Sea Duck Joint Venture
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Project Title SDJV project # 119: IDENTIFICATION OF MOLTING LOCATIONS OF ADULT FEMALE BARROW'S GOLDENEYE IN EASTERN NORTH AMERICA

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Project Description

Concern over the status of the eastern population of Barrow's Goldeneyes (*Bucephala islandica*) was already present more than a decade ago (Savard 1996; Savard and Robert 1997; Savard and Dupuis 1999) and eventually led to the listing of this population as a Species of Special Concern by the Committee on the Status of Endangered Wildlife in Canada in the year 2000. The species has since been listed as *Threatened* in Maine (MIFW 2008), as *Vulnerable* in the Province of Newfoundland and Labrador (Schmelzer 2006), and as a *Threatened or Vulnerable Vertebrate Wildlife Species Likely to be so Designated* (Gazette officielle du Québec 2003) in accordance with the Quebec Act respecting threatened or vulnerable species (R.S.Q. c. E-12.01). Although much has been learned about the distribution and ecology of the eastern population of Barrow's Goldeneyes in the last decade (Robert et al. 2000, 2002, 2003, 2006, 2008, Robert and Savard 2000, 2006; Bourget et al. 2007; Savard and Robert 2007), molting sites used by adult female Barrow's Goldeneyes are still unknown (Eadie et al. 2000; Robert et al. 2000; Environment Canada in prep.). This is a crucial piece of information to insure full protection of the population, especially as it is estimated that there are less than 2000 adult females in the population (Robert and Savard 2006). Molting female goldeneyes have been observed on a few inland lakes as well as in several areas of the St. Lawrence estuary (MR; JPLS unpublished observations) but they were likely Common Goldeneye (*Bucephala clangula*) females. During molt, both species are extremely difficult to distinguish at a distance. Molting areas are quite important in the annual cycle of waterfowl as birds become flightless for about 3-4 weeks during that period (Hohman et al. 1992; Van de Wetering 1997; Van de Wetering and Cooke 2000). Several molting sites of adult Barrow's Goldeneye males have been located in Quebec and Labrador and all are hundreds of kilometers north of the breeding areas (Robert et al. 2000, 2002). It is unknown whether the same sites are used by females. In British Columbia males and females seem to use different sites (Sean Boyd, unpubl. data). Determination of whether Common and Barrow's Goldeneye females molt in the same areas may also have important implications in terms of hunting management. Finally, if like breeding birds, molting females concentrate on fishless lakes it is urgent to locate them and

insure their protection against fish introduction for anglers (Savard 2003; Robert et al. 2008).

Capture techniques: Females were captured on their nest during late-incubation using dip nets. This technique has proven efficient in previous years (Robert et al. 2006; Savard and Robert 2007).Nest boxes (>130) have been erected since 1998 and have been used extensively by Barrow's Goldeneyes females for breeding. In 2008, 27 boxes were used by goldeneye females in the study area with likely half by Barrow's Goldeneyes. Nest boxes were checked in 2009. Several boxes were unusable for various reasons (underwater, fallen, destroyed, door missing). Several of the road access to breeding lakes were overgrown and poorly maintained, making access difficult to breeding lakes. We were fortunate to locate five boxes with incubating Barrow's Goldeneye females. All five females were captured and implanted with satellite transmitters. **Surgical procedures:** Female were implanted following an implant technique adapted from Korschgen et al. (1996) (Fitzgerald et al. 2001) by experienced veterinarians. We used a transmitter cycle similar to that used in British Columbia. **Stable isotope analysis:** A portion of the 9^{th} primary of each captured female was collected for stable isotope (δD, $\delta^{13}C$, $\delta^{15}N$) analysis. Feathers were prepared and analyzed following Wassenaar and Hobson (2006) methodology. Results are not yet available.

