History and Current Status of Sitka Black-tailed Deer in the Kodiak Archipelago

by

Roger B. Smith
Alaska Department of Fish and Game, Kodiak

Introduction

In the Kodiak Archipelago, populations of the introduced Sitka black-tailed deer (*Odocoileus hemionus sitkensis*) inhabit vegetative associations quite distinct from deer ranges in the rest of Alaska. Deer populations are still expanding into previously unoccupied or lightly occupied ranges. Concurrent with this range expansion, a decline in the population in areas first occupied by deer is evident. The direction of deer management has evolved from a protective phase, through a conservative phase, and into an exploitive phase as deer populations have expanded. This paper will review the history of the transplant and subsequent pattern of occupation of the Kodiak Archipelago by deer. Deer/habitat relationships, natural mortality, harvest patterns, and management problems will also be discussed.

Description of area--Karlstrom [1969] provides an accurate description of the topography, climate, and geology of the Kodiak Archipelago. The Archipelago is a group of islands extending 177 miles in a southwesterly direction off the southern tip of the Kenai Peninsula (fig. 1). The area is mountainous with maximum elevations above 4,000 feet. The 2 largest islands, Kodiak and Afognak, are characterized by steep bluffs descending into numerous long glacially-scoured straits and fiords. The islands in the Archipelago cover an area of approximately 5,000 square miles. Seldom do temperatures fall below 0° F and average annual precipitation is about 60 inches, although much local variation in rainfall and temperature occurs.

The vegetation of the Kodiak Archipelago can be classified into 3 major types. Batchelor [1965] describes the Sitka spruce (*Picea sitchensis*) type which covers Afognak, Shuyak, Raspberry, and much of northeastern Kodiak Island. Most of Kodiak Island is dominated by a grass-brush type. Alder (*Alnus sinuata*) stands are interspersed with dense meadows of salmonberry (*Rubus spectabilis*) and grass (*Calamagrostis canadensis*). Cottonwood (*Populus balsamifera*) and birch (*Betula kenaica*) occupy valleys and lower foothills. Approximately the southwestern quarter of Kodiak is occupied by tundra vegetation of willows (*Salix* spp.) and heath plants, including

