

## Sea Duck Joint Venture

### Annual Project Summary for Endorsed Projects FY 2017 (Year 3 of 4)

#### Project Title, SDJV # 143:

Annual cycle distribution and movements of Pacific scoters: addressing gaps in population delineation of surf, white-winged and black scoters.

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#### Project Description:

The effective management and conservation of North American (NA) sea ducks necessitates the delineation of demographically or spatially independent population units. Population delineation requires an understanding of how seasonal aggregations of sea ducks are affiliated among major life-cycle stages (e.g., breeding, molting, and wintering areas); and thereby fundamentally defines the geographic scale at which monitoring, harvest management, and habitat conservation efforts may be implemented. It is therefore, precursory to most other information needs and helps inform survey design, interpret population trends, identify critical habitats, and better understand population demographics. Despite numerous recent efforts using satellite telemetry, population delineation of many sea duck species still remains either incomplete or rudimentary.

In the Pacific flyway, several projects were conducted in the early 2000s to delineate scoter populations. Multiple agencies deployed satellite transmitters (PTTs) in surf scoters (*Melanitta perspicillata*; SUSC), white-winged scoter (*Melanitta fusca*; WWSC), and black scoter (*Melanitta nigra*; BLSC) throughout their winter range. However, for a number of reasons adequate effective (defined here as location data for adult females linking wintering, breeding and molting areas) and representative (sample proportional to flyway abundance and distribution) sample sizes for SUSC and WWSC were achieved only in the southern portions of their winter range (e.g., from San Francisco to southern British Columbia [BC]), with the largest information gaps from the northern coast of BC to South-central Alaska. Similarly, for BLSCs effective sample sizes were insufficient throughout their primary winter range, most notably in western Alaska. Thus, data gaps from the north coast of BC to south-central and western AK need to be filled to better assess population delineation and potentially identify independent population units for each species.

We proposed to augment previous satellite telemetry projects of Pacific scoters by filling remaining geographic gaps and boosting effective PTT sample sizes for SUSC, WWSC, and BLSC. Specifically, we proposed to mark adult female scoters with PTTs during winter in major coastal regions of AK; that includes marking SUSC and WWSC in the Southeast (2017) and South-central (2018) regions, and BLSC in the western (2015-2016) region. Satellite data from past studies of Pacific scoters have indicated high return rates to specific winter locations suggesting a possible need to recognize multiple management units throughout the Pacific flyway.

**Objectives:**

1. Describe the timing and pattern of seasonal movements and the associated annual variability for SUSC, WWSC, and BLSC wintering in coastal regions of AK
2. Identify habitats/areas used for breeding, molting, wintering, and staging
3. Identify coastal habitats used by a large proportion of marked birds that may indicate high significance at the population level to inform harvest and habitat conservation efforts
4. Determine inter-annual return rates of marked birds to habitats used during major life-cycle stages (i.e., breeding, wintering, molting, staging)
5. Combine data from this project with existing data for Pacific scoters to delineate independent population units

