Sea Duck Joint Venture
Annual Project Summary for Endorsed Projects
FY 2004 – (October 1, 2004 to Sept 30, 2004)

Project Title: No. 2 Identification of Beaufort Sea Migration Corridor for Sea Ducks

Principal Investigator: Lynne Dickson, Canadian Wildlife Service, Room 200, 4999-98 Ave, Edmonton, Alberta T6B 2X3. lynne.dickson@ec.gc.ca; Tim Bowman, U.S. Fish and Wildlife Service, Anchorage, Alaska tim_bowman@fws.gov

Partners: USFWS, SDJV; USFWS Region 7 Alaska; National Fish and Wildlife Foundation; Polar Continental Shelf Project, Natural Resources Canada; Inuvialuit Wildlife Management Advisory Council; Nunavut Wildlife Management Board.

Project Description: Oil development is increasing along the U.S. coast of the Beaufort Sea. This area is extremely important during migration for three species of sea ducks that are currently in decline: Pacific race of Common Eider, King Eider and Long-tailed Duck. Although there is some information on migration, little is known about the specific migration pathways and habitats used by these sea ducks. Hence, it is difficult to predict the degree of potential threats of expanded oil development. Using satellite telemetry, this study is providing information about the location and timing of use of migration corridors, so that analysts can better predict and mitigate any adverse effects of offshore oil development on subject populations. The study is also providing information on affiliations between wintering, breeding and moulting grounds, thereby helping to define populations units. Such information is essential to effectively manage a harvested species.

The long-term goal of this study is to put satellite transmitters on an adequate sample of individuals of each species at three different sites on their Canadian breeding grounds, then track their movement to moulting and wintering areas. The focus in the first two years of the study was on Common Eiders nesting just east of Bathurst Inlet, Nunavut. Due to manufacturer's error in programming the transmitters, work done in the second year had to be repeated in 2003. In addition in 2003, we tagged and tracked King Eiders and Long-tailed Ducks in a breeding area on Victoria Island. In 2004, we had intended to tag more Long-tailed Ducks on Victoria Island. However, their low densities and lack of interest in our decoys made them very difficult to capture. Consequently, we put the transmitters on King Eiders instead.

All three species were captured with mist nets on the breeding grounds in mid June prior to nest initiation. A veterinarian implanted the satellite transmitters in the abdominal cavity using isoflurane as anesthetic. Transmitters implanted in 2004 were programmed to transmit every 3 days for 6 hours except during the winter when the duty cycle was switched to every 5 days.

Objectives: The primary objectives of the study are: 1) to determine specific migration routes for declining western Canadian breeding populations of eiders and Long-tailed Ducks, 2) to document temporal and spatial relationships of migrating eiders and Long-tailed Ducks to pack ice, islands and other physical features in the Beaufort Sea, and 3) to identify wintering, staging and moulting areas, and their affiliation with specific breeding areas.

Other incidental benefits include: 1) identification of important coastal habitats for sea ducks, 2) collection of tissues for genetics, stable isotope and contaminant analyses, and 3) provision of information to develop more effective survey techniques to monitor the status of populations.

Preliminary Results: In June of 2004, satellite transmitters were successfully implanted in 12 King Eiders (6 male, 6 female) on their breeding grounds in central arctic Canada. As of mid September, all of the eiders were alive and 10 of the 12 transmitters functioning well.

As in 2003, King Eiders all migrated to the Bering Sea to moult. Likewise, moult migration across the Beaufort Sea occurred about a month earlier for males than females (mid July to mid August versus mid August to early September). However, the King Eiders spent less time in the Beaufort Sea in 2004 than in the previous year. All stopped for a day or two either off Cape Bathurst or off the Alaskan coast, but only one bird staged for an extended period of time in the Beaufort Sea. By contrast in 2003, males moved through the Beaufort Sea in a 2 – 5 week period, staging first in eastern Beaufort Sea off Banks Island and Cape Bathurst, then again off the Alaskan coast. As in 2003, females crossed the Beaufort Sea more quickly than the males (< 1 wk in 2004, n=4).

More than half of the satellite transmitters implanted in June of 2003 continued to provide locations through to the following spring, allowing us to track spring migration of 11 Common Eider, 11 King Eiders and 2 Long-tailed Ducks. Both eider species departed from the wintering areas in the Bering Sea in the second and third week of April in 2004, and migrated to an area of early open water off Ledyard Bay in the Chukchi Sea where they staged for 3 to 4 weeks. Departing the Chukchi Sea in mid May, they flew to Bathurst Polynya in southeastern Beaufort Sea where they staged until early to mid June (Figs. 1 and 2). From there they moved rapidly to their nesting areas.

