

Relationships Between Deer and Wolves  
on Coronation Island, Southeast Alaska

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Coronation Island is approximately 30 square miles in size and is located at the outer edge of the group of islands which constitutes Alexander Archipelago in Southeast Alaska. It is about 80 air-line miles southwest of the town of Petersburg. The maritime climate causes milder winters on the island than found in most areas of Southeast Alaska.

Sitka black-tailed deer (Odocoileus hemionus sitchensis) are indigenous throughout Southeast Alaska. Timber wolves (Canis lupus ligoni) are present over much of the deer range but there is no known record of them occurring on Coronation Island.

When a predator species, as the wolf, preys on a big game species which is hunted by man, there is usually conflict of opinion as to the value of the predator. This holds true in Alaska where many people feel wolves should be controlled to provide more game for the hunter. A bounty system introduced by the Territorial Legislature in 1915 is still in effect. Recognizing the lack of factual information available on wolves in Southeast Alaska, the Alaska Department of Fish and Game initiated a study to examine relationships between deer and wolves.

In October, 1960, four timber wolves (two males and two females), all approximately 19 months of age, were placed on Coronation Island. At the time of introduction the deer population was not as large as in many other areas of Southeast Alaska, but because of the moderate climate deer did not experience periodic heavy winter losses which occur in most Alaskan deer herds. In spite of relatively low but static deer numbers the habitat evidenced severe overuse of plant species by deer. Removal of forest under-story gave the island a park-like appearance in contrast to dense forest growth characteristic of most Southeast Alaskan forests.

Deer on the island were about 20 percent smaller than deer of equivalent age on better ranges. Remains of deer carcasses within the beach fringe evidenced some annual mortality. Examination of bone marrow indicated deaths were probably caused from malnutrition.

Since 1960 annual investigations have been made to evaluate changes in deer and wolf numbers, food habits of wolves, condition of deer and changes in the environment.

### Wolves

Wolf numbers increased slowly until the summer of 1965 when at least seven adults and two pups were present. This was a density of approximately one wolf per three square miles, probably the largest number of wolves per

unit area in existence. Since the summer of 1965 there has been a definite decline in wolf numbers. In February, 1966, only three adult wolves were positively identified. The present population probably does not exceed six.

Wolves are capable of producing from five to seven pups annually. To the best of our knowledge only one litter of pups has been produced each year since 1961, with the exception of 1962, when no pups were located. The largest number of pups known from any single litter is three.

Analysis of 609 wolf scats has shown deer to be the major food item. The number of scats containing deer remains increased from 78 percent in 1961 to 96 percent in the spring of 1965. From 1965 to date there has been a marked reduction in numbers of scats containing deer (of 110 scats collected in February, 1966, only 43 percent contained primarily deer). Harbor seal is second in order of occurrence. It is not known whether these marine mammals are killed or are carcasses which wash up on beaches. Of scats obtained in February, 1966, six contained only wolf material. Enough was present in each instance to indicate that wolves had actually fed on other wolves.

Even in the presence of a low deer population wolves were able to obtain them in sufficient numbers until 1965. At that time large amounts of miscellaneous food items began to appear in scats. Scats collected in 1966 show that almost half of the present diet of wolves ~~is comprised of~~ clams, chitons, crabs, birds and small mammals.

In February, 1966, two adult male wolves were captured and marked. One was emaciated and the second in apparent good condition.

#### Deer

Since the introduction of wolves to Coronation Island in 1960 deer numbers have steadily declined. In 1959 8.2 deer were observed per man-day in the field. This decreased to 2.0 per man-day in 1962 and in 1965 and 1966 no deer were seen during 40 days spent in the field. Several fresh deer tracks were observed during the summer of 1965. Most of these were in steep mountainous terrain.

Prior to the wolf introduction well-used deer trails were common throughout the island, and were especially noticable on summer alpine range. At the present time most of these trails have grown over with vegetation and are difficult to locate.

Since 1960 there has been no evidence of deer losses from malnutrition. Remains of many wolf-killed deer have been examined and the bone marrows have been white and solid.

#### Habitat

Fluctuations in deer and wolf numbers are difficult to measure however it is possible to obtain precise information on vegetation changes. Before a predator species was present almost every available plant was utilized by deer. Species which are normally unpalatable to deer showed heavy use. Sites inaccessible to deer supported a lush growth of plants which were absent from the forest floor. By 1962 the increase in plant abundance was

visually apparent. In 1965, five years after the wolf introduction, permanent range transects showed an average increase in plant occurrence of approximately 200 percent and some of the more important deer food species had increased as much as 300 percent.

### Discussion

The purpose of this study is an attempt to accelerate normal population fluctuations between a predator and prey species on an area small enough to allow changes to be measured. Some of the unknowns we are attempting to answer include: Can deer survive in the presence of an abnormally high wolf population. What happens to wolves when normal food sources become depleted. How fast and to what point will a wolf population increase. How long a time is required for deer range to recover after pressure is released. What is the carrying capacity of Alaskan deer ranges.

On Coronation Island we found wolf productivity much lower than the actual potential. They increased slowly over a period of five years to a peak of about one wolf per three square miles. At this time food became critical and the number of wolves began to decrease. The cause is not certain, but we do know wolves have been eating wolves. The poor condition of the animal captured in February, 1966, indicates that deaths may be from natural causes rather than from intra-specific strife. We found that wolf densities of ~~one~~ ~~to~~ (three per) square miles could quickly reduce the deer herd. When deer became difficult to obtain wolves began utilizing a wide assortment of animal species for food.

Deer numbers declined to a low in 1965. Examination of kill remains shows deer to be in better physical condition after their numbers were reduced.

Deer range recovered rapidly in five years from a status of depletion to one which could support a reasonable deer population.

In the future we hope to continue our investigations on Coronation Island. Will the wolves finally be eliminated? How long will it then take for the deer population to assume its previous degree of abundance. Will a larger and healthier deer be produced?

On an area as small as Coronation Island we can never expect to attain a true balance between predator and prey species. We do feel we are obtaining information which will enable management of these species to be based on a more intelligible basis.

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