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Division of Wildlife Conservation**

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# **Effects of Even-Aged Timber Management on Survivorship in Sitka Black-Tailed Deer, Southeast Alaska**

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# RESEARCH PERFORMANCE REPORT

**STATE:** Alaska

**STUDY NR.** 14.16

**GRANT NR:** W-27-3

**STUDY TITLE:** Effects of Even-Aged Timber Management on Survivorship in Sitka Black-Tailed Deer, Southeast Alaska

**AUTHORS:** Christopher J. Farmer and David K. Person

**PERIOD:** 1 July 1999–30 June 2000

## SUMMARY

During this report period we concentrated on monitoring deer and wolves and decommissioning the field camp facility. Four deer were successfully radiocollared, bringing the total to 71 deer and 8 wolves radiocollared to date. A total of >3000 radiolocations have been obtained for deer and >200 radiolocations for wolves since 1996. Of the 71 deer instrumented, 34 (47.9%) have died (3 this report period). All of the wolves that were radiocollared since 1996 have died or dispersed. Six wolves (5 this reporting period) have been shot or trapped, 1 has died from injuries from capture, and 1 has dispersed to the mainland and is still alive. The field camp was dismantled, and personnel and equipment were moved off Heceta Island. The field portion of this project ended June 30, 2000.

**Key words:** clearcuts, *Odocoileus hemionus sitkensis*, old-growth, Sitka black-tailed deer, Southeast Alaska, survivorship.

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## BACKGROUND

Previous research on habitat relationships of Sitka black-tailed deer (*Odocoileus hemionus sitkensis*) in Southeast Alaska has focused on patterns of habitat use (Wallmo & Schoen 1980, Rose 1982, Schoen & Kirchhoff 1985, Yeo & Peek 1992). These studies have concluded that deer select old-growth forest over even-aged second growth stands, particularly during winter. Patterns of habitat selection typically have been attributed to variation in forage abundance and availability (Wallmo and Schoen 1980), nutritional quality (Hanley et al. 1989), and snow accumulation (Kirchhoff and Schoen 1987).

Measures of habitat use alone generally are not valid for characterizing the value of habitats to a population (VanHorne 1983, Hobbs & Hanley 1990). VanHorne (1983) proposed a measure of habitat quality that included population density, survivorship, and reproduction, yet admitted that such data could not feasibly be obtained in many wildlife studies. VanHorne (1983) and others have noted that source-sink population dynamics can result in high population densities in poor habitats, and habitats with low population density may be seasonally important to the population. Hobbs & Hanley 1990) concluded that there was a need for studies of habitat use to examine causal relationships between resources and wildlife populations and that simple measures of use and availability were likely to obscure important information.

To resolve questions of habitat quality for deer in logged landscapes, it is necessary to go beyond the earlier examinations of use and availability of specific habitat types (e.g., Wallmo & Schoen 1980, Schoen & Kirchhoff 1990). This study examines how deer survival varies as a function of landscape condition and the risk of predation. We describe the condition of the landscape in terms of the composition of plant species, quantity and quality of understory vegetation, and the ability of habitats to intercept snow. Measures used to assess the risk of predation are the distances of deer from centers of activity for wolves and the amount of hiding cover associated with each habitat type within the home ranges of deer.

## OBJECTIVES

To determine how even-aged timber management influences survivorship in Sitka black-tailed deer and interactions between deer and Alexander Archipelago wolves (*Canis lupus ligoni*).

### JOBS

1. Characterize the habitat types available to deer in terms of forage composition and abundance, seasonal forage availability, and hiding cover.
2. Measure the frequency of use by radiocollared individuals that each habitat type receives and determine diurnal and seasonal patterns of use.
3. Compare adult survivorship, reproduction, and recruitment by landscape type and by habitat composition within the home ranges.
4. Measure the risk of predation associated with individual habitat types as a function of vegetative structure and proximity to wolf den sites or wolf activity centers.

This report focuses on results for jobs 2–4. Job 1 was completed during the previous reporting period and the results were summarized in Farmer et al. (1998).

