Sea Duck Joint Venture
Annual Project Summary for Endorsed Projects
FY 2008 – (October 1, 2007 to Sept 30, 2008)

Project Title (including SDJV project tracking #:

Effects of Surgically Implanted Transmitters with Percutaneous Antennae on Breeding Behavior of Captive Lesser Scaup Used as Surrogates for Wild Seaducks (#90)

Principal Investigator(s):

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Partners:

Microwave Telemetry, Inc.

Project Description:

In this study we focused on the need to better understand the effect on courtship and egg laying during the spring and the effect 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 transmitters commonly used by researchers are 26 gram PTT-100 (Type A) or 39 gram PTT-100 (Type B) with a percutaneous antenna when it is in the duck Figure 1). Typically the 26 gram package is used for smaller seaducks like long-tailed ducks and harlequin ducks, whereas the larger 39 gram package is used with larger ducks such as scoters and eiders. For this study Type A and B transmitter design were used.

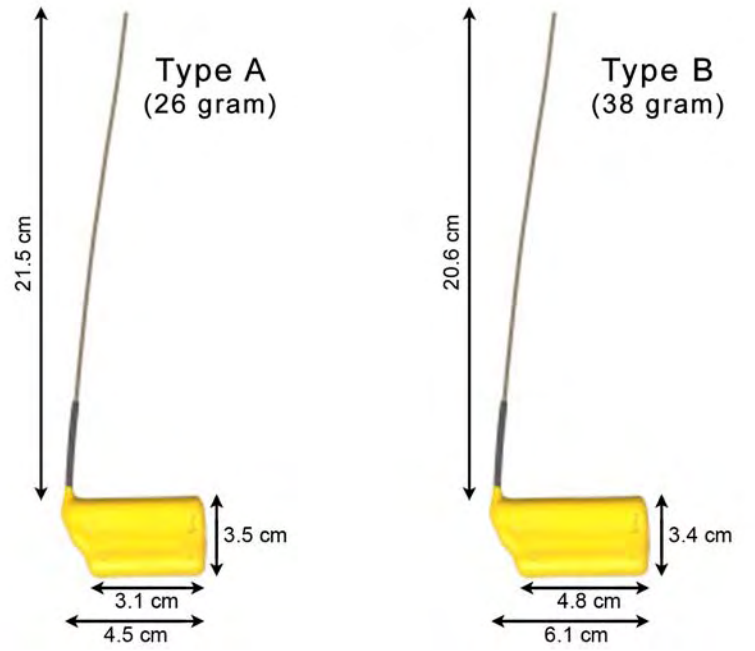

Figure 1. A visual comparison of the two transmitter designs commonly used for satellite tracking of seaducks and used in this study.

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:

Captive ducks at Patuxent Wildlife Research Center in Laurel, Maryland, USA are being used to test the long-term influence of surgically implanted satellite transmitters. Lesser Scaup (*Aythya affinis*) were instrumented with 26 g and 39 g dummy PTT-100 transmitters. All ducks were paired by "free-pair bonding" in pens with 4-7 ducks each in a captive colony and then individual pairs were placed in separate pens. Pairs were randomly selected for instrumentation or for control. Instrumentation was conducted in a veterinary hospital at Patuxent and controls were handled similarly except for surgery. Maintenance and reproductive behaviours were recorded along with productivity during the 2007 and 2008 breeding season (April-June). No differences ($p>0.05$) between the instrumented and the control ducks were detected for major groups of behaviours. Control females laid 65 eggs and instrumented females laid 31 in the two years. The instrumented ducks laid 16 malformed eggs, whereas no malformed eggs were laid among control ducks. Statistical analyses on the length, width, and weight of eggs indicated that there were differences ($p<0.05$) between the instrumented and control ducks. Some of the malformed eggs were not measured because they were crushed or had no eggshell. Transmitter position near the

oviduct appeared to be affecting shape of egg, but size of transmitter did not appear to be a factor in causing malformed eggs. An unexpected finding was that two of the five female Lesser Scaup ejected the 39 g dummy transmitters through a hole in the skin at antenna site. Surgical attachment has been modified to prevent loss of transmitter. Other species with smaller sample sizes being tested with dummy transmitters include White-winged Scoter (*Melanitta fusca*), Surf Scoter (*Melanitta perspicillata*), and Long-tailed Ducks, (*Clangula hyemalis*). The effect of instrumentation on diving and foraging behavior is being tested in large dive tanks, and preliminary data indicate no differences between control and instrumented ducks.

