

The decline in the area of young clearcut forest may have the greatest influence on deer harvest opportunities. Due to the decline in the timber industry, young clearcuts will become uncommon within the next decade regardless of road or boat access. Most clearcuts have reached an unsuitable stage for hunting in which the patch either consists of a dense stand of even-aged saplings with thick understory vegetation or dense second-growth stand. Because these stands are located along roads, hunters' visibility and efficiency in harvesting deer from roads have decreased. Area of unsuitable habitat for hunting (i.e., second-growth and pre-commercially thinned forest) has increased rapidly, and this trend will likely continue.

Hunters and resource managers: respond to the changing landscape

Many northern indigenous people are proud of their ability to adapt to changing conditions. Hunters who focus their effort on permanent and naturally occurring open habitat (e.g., alpine tundra, muskeg, shoreline) are least vulnerable to logging-associated changes in vegetation and are likely to have more success sustaining their harvest opportunities in the future. On the other hand, hunters' success is particularly vulnerable to forest changes are those who depend on vehicles for access, concentrate their hunting effort in young clearcuts adjacent to roads, and are unwilling or unable to travel on foot away from maintained roads.

From a forest management perspective, active cutting of second-growth forest and road closure strategies that minimize loss of access to preferred hunting areas may serve as options that help sustain deer harvest opportunities. Manipulation of forest structure and access would require relatively few changes in harvest regulations and hunter strategies. Harvest of older second-growth forest (50 to 60 to years old) could increase the area of young clearcut habitat and potentially provide the revenue necessary to maintain roads important for the harvest of local resources (fuel wood, berries, wildlife). If a market for 60-year-old timber were identified, forest managers would have an incentive to keep roads open to foster efficiency of revenue-generating timber sales rather than rebuild roads every 50-60 years. With a market for 60-year-old timber on Prince of Wales Island, an annual average up to 5.4mi^2 (5.8 times the level in 2006) of second-growth forest could be made available for potential conversion back to clearcut habitat between the years 2010 and 2030. This would create up to 43mi^2 (2.3 times 2006 level) of desirable clearcut habitat (0-8 years old) for deer hunting during that time period with little or no cost of additional road construction.

Another forest management option to restore deer harvest opportunities for vehicle-based hunters preferring clearcuts is additional harvest of remaining old-growth forest. This could provide a temporary solution for those who prefer hunting in young clearcuts, but would hinder the long-term sustainability of the hunting system by increasing the overall population of poor habitat for deer and deer hunting a decade later.

Biologists believe that logging old-growth forest will result in a long-term decline in carrying capacity for deer. Additional research focusing on how deer densities change with forest succession and changes in access will be critically important when evaluating and modeling the sustainability of the hunting system. This information will be needed before wildlife researchers, forest managers, and local hunters can confidently move forward together toward a more sustainable hunting system.

Photos A (left) B (right): On much of Prince of Wales Island, the view from the road has transitioned from "A" to "B" making the spot, stalk, and harvest more challenging.

By Todd Brinkman, UAF, Ph. D Candidate
Photos by Todd Brinkman and ADF&G Staff
Deer hunting photo courtesy of Richard Bachman

Mid-Winter Beach Surveys Indicate Healthy Deer Numbers Near Sitka

Does and fawn/ yearlings are often seen together and can be observed squatting to urinate, confirming their gender.

The body condition of the deer was quite good for both males and females.

The difference this late winter from the previous two winters is the snow is tapered back from the high tide line and the deer can walk on top of it to access open areas back in the trees.

In mid February 2009, shoreline surveys were conducted to count deer on portions of Kruzof Island, Nakwasina Passage, Olga and Neva Straits, and Peril Strait to Rodgers Point near Ushk Bay. A total of 386 deer were counted along 164 miles of shoreline. About 30% of those were classified for body condition, sex, age or a combination of those categories.

Identifying sex of deer difficult

Although attempts are made to separate adult deer by sex, nearly 41% of those deer classified as adults end up in the unidentified column. Many of those deer are likely does, but without good indicators to confirm the sex, they get placed in the unidentified column. Does can be observed squatting to urinate, confirming their gender. Since does and fawn/yearlings are often seen in groups, this is another indicator the adult is likely a doe. Does that could be classified accounted for 24% of the adult deer. Body size and head shape are used to identify fawns/yearlings which made up 31% of the classified deer. Adults identified as bucks represented only 4% of the classified deer, because the pedicel scars where the antlers were attached need to be seen. Even with good binoculars, lighting and body angle, observers must get in close. Most of the deer would not let the boat approach closer than 30 to 40 yards and in some cases would walk away when the boat was still 100 yards offshore.

Deer appear to be in good shape

Body condition assessments for all the categories of classified deer were quite good. By this time, fawns and bucks usually start to look a little gaunt and ragged, but they currently appear to be doing just fine. All but two adult deer ended up in the fair category. Snow conditions get deeper and more extensive continuing north of Sitka through Peril Strait. The lower third of Ushk Bay is still frozen and there are 24 inches of snow on many south facing slopes. The difference this late winter from the previous two winters is the snow is tapered back from the high tide line allowing the deer to walk on top of it to access open areas back in the trees. There are hundreds of deer trails extending back and forth through the snow on the shorelines. Back in the beach fringe a short distance, open areas free of snow are common under conifer canopies. Where slope and aspect catch a bulk of the winter sun, large open areas are present up to about 600 feet in elevation.

Conserving energy

Deer are currently feeding on alder buds and browse species such as huckleberry and blueberry where available. They still remain in a significant conservation of energy mode where they may move just enough to browse and take advantage of the warming sun, or move from cold wind. As a whole, they will be feeding just enough to support what is considered a maintenance diet. Most of the deer will continue to lose body weight until the spring green up begins. Because of this, it is very important to try and minimize disturbing them so they do not exhaust their fat reserves.

Deer surveys will continue into other areas of Unit 4 in Spring, including locations such as northern Chichagof Island, where the deer were hit hard by deep snow back in 2006-07 creating higher mortality. Without predators such as wolves, weather remains the largest factor left in determining how the deer population survives this winter. A cold Spring with significant and persistent snowfall will rapidly undermine the status currently observed in the deer population.

The longer days have brought out beachcombers. It's essential owners control their dogs if they are brought along, so they do not chase deer. Dogs in Sitka have mauled three deer in town since January, resulting in the deaths of the deer. Dog owners are reminded that it is against the law to allow dogs to harass deer and can result in the destruction of the dog(s).

By Phil Mooney, Area Biologist based in Sitka
Photos by Phil Mooney