Sea Duck Joint Venture
Annual Project Summary for Endorsed Projects
FY 2004 - (October 1, 2003 to September 30, 2004)

Project Title

Brood and molting ecology of Red-breasted Mergansers in the Gulf of St. Lawrence

Principal Investigators

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Partners

McGill University, Canadian Wildlife Service, Parks Canada, New Brunswick Wildlife Trust Fund, Province of Quebec Society for the Protection of Birds (PQSPB).

Project Description

Recruitment of young Red-breasted Mergansers *Mergus serrator* to fall populations requires that adequate brood-rearing habitat be available. However, habitat preferences and requirements from hatching to fledging as well as population dynamics (e.g. nest and duckling survival) of Nearctic coastal mergansers have not been investigated.

In 2004, we continued our investigations of Red-breasted Merganser broods that originated from a breeding colony located on four coastal barrier islands at Kouchibouguac National Park, New Brunswick. A total of twelve merganser hens were captured at the nest during the later stages of incubation and equipped with subcutaneous radio transmitters (Figure 1). Newly-hatched young were captured at the nest following hatching and fitted with small individually-coloured nape markers. Broods were located daily throughout the rearing period via sea kayak or small motorcraft in order to determine habitat use patterns and duckling survival probabilities. Individual brood locations were classified into one of eight coastal deepwater or wetland habitats. The

breeding islands were systematically searched by foot in order to locate merganser nests and to determine population dynamics concerning this coastal breeding colony.

Objectives

The objectives of this study were: 1) to determine habitat selection by marked Red-breasted Merganser females with their young at differential spatial scales (brood rearing areas and specific sites within brood rearing areas); and 2) to determine the population dynamics, including nesting success and duckling survival from hatching to fledging, of mergansers in the Gulf of St. Lawrence.

Preliminary Results

In 2004, 46 Red-breasted Merganser nests were located and monitored on four barrier islands. A total of 31 nests were successful, yielding 198 ducklings. Nest abandonment (n = 15) was the major cause of nesting failure. Daily survival of merganser nests (0.98%) was higher than that determined during the first two years of the study. As a result, nesting success in 2004 (56.06%) was considerably greater than that observed in 2002 (31.70%) and 2003 (42.70%). Nape tags presented a problem in identifying merganser young throughout the study. In 2003, we observed merganser young pulling the nape tags free of their bodies and despite a modified design in 2004, we were forced to cease tagging young after three broods were abandoned following marking. However, duckling mortality was highest throughout the first 10 days of brood-rearing, a period when brood survival appeared to be influenced by both initial brood size and adverse weather.

Of the 12 females radio-marked, four hens were observed without a brood within 24 hours post-hatch and one nest failed to hatch. However, a total of 10 females yielded habitat use information throughout the brood-rearing period. Primary brood movements from the nesting islands to initial rearing areas were extensive, averaging 4.04 km (SD 1.08). Similar to 2002 and 2003, the majority of the 160 sightings in 2004 were on either intertidal estuarine flats (46.25%) or subtidal estuarine flats comprising extensive stands of submergent eelgrass *Zostera marina* (31.25%). Movements from protected bays and tidal brooks used throughout the initial days of brood-rearing to more open estuarine flats frequented during the later stages of development may have reflected both a change in diet requirements and hardiness of young mergansers. We are currently developing a geographic information system (GIS) model of the study area that will be used to determine coastal habitat selection at different spatial and temporal scales.

Project Status

Field studies of Red-breasted Merganser brood ecology (2002-2004) have been completed. However, we intend to continue monitoring the population dynamics of merganser nests at Kouchibouguac in upcoming years. Beginning in 2005 and continuing in 2006, research efforts will focus on the molting ecology of mergansers in the Gulf of St. Lawrence. In 2004, we documented the distribution of Red-breasted Mergansers in the coastal waters of Anticosti Island, Quebec and experimented with time budget techniques. We confirmed the presence of several thousands molting mergansers in the coastal waters of Anticosti Island. Stable isotope analyses of primary flight feathers from both adult males and females at Kouchibouguac will reveal clues to molting environments (freshwater vs. saltwater) used by mergansers during the molt of remiges. We also aim to examine whether molting individuals exhibit differential allocation of energy than breeding birds. The combination of these studies will facilitate the Ph.D. dissertation of S. Craik, in which a thesis should be written to its completion by the summer of 2007.

Figure 1. A subcutaneous radio transmitter implanted into a female Red-breasted Merganser *Mergus serrator* at Kouchibouguac National Park, New Brunswick, Canada.