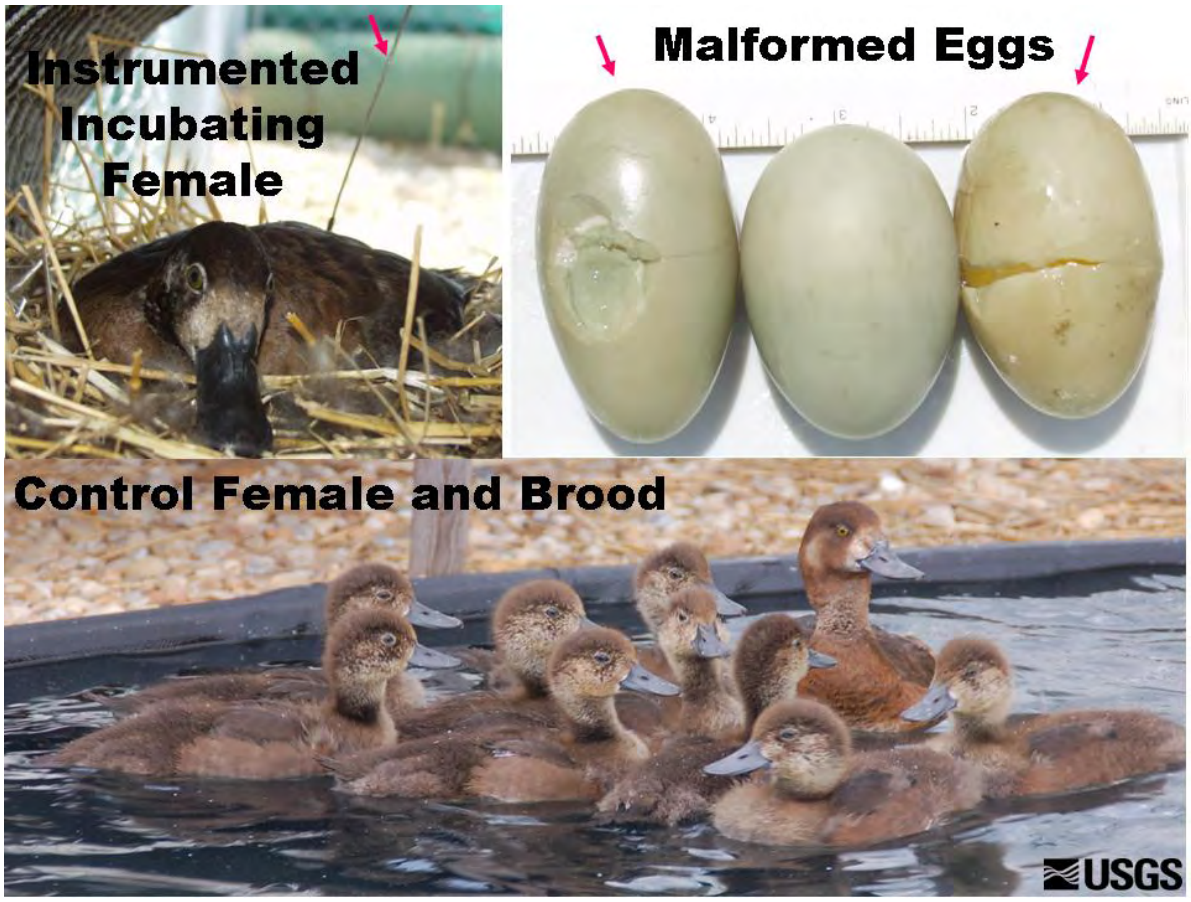

Figure 2. Incubating female lesser scaup, two malformed eggs with a normal egg, and a brood of ducklings with a control lesser scaup.

Figure 3. Rubbery egg and PTT-100 transmitter being ejected from lesser scaup.

Project Status:
Field work on this project has been completed and publications on the results are being prepared. Three posters dealing with this study will be presented in Quebec at the Sea Duck Conference.