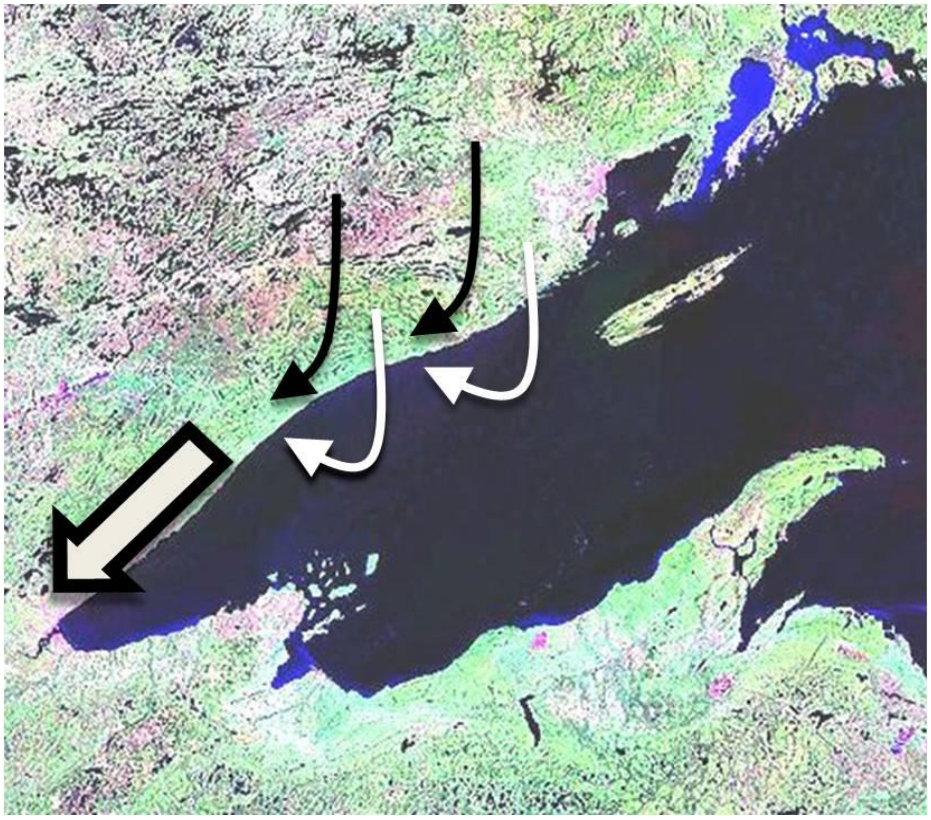
The North Shore Migration Phenomenon

The North Shore of Lake Superior is one of the premier migratory routes for raptors and passerines in North America. Due to the lack of information about the North Shore migration beyond Hawk Ridge, the Natural Resources Research Institute, University of MN Duluth, and HRBO initiated a 3-year study that began in 2008 to examine the size of the migration, important flight lines, and important stopover habitats. Fall migration counts of raptors and passerines at Hawk Ridge and during the recent North Shore study are estimated to be in the hundreds of thousands to millions, indicating a massive movement that has been previously underestimated. These recent studies have begun to show the true magnitude of the fall migration and the importance of the North Shore region as a major migration corridor. Reasons for this concentration of birds along the North Shore of Lake Superior are many, but the presence of Lake Superior and topography play a major role. As migrating birds fly south they seek out cover and food along their routes. Lake Superior presents a barrier void of food and shelter (Figure 1). If birds approach the Lake during daylight hours they change their course to follow the shoreline (black arrows). If birds that fly during the nighttime hours find themselves over the Lake at dawn, they reorient to the nearest shoreline (white arrows). This movement coupled with the prominent ridgelines that parallel Lake Superior that act as funnels, cause a massive congregation of birds within the Lake Superior coastal region.

Figure 1. Movements of fall migrating birds and the concentration within the Lake Superior coastal region.



The objectives of the current North Shore migration study are to examine the true magnitude of the migration and to identify specific areas or characteristics that lead to the highest concentrations of birds within the coastal region. As data is simultaneously collected at Hawk Ridge, we are able to use these data as a baseline for comparisons of the migration along the North Shore (Figures 3 and 4). This information shows the concentration of raptors as they approach Hawk Ridge at the southwestern tip of Lake Superior. This information was also our first clue that the nonraptor migration was much larger than previously known as numbers of these birds at Hawk Ridge mirror the number of birds seen along the shoreline in some areas. One particular variable has also stood out in importance: closeness to the shoreline itself. Data is collected at three perpendicular distances from shore: near, middle, far (<1 mile, ~3miles, ~6 miles) at different sites spread out along the North Shore (Figure 2). This information shows that migrating birds, especially nonraptors (mainly songbirds) are concentrating within 1 mile of the Lake Superior coastline (Figure 5).

Figure 2. Fall migration survey sites.

