Sea Duck Joint Venture
Annual Project Summary for Endorsed Projects
FY 2007 – (October 1, 2006 to Sept 30, 2007)

Project Title: SDJV project # 90: Effects of Implanted Transmitters with Percutaneous Antennae on Breeding and Foraging Behavior of Captive Seaducks Used as Surrogates for Wild Seaducks

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Partners : ***Microwave Telemetry, Inc.***

Project Description:

In this study we focused on the need to better understand the affect on courtship and egg laying during the spring and the affect of the transmitter and antennae during winter foraging activities, when energetics may be more critical to survival. The data collected in this study will assist in future telemetry studies using implanted transmitters (satellite and conventional VHF) equipped with percutaneous antennae with seaducks and will assist with the management of these populations in the breeding, molting, and wintering areas. This study will ultimately document the effects of implantable transmitters on the behavioral ecology of diving ducks and seaducks. This information is needed to obtain the knowledge of the effect that these transmitters have on the future success and survival of the instrumented ducks while transmitting, but also after the transmitters have stopped transmitting. Telemetry has provided very valuable information for the management of seaduck populations, but more is needed to be known about the potential adverse effects on ducks. The goal of this study is to obtain data under controlled conditions that we hope show no adverse effect of the implantable transmitters so that future researchers do not have to assume this fact. This information is a major priority for the Sea Duck Joint Venture, which is the major donor of funds.

Waterfowl biologists conducting research with seaducks in North America have used two main types of implantable platform tracking terminal (PTT) transmitters with their studies dealing with the movements of seaducks. The transmitter commonly used by researchers in Alaska, Pacific coast, and in Labrador has the antenna that exits the body of the transmitter on the posterior side (Type A) when it is in the duck, whereas, the transmitter used in the Atlantic Seaduck project has the antenna exiting the transmitter from the posterior top of the transmitter (Type B) when it is in the duck (Figure 1). For this study Type B transmitter design was used.