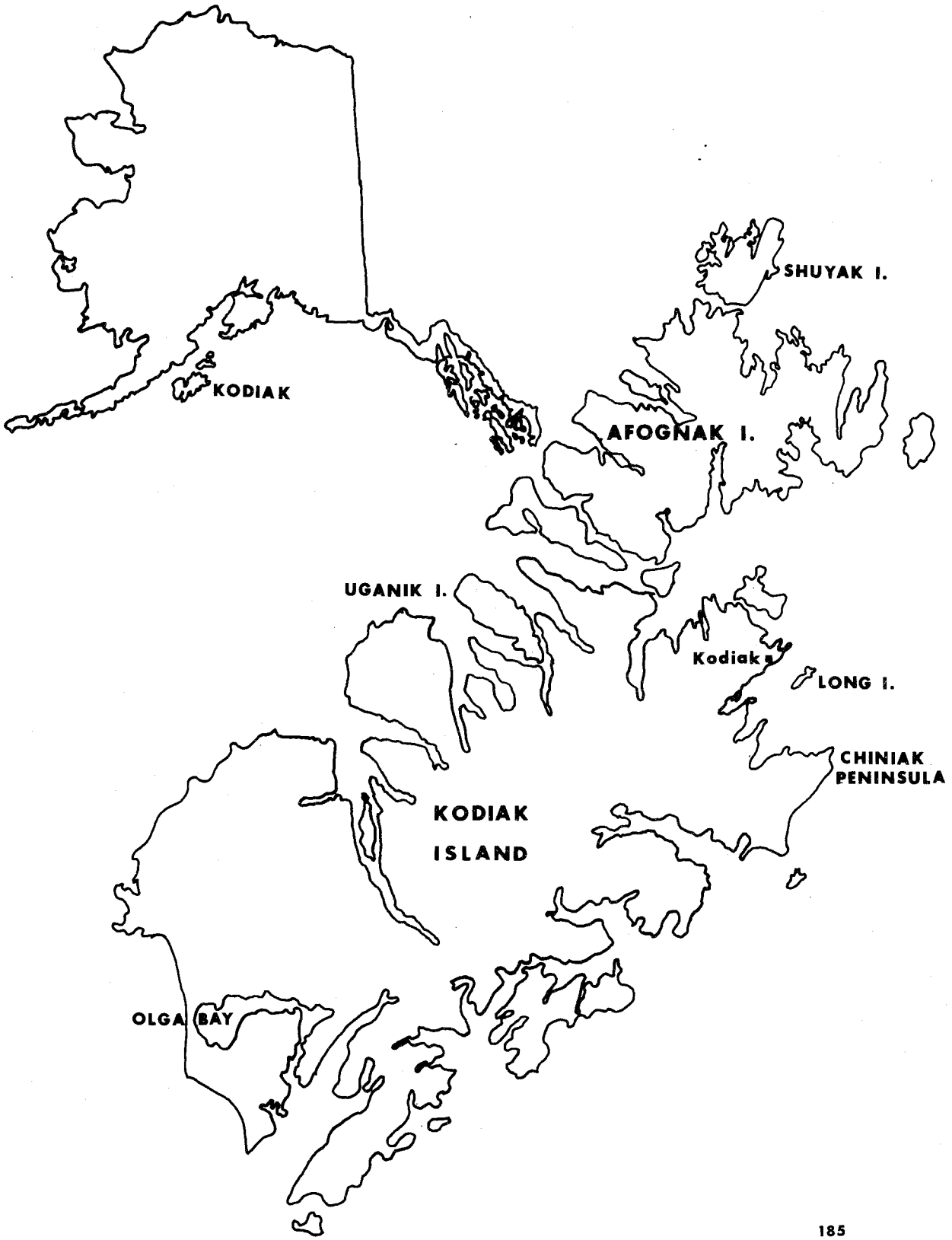

Figure 1. Location map of major islands in Kodiak Archipelago, Alaska.

crowberry (*Empetrum nigrum*), bearberry (*Arctostaphylos uva-ursi*) and low cranberry (*Vaccinium vitis-idaea*). Hulten [1969] described this vegetative type in detail.

Discussion

History of transplant and population trends--Fourteen deer, captured in the Sitka area, were released in 1924 on Long Island, about 4 miles east of the town of Kodiak [Burris and McKnight, 1973]. Two more deer were placed there in 1930. A small population of deer became established on this spruce-forested island approximately 3 square miles in area. Although reports are sketchy, apparently it was intended that deer moving from Long Island would eventually stock Kodiak Island. Long Island is separated from Kodiak's mainland by some smaller islands and deer would have to swim a maximum of 1 mile between adjacent islands. A 1931 Alaska Game Commission report mentioned that 3 does and 2 bucks had been seen on Kodiak. An additional transplant seemed appropriate and in 1934 4 bucks and 5 does were released on Kodiak Island. If the 1931 Game Commission report was accurate, deer had probably already become established on Kodiak when the 1934 transplant was accomplished.

The Long Island deer population was estimated at 80 deer in 1938, according to Palmer [Rhode, 1948]. Jack Benson, Wildlife Agent in Kodiak, in a March, 1941 letter to the Alaska Game Commission, detailed a proposal to move the Long Island deer herd to Afognak Island in anticipation of planned military fortification which, he felt, would doom the Long Island deer herd. The transplant was not initiated and deer were reduced to a low level when the Island was occupied by extensive military installations during the 1940s. Only an occasional straggler occupies Long Island today as cattle grazing, maturation of the spruce forest, and high recreational use of the Island have seriously diminished the habitat.

Back on Kodiak's mainland, the 1940s found deer rapidly occupying the northeastern corner of the Island. By 1950, deer were quite common near the town of Kodiak and the first hunting season was held in 1953. During that 5-day August season, 200 hunters took 38 bucks, mostly from the Chiniak Bay drainages. According to Chapados [1953], deer populations were still increasing on northeastern Kodiak in the early 1950s. While the nucleus of the population inhabited the Chiniak Peninsula and Chiniak Bay drainages, deer had already moved as far south and west as Ugak Bay, Terror Bay, and Uganik Island. Reports of deer on Whale, Raspberry, Afognak, and Shuyak Islands were becoming more common. Hoffman [1953] reported the first observation of deer wintering in the Pasagshak Bay area in 1953.

During the 1952-1953 winter, 11 deer were found dead of apparent malnutrition on the Chiniak Peninsula [Hoffman, 1953]. The same report stated that the browse on the winter ranges did not appear overutilized. The first season in 1953 followed the first reported significant mortality from winter starvation.

The remainder of the 1950s decade was marked by a rapidly increasing population spreading southward along Kodiak Island. In 1958, 25 percent of the harvest was taken in areas remote from the road system on northeastern Kodiak [Troyer, 1958]. By 1955, Troyer [1955] estimated that half the deer population was found outside the road system drainages. Although Troyer then opined that either-sex hunting would probably constitute good management, it wasn't until 1959 that a 3-day doe hunt was held. The annual harvest continued to increase as seasons became more liberal and deer populations expanded. The average annual harvest during the 1957-1959 period was about 200 bucks.

Whether by coincidence or consequence, the estimated Kodiak deer harvest nearly doubled when the State of Alaska assumed administration of its wildlife in 1960. A trend toward liberalization of harvest in the 1960s began when the bag limit was raised to 2 deer in 1960.

Bathelor [1962] observed that the major deer ranges occupied by the early 1960s were in the Sitka spruce climax forest of northeastern Kodiak and nearby islands. He observed that deer were found nearly exclusively in the spruce zone in bad weather. He felt that spruce cover was a primary requirement for establishing substantial deer populations, although acknowledging that Uganik Island, a relatively sparsely forested area, was already one of the major deer winter ranges.

