History and Current Status of Sitka Black-tailed Deer in Prince William Sound

by

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Introduction

Deer are not native to Prince William Sound. The Cordova Chamber of Commerce in 1916 arranged to have 8 black-tailed deer (*Odocoileus hemionus sitkensis*), captured near Sitka, transplanted to Hawkins and Hinchinbrook Islands in Prince William Sound. From 1917 to 1923, 16 more blacktails were added to supplement the original transplant. The introduction of deer to Prince William Sound was the initial big game transplant in Alaska and has proven to be one of the most successful [Burris and McKnight, 1973].

The browse in Prince William Sound was not being utilized by any ungulate when deer were introduced. Thus, the deer responded rapidly to the virgin habitat--they increased rapidly and dispersed throughout Prince William Sound wherever suitable habitat existed. The population peaked about 1945 and by 1950 range damage was severe, drastically reducing the carrying capacity of the winter range [Robards, 1951]. Extreme population fluctuations are common with most species at the northern limits of their range; Prince William Sound deer are no exception. Major die-offs were recorded in the late 1940s, mid-1950s, late 1960s, and early 1970s. Winter snow depth and duration is the primary regulating factor of deer abundance in Prince William Sound.

Discussion

Distribution and abundance--The distribution of deer in Prince William Sound is fairly stable and what observable, though slight, expansion and retraction of range utilized by deer is the direct result of the severity of previous winters. A series of mild winters allows deer to expand their range only to be reduced by the next normal or severe winter.

In Prince William Sound, the better deer populations are found on the larger islands: Hawkins, Hinchinbrook, Montague, LaTouche, Green, Knight (eastern side) and the Naked Island group (fig. 1). The mainland is marginal deer habitat with the exception of the Gravina Point to Rude River area which contains a moderate deer population. The northern and western portion of Prince William Sound is marginal habitat. Prince William Sound fishery biologist J.D. Solf, now deceased, stated [personal communication] that he had seen deer or deer tracks in nearly every major drainage of Prince William Sound at one time or another. Each year deer are reported in atypical areas around Prince William Sound, but winter snow depth does not allow them to become established.

Hawkins, Hinchinbrook and Montague Islands support probably 70 to 75 percent of the Prince William Sound deer population. No attempt to estimate total numbers of deer in Prince William Sound has ever been made. The current deer population would be classed at a moderate-to-low level compared to the carrying capacity of a "normal" winter.

Harvest--Deer hunting in Prince William Sound commenced in 1935. The regulations made it legal to take 1 buck having antlers not less than 3 inches in length, from September 20 to September 30, under a special permit prescribed by the Secretary of Agriculture. The drainages into Prince William Sound open to hunting were: north of the center of the Copper River and Northwestern Railway and west of Mountain Slough, including the islands of Prince William Sound, except Hawkins and Knight Islands.

In 1938, the regulation stipulated that only residents could hunt. In 1952, after a major die-off, the bag limit was raised to 2 bucks. Does became legal in 1953 and fawns a few years later (1955?). Season lengths, bag limits and areas open to hunting varied from year to year, but gradually increased until 1964 when the Game Management Unit 6 (Prince William Sound) deer season was set for August 1 through December 31 allowing 4 deer per year, provided that antlerless deer could only be taken from September 15 through December 31. The season and bag limit has remained the same for the past 14 years.

Good harvest data are not available. Presently, 2 methods of collecting harvest data are utilized: harvest report cards and Cordova hunter interviews. Deer harvest tickets have been required since 1965, but hunter compliance in returning the harvest report card has been poor. For Game Management Unit 6 the harvest report card data probably give a fair picture of the overall harvest; that is, percent of males, number of deer taken per hunter (1, 2, 3, or 4), deer per hunter plus chronology and location of the harvest. Harvest report card data have not accurately reflected the magnitude of the harvest or the hunting effort (days hunted). The 1977 harvest report card was modified to better reflect hunting effort. The Cordova hunter interview, which is conducted annually by interviewing 100 Cordova hunters and extrapolating the results, gives a fairly reliable picture of the deer harvest by local hunters. But, the interview data probably give a distorted "overall" picture of the harvest. Local hunters probably kill more deer with less effort than those from Anchorage, Fairbanks, and Kenai Peninsula, but they are also very lax in returning their harvest report cards. The number of deer reported taken by Cordova hunters (interview data) is often larger than the harvest indicated by the statewide harvest report card.