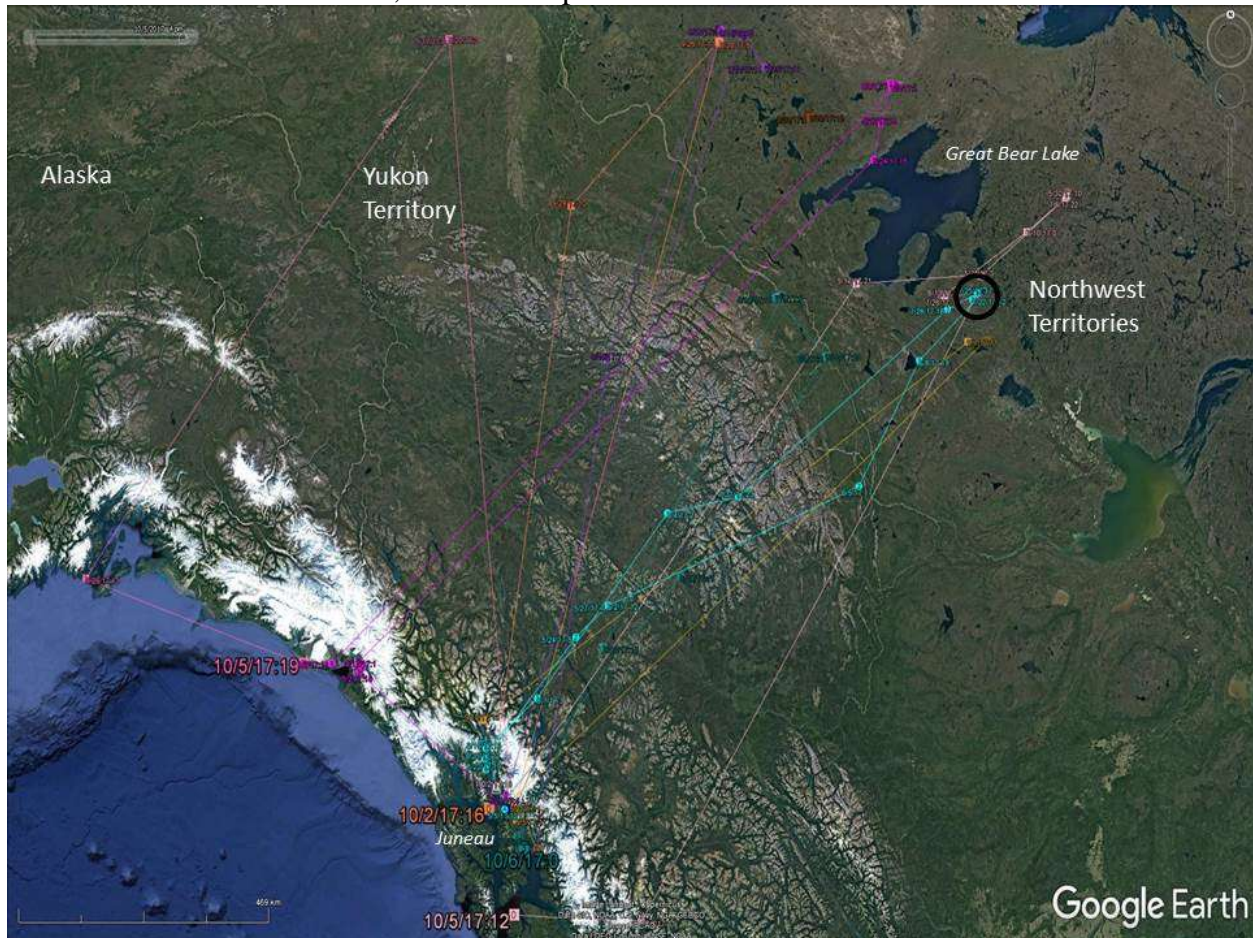
**Preliminary results 2017:**

*Captures* - In April 2017, we completed the third (of 4 years) year of PTT deployments. We conducted captures over the span of two weeks in Juneau, Alaska with the objective to deploy 9 and 16 PTTs in adult female WWSC and SUSC, respectively. We captured birds using over-water-floating mist-nets and decoys. A total of 30 WWSC and 92 SUSCs BLSCs were captured. We banded all captured birds and collected contour and flight feathers for future genetics and stable isotope analyses from a sub-sample of birds. We obtained an additional 9 “leftover” PTTs from the LTDU study in Lake Michigan, and deployed PTTs in 12 and 22 adult female WWSC and SUSC, respectively. Immediately after capture, these birds were administered an intramuscular dose of midazolam, transported back to a surgical facility, and surgically implanted with a PTT.

Within the first two weeks following surgery and release, there was a high incidence of transmitter failure or mortality (based on internal body temperature sensor), particularly for SUSC. A total of 7 transmitters failed and 16 PTTs signaled low body temperature indicating mortality. The source of mortality was unknown, but probably related to a high predator population of bald eagles (*Haliaeetus leucocephalus*). We retrieved or located 6 PTTs from dead scoters, and all had evidence of either predation or scavenging by eagles (e.g., in or under nest, bill drag marks obvious on surface of PTT). The surviving marked females, 2 SUSCs and 9 WWSCs, migrated from Juneau to summer locations in Canada (Figure 1).

*Movements* - The 11 marked females departed Juneau in early to late May. Most females migrated directly inland, stopping briefly at a few locations in transit to their final summer location. Two birds stopped at coastal areas before traveling inland. All but a single bird spent the summer at locations in the Northwest Territories of Canada, primarily near Great Bear Lake with half above the Arctic Circle and half below (Figure 1); and a single female surf scoter spent the summer offshore in the Mackenzie River Delta (not pictured in Figure 1 for scale). A single female spent the summer above the Arctic Circle in the Yukon Territory. Females arrived to terminal summer locations in late May to early June and stayed through the summer period. Departure dates from summer areas were variable, ranging from late July to late September; although a single female was still in the Northwest Territories as of 15 October. Two females departed summer locations in early July and traveled to large lakes nearby and stayed until mid-September; a third female departed in early August and traveled to the present coastal location in Yakutat Bay. Most females returned to the Juneau area or within 125 km near Admiralty Island or upper Lynn Canal where they currently reside.

Figure 1. Annual movements of a surf scoter (circled) and white-winged scoters marked with satellite transmitters at Juneau, Alaska in April 2017



**Project Status:**

We will continue collecting and compiling Argos data from females marked in 2017. We are analyzing data collected in 2015 and 2016. As proposed we have completed 3 of 4 years with the final year of captures planned for spring 2018 in Prince William Sound (PWS), focused on SUSC and WWSC. In PWS, the intent was to coordinate captures with herring spawn events which in the past occurred annually during the spring. Herring spawn concentrates scoters that tend to be sparsely distributed throughout PWS, and possibly offers improved post-surgery survival of scoters (S. Boyd, pers. comm.). However, herring spawn has been very light in the last few years in PWS and is predicted to be light again in 2018. Thus, captures in PWS likely are not a viable option next spring. We are investigating the possibility of conducting captures at Kayak Island, which is approximately 60 miles south of Cordova in PWS. We've received reliable reports of large concentrations of scoters consistently in this area during spring in recent years, sometimes associated with herring spawn. However, there is some uncertainty about the feasibility of conducting captures there due to logistics. We are looking into this and plan to present the SDJV with a revised proposal prior to the fall meeting in November.

**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 (name of agency or organization)
14,250					
	42,300				AK Fish and Game
	5,000				USFWS-MBM R7

**Total Expenditures by Category (SDJV plus all partner contributions; US\$).**

ACTIVITY	BREEDING	MOLTING	MIGRATION	WINTERING	TOTAL
<b>Banding</b> (include only if this was a major element of study)					
<b>Surveys</b> (include only if this was a major element of study)					
<b>Research</b>	<b>15388</b>	<b>15388</b>	<b>15388</b>	<b>15388</b>	<b>61,550</b>