Transmitters on 7 Common Eiders sent locations daily during spring migration providing valuable information on the route taken across the Beaufort Sea and whether the eiders stop off the coast of Alaska. All 7 birds took little more than a day to travel from the Chukchi Sea to Bathurst Polynya in the southeastern Beaufort Sea. While crossing the Alaskan Beaufort Sea, they likely followed the transition zone between the arctic pack ice and shore fast ice where cracks and patches of open water occur in May. At least 5 of the 7 eiders stopped briefly (a few hours) along route (Figure 1). Both of these findings will be useful in our assessment of potential threats of offshore oil development.

Female King and Common eiders all returned to the same nesting area used the previous year (n=4 and n=5 respectively). However, none of the male King Eiders (n=4) and only 1 of 7 male Common Eiders returned to the same nesting area. Two male King Eiders migrated to arctic Russia to nest and the other 2 to western Banks Island. The Common Eider males were scattered from Bathurst Inlet to Camden Bay, Alaska during nest initiation period.

Both Long-tailed Ducks with transmitters that were still functioning the following spring were males, and neither returned to the previous year's nesting location. Instead, one migrated to arctic Russia to nest and the other to northwest Alaska near Icy Cape.

Project Status: To date we have successfully deployed satellite transmitters on 47 Common Eiders at Nauyak Lake east of Bathurst Inlet, 41 King Eiders at Kagloryuak River on Victoria Island, 5 King Eiders on Banks Island and 3 Long-tailed Ducks at Kagloryuak River. Once sufficient matching funds can be secured, we intend to complete marking of King Eiders on Banks Island. A minimum of 10 transmitters will be programmed to transmit daily during spring migration to better define the route and staging areas for King Eiders, particularly in the vicinity of offshore oil development in the Beaufort Sea.

Due to our lack of success catching Long-tailed Ducks on their nesting grounds, we recommend they be tagged during the moult. Potential sites for this in western arctic Canada are McKinley Bay and Hutchison Bay just east of the Mackenzie Delta, where several thousand Long-tailed Ducks are known to moult each year in early August.

