**Sea Duck Joint Venture**
**Annual Project Summary for Endorsed Projets**
**FY 2006 (October 1, 2005 to September 30, 2006)**

**Project Title:** Population delineation, winter/spring habitat use, winter and migration ecology and harvest of Pacific Surf Scoters (*Melanitta perspicillata*) from the southern portion of their winter range (SDJV Project # 63).

YEAR 1 of a 3-YEAR STUDY

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**Project Description:** Thousands of Surf Scoters (*M. perspicillata*) winter along the west coast of Baja California (Conant and Voelzer unpubl. data), which represents the southern extent of their wintering range, yet we know virtually nothing about their wintering ecology (e.g., movements, foods, habitats used) in the region. In contrast to more northern wintering sites, preliminary observations indicate that Surf Scoters in Mexico appear to have a different diet, exert greater foraging effort, and have a disproportionately higher number of females and juveniles in the population. We are using telemetry to study the ecology of Surf Scoters wintering in Baja California and gain a more complete delineation of the winter population structure, specific migration routes and patterns, and breeding distribution of scoters in the Pacific Flyway. In February 2006, we captured Surf Scoters in Bahia San Quintin (BSQ), Baja California, Mexico and deployed both satellite and radio transmitters to obtain spatial and temporal movement patterns of this wintering population.

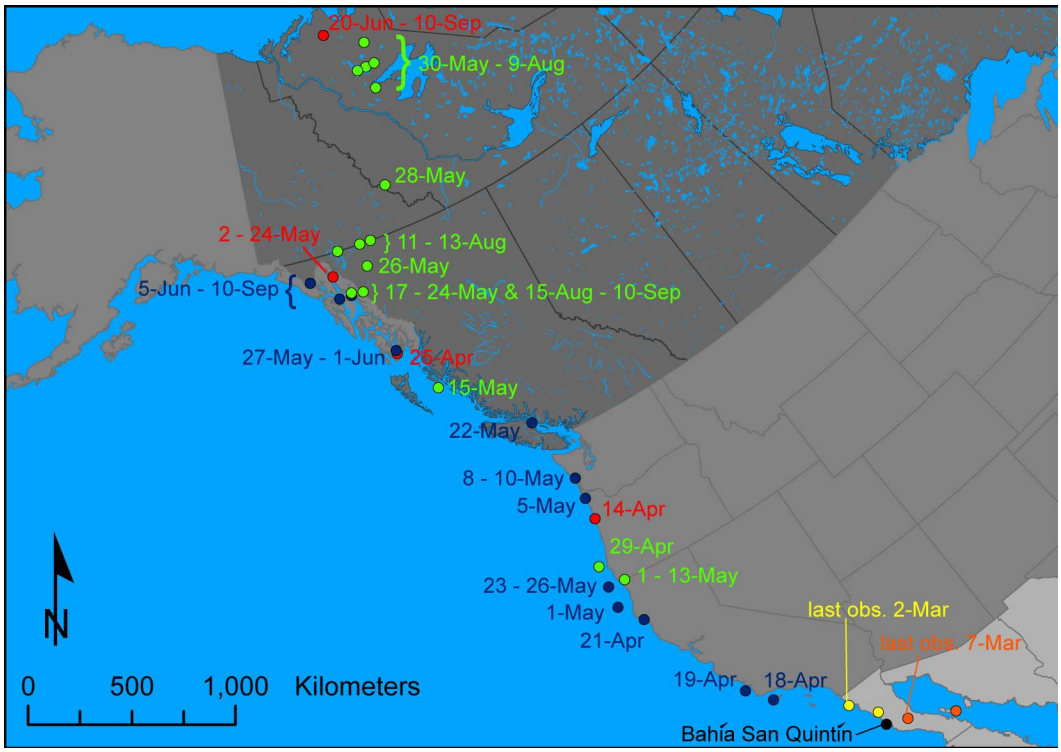
**Objectives:** The principle justification for this project is to gain a more thorough understanding of the winter ecology, population structure, migration strategies, and breeding distribution of the Surf Scoters that winter in Baja California, and to evaluate differences between this wintering population and populations that winter further north. Specifically, our stated objectives are to: (1) describe key migration routes, timing of movements, and affiliations with staging (spring and fall), breeding, and molting areas; (2) evaluate survival, habitat use patterns, foraging behavior, and diet of scoters wintering in Baja California in contrast to scoters from more northern wintering areas; and (3) test a new surgical technique for coelomic implantation of transmitters.

**Preliminary Results:** We captured, banded, and took samples from 35 Surf Scoters (5 males and 30 females) in BSQ from 2/17/2006 to 2/23/2006. We captured 19 scoters with floating mist-nets and 16 scoters with a net-gun. Five adult (ASY) female scoters were selected for intra-abdominal implantation of PTT-satellite transmitters and 17 females were selected for intra-abdominal implantation of VHF-radio transmitters. We selected all females for the implantation of transmitters in order to reduce bias when comparing the two surgical procedures, which were tested to address the high mortality rates in radio-marked scoters. Unfortunately we were only able to monitor the VHF-tagged scoters for 5 to 10 days following implantation and were not able to determine mortality rates for either technique. A crew from Simon Fraser University had planned to conduct daily monitoring of the marked scoters until they left on spring migration, but they had to leave because of a tragic event on the day following capture activities. The death of a long-time USGS employee was a personal loss for many of the people involved in the project, and the field season was aborted.

