

## Owl Habitat Associations on Prince Edward Island: 2010-2013

Owls are vulnerable to environmental disturbance, particularly forest loss which reduces the habitat they need for hunting and nesting. Once mostly forested, nearly half (43%) of Prince Edward Island (PEI) is now cleared for agricultural use and much of the forest currently present is young, having re-grown after being harvested in the past. In order to conserve owls in PEI, we need to understand how they are using this modified landscape – which types of habitat owls prefer or avoid, and how the size and configuration of forest habitat patches matter to owls.

Fortunately, volunteers have been collecting data on owls in PEI for 20 years, as part of the Birds Canada Nocturnal Owl Survey. Owl observations are mapped along road-based routes across the province. The province of PEI also has excellent landscape maps, illustrating a patchwork of land cover types (forested, agricultural, wetland, urban-built, etc.; see Figure 1). We used a GIS mapping program (ArcMap) to overlay a subset of Nocturnal Owl Survey data (collected between 2010 and 2013) onto these landscape maps to determine how habitat is used by the three most common owl species in PEI: Barred Owl, Great Horned Owl, and Northern Saw-Whet Owl. We found that not just amount of forest, but the way forest patches are distributed on the landscape, is important for owls – particularly for Barred Owls. All species were more likely to use areas with greater mature forest cover, while the amount of younger forest cover on the landscape affected the species differently. Landscapes without forests were less likely to support owls, with a few exceptions. We describe our findings for each species below.



**Barred Owl – prefer mixed hardwood-conifer mature forest and larger, less isolated forest patches.** Barred owl were most strongly associated with Northern Hardwood-Conifer habitat – a mature forest type with large deciduous (hardwood) trees and pines and well-drained soils (Figure 2 shows the distribution of this habitat in PEI). Barred Owl seemed to avoid areas with larger amounts of young forest. Mature forests tend to be more open, whereas young forests have a lot of shrubby undergrowth. The preference of these owls for mature forests is likely because the species relies on tall, older trees with large nest cavities as well as open

areas under the forest canopy to hunt their diverse prey (small mammals, invertebrates, birds, and amphibians). The configuration of forest patches on the landscape was also very important for Barred

Owls. Landscapes with mature forest patches that were less fragmented and had more core, 'deep forest' habitat were preferred, as well as landscapes with a variety of mature and young forest patch sizes and spacings. Interestingly, Barred Owl were also associated with sites having moderate (35%) cover by residential development and infrastructure. This is consistent with reports from elsewhere in North America that this species can nest in small suburban woodlots and other developed areas, despite the stark contrast with the deep forest habitat they typically prefer.

**Great Horned Owl – prefer mature softwood (spruce/fir) forest and open wetland areas.** Great horned owls preferred landscapes with more forest cover, particularly those with more Boreal Upland Forest habitat – a mature forest type dominated by spruce and fir with moderate to poorly drained soils (Figure 2 shows the distribution of this habitat in PEI). This is consistent with many studies that have found that Great Horned Owls prefer landscapes with larger amounts of forest cover overall, and prefer mature forest stands in some regions. In PEI, this species may also prefer landscapes with more open wetland habitat but less agriculture. While they seem to avoid large open agricultural areas, they may need forest edges and some open habitat for hunting prey.



**Northern Saw-whet Owl – tolerant of younger forest but prefer larger, less isolated forest patches.** Northern Saw-whet Owls were most strongly associated with landscapes that had little variation in the size and distance between forest patches – particularly young forest patches. In PEI, such preferred landscapes had larger forest patches located closer together. Northern Saw-whet Owls were also present in areas with larger amounts of mature forest; however, mature forest was much less important for this species than for Barred Owls. Northern Saw-whet Owls also avoided landscapes with more wetland cover.

