

RESEARCH TECHNIQUES UTILIZED IN DEER MANAGEMENT IN ALASKA

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Introduction

The Sitka black-tailed deer (Odocoileus hemionus sitkensis) is indigenous to the coastal islands and adjacent mainland of southeast Alaska. Deer have been successfully transplanted from southeast Alaska to Yakutat, Prince William Sound and Kodiak Island where well-established populations are now present.

The summers of these regions are cool and wet. Winters are usually mild with little snowfall at sea level; however, at intervals severe winters with heavy snowfall do occur. Dense stands of Sitka spruce and western hemlock are present on the mountains which rise steeply from the sea.

The Sitka black-tail thrives in this wet environment. Deer are abundant in southeast Alaska and Prince William Sound, probably in excess of 20 deer per square mile. Hunting has little impact on deer populations in these areas and in many locations the report of a hunter's gun is a rare occurrence. Seasons are long (five months) and the limits liberal (four deer of either sex). Deer numbers fluctuate with the severity of the winters. In most areas, there is little the game manager can do to manipulate populations.

On Kodiak Island deer density is lower than in southeast Alaska or Prince William Sound. However, all available habitat has not been occupied and deer numbers are increasing. Since hunting does appear to limit deer numbers in areas of easy access, restrictions have been imposed on Kodiak Island.

A small, but dense, deer population is present in the vicinity of Yakutat. Because of the isolated location, it received very little hunting effort.

Deer research in Alaska is aimed at obtaining data on the current status of deer populations and their habitat as well as information which will be useful for future management.

Population Studies

Various census techniques have been employed to assess deer numbers. Most have proven unsuitable for the unique habitat and weather conditions found in Alaska. Many deer can be seen during severe winters along the beaches and in the high alpine meadows during some summers. Aerial and ground censuses have been attempted in both areas but the correlation from year to year is low.

A high population may be present; however, if the winter is mild, few deer will be seen on the beach. Conversely, if the spring is colder than usual, fewer deer will utilize the alpine range during summer. Winter aerial counts have proven useful on Kodiak Island where few conifers are present and

deer are readily observed when snow covered the ground. Aerial line transects and a random sample of square-mile plots were tested. A 10 per cent sample of square-mile plots was required to obtain .95 confidence limits with an allowable error of ± 1.0 deer per plot. Each plot was flown until the observer felt it had been thoroughly covered. The plots required less time to fly and provided a more accurate population estimate than the line transects.

In one area of southeast Alaska, morning highway counts in May and June have proven useful for determining trends. Counts begin at 6:00 a.m. along a 35 mile length of highway which passes through good deer range. The average number of deer per trip for a four-year period has ranged from 13.8 to 19.8.

Pellet plots have been established to determine population trends. A system of transects is used, located in areas known to be deer wintering range. Transects commence at sea level and run to 1200 feet in elevation. At 100 foot elevation intervals, four 100 square foot circular plots are located in a clover leaf cluster. Deer winter at varying elevations depending on the severity of the winter. Using this method, the transect will cross the zone of maximum use at some point and should indicate trends in numbers. In 1964 the average number of pellet groups per transect was 35.

Mortality Surveys

Winter mortality from starvation is the major limiting factor for most deer herds in Alaska. Mortality data is probably easier to obtain here than in other regions as the majority of deer die in the timber fringe at sea level. Permanent transects, each one-half mile in length, have been located throughout deer ranges in Alaska. Each transect parallels the beach, just within the fringe of timber. Transects are checked in March and April to determine the number of deaths per mile. A good correlation has been obtained between mortality and the degree of winter range use. Mortality is also reflected by the proportion of yearling deer in the following hunter harvest.

Wolves are the only important predator on deer in Alaska. The thrickest deer populations are often in areas which also support many wolves. To evaluate the relationship between deer and wolves, Coronation Island, a 30 square mile island located in southeast Alaska, was set aside as a study area. The island evidenced extreme use by deer, had no known predators and received little hunting pressure. Four adult wolves, two males and two females, were placed on the island in October 1960. Since that time wolf numbers have increased to 10 to 15 animals. The deer population has been reduced by at least one-half of the original number. Even with the extremely heavy pressure by wolves, deer are still present on the island. In June, 1965, 224 wolf scats were collected and analyzed for food content. Over 95 per cent contained remains of deer. Wolf productivity has been low, the largest known number of surviving pups is three. In 1965, no evidence of denning was found, even though four or five adult females of breeding age are probably present. With reduced pressure from deer, the range has come back very rapidly.

Range Studies

Under a cooperative agreement between the U. S. Forest Service and the Alaska Department of Fish and Game, Forest Service personnel accomplish most of the field work on range studies with the Department of Fish and Game acting in an advisory capacity. Deer range units have been established in 69 locations of southeast Alaska alone. Each range unit incorporates a utilization transect, two condition and trend transects and a deer enclosure. Utilization transects measure the winter use of the key browse species Vaccinium ovalifolium. They are checked each spring in March and April after the period of winter use. Transects are one-half mile in length with tagged plants located at two-chain intervals. Utilization is measured by the per cent of current growth removed each year. Condition and trend transects are 50 feet in length and are checked at three-year intervals to determine changes in density, size and vigor of plant species. All vegetation along the transect is recorded. Enclosures are two mil-acres in size. Their primary purpose is to provide a visual comparison between used and unused deer range. A photographic record is kept on each enclosure.

A study has been made of the effect of a 1/4 pound per acre DDT application on deer range. Results show that preferred deer food species contained up to 40 ppm (parts per million) DDT one month after spraying, but residue content decreased to less than three ppm within six months. Samples of deer tissue were obtained at one month, six month, nine month, and 21 month periods after spraying. Results from the 21 month sample are not available as yet, but no residue was found in muscle tissue and 3.6 ppm was the highest in fatty tissue in the other samples.

Studies are currently in progress to determine the nutrient quality of various deer food species from several vegetative types at different seasons of the year and to evaluate the influence of logging on deer populations and habitat.

Hunter Harvest Studies

Each year about 8,000 deer hunters take to the field in Alaska. Hunter success ranges from 55 to 85 per cent depending on the region. Success is highest in southeast Alaska where each hunter takes an average of two deer. Normally about 30 per cent of the take is does and about 50 per cent of all animals taken are three and one-half years of age or older.

Harvest information is divided into two categories: physical measurements and hunter interviews. Weights, measurements, jaws, front leg bones and reproductive specimens are obtained from as many hunter kills as possible throughout the season.

Immediately after the close of the season, hunter interviews are made in towns and outlying villages. A random sample of approximately 10 per cent of all hunters is queried regarding total take and effort, and sex, date and location of kills. A postal survey has also been used with results very similar to that of the hunter interview. However, the greater expense and time required to obtain results from the postal survey did not justify its use. In addition, by employing the interview method, a tabulation of results can be obtained within a week after the close of the hunting season.

The personal contact the interview provides between biologist and the hunter is also valuable.

This has been a brief review of our deer investigations in Alaska. As stated previously, in most areas we can only watch and attempt to learn. On only a small fraction of the total deer habitat does hunting exert any influence on the total deer population. It is sometimes frustrating to the biologist to work in the vast regions of Alaska where access is chiefly by boat or plane and many areas are seldom, if ever, reached. But the frustrations are more than compensated by the privilege of working in country which is as yet largely unchanged by man and true wilderness still prevails.

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