Sea Duck Joint Venture – Annual Project Summary for Endorsed Projects
FY02 – (October 1 to Sept. 30)

Project Title: No. 7: Ecology of breeding Long-tailed Ducks on the Yukon-Kuskokwim Delta, Alaska.

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Partners: Region 7, U.S. Fish and Wildlife Service, Yukon Delta National Wildlife Refuge.

Project Description:
Population indices of Long-tailed Ducks in sub-arctic Alaska show a continuous, and statistically significant, population decline since 1976, resulting in current population size estimates that are about 25% of the mid-1970's estimates. Thus, Region 7 of the U.S. Fish and Wildlife Service (USFWS) has identified Long-tailed Ducks as a '*species at risk*'.

One of the primary breeding grounds for Long-tailed Ducks is the Yukon-Kuskokwim Delta (YKD), which supports >30% of Long-tailed Ducks counted in Alaska. However, Long-tailed Ducks nest at very low densities making them difficult to study in detail.
Since 1991 we have examined the nesting ecology of ducks at a single site along the outer coastal fringe of the YKD. Initially, these studies focused on Northern Pintail (*Anas acuta*) nesting success and duckling survival. In 1994, emphasis shifted to survival and reproductive output of Spectacled Eiders (*Somateria fischeri*). In conjunction with these studies, we have consistently searched a study area of approximately 27 km^2. We monitored all Long-tailed Duck nests to determine nesting success (approximately 15 nests per year). Additionally, adult females were trapped on nests in early to mid-incubation and marked with subcutaneously anchored radio transmitters and followed to determine brood rearing success. Adult females have been trapped on their nests every year since 1994 and we plan to use standard mark-recapture techniques to estimate annual survival. Finally, we obtained blood samples from females to examine exposure to lead poisoning which has been shown to influence breeding Spectacled Eiders on this study area.

We question the applicability of results from a small sample at a single study site to a large breeding area such as the YKD. However, because Long-tailed Ducks nest at low densities, it is unreasonable to establish a study site committed solely to Long-tailed Duck research. Thus in 2002, we expanded our study at Hock Slough to include five additional sites on the YKD (Kigigak Island, Manokinak River, Tutakoke River, Old Chevak and Aropuk Lake) where long-term waterfowl research was occurring. We provided additional personnel and logistic support necessary to search for breeding Long-tailed Duck nests in addition to the existing research at each site.

The experimental design followed that which has been previously used on Long-tailed Ducks and other species of sea ducks nesting on the YKD. Nests were located by searching suitable habitat on foot or with the aid of dogs. We revisited nests on a regular schedule to allow estimation of nesting success via the Mayfield method as modified by Grand and Flint (1997). Females were trapped on nests at hatch and marked with a metal leg band and a radio transmitter. Brood rearing success will be determined by regular observation of marked broods after hatch.

Estimation of duckling survival will follow a Kaplan-Meier approach allowing for lack of independence among brood mates. Blood was collected (2cc) using standard venipuncture techniques for lead exposure analyses. Females with >0.2 ppm lead in their blood, based on wet weight, will be considered exposed. Prevalence of exposure to viruses will be determined by microtitration serum neutralization assays and virus isolation from cloacal swabs using cell culture methods. Survival and brood rearing success of radio marked birds will be examined relative to their lead and virus exposure levels. Survival analyses will be based on recapture histories obtained in future years.

Objectives: Our goal for this study is to estimate the survival and productivity of female Long-tailed Ducks breeding at three sites on the YKD. Information regarding population dynamics of Long-tailed Ducks has been listed as high priority by the Sea Duck Joint Venture.

Preliminary Results:

	No. nests found	No. nests hatched	No. females marked
Aropuk Lake	19	7	6
Kigigak Island	18	13	12
Hock Slough	33	18	16

A total of 70 nests were found of which 38 hatched. The sample size of marked females was increased dramatically. Additionally, numerous blood samples were obtained for lead exposure and virology. One female was recaptured with an implanted satellite transmitter from 1999.

Project Status: Three of the sites we searched failed to yield a sufficient sample of nesting birds for our purposes. However, we found numbers of nesting females at Kigigak Island and Aropuk Lake similar to those found annually at Hock Slough. Thus, we requested funds to resume the long-term study at Hock Slough and continue to provide the support required to locate Long-tailed Duck nests at Kigigak Island and Aropuk Lake in 2003.

Project Funding Sources:

SDJV (USFWS) Contribution	Other U.S. federal contributions	U.S. non-federal contributions	Canadian federal contributions	Canadian non-federal contributions	Source of funding (agency or organization)
40,000					
	180,000				USGS

Total Expenditures by Category:

Activity	**Breeding**	**Molting**	**Migration**	**Wintering**	**Total**
Banding					
Surveys					
Research	**220,000**				
Communication					
Coordination					