The results for this species were not as conclusive as those for Barred Owl and Great Horned Owl. Northern Saw-whet Owl can use a wide variety of habitats, including mature forests, regenerating

forests, coniferous swamps, and even savannah, often hunting along forest edges. They also can prefer deciduous trees for nesting and foraging but dense conifers for roosting. It is possible that this species uses a very diverse set of habitats in PEI, and so shows no strong associations with any single habitat type. Complicating matters, Northern Saw-whet Owl can be hunted by Barred Owl and Great Horned Owl and thus may avoid a good habitat if it is occupied by a larger owl.

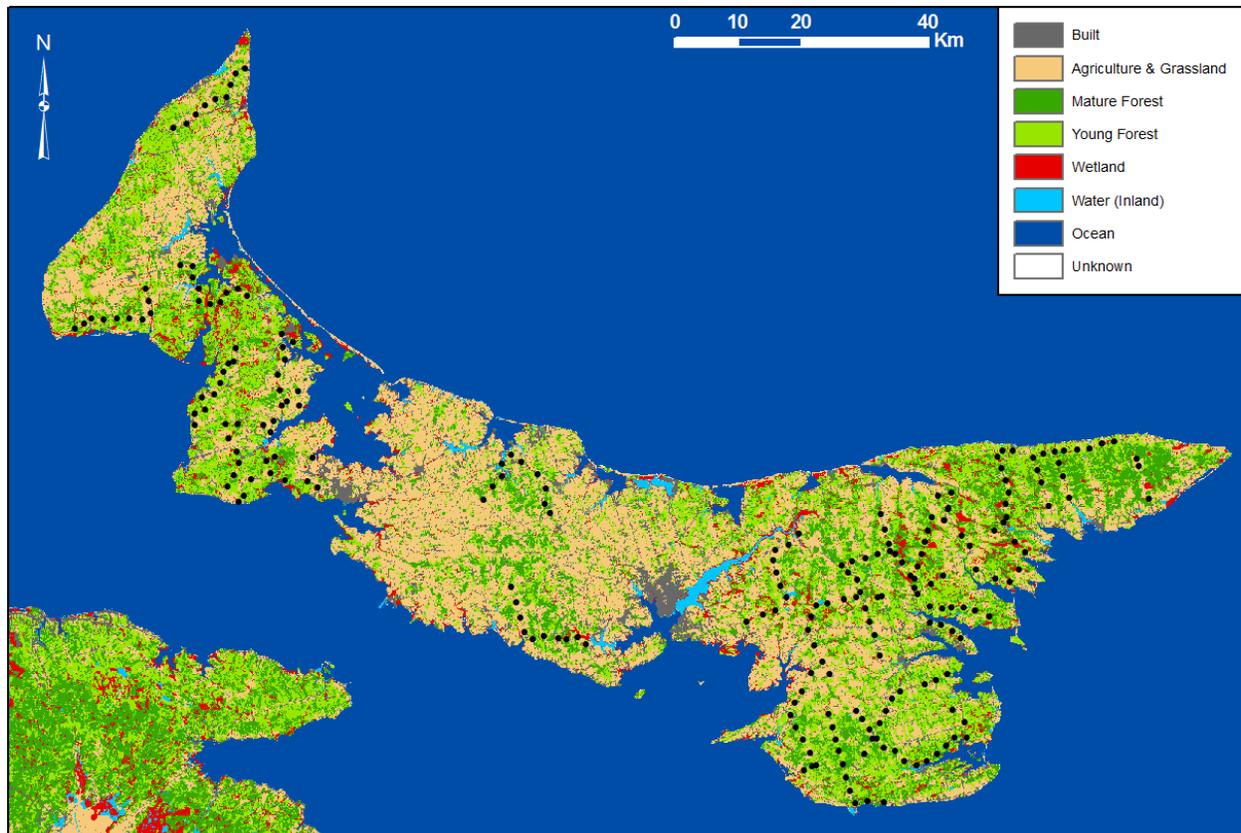


Figure 1. Owl point count locations (data collected by volunteers; see black dots) and an example of the landscape cover maps describing major habitat types used in our work.