The Unit 6 (Prince William Sound) deer harvest varies from about 500 to 1,500 deer per year. Hunters that go afield average slightly more than 1 deer and average 3 to 4 days per deer. Hunter success is variable, but normally better than 50 percent. Snow conditions influence the magnitude of the harvest more than the size of the deer population.

There appear to be 2 basic types of deer hunting: 1) hunting in alpine areas early in the season prior to deep snow, and 2) hunting in the lowlands after snow has

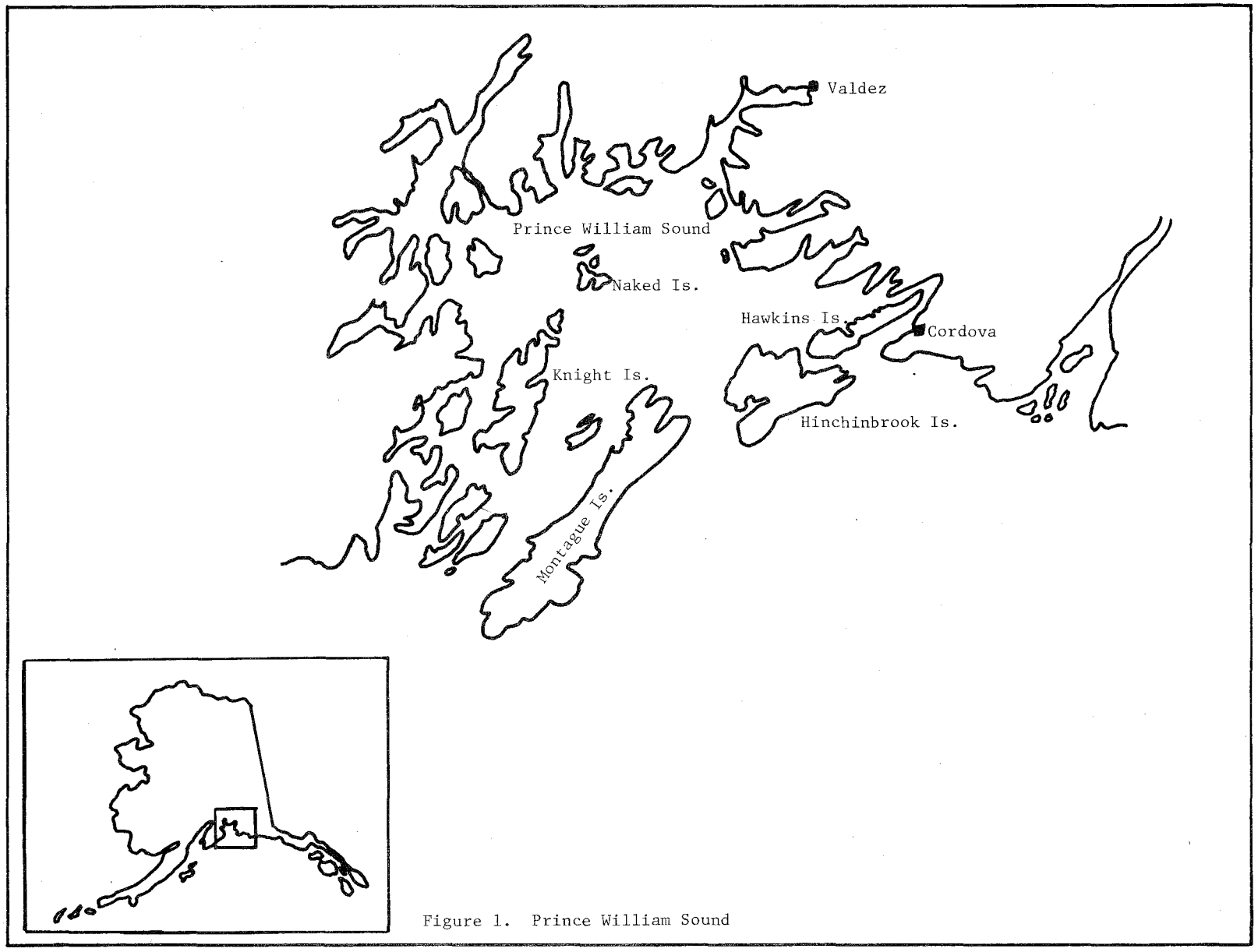

Figure 1. Prince William Sound

concentrated the deer on or near the beaches. The alpine hunter is the avid hunter who hunts for the sport and for the meat. The late-season, deep-snow, hunter is more interested in meat than sport, and may not hunt if deer are not pushed to the lower elevations by snow.

Hawkins Island receives the majority of early season hunting pressure. Once snow concentrates deer in the lower elevations, hunting effort shifts to Hinchinbrook and Montague Islands. The other major deer islands are also normally hunted at this time but to a lesser extent. Local (Unit 6) hunters tend to be more meat- than sport-oriented and probably account for about half of the Unit 6 deer harvest. They commonly utilize commercial fishing boats for transportation and lodging. They are mobile and are able to hunt when and where conditions are optimum. The visiting hunter primarily hunts for sport and concentrates on Montague and Hinchinbrook Islands where Forest Service cabins are available. Less than 5 percent of the Prince William Sound hunters are non-residents.

Habitat--Prince William Sound deer are dependent upon climax forest vegetation rather than sub-climax habitat which is considered their normal relationship in the "lower 48." A climax forest provides the essential shelter and forage necessary to survive through the winter months. Deer could not survive in Prince William Sound without a climax forest along the beach fringe.

Prince William Sound deer have a fairly small home range that includes vertical migrations with the changing seasons. A 3-1/2-year-old doe ear-tagged during March, 1967 in Port Etches was killed by a hunter on the same beach 10-1/2 years later in November, 1977. Most likely this deer had moved up and down the same drainage for the past 13 years. The greatest documented movement of an ear-tagged deer in Prince William Sound was a female fawn tagged in February, 1968 at Double Bay, Hinchinbrook Island. It was killed in November, 1971 at Juania Bay, Hinchinbrook Island, a straight line distance of 9 miles. No major geographic features separate the tagging and kill sites.