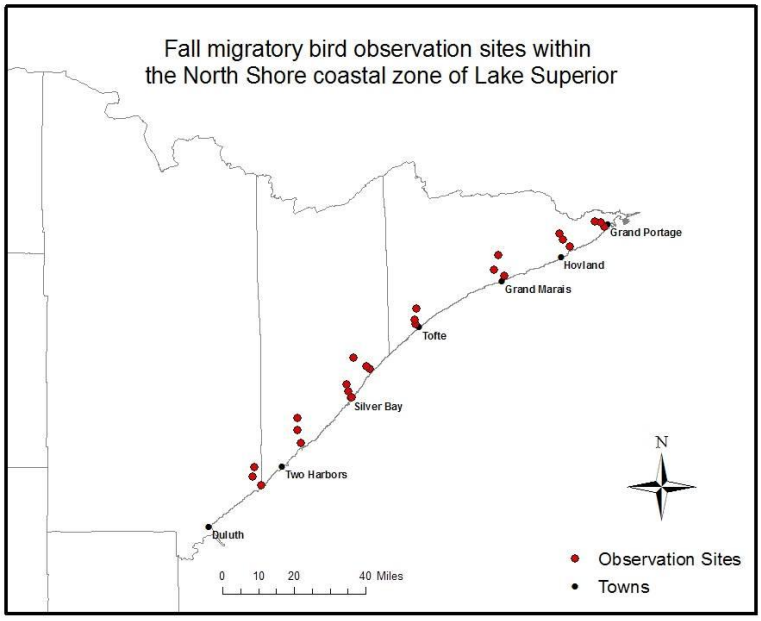


Figure 3. Raptors observed per hour of observation during survey years 2008 and 2009 at Hawk Ridge and along the North Shore of Lake Superior.

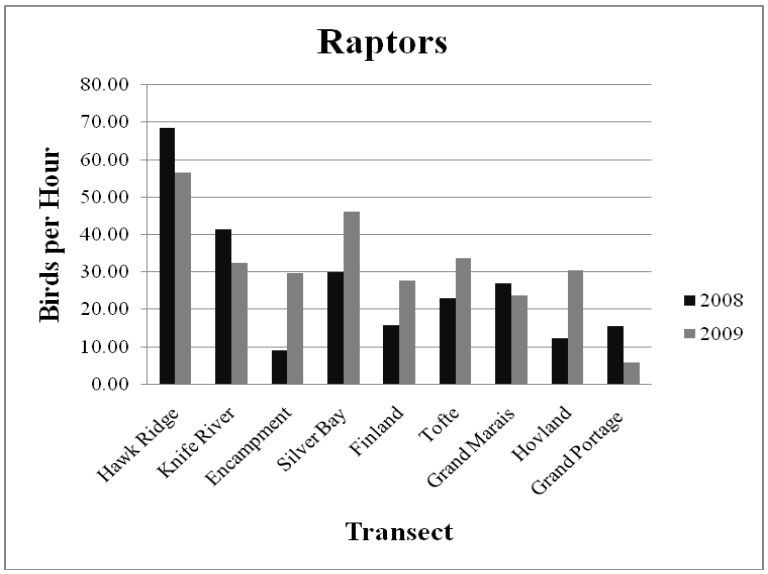


Figure 4. Nonraptors (mostly songbirds) observed per hour of observation during survey years 2008 and 2009 at Hawk Ridge and along the North Shore of Lake Superior.

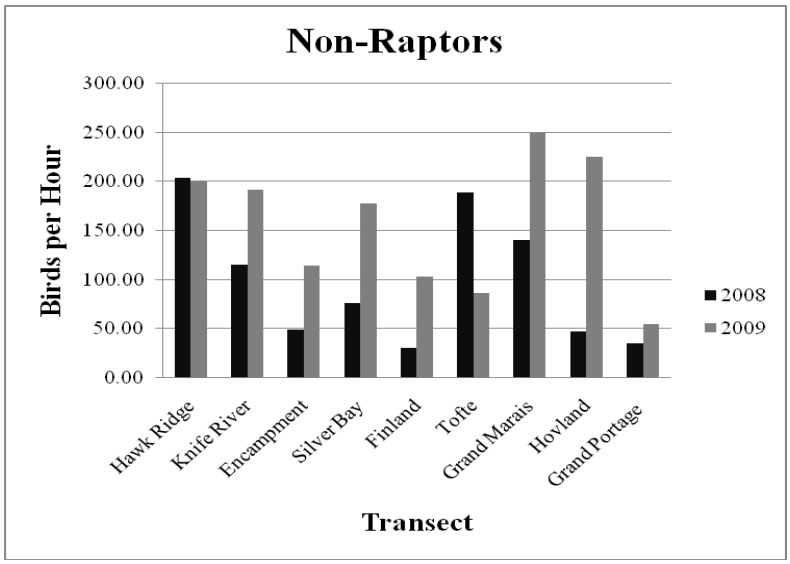


Figure 5. Total nonraptors sampled at the eight study sites along the North Shore. Totals represent surveys during 33 random days between August 15th and November 15th.

Researchers from NRRI and HRBO will again be out watching birds during the 2010 migration season. A website to follow progress of this research is available on the Hawk Ridge website (http://www.hawkridge.org/research/nsm.html; under construction). This study is funded by the Minnesota DNR Coastal Program and the U.S. Fish and Wildlife Service.