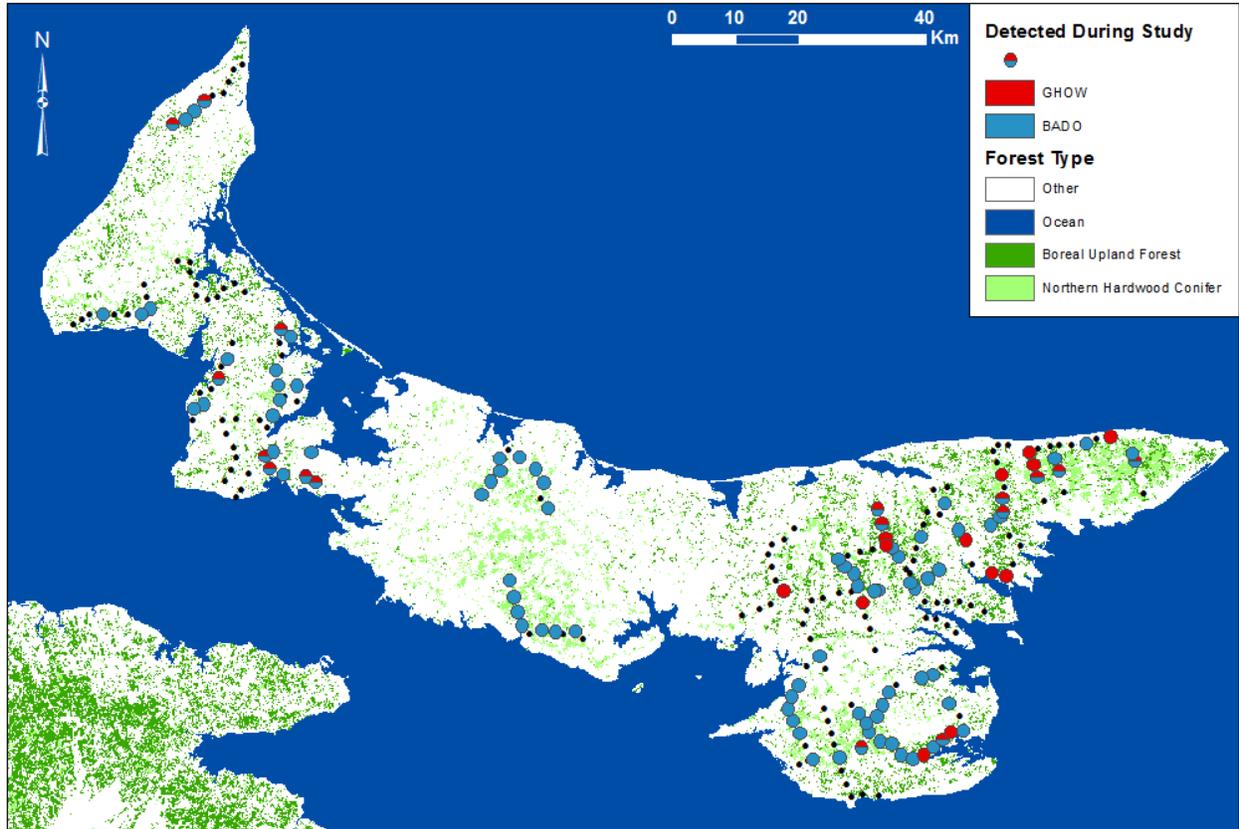


Figure 2. Land cover by the two types of mature forest most strongly associated with the presence of Barred Owls (BADO) and Great Horned Owls (GHOW) on Prince Edward Island, overlaid with survey sites where these species were detected from 2010 to 2013. Black dots indicate sites with no detections.

**Photos:** Denis Doucet (Great Horned Owl, Northern Saw-whet Owl) and Rod O’Connell (Barred Owl)