

Unraveling the Migration Strategies of Scaup

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Greater Scaup/*Fuligule milouinan* Photo: Ron Ridout

Long Point Waterfowl and Wetlands Research Fund (LPWWRF) staff and students have been studying the staging and wintering ecology of Lesser and Greater scaup on the lower Great Lakes since 1999. This research initiative was sparked by the decline of the continental scaup population since the mid-1980s and lack of knowledge about the use of the Great Lakes by scaup.

Also, since the introduction of zebra mussels to the Great Lakes in the 1980s, scaup have altered their diets to take advantage of this readily available food source. Birds appear to be spending substantially longer periods on the lower Great Lakes, quite possibly in response to increased food availability and higher winter temperatures. This may be problematic since scaup are acquiring elevated levels of selenium (a semi-metallic trace element) through the consumption of large quantities of zebra mussels in the spring. In fact, LPWWRF has determined that 77% of spring staging Lesser Scaup and 94% of Greater Scaup have selenium burdens above the level known to cause reproductive and health-related problems in waterfowl.

Although it is possible that females are transporting selenium to their breeding grounds from the lower Great Lakes, it currently is not clear how much selenium they retain, because body concentrations can decline after birds stop feeding on selenium-contaminated foods. Therefore, it is of particular interest to determine where females staging on the lower Great Lakes tend to breed, and how long it takes birds to arrive on breeding areas.

Until now, scaup migration pathways and their affinities to migratory stopover sites and breeding and wintering areas largely have been inferred from either direct observation or through band recoveries during fall and winter. Moreover, there is no specific information regarding seasonal migration chronologies or how individual



Scott Petrie carefully removes a bird from the capture pen. Scott Petrie retire avec précaution un oiseau de l'enclos de capture. Photo: Theodore Smith

birds move across the landscape during spring and fall. Advances in satellite transmitter technology now allow individual birds the size of scaup to be tracked throughout the year. Thus, LPWWRF has been using satellite telemetry to study several aspects of the migration ecology of scaup captured on the lower Great Lakes during spring.

The main objectives of our research are to: (1) determine spring and fall migration pathways of lower Great Lakes scaup; (2) determine the breeding and wintering grounds of scaup; and (3) assess spring migration chronology, especially the amount of time spent outside the lower Great Lakes region until arrival at the breeding sites.

Scaup included in this study were captured during early spring at Long Point, Lake Erie, and Hamilton Harbor, Lake Ontario. All birds were captured using baited traps. In 2005, three adult female Lesser Scaup were implanted with 22-gram transmitters and three were implanted with 38-gram transmitters. During this pilot year,

we determined that the 38-gram transmitters were much more reliable than the smaller 22-gram model. In fact, the three birds with the 38-gram models all provided data throughout spring migration, and well into the fall and wintering periods.

Based on the success of the program last year, we decided to expand our research by implanting an additional 20 scaup (18 Lesser Scaup and 2 Greater Scaup) in 2006. Five birds were captured at Hamilton Harbor and 15 were captured at Long Point. In order to conserve battery life, transmission cycles were set to occur every three days for spring migration periods and every 10 days thereafter. We are hopeful that at least some of the transmitters will last for two years, thereby providing movement pattern information during up to four migrations. Because very few male scaup have been implanted so far, the discussion below will be limited primarily to adult female Lesser Scaup.

On average, female Lesser Scaup remained on the Great Lakes for 32 days after release (range = 15-55 days), which is not

surprising since scaup are known to linger on spring staging areas and generally do not start nesting until June.

Between the lower Great Lakes and breeding areas, birds on average made five migration movements (range was three to seven movements), with an average distance of 490 kilometres (range = 10-1938 km). This hopscotch-style of migration would enable females to rest and acquire body fat throughout the migratory period. Interestingly, male Lesser Scaup made considerably more movements (average = 10; range = 8-11) and their migration patterns were much less direct than were female movements.

Total migration distance from the lower Great Lakes to breeding areas averaged 2605 kilometres (range = 1617-5277 km) for females. After leaving the Great Lakes, females spent a variable amount of time on prairie, parkland and/or boreal forest staging areas (average = 25 days; range = 6-50 days) before arriving on breeding areas. Selenium has an 18-day half-life in waterfowl, so birds start to purge themselves of this contaminant as soon as they are removed from a selenium-enriched diet such as zebra mussels. Given that selenium is high in spring migrants on the lower Great Lakes, female scaup, especially those arriving relatively early on breeding areas, may be retaining selenium and transferring it to eggs.

Results from our first two years of study indicate that Lesser Scaup staging on the lower Great Lakes during spring have variable migration strategies and chose several different migration pathways to their breeding areas. Our findings indicated (and corroborated earlier evidence) that prairie and parkland regions of North Dakota, South Dakota, Manitoba, and Saskatchewan are important for spring migration of Lesser Scaup originating from the lower Great Lakes stopover sites and/or wintering areas.

We were, however, surprised that so many of our satellite-tracked Lesser Scaup migrated northeast from the Great Lakes to breeding areas in northern Québec and Labrador. It certainly was noteworthy that female Lesser Scaup ended up on breeding areas widely dispersed between Labrador and Alaska.

Our initial evaluation of the fall migration pathway and wintering ground affinities is limited to birds implanted in 2005, since birds implanted in 2006 will be migrating south this fall. During fall migration, two of three Lesser Scaup returned to major lower Great Lakes stopover sites (Long Point Bay, Lake Erie, and Bay of Quinte, Lake Ontario) that they had used the previous spring. One female that spent the summer in the western boreal region (Yukon Territory) did not return to the lower Great Lakes during fall; instead, she spent nearly the entire fall migration period in the



Shannon Badzinski releases a scaup. Shannon Badzinski relâche un fuligule. Photo: Theodore Smith

Canadian parkland/prairie region and relatively less time in the southeastern U.S. en route to her wintering grounds in eastern Florida. This bird subsequently returned to the lower Great Lakes during the following spring migration.

Our results suggest that at least some spring-staging Lesser Scaup using the lower Great Lakes originate from major wintering areas in the southern portion of the Atlantic Flyway. Our data also show that at least some Lesser Scaup remain on the lower Great Lakes throughout winter and may not necessarily use the same lower Great Lakes stopover sites each spring.

Because we still have 18 birds with transmitters that could last for up to three more migrations, we will learn substantially more about scaup migration over the next few years. Further, we plan to increase our understanding of Greater Scaup movements by implanting 6 more birds in early 2007. This information, in conjunction with ongoing research conducted by LPWWRF staff and students, will allow us to better evaluate the potential effects that selenium may have on reproduction of Greater Scaup, as well as the relative importance of the lower Great Lakes for these two species. In the

meantime, you can follow the movements of our tagged scaup on our “Scaup Tracker” website at www.bsc-eoc.org/lpbo/lpwwrf/scauptrack.html.



Transmitters were carefully implanted in female scaup. Des émetteurs ont été implantés avec soin dans des fuligules femelles. Photo: Theodore Smith



A female Lesser Scaup makes her escape with her new transmitter. Une femelle Petit Fuligule prend son envol avec son nouvel émetteur. Photo: Theodore Smith