

Project title: Annual cycle connectivity, inter- and intra-annual site fidelity, and habitat use of Pacific Barrow's Goldeneye (SDJV Project # 85; Year 2 of 3)

Principal Investigators:

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Partners: Sea Duck Joint Venture, Environment Canada, Simon Fraser University

Project Description:

This proposal helps fill some of the more important information needs for BAGO in the latest SDJV Strategic Plan, namely population delineation, population dynamics and population ecology. We marked individuals with satellite transmitters to quantify these important demographic attributes. Our project is designed to generate information on seasonal connectivity, site fidelity and dispersal rates of all BAGO age and sex classes.

Objectives:

- 1) What are the rates, and geographic scale, of inter-annual site fidelity by different sex and age classes at various stages of the annual cycle (i.e., winter, breeding, molt)?
- 2) Do birds from the same breeding site occur in discrete areas during winter, or are they widely distributed, and vice versa?
- 3) How do the answers to 1 and 2 above combine to indicate demographically distinct management units?
- 4) Are there important habitats or specific sites that are used by a large proportion of marked birds, which would indicate their value for conservation?

Results

During our preliminary marking in 2006-2007 and work on this specific project, we have deployed over 110 PTTs on BAGO in BC to date. This involves all age and sex classes and encompasses breeding adults and young at Riske Creek BC and wintering adults at Indian Arm BC (see Table 1). We used PTT units manufactured by either Microwave Ltd or HABIT Research. Most of the Microwave transmitters generated reasonably good location data over the course of their expected life-spans but many of the HABIT units produced poor data or failed prematurely. Largely because of this, our effective sample size is more on the order of 50-60 PTTs. Although not included in our study proposal submitted to the SDJV last year we managed to secure 17 Microwave PTTs to mark HY birds in August 2009. Of these 17 units, 16 (9 HY males and 7 HY females) are generating data at the present time, along with 7 (of 10 original) adult females and 7 (of 10 original) adult males marked in 2008 at Riske Creek.

Table 1: BAGO PTTs deployed during 2006 - 2008.

	<u>Males</u>	<u>Females</u>	<u>HYS</u>
Indian Arm (near Vancouver), wintering area			
Deployed, Feb 2007	10	10	
Riske Creek, interior BC, breeding area			
Deployed, May 2006	20		
Deployed, May 2007	15		
Deployed, May & Aug 2008	10	10	22
Deployed, Aug 2008			17

In Mays of 2006 - 2008, we marked only adult males at Riske Creek. From June to October each year these males showed the same general pattern of movement; i.e., almost all birds moved north to molt, with some migrating as far north as Great Bear Lake and Great Slave Lake, Northwest Territories (see temporary Argos map in Fig. 1). From early November to late April all birds were on the Pacific coast, from northern Washington State to southern Alaska.

In February of 2007, we marked adult males and females wintering on the coast near Vancouver. At the start of breeding season in late April both sexes dispersed over a broad area, spanning from Washington State to northern BC and west-central Alberta. Based on location/movement data, several females appeared to breed successfully while the males departed their respective breeding areas during mid-incubation and flew north to molt.

In addition to the above general movement patterns, the PTT data suggested a definite connection for adult males breeding at Riske Creek and a molting/staging lake in northern Alberta. Roughly 30-40% of all males marked at Riske Creek were found to consistently use Cardinal Lake AB from June to November each year. This finding, and a recent proposal to construct a nuclear power plant on or near Cardinal Lake, encouraged Ducks Unlimited Canada (J. Thompson) to undertake detailed waterfowl surveys in August 2008. These surveys determined that more than 90% of the 4-5,000 goldeneye on Cardinal Lake in August are BAGO, making this the most important (known) molting/staging lake for this species in NA outside of Old Crow Flats in the Yukon. A proposal to conduct a 3-year study on the molt ecology of these males was successfully submitted to the SDJV for funding support (Project #18). Part of the proposed work involves marking up to 40 males with PTTs over the next 2 years, which will generate additional data from breeding and wintering areas.

Project status:

Aside from the problems with the HABIT PTTs, we are accomplishing our goal of marking BAGOs at a key breeding area in south-central BC, including all sex and age classes. Each PTT has been programmed to generate location and movement data over at least two annual cycles. Argos data will continue to be downloaded and temporary map updates will continue to be generated and circulated. Once all PTTs have stopped transmitting after Year 3 of this study, we will develop more sophisticated, detailed maps using GIS, prepare a website describing findings, and answer the questions posed in the Objectives section.

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)
\$10000 ¹	\$10000 ² (not counted)				SDJV/USFWS
			\$46000 ³		Environment Canada
				\$4000	SFU

¹ – SDJV funding contribution

² – 3x PTTs provided from USFWS, Prince William Sound mortalities

³ – Original 16K in proposal plus 30K for 10x new PTTs (not included in original budget). Another 6 PTTs were refurbished units retrieved from dead birds; the cost of refurbishing these units is not included here.

ACTIVITY	BREEDING	MOLTING	MIGRATION	WINTERING	TOTAL
Banding					
Surveys					
Research	\$13000	\$17000	\$13000	\$17000	\$60000
Communication					
Coordination					