Food is not a limiting factor during the snow-free portion of the year. Some of the more abundant plants utilized by deer are *Cornus canadensis* (bunchberry), *Rubus pedatus* (trailing bramble), *Coptis asplenifolia* (gold thread), *Maianthemum dilitatum* (false Lily-of-the-Valley), *Lysichiton americanum* (Yellow Skunk Cabbage), and *Vaccinium ovalifolium* (blueberry). Realistically, kelp should also be listed as a major food item for Prince William Sound deer.

During the summer, deer may be found at any elevation but the preferred habitat is at or above timberline. This alpine range is characterized by lush meadows of *Maianthemum* in small openings of hemlock at timberline or dwarf hemlock above timberline. In the fall after frost kills the *Maianthemum*, deer move down into the high timber country where *Cornus*, *Rubus*, and *Coptis* are abundant. During the winter, deer remain just below the snow line, moving up and down with the changing snow depths. They continue to feed on evergreen forbs until snow forces them to utilize woody plants, with *Vaccinium* being the most important. Usually they are near the beach when *Vaccinium* becomes their staple diet. As *Vaccinium* becomes scarce they turn to kelp for the bulk of their diet. If forced to remain on the beaches for an extended period, approximately 2 months, winter mortality commences. The beach and timbered beach fringe is the most critical habitat to Prince William Sound deer. Snow depth forces deer to lower elevations until there is no place to go except onto the beach. Deep, rutty trails, sometimes shoulder deep to the deer, are formed between the tidal beach and the beach fringe timber. Their life evolves around feeding on kelp at low tide and scrounging food under the climax canopy along the beach fringe at high tide. Critical winter range is often less than a 100-yard-wide strip of forest parallel to the beach. If snow conditions are not too severe they may range inland approximately 1/4 mile. Prince William Sound's deer winter range is poor in quality.