Merriam [1964] reported that, by 1963, the deer population in the Chiniak Bay drainages had declined appreciably, despite a series of apparently mild winters and little observed mortality other than from hunting. In 1960, 41 percent of the harvest was recorded from the drainages along the road system between Kalsin and Women's Bays and this had declined to only 7 percent in 1962. Merriam felt that overhunting may have contributed to the decline and that areas without spruce forests were more likely to be overharvested. Erickson [1958] observed that competition between deer and cattle was occurring near the ocean fringe in the Chiniak Bay drainages. The lowlands near the ocean became critical range during periods of heavy snow cover. Erickson noted that willow (*Salix* spp.) and blueberry (*Vaccinium ovalifolium*), prime deer browse species, were also browsed heavily by cattle. He believed that cattle were primarily responsible for range deterioration. Recognizing that limited winter range was probably responsible in part for the decline, and observing that populations were building in other areas, Erickson recommended instituting an either-sex season encompassing the month of December, when deer would be vulnerable to hunting.

A record estimated harvest of 1,040 deer occurred in 1965 during a season extending from August through December 31. Over 400 deer (42 percent) were taken on the Chiniak Peninsula excluding the Kalsin Bay-Women's Bay drainages where the population had declined and had a more restrictive season. Another harvest record was set in 1967 when an estimated 1,500 deer were taken following a winter with only light natural mortality. The following year, the harvest rose to 2,100, with 50 percent of the harvest from the Chiniak Peninsula; the Chiniak Peninsula was probably at a population high then and has subsequently declined. The Chiniak Peninsula area today has the best deer population in the part of northeastern Kodiak Island accessible by road, but is still far below the mid-1960s level, despite relatively light hunting pressure. Much of the Chiniak Peninsula is only lightly grazed by cattle compared to the drainages in which the early-1960s decline was recorded. Extreme browsing of willow by deer is apparent along the ocean fringe wintering areas where cattle use is lighter or non-existent. Overall range quality has undoubtedly declined to well below the former carrying capacity.

During the 1969-1970 winters, unusually severe cold and heavy snows resulted in heavy mortality from starvation. Despite the low deer population, hunters took 870 and 915 deer following those respective winters. Although 54 percent of the harvest in 1971 came from the area accessible by road, hunters were taking deer on Afognak, Raspberry, Whale and Uganik Islands and about 10 percent of the harvest occurred even further south on Kodiak Island.

A general upward trend in the Game Management Unit 8 deer population has occurred since the 1970-1971 winter. During the past decade deer have populated most of the available deer habitat on Kodiak, Afognak and adjacent islands. Low densities of deer have inhabited even the tundra habitat of southwestern Kodiak Island. Reports of deer sightings in Deadman Bay, Olga Bay, Karluk Lake and Sturgeon River drainages have become more frequent in the past 5 years. Afognak Island, Raspberry Island, and