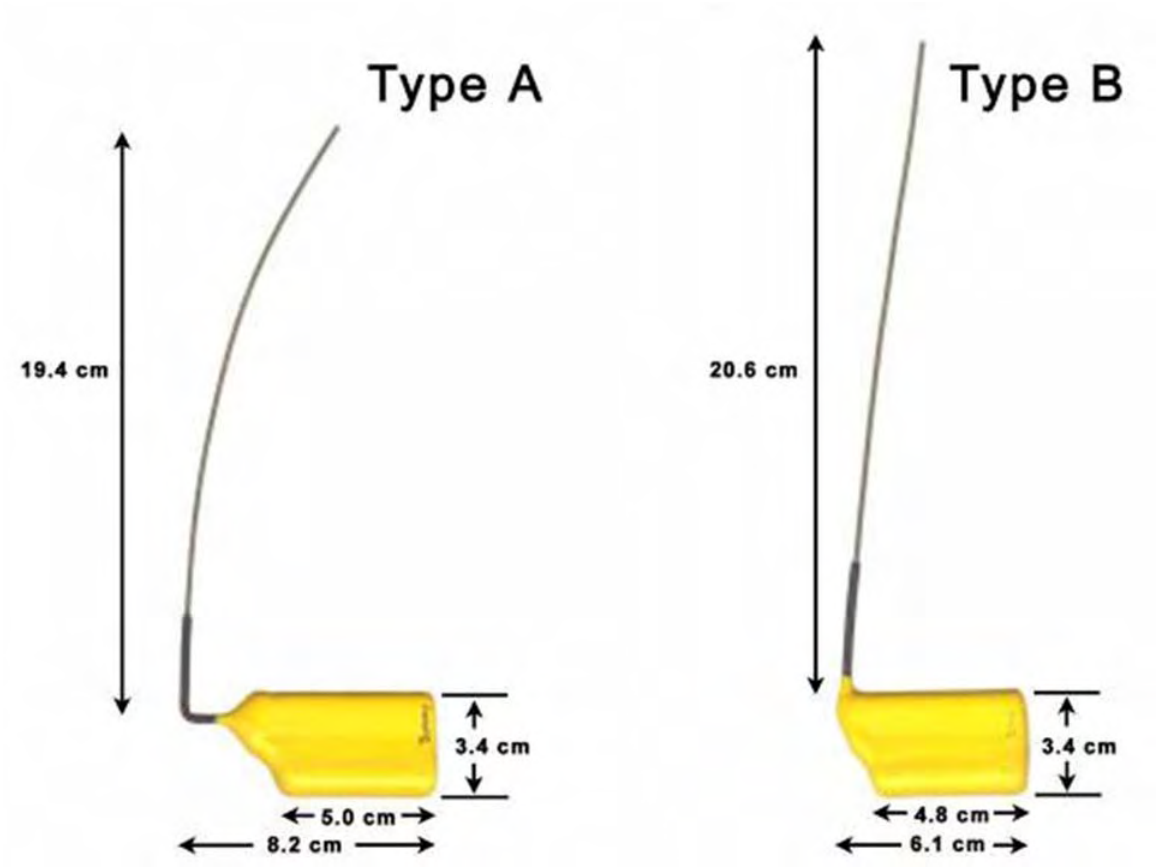

Figure 1. A visual comparison of the two transmitter designs commonly used for satellite tracking of seaducks.

Objectives:

This study will determine the effects of implantable transmitters with percutaneous antennae on seaduck behavioral ecology. The specific objectives are:

1. Determine the influence of implantable transmitters with percutaneous antennae on behavior (courtship, copulation, feeding, maintenance, and inactivity), egg production, and incubation with captive lesser scaup.
2. Determine diving and food intake rates of three seaduck species with implantable transmitters with percutaneous antennae and compare with ducks without implant and antennae.

Preliminary Results:

Due to the lack of captive colonies of seaducks, most studies that use implantable transmitters with conventional and satellite telemetry do not have the luxury to test the effect of the transmitters on the target species prior to use in the wild. Results of telemetry studies rely mostly on the perceived normality of the movements, locations, and behavior of the ducks. This study monitored five instrumented female lesser scaup (*Aythya affinis*) in a captive colony at Patuxent Wildlife Research Center and recorded their reproductive behavior and their productivity during the spring (April-June) breeding season of 2007. Significant differences between the instrumented and the non-instrumented ducks were detected for some behaviors, most notably courtship during June. Inactive behavior was the activity that was the most common of all behaviors observed, forming 60% and 62%,

respectively, for instrumented and control ducks. There was a significant decline in inactive behavior as the breeding season progressed from April to June. A total of 42 eggs were laid by the lesser scaup that were not instrumented and 20 eggs by the scaup that were instrumented. The instrumented ducks laid 7 malformed eggs, whereas among the non-instrumented ducks no malformed eggs were laid. Statistical analyses of the length, width, and weight of eggs laid by the ducks indicated that there were no significant differences between the instrumented or non-instrumented ducks. Weight of the ducks at the beginning and end of the study were not significantly different between ducks with transmitters and those without transmitters. Blood data collected from all ducks at the beginning and end of the breeding season showed no significant differences between instrumented and non-instrumented ducks. Based on preliminary data from this study it appears that the instrumentation of female lesser scaup with an implantable transmitter immediately before the breeding season caused a change in behavior and also affected normal production of eggs. We recommend that a smaller transmitter (e.g., 19 g PTT) should be used for ducks the size of lesser scaup for future studies with wild diving ducks.

Figure 2. Malformed eggs from instrumented lesser scaup female compared to egg of non-instrumented lesser scaup female.

Project Status:

We accomplished the first objective of the study, but due to problems with water supplies at the Patuxent facility we were not able to complete the second objective which we are conducting in fiscal year 2008.