It has been overbrowsed periodically since the late 1940s and will never support a large deer population, as compared to the early 1940s. Only after a series of mild winters during which deer are not forced onto the beaches for an extended period of time, will they become "abundant."

The only practical way to preserve critical winter deer range is to refrain from disturbing the climax forest [Leopold and Barrett, 1972]. In Prince William Sound, this means no logging within 1/4 mile of winter deer range beaches. Also, forested areas above the critical winter range to 500 feet elevation should be maintained. This area provides critical relief from the beach fringe during late fall and early spring.

Browse utilization and range condition data were collected from 1964 to 1970 in a cooperative effort by the U.S. Forest Service and Alaska Department of Fish and Game. Ten range transects were established in Prince William Sound to determine browse utilization annually on key winter ranges. The technique utilized is described in the Alaska Department of Fish and Game Annual Segment Report, Project W-6-R-3, Work Plan A - 1e. This method employed 1/2 mile transects parallel to the beach fringe consisting of 20 permanently marked *Vaccinium* plants. Data on the number of browsed and unbrowsed leaders, plant height and condition, plus deer winter mortality, were taken annually in the spring. The browse utilization study was dropped in 1971 because the data collected gave an erroneous impression of winter range conditions. A severe winter would show relatively little utilization of *Vaccinium* because it was covered with snow. A mild winter would show the same percent utilization because deer were not forced onto the winter range for any duration. It is interesting that the 7-year average for *Vaccinium* utilization (annual leader growth) was 61.2 percent with annual fluctuations from 30.2 percent to 82.0 percent. Presently, no range studies are being conducted.

Mortality--There are 2 major sources of mortality to deer in Prince William Sound: 1) starvation and 2) hunting. Starvation is by far the greatest cause of mortality; but occasionally, hunting can have a significant effect upon the deer population.

This past winter (1977-1978) proved to be an example of how deer hunting can affect the population. Heavy snow fall in early November forced deer onto the beaches and basically held them there through December. The winter appeared to be a repeat of the 1971-1972 winter when an estimated 80 percent of the Prince William Sound deer population was lost through starvation. Fortunately, hunting conditions were good in November and December and hunters took large numbers of deer off the beaches. By late December hunters were taking deer which contained little or no fat. Warm weather (wind and rain) in January, 1978 caused the snow to recede from the beach fringe timber, making available the abundant *Cornus*, *Rubus*, and *Coptis*. A field reconnaissance trip in late January revealed little winter mortality, but utilization of *Vaccinium* was estimated at 80 percent of the previous year's leader growth. In addition, extensive use of alder (*Alnus*) and rusty menziesia (*Menziesia ferruginea*) was noted. Rusty menziesia has rarely been utilized by Prince William Sound deer in the past except for an occasional bite or two; only the young *Menziesia*, about 2 feet tall, had been browsed. The extensive use of *Vaccinium*, *Alnus*, and *Menziesia* indicated that by the end of December deer were desperate for food. Had the deer harvest not been heavy, and in some areas almost excessive, considerable winter mortality would have occurred before the warm weather in January made feed available. This past winter was not typical. Usually the deer are not concentrated on the beaches during the hunting season long enough for a significant harvest to occur, and the majority of winter mortality through starvation would occur in late winter or early spring.

The magnitude of winter mortality in Prince William Sound is difficult to determine. Snow depth at the high tide line during a severe winter may be 4 to 6 feet. Deer that are weak often die on the beach and are gradually carried off by the next series of high tides.

Predation is not a significant problem to Prince William Sound deer. The majority of deer are found on the larger Prince William Sound islands which have no wolves or coyotes. Brown bear is the only large predator on Hinchinbrook and Montague Islands but is usually in hibernation during the critical winter months. A few coyotes are present along the mainland in deer country (Gravina Point to Rude River) and probably take their toll of deer during periods of deep snow. A few deer are present near the town of Cordova. They fall easy prey to dogs and coyotes when snow depth restricts their mobility.