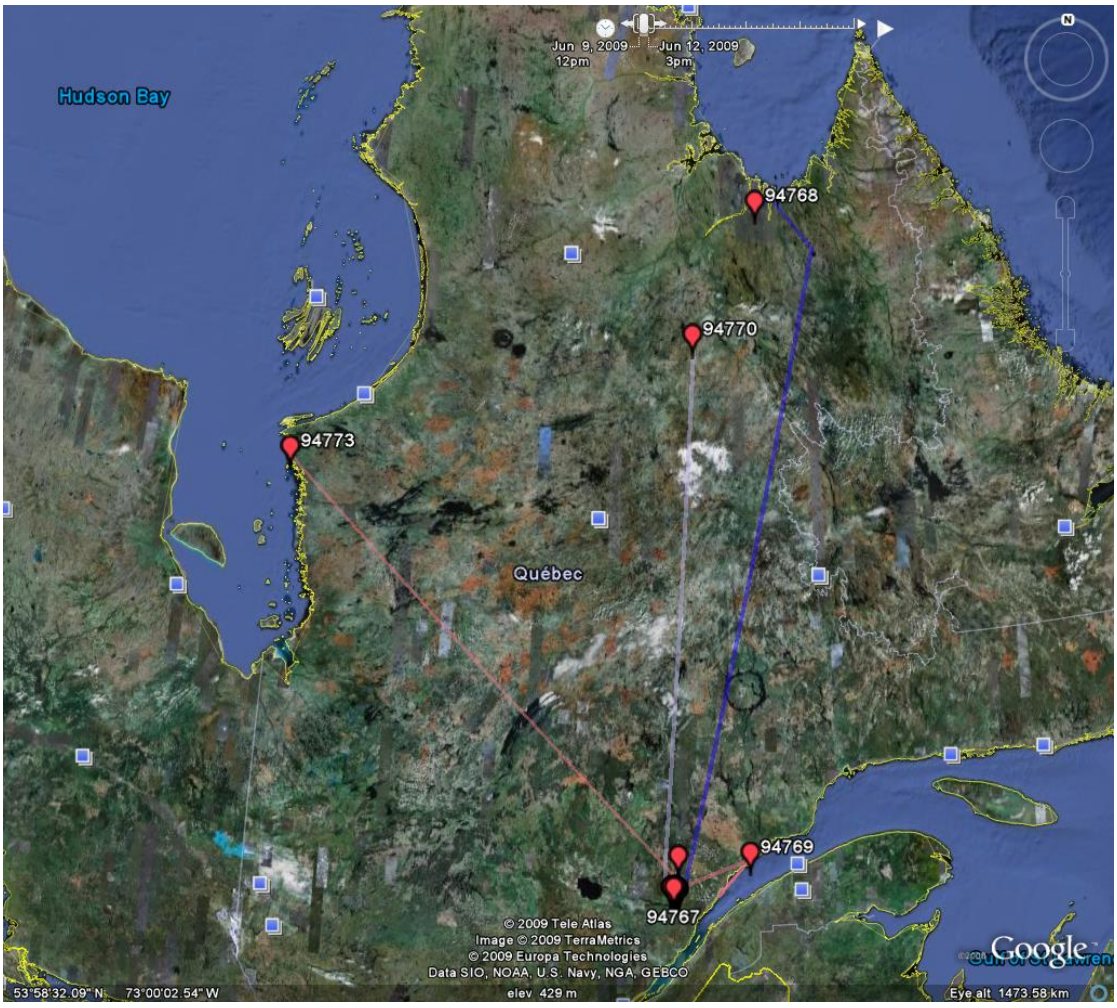
Objectives

Much has been learned about the movements and ecology of the eastern population of Barrow's Goldeneye since 2000, when it was listed as a Species of Special Concern by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC). However, the molting locations of adult female Barrow's Goldeneyes are still unknown. This specific lack of information has been identified in the SDJV Strategic Plan under Habitat Requirements as high priority information needs (SDJVMB 2007). Female molting areas has also been identified as an important knowledge gap in the Management Plan developed for the Barrow's Goldeneye eastern population as part of Canada's *Species at Risk Law* (Environment Canada in prep.). The main objective was to locate molting areas of adult female Barrow's Goldeneyes for the eastern North American population.

Preliminary Results

In spite of our small sample size, we were able to achieve most of our objective
Two females migrated north to the Ungava Bay Region and one to the Hudson Bay Region (Figure 1). One female may have molted on a freshwater lake near the breeding area. One female molted at the mouth of the Aux Outardes River near Ragueneau, and Baie Comeau, a known molting site for Common Goldeneyes.

Figure 1. Movements of Barrow's Goldeneye females as of 27 August 2009.



Female 94767 (Fig. 2) remained on the breeding area until 17 July. Only two signals were received after this date, the 24 July and 7 August, on the St. Lawrence near Île aux Lièvres near Rivière du Loup (86 km from breeding areas). This female had not yet reached her molting site when last located near Île aux Lièvres. Molting goldeneyes have been observed molting just south west of that location near the south shore. Hopefully we will obtain more signals from that bird.

Female 94768 (Fig. 3) was last recorded on her breeding area on 27 July and next on 30 July just a 100 km south of Ungava Bay. On 5 August she had an inlet just x km from Kuujjuaq where she stayed at least until 9 August. She then moved to an adjacent inlet, just 20 km east of Kuujjuaq where she apparently molted (1164 km from breeding areas). She was still there on 7 September.

Female 94769 (Fig. 4) was captured on 5 June 2009 and last recorded on her breeding area on 30 July. She was recorded on her molting area in the St. Lawrence estuary on 2 August and was still there as of 9 September.

Female 94770 (Fig. 5) was captured on 10 June and remained on her breeding area until 23 July. The next signal was received on 26 July and she had travelled north towards Ungava Bay but stopped short on a lake where she moltled. The lake was located 845km for her breeding area and was about 275 km south of Ungava Bay. The center of the lake is at the following coordinates: 56° 15’ 01.11’’ North and 69° 47’ 19.22’’ West. Whether the female stopped there because of her condition or whether she intended to molt there is unknown. It would be pertinent to visit that lake in August to determine whether this is an important molting location.

Female 94773 (Fig. 6) was captured on 9 June 2009 and remained on her breeding area until 9 August. She was next located xx km south of her molting lake on 16 and 19 August and had reached her molting lake on 22 August and was still there on 7 September. The lake is located 915 km from the breeding area, along the east coast of Hudson Bay (3 km from the coast).