*VHF Monitoring* -- We were able to collect a small amount of data on VHF-tagged Surf Scoters using ground-based monitoring. Four of the 14 scoters implanted in February 2005 (all HY: 2M, 2F) returned last winter and a field crew studying Black Brant monitored their locations intermittently. Additionally, 1 bird marked at San Francisco Bay was detected at Bahia San Quintin in Feb 2006. Following the capture of last season's scoters, we were only able to collect location data for a few days. We did not document any mortality following the surgeries, although two of the newly implanted scoters did not return to the bay in the days following their release. From the monitoring that was done, it appears that the scoters were relatively site-faithful from day-to-day, consistently foraging in either in the bay, at the mouth of the bay, or outside the bay. On April 20$^{th}$, four scoters were still present in BSQ (one day of monitoring). We will monitor frequencies of radios deployed in February 2006 in the upcoming winter, as the battery life should allow the radio to function more than one year.

*PTT Monitoring* -- We monitored the spatial and temporal movements of 3 of the PTT-tagged birds through the spring migration and breeding season (Figure 1). We lost the signals from two of the five units that were deployed in the first week of March, presumably due to the transmitters malfunctioning. All three scoters left BSQ in April, but stopover locations and elapsed time to migrate north varied by individual. The youngest of the PTT-tagged scoters (TY) spent the breeding season in southeast Alaska. The remaining two spent the breeding season in northern Northwest Territories, in areas similar to those from other wintering areas and similar to scoters marked in Baja in 2005.

**Figure 1**: Estimated locations of PTT-tagged Surf Scoters following their departure from Bahía San Quintín, Baja California, Mexico. Individual scoters (n = 5) are indicated by color. Estimated locations that did not have an accuracy rating are not displayed. We lost the signals from two of the units in early March and the last documented locations are indicated on the map.




Differences in age- and sex-ratios and body morphology between the wintering population in Baja and populations at more northern wintering sites are of particular interest in this study. We conducted one age- and sex-ratio survey in BSQ for preliminary analysis and found that the sample was female-biased, with 0.53 males to 1 female, which is dramatically different from more northern wintering areas. In a preliminary test to determine if body morphology varies by latitude, we used the banding data to look for differences in mass and body measurements among scoters captured the same time of year: (1) in BSQ (Latitude = 30) (2005 and 2006), (2) near San Francisco Bay, CA (Latitude = 38) (2005), and (3) in the Strait of Georgia, BC (Latitude = 50) (2005). We did not find any significant differences ($P < 0.05$) but, especially for males, measures trended lower in Mexico than Canada and we intend to investigate the question further.

**Project Status**: Due to the unfortunate circumstances of February 2006, we did not monitor the VHF-tagged scoters for the remainder of the winter season. Consequently, we were unable to meet our objective of testing a new surgical technique. However, the data that were collected will help direct our endeavors in Baja in the coming season. We have valuable information from the PTT-tagged scoters which is now part of a small but growing pool of information on migration patterns, including affiliations with staging, breeding, and molting areas for the scoters that winter at the southern extreme of the range in the Pacific.

Currently, we are gearing up for an early start to the winter season. We will be deploying an additional 40 VHF transmitters and 5 PTT transmitters at two locations, Laguna Ojo de Liebre and Bahía San Quintín, in November this year. There could be another 10 months of life in the

transmitters that were implanted in February 2006 and possibly another season of life left in the transmitters implanted in Baja in February 2005. A full-time crew will remain in Baja, monitoring habitat use, distributions, and foraging effort of the marked scoters. We will continue gathering location data from the active PTT-transmitters through fall migration and throughout the winter, which will offer insight into migration patterns and winter-site fidelity. Additionally, a graduate student from Centro de Investigación Científica y de Educación Superior de Ensenada, Baja California, Mexico (CICESE) will assess scoter diet and food resources in the 2 lagoons as part of their thesis work.

Plans have been made to process the samples that were collected from the captures. Blood samples have been saved for subsequent genetic analyses of population structure at Molecular Ecology Laboratory at USGS-Alaska Science Center. Fatty acid signatures from the lipid samples that were collected during captures both in 2005 and 2006 will be used to evaluate differences in diet between scoters wintering in Baja and other parts of the winter range. The CICESE graduate student will evaluate fecal samples as part of the study on diet.

**Project Funding Sources (US$)**

| 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) |
|---|---|---|---|---|---|
| $30,824 | | | | | |
| | | | | $16,200 | SFU |
| | $40,000 | | | | USGS |

**Total Expenditures by Category (US$)**

| ACTIVITY | BREEDING | MOLTING | MIGRATION | WINTERING | TOTAL |
|---|---|---|---|---|---|
| **Banding** | | | | | |
| **Surveys** | | | | | |
| **Research** | | | | **$87,024** | **$87,024** |
| **Communication** | | | | | |
| **Coordination** | | | | | |