Disease has never been a problem to Prince William Sound deer. In fact, they are probably the most disease and parasite-free big game species in Alaska. Occasionally a deer with "warts" will be taken by hunters. These probably are fibromas or papillas --usually benign tumors. Only 3 to 4 cases have been reported in the past 9 years.

Management--Deer management in Prince William Sound has been largely a matter of maintaining liberal seasons and bag limits, and letting the hunters harvest what they could. The deer season has only been altered twice since 1964. In January, 1967 the season was extended by 2 weeks (with an increased bag limit of 2 deer of either sex) because large numbers of deer were concentrated on the beaches. In 1973, the season was closed 2 weeks early by emergency order because of the large harvest that had occurred with a relatively small deer population.

According to the "Alaska Wildlife Management Plans" [Alaska Department of Fish and Game, 1976], which have not formally been approved by the Board of Game, the Prince William Sound deer management goal is "to provide the greatest opportunity to participate in hunting deer." The opportunity to participate is deemed more important than success or quality of the hunt.

The management philosophy at present is to maintain the liberal season and bag limits because hunting has little effect upon the deer population. The season will be closed by emergency order only when a small deer population exists coupled with a potentially excessive harvest. Rather than harvest all the animals that might die of starvation, their fate will be dependent upon a warm trend occurring in mid-winter. If the deer population is "high," the season will remain open regardless of the magnitude of the harvest. Prince William Sound deer range will never support a large deer population except following a series of mild winters, so with a high deer population the hunters might as well harvest all they can.

Except in extreme cases, hunting has little effect upon the status of Prince William Sound deer populations. Winter snow depth and duration are the controlling factors. Preservation of the habitat is the best management possible at present.

Summary and Conclusions

Problems--The most critical problem facing deer management in Prince William Sound is maintaining their winter range, namely preserving the climax forest within 1/4 mile of the beach. In southeast Alaska, it has been estimated that a clearcut will take at least 200 years for a new forest to reach the climax stage where forage is again available to deer [Schoen, 1977]. Once the climax forest along the beach fringe is clearcut it is essentially lost as deer habitat forever. In the past,

little conflict between logging and deer habitat has occurred in Prince William Sound because the timber sales were small and not in critical deer habitat. In addition, the Forest Service has been fairly responsive to Alaska Department of Fish and Game suggestions. Native selection of lands for timber resources in eastern Prince William Sound could result in a loss of deer haibtat. Also, native and D-2 land selections could force the U.S. Forest Service into selecting deer habitat for future timber sales.

Another potential problem is oil contamination of kelp on critical winter beaches. If an oil spill should occur dring a critical period when deer are subsisting on kelp, it could be detrimental, perhaps fatal if they are in a very weak condition. A possible solution might be to have the oil company responsible feed the animals until the oil can be cleaned off the beaches.

Predation could also pose a threat to Prince William Sound deer. Wolves were not common residents of the Copper River Delta until recently. The introduction of moose to the Delta during the 1950s and their rapid increase in numbers and distribution, coupled with existing goat populations, has provided a food base. If wolves should become established in Prince William Sound on the major deer islands, they would drastically affect deer abundance. Deer would be extremely vulnerable to wolf predation in most winters because of the very narrow and limited winter range.

The future-- future of deer in Prince William Sound is neither good nor bad. Deer have existed in the Prince William Sound region for over 60 years. They have dispersed throughout the South and occupy all suitable habitat. Thus, it is a "stable," established population that is likely to be around for a good many years if their habitat is protected.

Hunters must be made aware of the limited winter range and that Prince William Sound deer abundance will fluctuate considerably with the severity of future winters. It is not a realistic possibility to improve the forage along the beach fringe, nor is it economically feasible for the State to feed deer during the winter months as is done in some West Coast states.

A baseline study of deer dependency upon the beach and beach fringe timber, as influenced by snow depth and duration, would be extremely beneficial in better understanding and anticipating population fluctuations. At present, the future of Prince William Sound deer rests in maintaining the climax forest along the beach fringe.