Figure2. Female 94767

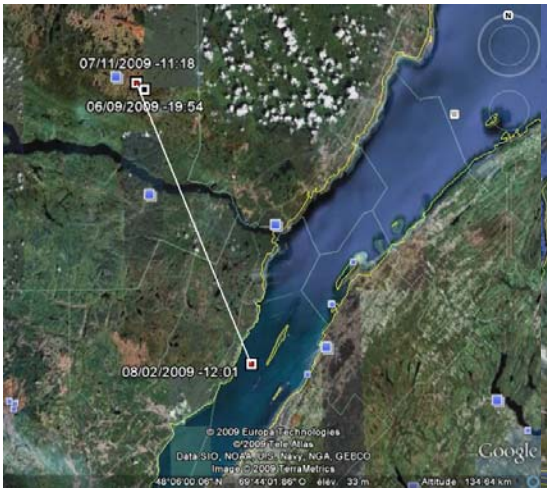


Figure 3. Female 94768

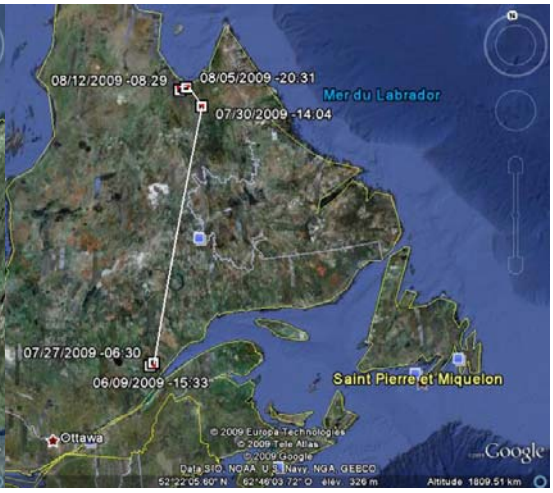


Figure 4. Female 94768

Figure 5. Female 94769

Figure 6. Female 94770

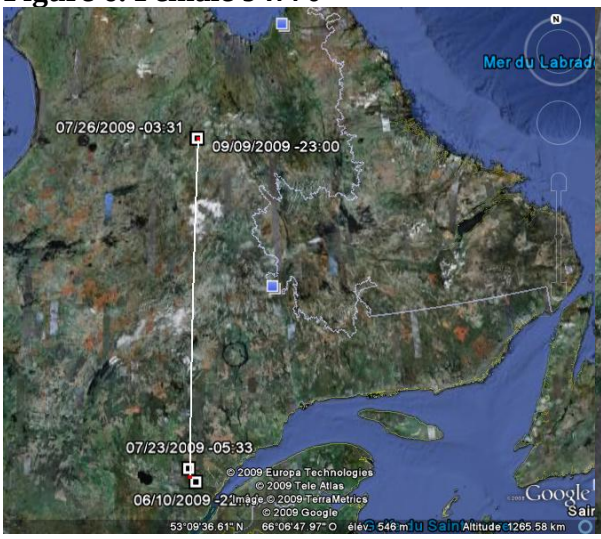
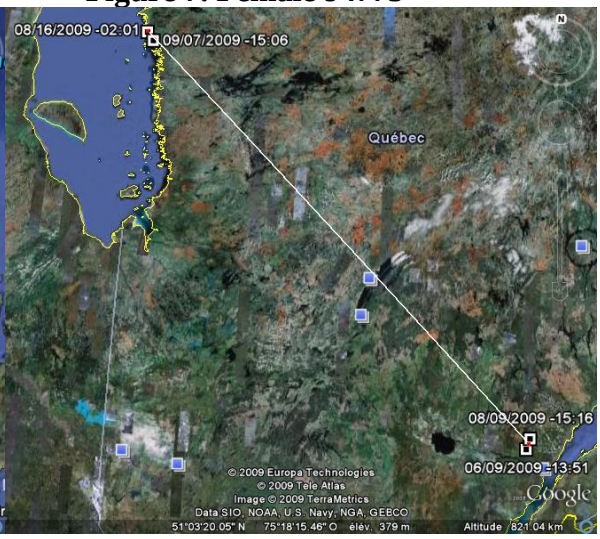


Figure 7. Female 94773



This great dispersal of the females of the same breeding area was somewhat unexpected and it remains a mystery as to how do females select a molting site? Because young females return to their natal area to prospect for nest site in their first year, they may follow breeding unsuccessful adult females to their molting areas. However, this does not explain why they are so dispersed. A possible explanation is that molt site selection has a genetic basis originating from the last glaciations.

Project Status

We initially wanted to implant seven breeding females but were only able to capture five because mostly of a large number of nest boxes that proved unusable**.** In spite of this small sample size we were fortunate to be able to achieve our objectives. Often a small number of transmitters can provide an unusually large amount of new information, especially when they are used for the first time**.** We hope to complete the isotope analysis for spring 2010. Given the great diversity observed in molt location of adult females, more females need to be followed to identify other molt sites. From a conservation perspective, this dispersion of molt sites is good news as it protects the population from disasters at a given site.

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