### STUDY AREA

The study area is located on Heceta Island (55°45' N, 133°45' W) in Game Management Unit (GMU) 2 in southern Southeast Alaska. Heceta Island is approximately 180 km<sup>2</sup> in area, with 100 km of coastline. The island is underlain with extensive karst limestone deposits and supports productive forest growth, dominated by Sitka spruce (*Picea sitchensis*) and western hemlock (*Tsuga heterophylla*), with lesser amounts of western red cedar (*Thuja plicata*), Alaska yellow cedar (*Chamaecyparis nootkatensis*), and shore pine (*Pinus contorta contorta*). Common shrubs include several species of blueberry (*Vaccinium* spp.), rusty menziesia (*Menziesia ferruginea*), salmonberry (*Rubus spectabilis*), and devil's club (*Oplopanax horridus*). Ground vegetation is dominated by evergreen forbs (*Cornus canadensis*, *Coptis asplendifolia*, *Rubus pedatus*, *Tiarella trifoliata*), ferns (*Dryopteris expansa*, *Gymnocarpium dryopteris*, *Blechnum spicant*, *Polystichum munitum*), and bryophytes (*Sphagnum* spp., *Hylocomium* spp., *Rhytidiadelphus* spp.).

Timber harvest on the island began about 1926 and peaked between 1970 and 1985. As of 1996, 42% of the productive forestland had been cut (USFS 1996). Of that, 65% was in a young clearcut stage (i.e., less than 26 years old), while 35% was in a closed second growth stage (26–150 years old). An estimated 83% of the island is accessible by road due to logging activities (USFS 1996). Approximately 4 miles of new road were built during the reporting period, and the harvest of an additional 15 million board feet of old-growth timber is scheduled during 1998–2000.

## METHODS

Methods that we used to capture and monitor deer and wolves have been described in previous performance reports (Farmer and Kirchhoff 1997, Farmer et al. 1998, Farmer and Person 1999). Statistical analyses used also have been described in previous reports (Farmer and Kirchhoff 1997, Farmer et al. 1998, Farmer and Person 1999).

## RESULTS

Four deer were captured and fitted with radio collars in autumn 1999. We have radiocollared 71 deer since 1996 and have obtained >3000 radio locations. A total of 34 (47%) died between September 1996 and July 2000 mostly from hunting and predation by wolves. We reported preliminary analyses of these data in Farmer et al. (1998) and Farmer and Person (1999). Complete analyses will be reported in the final report due July 1, 2001.

No new wolves were captured during the reporting period. Since September 1996, we have captured and radiocollared 8 wolves and obtained >200 radiolocations. Trappers killed 6 wolves; 1 wolf died of causes related to the capture, and 1 wolf dispersed to the mainland and is still alive. Three other wolves have dispersed since 1996 but all were subsequently killed by trappers. We observed 8 wolves in the pack occupying Heceta Island during autumn 1999. Six of those wolves were killed in the 1999–2000 trapping season, leaving only 2 females on the island in spring 2000. We do not know the fate of those 2 survivors. No denning activity by wolves was observed on Heceta Island in spring 2000.

The wolf that dispersed to the mainland was an adult female that we radiocollared in summer 1998. She left the island in March 2000 and swam to Prince of Wales Island (Fig. 1). We observed her near Thorne Bay on Prince of Wales Island in mid-March. In the beginning of April, we located her in Union Bay on the Cleveland Peninsula, which is connected to the mainland. To reach the Cleveland peninsula, she must have swum at least 8 km across Clarence Strait. She was located near Spacious bay on the Cleveland Peninsula during summer 2000 and, subsequently, she dispersed to Revillagigedo Island.

## DISCUSSION

During this reporting period we completed monitoring deer and wolves and then dismantled and decommissioned our field camp facility. Complete analyses of the data and interpretation will be forthcoming in the final report. The long-distance dispersal of a female wolf that we observed probably represents the longest swim documented for a wolf and is noteworthy. We emphasize that the swim was made across open ocean that was subject to high winds and strong currents. The event supports the notion that some connection, albeit restricted, exists between wolf populations distributed throughout Southeast Alaska.