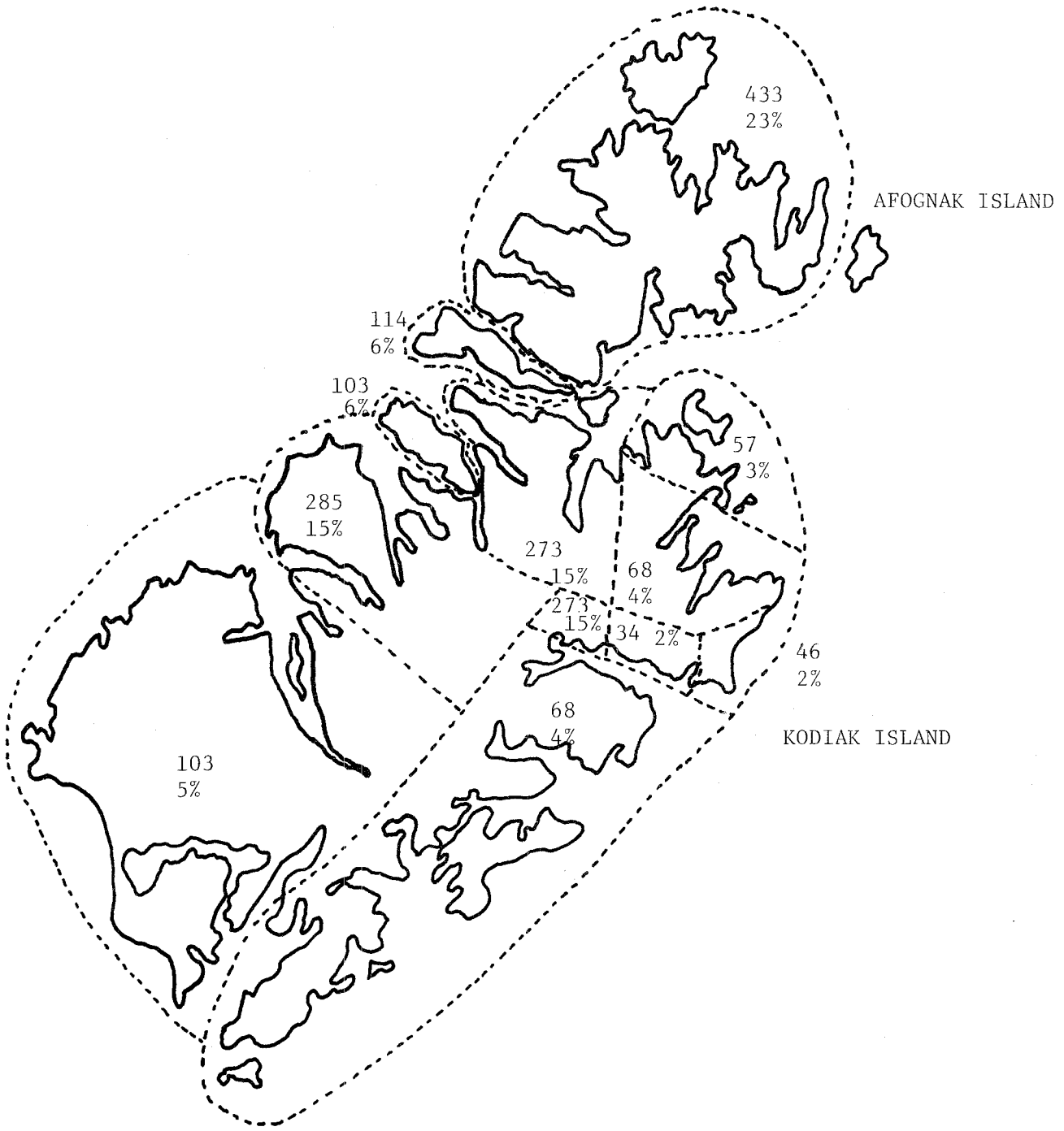

Figure 2. Distribution of 1977 deer harvest. Game Management Unit 8, Kodiak and adjacent islands.

Shuyak Island deer populations have increased steadily since 1971 and are probably at an all-time high.

Shifts in harvest patterns have followed the changes in distribution of high populations. In 1971 only 10 percent of the Unit 8 harvest was recorded from Afognak, Shuyak, and Raspberry Islands. During the 1975, 1976, and 1977 seasons, approximately 30 percent of the annual harvest came from these islands--an estimated 547 deer were taken on these islands in 1977, the largest take on record. Harvest has increased along the westernmost bays south of Uganik Island in the '70s, reaching a peak in 1976 with 34 percent (367 deer) of the Unit 8 harvest. Distribution of the 1977 estimated harvest is illustrated in fig. 2.

Deer habitat relationships and food habits--The diversity of habitats which now support deer populations belies the early predictions of Batchelor [1962] who believed spruce cover to be a requirement for establishing significant deer herds. The grass-brush vegetation type which covers most of Kodiak Island now supports higher densities of deer than any of the predominantly spruce habitat. Batchelor apparently felt that the grass-brush vegetation on most of Kodiak Island would not provide sufficient winter cover for deer. However, Batchelor underestimated the adaptability of the Sitka blacktail to non-coniferous habitat. The density of the cottonwood, birch and alder thickets is sufficient to provide considerable protection from the frequent storm winds and precipitation affecting the Kodiak area. Moreover, the diverse and relatively more abundant foods found in the grass-brush association appear to be capable of supporting more deer than spruce habitat, at least in the early years of occupation. During persistent deep snow conditions in this vegetation type, deer are susceptible to heavy winter losses as Batchelor predicted. However, observations indicate that the northern Kodiak and the Afognak Islands group frequently receive heavier and more persistent snowfall than the southern and western part of Kodiak Island. Deer in southwestern and central western Kodiak are less often subject to heavy snow conditions and, therefore, have increased chances for survival during most winters. Snow accumulations on Kodiak often do not exceed 1 to 2 feet on most of the deer winter ranges below 500 feet elevation. Rainy periods characteristically occur intermittently all winter, melting and crusting snow below 500-1,000 feet elevation. Deer sometimes range freely during the winter to above 1,000 feet into the edge of alpine areas which are normal summer and early fall ranges. The rain- and wind-crusted snow sometimes easily supports an adult deer when temperatures are below freezing. With warming temperatures and rain, snow becomes soft and may not support deer. Deer are sometimes seen moving freely over snow 3 or more feet in depth, foraging in willow and alder thickets and on wind-blown heath knolls at 800 to over 1,000 feet elevation. The advent of warming temperatures, rain or additional snowfall may cause deer to become entrapped at higher elevations where they subsequently starve. It is not unusual to find deer carcasses in such situations during winters with high snowfall. The occasional availability of these higher winter ranges is probably a positive survival factor.

Deer move into alpine ranges in late June, depending on snow-melt patterns and phenology. There is by no means a complete shift of deer populations to the alpine areas, as some deer are found at all elevations during summer. The alpine-subalpine range receives heavy use until mid-September when freezing weather desiccates herbaceous plants and occasional snowfall begins at higher elevations.