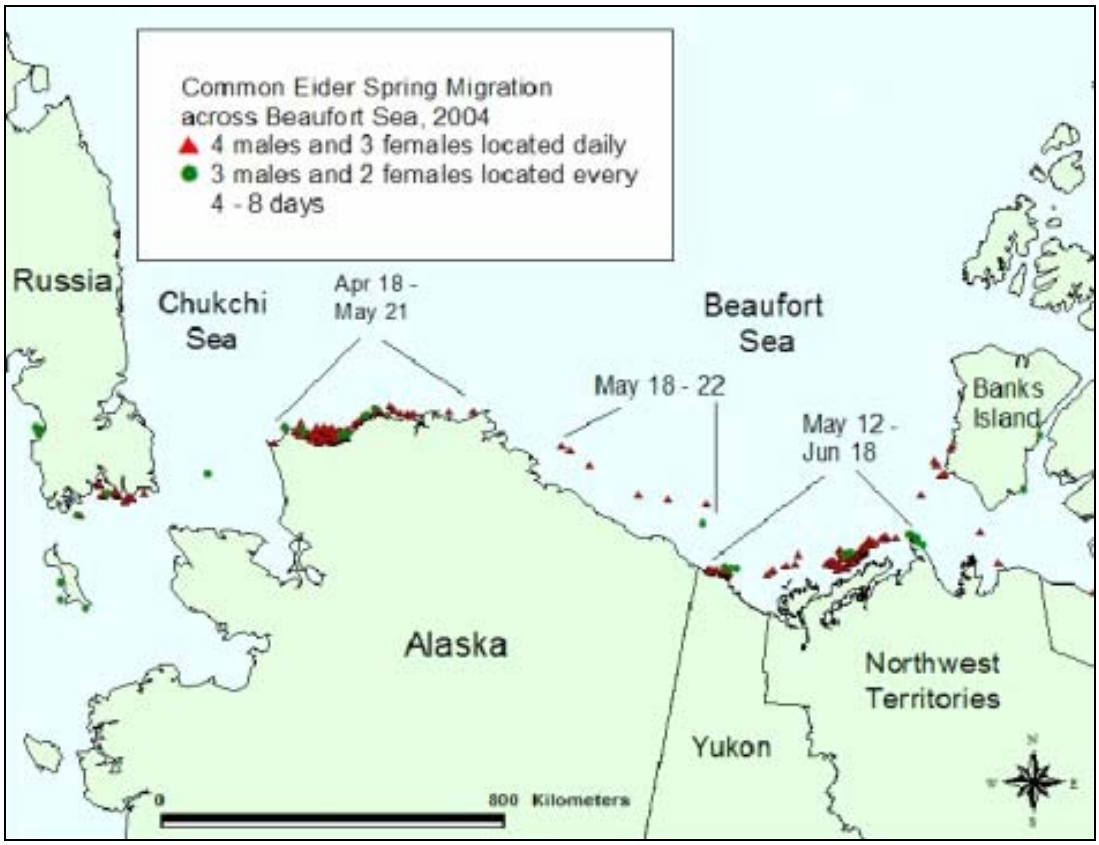

Figure 1. Location and timing of spring migration eastward across the Beaufort Sea in 2004 by Common Eiders tagged with satellite transmitters on their nesting grounds near Bathurst Inlet, Nunavut the previous spring.

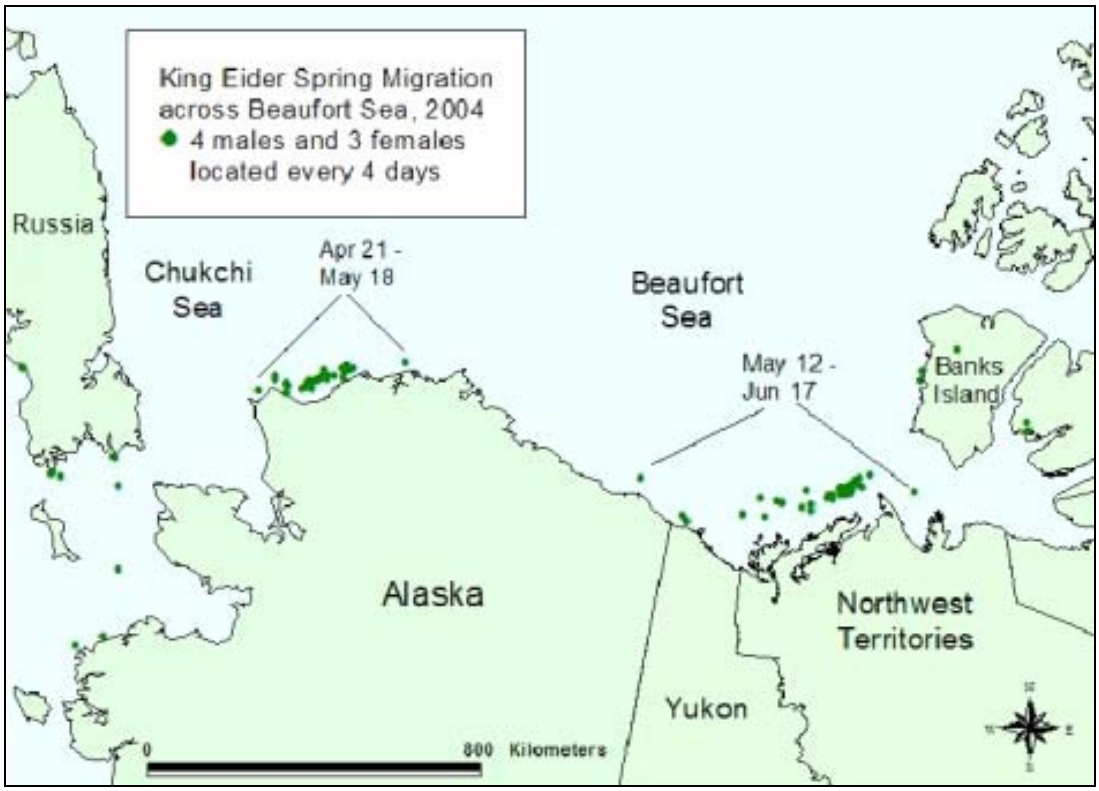

Figure 2. Location and timing of spring migration eastward across the Beaufort Sea in 2004 by King Eiders tagged with satellite transmitters on their nesting grounds on Victoria Island, NWT the previous spring.