# Sea Duck Joint Venture
# Annual Project Summary for Endorsed Projects
**FY 2012 – (October 1, 2011 to Sept 30, 2012)**

## Project title:

Annual cycle connectivity, inter- and intra-annual site fidelity and habitat use of Barrow's Goldeneye wintering in Southeast and South-central Alaska

## Principal Investigators:

Sean Boyd, Science & Technology Branch, Environment Canada, 5421 Robertson Road, Delta, BC, V4K 3N2; sean.boyd@ec.gc.ca; (604) 940-4682

Dan Esler, Centre for Wildlife Ecology, Simon Fraser University, Vancouver, BC

Jason Schamber, Alaska Department of Fish and Game, Anchorage, AK

Tim Bowman, U.S. Fish and Wildlife Service, Anchorage, AK

Jerry Hupp, U.S. Geological Survey, Anchorage, AK

## Partners:

Sea Duck Joint Venture, Environment Canada, US Fish and Wildlife Service, Simon Fraser University

## Project Description:

Connectivity among annual cycle stages, rates of site fidelity, and the geographic scale of dispersal are largely unknown for Pacific Barrow's Goldeneye (BAGO). This precludes managers and researchers from identifying demographically discrete units for population management, and for understanding the scale of inference from field studies. Further, habitats and specific sites that may be particularly important for BAGO are difficult to identify, as this species is not well covered by surveys for most of its annual cycle and most of its range. This proposal takes advantage of a relatively large number of satellite transmitters (PTTs) being made available by the SDJV, enabling the continued study of the annual cycle and ecology of BAGOs wintering in Alaska. It complements similar studies on BAGOs in BC (SDJV Project #85) and Prince William Sound, AK (SDJV Project #116). This project will help fill some of the more important information needs identified for this species in the latest SDJV Strategic Plan, namely population delineation, population dynamics and population ecology. Satellite telemetry has proven to be an effective tool for identifying important habitats for sea ducks, describing connections among annual cycle stages and determining the demographic structure of populations (i.e., identification of management units). Little is known about the large-scale movements of BAGOs wintering along the Pacific Coast.

To date, we have marked BAGOs at an important breeding site (Riske Creek, BC), at an important molting site (Cardinal Lake, AB, described elsewhere), and at two wintering sites (Indian Arm, BC; and Prince William Sound, AK, described elsewhere). Effective sample sizes from PTT

deployments at Riske Creek and Cardinal Lake are considered to be sufficient but the winter range still has some major gaps. First, Indian Arm and Prince William Sound are at the southern and northern limits of the coastal winter range for BAGOs, respectively. The large majority of the Pacific population winters between these two extremes, suggesting that PTT marking around southeast Alaska (Juneau) is warranted. Second, poor weather, premature PTT failure, and bird mortality at Prince William Sound resulted in low sample sizes for adult males and females (see web site). Therefore, additional markings in south-central Alaska were warranted to improve our understanding of BAGO movement patterns and affiliations for this region. Funds were requested from SDJV to purchase PTTs, Argos location data and some logistical support for southeast Alaska; and the purchase of PTTs for south-central Alaska.

For more information on the satellite transmitters deployed in B.C. and AK, please visit the following web site:

***http://www.sfu.ca/biology/wildberg/CWESeaducksfolder/BAGOwebpage/BAGOMigrationHome.html***

**Objectives:**

This study is describing the seasonal connectivity, movements and timing of movements, and site fidelity to breeding, molt and winter sites for BAGOs wintering in Alaska at the central and northern limit of their Pacific winter range. Our research is addressing the following questions:

- What are the rates, and geographic scale, of inter-annual site fidelity by southeast and south-central Alaska males and females at various stages of the annual cycle (i.e., winter, breeding, molt)?
- Do birds from the same wintering site occur in discrete areas during the breeding season, or are they widely dispersed?
- How do the answers to 1 and 2 above combine with previous satellite telemetry information to indicate demographically distinct management units?
- Are there important habitats or specific sites that are used by a large proportion of marked birds, which would indicate their value for conservation?

**Preliminary results:**

BAGOs were captured in April 2012 to maximize chances of good weather and ensure that birds were in optimal body condition. We captured birds in mist nests, as we did in previous projects, and surgically implanted PTTs into 33 birds (20 males, 13 females) at Juneau. Standard measurements of body mass and morphology were recorded. The PTTs were programmed with a duty cycle of 2 h ON and 4 days OFF to generate Argos location data over at least 2 and possibly 3 annual cycles. The marked birds survived at a very high rate compared to the 2009 Prince William Sound birds, possibly due to the excellent weather conditions experienced in April 2012. Of the 33 marked birds, 30 are still alive and signaling. Most of the adult females migrated to northern BC and southern Yukon to breed and all males migrated further north to molt on wetlands between Great Bear Lake and the Arctic Ocean. Preliminary analysis and mapping strongly suggest that this Juneau population is demographically independent of the BAGO populations wintering in southern BC and in Prince William Sound. We are downloading Argos data periodically and will eventually add to the BAGO migration website. Movement data specific to south-central and southeast Alaska also will be posted on an Alaska Department of Fish and Game (ADFG) website.

**Project funding sources (US$):**

The following budget summary includes all expenses incurred to date and Argos data costs still to come.

| 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) |
|---|---|---|---|---|---|
| $80,500 * | | | | | SDJV |
| | $13,500 | | | | USFWS |
| | $17,300 | | | | USGS |
| | | $35,500 | | | ADFG |
| | | | 16,500 | | Environment Canada |

* includes Argos and PTT costs for the upcoming 2 years as well, but reported here because it is all FY2012 funds.

| ACTIVITY | BREEDING | MOLTING | MIGRATION | WINTERING | TOTAL |
|---|---|---|---|---|---|
| **Banding** | | | | | |
| **Surveys** | | | | | |
| **Research** | $40,825 | $40,825 | $40,825 | $40,825 | $163,300 |
| **Communication** | | | | | |
| **Coordination** | | | | | |