Evaluation of Kodiak's deer habitat is limited by scanty quantitative data on food habits and distribution and abundance of major food plants. Feeding observations, examination of browsed vegetation, and limited analysis of rumen contents provide some insight into deer food habits. Merriam [1964], in observing deer feeding in alpine and sub-alpine summer range, noted that fireweed (*Epilobium angustifolium*) was a primary summer food. Red-berried elder (*Sambucus racemosa*), Nootka rose (*Rosa nutkana*), salmonberry, cow parsnip (*Heracleum lanatum*), reedgrass, and hairgrass (*Deschampsia* sp.)

were fed upon to a lesser extent. Merriam [1968] noted that on Kodiak deer use many species of food plants not generally found or used on other Alaskan deer ranges. Rumen samples he examined, which were collected in November and December, contained substantial amounts of alder, spruce, willow, bearberry, crowberry, fireweed (*Epilobium angustifolium*) and various grasses. Spruce and alder are not preferred foods and use of these species probably indicates poor range condition or unavailability of forage due to snow cover.

Alexander [1968] used the point-frame method to analyze 49 deer rumen samples collected during December through March. Sampling rumen material from deer taken in both spruce and grass-brush habitat, he noted that diversity and probable nutritional quality of food species in non-spruce areas was much greater than in spruce areas. He found 12 species of plants in deer rumens from spruce habitat including cranberry, salmonberry, crowberry, fireweed, alder, spruce, kelp, lichens, and various grasses. He found 7 additional species used in the grass-brush areas, including highbush cranberry (*Viburnum edule*), bearberry, skunk cabbage (*Lysichiton americanum*), ground dogwood (*Cornus canadensis*), fern (*Dryopteris austriaca*) and birch. Alexander's study indicated that foraging on spruce increased as the winter progressed, as did use of kelp. Although spruce showed the highest frequency of occurrence and volume, red-berried elder and willow appeared to be the next most-heavily used plants in the spruce habitat. Crowberry, low cranberry, willow, salmonberry, Nootka rose, and red-berried elder appeared to be the most commonly used plants in non-spruce areas. The high use of kelp, alder, and spruce was evidence to Alexander that deer took foods of poor nutritional quality on spruce range.

Steep, windblown, and southerly-exposed hillsides are commonly used winter feeding areas. Deer forage on the rhizomes and petioles of the fern, *Athyrium filix-femina*, which is abundant on many sites. Hjeljord [1971] noted that this fern was the major food of mountain goats during 1 winter when he was studying food habits on Kodiak Island. The laterally-spreading form of the abundant alder intercepts snow, resulting in less accummulation under its stem, thereby facilitating goat feeding on the growing fern beneath, according to Hjeljord. I have observed deer feeding in similar sites, sometimes pawing through 12 to 18 inches of snow to feed on the fern. Hjeljord reported that the plant is rich in nitrogen-free extract.

The windblown capes and bluffs at the mouth of bays and along ocean entrances are favored wintering areas through the Kodiak Archipelago. Scattered heath patches are found near sea level in these areas and deer forage heavily on crowberry, low cranberry and bearberry. On some ranges these heath knolls are noticeably denuded by deer browsing. Cottonwood, birch, and scattered spruce pathces, dense alder thickets along steep draws provide cover.

Red-berried elder is one of the most heavily used browse species on most of Kodiak. The elder grows abundantly in association with the ubiquitous alder thickets. Deer strip the bark from the larger stems and take tops of the smaller stems. Highbush cranberry is a highly preferred species, often occurring as widely dispersed single plants. This species is severely browsed on northeastern Kodiak where deer have been present longest. The plant is much more abundant on the west side of Kodiak, often forming small thickets. A local resident reported that the cranberry crop in the Uganik Bay area noticeably declined after deer occupied the area. The plant may be a good indicator of the intensity of deer range utilization.

Afognak's deer undoubtedly use many of the same food plants used on Kodiak as the meadows and forest openings contain some of the same species. Blueberry is fairly abundant in spruce habitat and receives heaviest use under mature spruce forest adjacent to capes. Only light overall use of blueberry in the Afognak Island area is apparent, but deer populations have been low until recently and it may be a much more important browse species than is indicated. Afognak generally has deeper and more

persistent snow than most of Kodiak and deer do use beach timber fringes during severe winters. During many winters, however, rains and warmer temperatures prevent heavy snow accumulations. When heavy snows do occur, the coastal timber becomes critical for providing deer with cover and food.

Natural mortality--Overwinter mortality is assessed each spring by searching predetermined sections of coastal winter ranges much as Klein [1956] described for black-tailed deer in southeast Alaska. Deer are not forced onto the beaches in most of the grass-brush habitat of Kodiak, as occurs in the coastal forest areas of southeastern Alaska and Prince William Sound. Snow depths comparable to those of southeastern Alaska are seldom recorded on Kodiak. Deer generally range over a broader band of coastal winter range and frequently move up and down, elevationally, with changing snow conditions. While some deer may die close to the beach during heavy snow periods, others move away when rapid snowmelt occurs, subsequently dying some distance from the beach where they are less likely to be found during the spring searches.

