Project title: Annual cycle connectivity, inter- and intra-annual site fidelity, and habitat use of Barrow's Goldeneye wintering in Prince William Sound, Alaska (SDJV Project # 114; Year 3 of 3)

Principal Investigators:

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

Project Description:

This project helps fill some of the more important information needs for BAGO noted in the latest SDJV Strategic Plan, namely population delineation, population dynamics and population ecology. We marked individuals with satellite transmitters to quantify several important demographic attributes, including seasonal connectivity, site fidelity and dispersal rates.

Connectivity among annual cycle stages, rates of site fidelity at all stages, 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 project takes advantage of a relatively large number of satellite transmitters (PTTs) provided by USFWS to study the annual cycle and ecology of BAGOs wintering in Prince William Sound AK. It complements similar studies on BAGOs in BC (SDJV Project # 85) and Alberta (SDJV Project # 18).

Objectives:

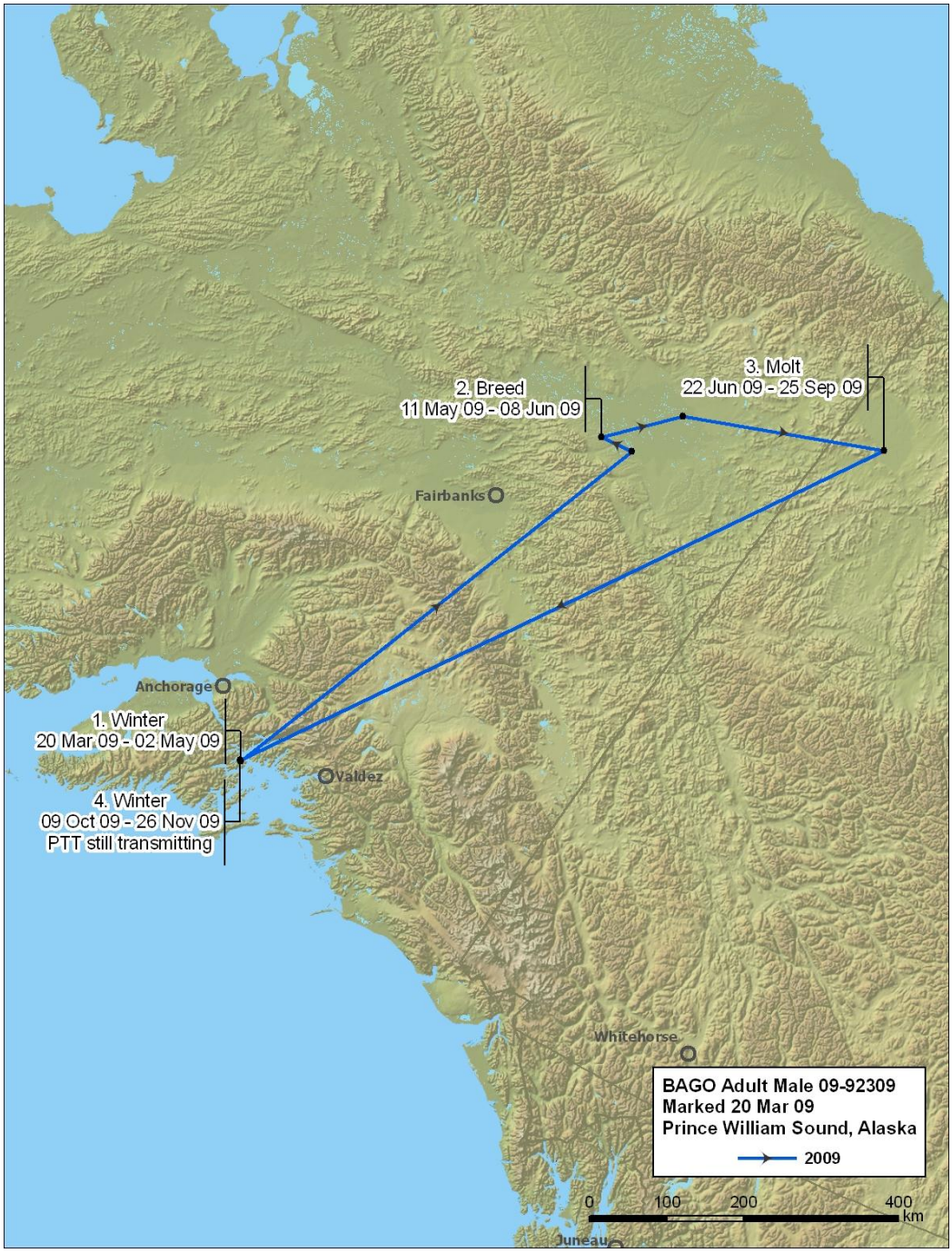
- What are the rates, and geographic scale, of inter-annual site fidelity by PWS adult males and females at various stages of the annual cycle (i.e., winter, breeding, molt)?
- Do birds from the same wintering site occur in discrete areas during breeding season, or are they widely dispersed?
- How do the answers to 1 and 2 above combine 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:

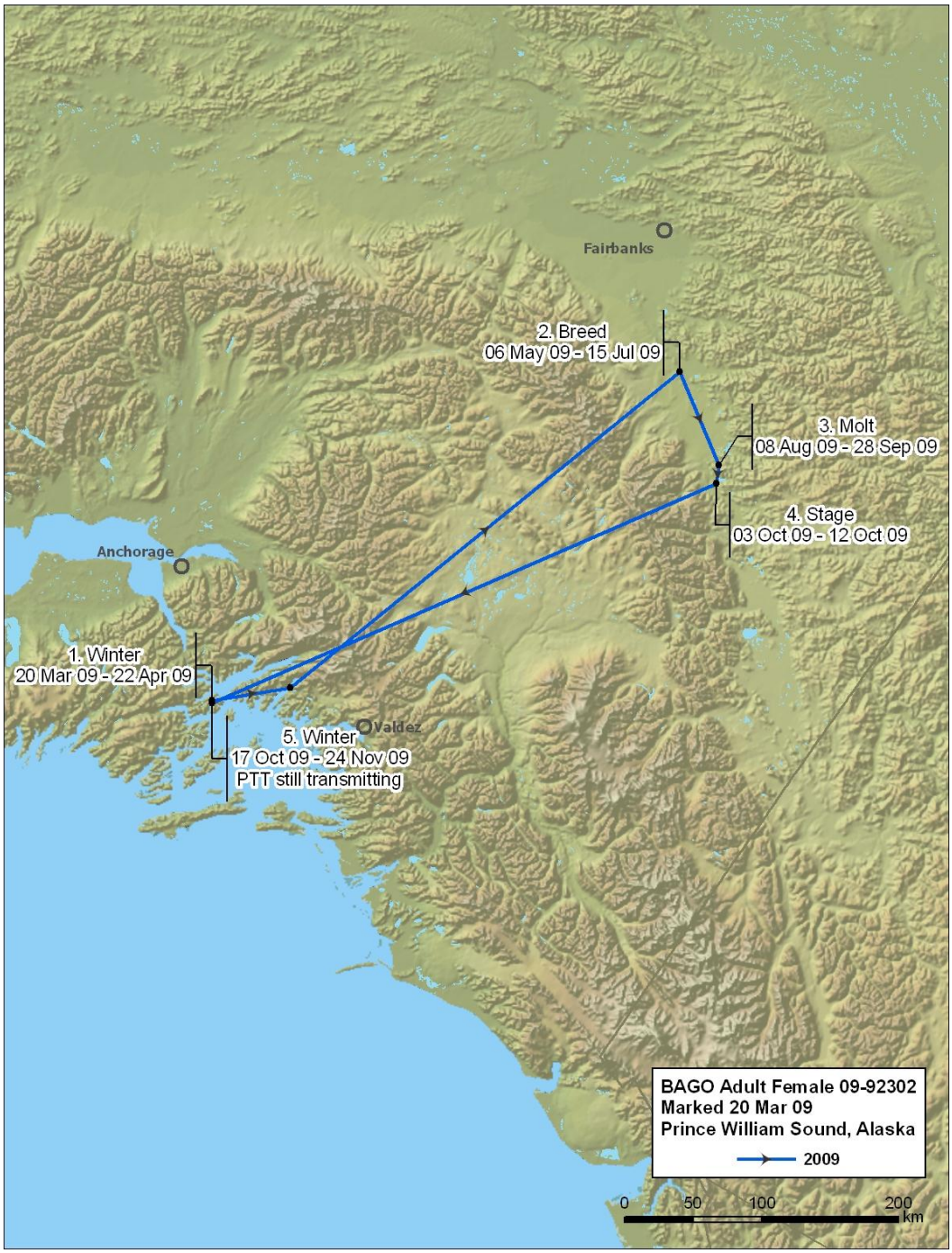
2009-2010: BAGOs were captured in March 2009 in Prince William Sound AK. Microwave PTTs were implanted into 30 birds (10 females and 20 males). Measurements of body mass and morphology were taken along with liver biopsies (for contaminant analyses) and feather samples

(for stable isotope analyses). The PTTs were programmed with a duty cycle of 2 h ON and 4 days OFF to generate Argos location data over 2-3 annual cycles. Unfortunately, 20 of the 30 birds died within 2 weeks of the surgeries due to harsh weather conditions (suspected reason). Nine birds (6 males and 3 females) generated excellent signals over the first annual cycle and they showed some interesting movement patterns. Almost all marked birds departed Prince William Sound for the interior between 16 April and 2 May 2009, the 3 females bred in central interior Alaska, and 4 of the 6 males molted at Old Crow Flats in the Yukon. All birds returned to Prince William Sound and spent the entire winter at locations close to their original capture sites (the maps below show a high level of site fidelity to winter sites for one male and one female; movement details for all birds can be found on the web site noted below).

PWS BAGO Adult Male 92309



PWS BAGO Adult Female 92302



We developed the following web site which illustrates migration maps for all BAGOs marked with PTTs (including the PWS birds):

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

The website was updated in 2010 and is currently being updated for the third time to include recent data.

2010-2011: The 3 females bred again in the AK interior, 2 of the 5 males molted at Old Crow Flats and 2 males molted in the AK interior.

2011-2012: The number of active PTTs declined to 2 females and 3 males at the start of this year. We continue to download Argos data periodically and develop temporary map updates.

Project status:

Aside from the mortalities, we are accomplishing our goal of marking BAGOs at one of the most northern wintering sites for BAGO in N.A. If funding becomes available in the future we would like to mark BAGOs again in Prince William Sound or at a nearby site in south-central Alaska to increase sample size. Finally, we would eventually like to mark birds near Juneau AK to fill in the relatively large gap between the wintering sites at Vancouver BC in the south and Prince William Sound AK in the north. To minimize weather related mortalities, captures would occur as late as possible in spring (i.e., early –mid April), just prior to BAGO migration to interior breeding sites. These data will add to our understanding of range-wide affiliations and connectivity for this species in western N.A.