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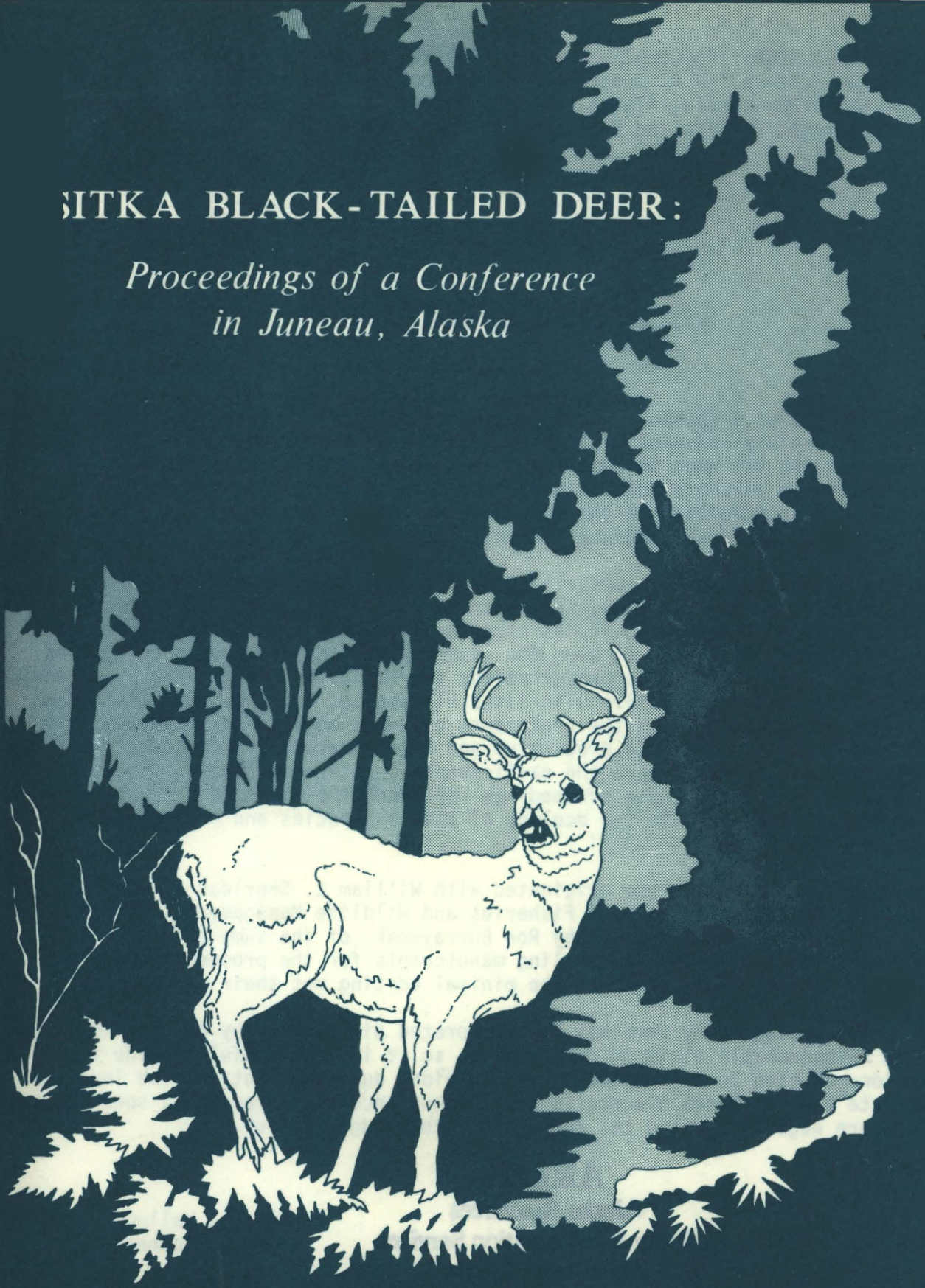
SITKA BLACK-TAILED DEER:

Proceedings of a Conference in Juneau, Alaska



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