The highest mortality recorded for Kodiak was 1.3 deer per mile after the severe 1970-1971 winter. The population was at a low then and much greater mortality probably would have been recorded with a higher population. Winter mortality on Kodiak, as indicated by searching beach transects, does not appear to be as extensive as in much of southeastern Alaska. Less severe winter conditions, wider elevational disperal of deer in winter ranges, and better quality winter range with a shorter history of occupation by deer may explain the relatively high survival of Kodiak's deer populations. With the lush herbaceous growth available on the summer range, deer may enter most winters with good fat reserves. It is not unusual to find significant backfat on mature bucks in late December, well after the rut. In northeastern Kodiak Island, with the longest history of occupancy by deer populations, some starvation losses occur during most winters, indicating that winter range is overutilized and much below its former carrying capacity. Some fawns are rather quickly lost to starvation when snow is deep enough to significantly hamper their movements.

Accidents account for minor losses of deer. Most occur during the winter when trails along cliffs become icy. Drowning accounts for a few deer who venture onto soft ice in lakes and protected bays or are injured and trapped by tides.

Predation and chasing by dogs accounts for an undertermined number of deer mortalities. Packs of free-roaming dogs are especially common near the town of Kodiak and other areas of human settlement. Deer frequently attempt to escape pursuit by swimming. Two adult deer were rescued from Women's Bay during the 1973-1974 winter after being chased by dogs. One was released, apparently in good condition after being dried and confined overnight. The other deer died of apparent exhaustion within a few minutes after rescue. Examination of femur marrow indicated that this deer, a buck estimated at 6 years of age, was in good condition. Another dead buck, cornered against a corral, showed severe hemorrhage from dog bites in the hindquarters but apparently died of exhaustion. Most deer-dog incidents occur when snowfall brings deer to low elevations.

Although brown bear sometimes feed on deer carcasses, there are no recorded incidents of brown bear predation on deer in the Kodiak area. Given the opportunistic nature of brown bear, predation on deer undoubtedly occurs, but is not a significant limiting factor on deer populations.

Management and harvest characteristics--An expanding deer herd and the remote location of some of the best deer populations dictate that management be directed toward achieving increased harvest. A 5-month season, beginning August 1 and ending December 31, and a 3-deer limit went into effect in 1963 over most of Kodiak and adjacent islands. In 1971, the bag limit was raised to 4 deer. The season was

extended through January 15 in 1978. Despite the liberal bag limit, long season, and either-sex hunting, harvest lags far behind being proportional to population increases.

Accessibility of hunting areas is the singlemost important factor determining hunting pressure. Many areas on eastern Afognak and western Kodiak Islands have high deer populations but are only lightly hunted. Float-equipped or amphibious aircraft and fishing boats are used almost exclusively to reach the more remote hunting areas. The presence of a large fishing fleet in Kodiak provides many boat owners and their friends an opportunity to hunt remote areas in relative luxury. The tempestuous nature of Kodiak's weather frequently postpones hunting trips by even the largest of the fleet, however. Trips to the west side of Kodiak, where deer populations are highest, involve passage through Shelikof Strait, one of the most notoriously hazardous stretches of water in Alaska. Some rather spectacular hunts are accomplished, as a single fishing boat may bring in 25 or more deer. Occasional complaints of excessive harvest are received when people observe large numbers of deer carcasses hanging from the rigging of boats as they return to the harbor. Although some of the large boat hunts take numerous deer, many are more of social than subsistence ventures. The characteristic cruising and searching until an animal is spotted is closely akin to "road hunting."

Approximately 50-60 percent of the estimated annual harvest is taken by hunters using boats for transportation. Probably half of this harvest is taken by hunters using small skiffs, but the type of boat used is not recorded in compiling harvest data. Small skiffs and cabin cruisers do provide transportation to many hunters residing in Kodiak and outlying villages. The southern coast of Afognak Island and Raspberry Island receive much of the hunting pressure by skiff hunters from Kodiak. Many skiff-borne hunters seek trophy bucks and go hunting nearly every suitable weekend during the season.

Approximately 20-30 percent of the annual harvest is taken by hunters using private or commercial aircraft for transportation. Less than 5 percent of the harvest is taken by hunters using their own aircraft. A few beaches are suitable for wheelplane operations, but amphibious and float-equipped charter aircraft provide most of the service to hunters. Floatplane use is limited to the more protected bays, lagoons and some lakes, prior to freeze-up. Many of the outer capes with high deer numbers also have rough seas which prohibit landings except on the rare calm days. Frequent windy, rainy, and foggy fall weather further limit the use of aircraft.

The cost of commercial aircraft transportation also limits its use by deer hunters, particularly for the more remote areas with high deer populations. A typical hunting party of 3 might spend $500-600 to charter a Grumman amphibian for a round trip to the better hunting areas.