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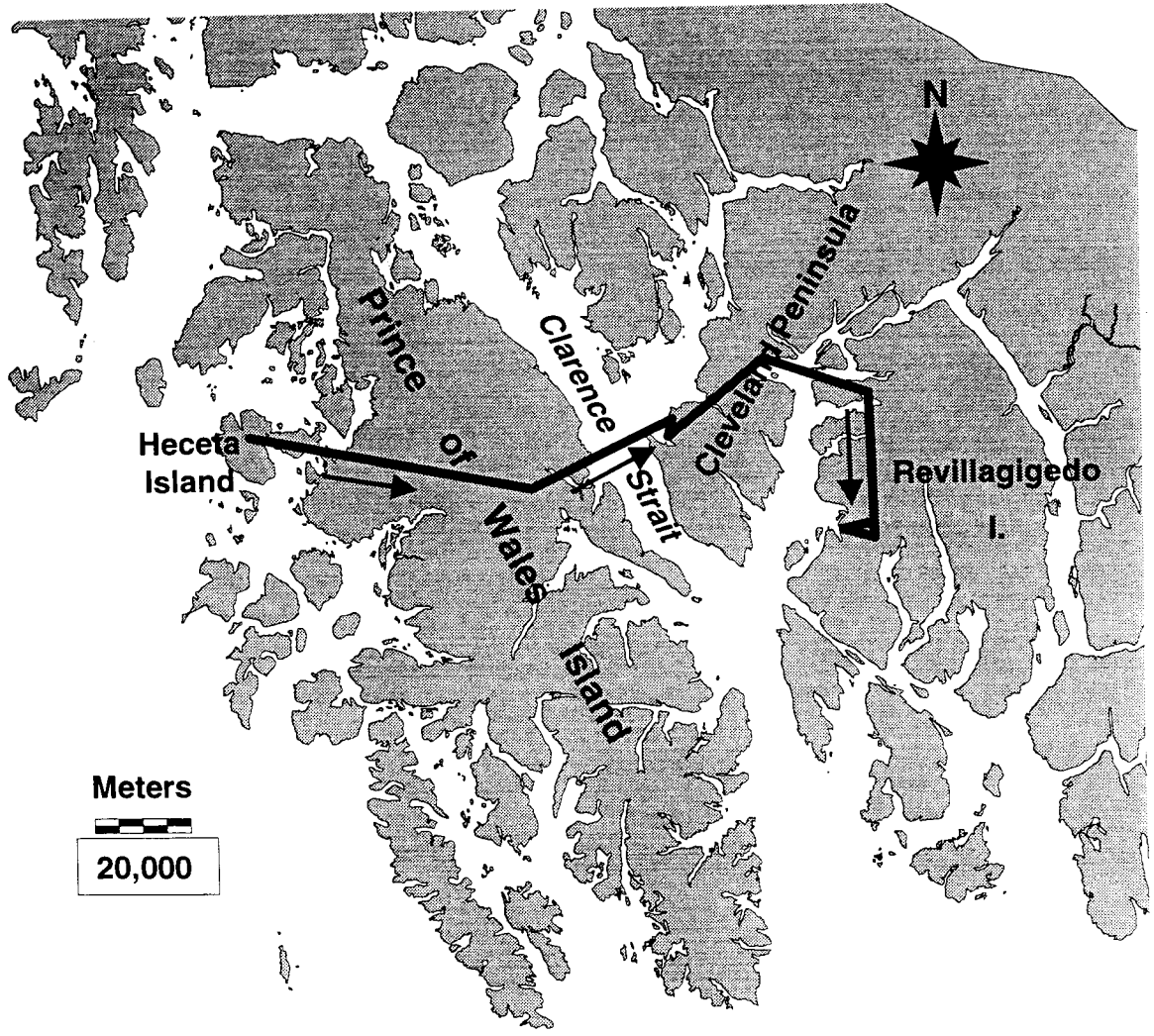
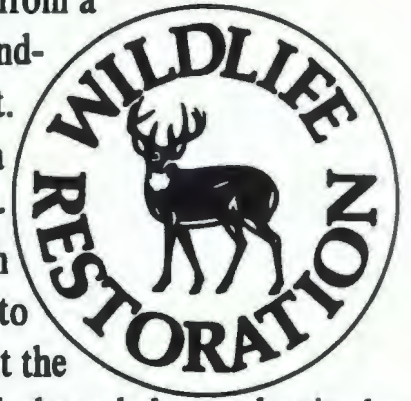


Figure 1. Map showing dispersal of female wolf from Heceta Island to the mainland and Revillagigedo Island.

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