The lack of good shelter discourages deer hunting to some extent. Approximately 2/3 of Kodiak Island is within the Kodiak National Wildlife Refuge which provides only a few public-use cabins in good deer hunting areas. There are numerous cabins on the Refuge which are under special use permits for salmon set-netting and these have been available to a limited extent for use by hunters prior to 1977. In 1977 the Refuge prohibited use of these cabins for activities other than salmon fishing. Some cabins on private lands are available to deer hunters when unoccupied. The U.S. Forest Service maintains a limited number of public-use cabins on Afognak, but all are not located in good hunting areas.

Although the hunting season begins in late summer, only about 10 percent of the annual harvest is taken during August and September when deer are frequenting alpine areas. Effort picks up in October as the dense vegetation dies back with the onset of freezing temperatures and occasional snows. Weather conditions largely determine the chronology of the harvest during the last 3 months of the year. It is not unusual for

a hunter to spend up to a week waiting in Kodiak for suitable flying or boating weather. Usually deer become more accessible later in the season as they move down into winter ranges. Sometimes significant snowfall does not occur during the season and deer remain widely dispersed.

During 1977, the estimated harvest, based on a telephone survey of 9 percent of the Kodiak hunting license purchasers, was 1,868 deer. This was the highest harvest since 1974, but represents a minimum estimate. Nine hundred fifty-seven hunters were estimated to have pursued deer. The telephone survey does not sample residents of outlying villages, hunters under 16 years old, hunters without licenses, or hunters who purchase licenses somewhere other than Kodiak. Analysis of 1975 harvest report returns indicated that 18 percent of the kill was taken by residents of other areas of Alaska. The harvest is probably at least 30 percent greater than that estimated from telephone hunter interviews. Using the 30 percent correction, the 1977 harvest was about 2,500 deer. Deer hunting pressure by residents of other areas of Alaska appears to be increasing with recent restrictions in seasons for moose and caribou.

Deer hunting in Unit 8 is both a recreational and food-gathering pursuit for most hunters. Although venison is highly valued for food, most hunters have either permanent or seasonal employment and are not dependent on deer for food. Some families with more than 1 hunter do, however, fill much of their red meat demand with venison. Some residents of outlying areas and villages hunt deer all year and probably depend fairly heavily on venison for food, thus freeing their cash for other needs. Approximately 75 percent of the hunters interviewed in 1977 took more than 1 deer, further indicating the desirability of venison for food. At 40 pounds of meat per deer and a harvest of 2,500 deer, the 1977 harvest represents 100,000 pounds of venison.

The fact that 60-70 percent of the deer reported taken are males indicates trophy selection is common. In the 1971 edition of Records of Alaska Big Game, 26 of 35 (74 percent) deer listed were killed on Kodiak. One Kodiak sport shop sponsors a highly popular "big buck" contest. It is rumored that a few local hunters far exceed the bag limit each year seeking large trophy antlers.

Summary and Conclusions

The inability to harvest Kodiak's deer populations at a level sufficient to affect their rapid growth is the major management problem. It is unlikely that enough hunting pressure will develop to exert controls on Unit 8 deer herds within the foreseeable future. Most of the available habitat is now occupied by deer, and high populations are present even in the most recently-occupied areas on western Kodiak and Afognak Islands. Deer numbers may be nearing an all-time peak in Unit 8. While much of the recently-occupied range on western Kodiak appears to offer better food plant diversity and abundance than found in northern Kodiak and Afognak, continued high populations will inevitably deplete the low coastal winter range. The population will then fluctuate with the severity of winters. A continuing series of mild, snow-free winters will accelerate the depletion of recently-occupied ranges. The decline of deer in northeastern Kodiak Island from early 1960s levels provides a good basis for this prediction.

Management will continue to be directed at maximizing harvest and recreational hunting opportunity. Even when deer populations are at low levels it is doubtful that hunting will become a limiting factor over most of the Kodiak area. The dense vegetation, severe weather and difficulty of access will enforce the law of diminishing returns.

In the most northeastern corner of Kodiak Island about 100 miles of roads provide relative easy accessibility. Continued closure of hunting during November and December, when deer move closer to the road system, should prevent overharvest. However, management emphasis there will be on providing maximum opportunity to hunt while minimizing harvest. Less than 10 percent of the annual harvest is taken there, although about half the hunters interviewed reported hunting 1 or more days in this area during the 1973 season. Illegal harvest and predation by dogs is potentially limiting when added to legal harvest. Competition with cattle for browse and increasing human settlement in this area will continue to diminish habitat.

Approximately half the coastline of Kodiak and Afognak Island will ultimately be deeded to Native village corporations under terms of the Alaska Native Claims Settlement Act. Some restrictions on access for hunting on these lands may be imposed, but will probably have little impact on deer hunting. Possible development of recreational cabins or other facilities may even benefit hunters. The impact of this change in land ownership on deer habitat will probably be minimal on Kodiak Island. Native corporations will receive title to much of the commercial forest lands in northeastern Kodiak, Afogank and adjacent forested islands. An accelerated logging program with extensive clearcuts could be detrimental to deer. Much of the area of the current U.S. Forest Service administered Perenosa Bay timber sale on Afognak will ultimately become Native corporation lands. Afognak has little previous history of logging and deer/habitat relationships are little researched. Additional research on plant succession in clearcuts, as well as seasonal food habits and habitat use by deer, is needed.

The introduction of Sitka black-tailed deer into the Kodiak Archipelago was one of the most successful transplants of big game animals done in Alaska. The full potential of recreational hunting for Kodiak's blacktails has yet to be realized. As hunting pressure increases in Alaska and keener competition for opportunity to hunt mainland species, such as moose and caribou, develops, more and more hunters will brave the vagaries of Kodiak's weather to pursue the mossy-backed blacktail.

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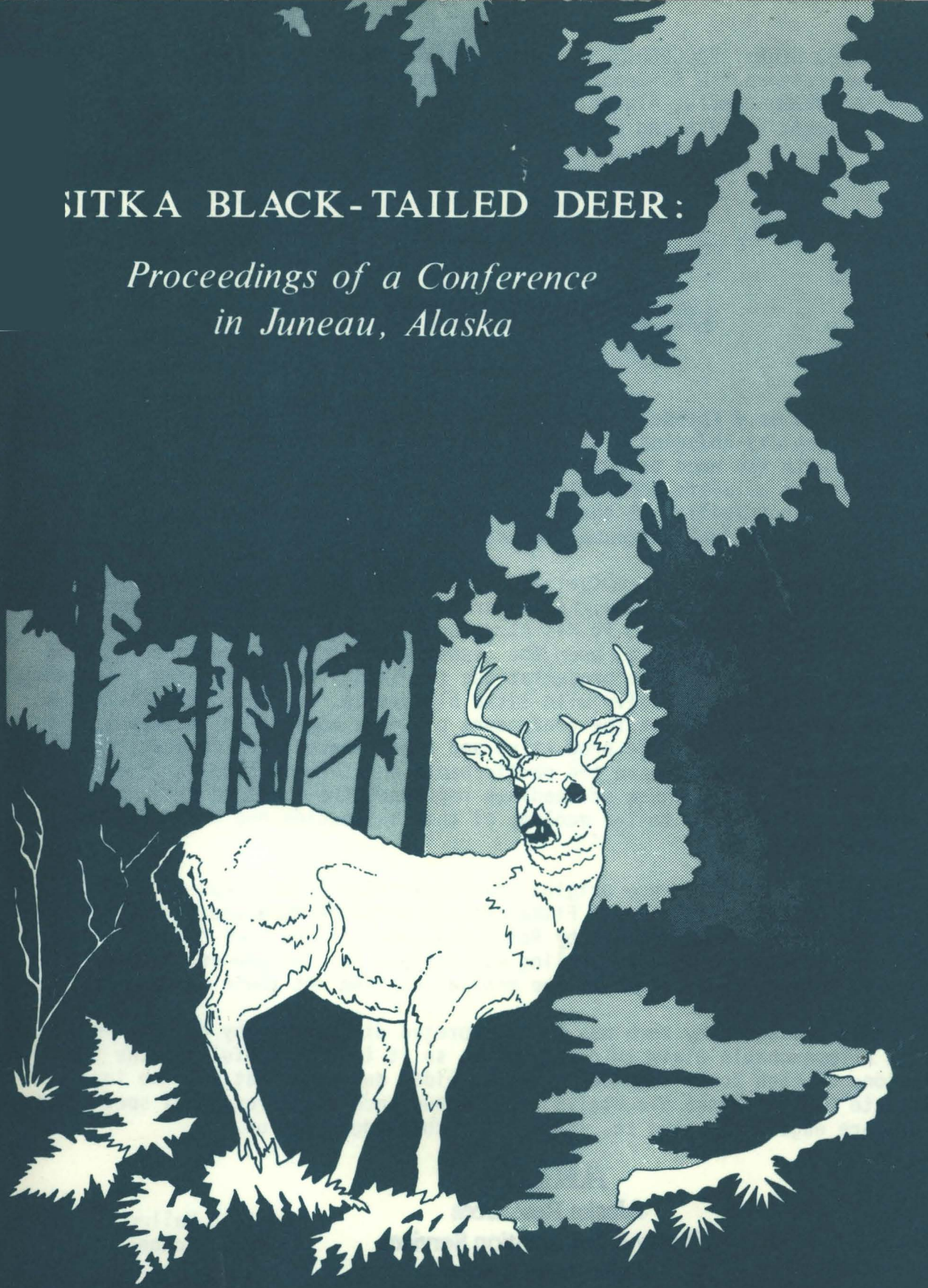
SITKA BLACK-TAILED DEER:

Proceedings of a Conference in Juneau, Alaska



U.S. Department of Agriculture, Forest Service, Alaska Region, in cooperation with the State of Alaska, Department of Fish and Game