# *American Black Duck, Breeding Season*

American Black Duck (breeding) was selected as a representative species for the Designing Sustainable Landscapes project of the North Atlantic LCC (https://scholarworks.umass.edu/designing_sustainable_landscapes/). The habitat clusters (ecological systems) and associated wildlife species that it represents generally consist of marshes, ponds and bogs. The *Landscape Capabilit*y (*LC*) index integrates habitat capability, prevalence and climate suitability into a single index that reflects the relative capacity of a site to support the species.

Habitat capability (*HC*) - The *HC* index considers six factors representing: (1) terrestrial and wetland ecosystems for nesting as defined by ecological systems and proximity to suitable aquatic habitat, (2) Aquatic ecosystems for brood rearing consisting of lotic systems (large rivers) and lentic systems (ponds) that are in close proximity to shoreline, (3) suitable habitat extent, representing the amount of suitable breeding habitat in the surrounding landscape, (4) small extent development, representing the likelihood of anthropogenic disturbance that occurs on a scale of tens to a few hundred meters from a developed edge, and (5) large extent development, representing the effects of human-mediated landscape changes that accumulate over a larger geographical area. The *HC* index represents the relative capacity of a site to provide the habitat needed by the species during the breeding season based on current scientific knowledge.


American Black Duck Breeding Landscape Capability Model
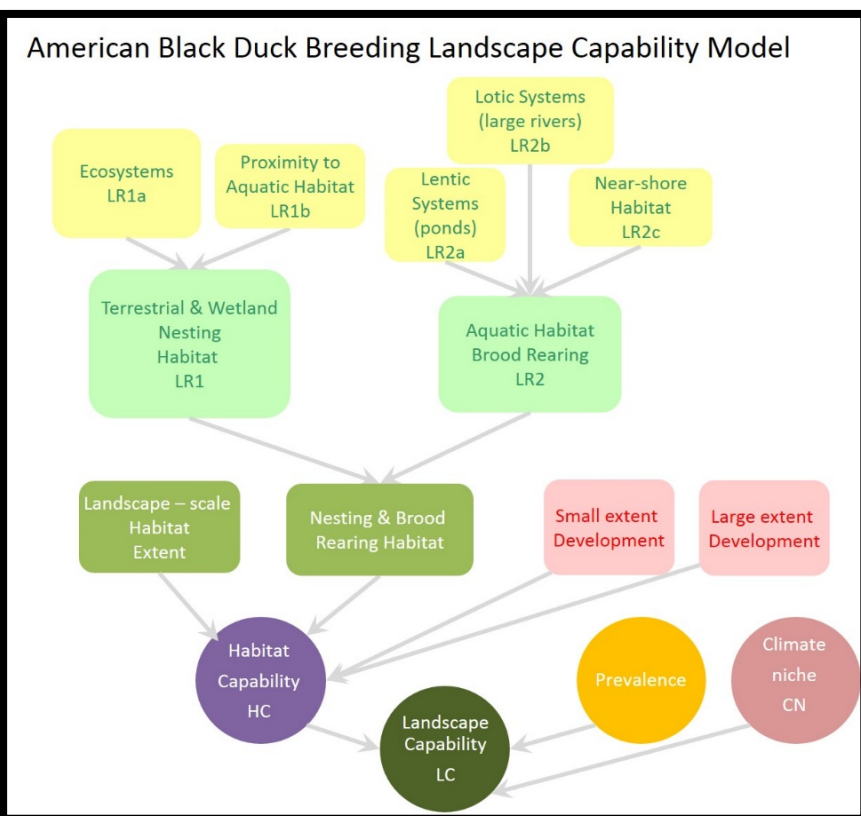
Climate niche (*CN*) - The *CN* index considers five climate variables representing: (1) growing degree days, (2) annual precipitation, (3) precipitation that occurs during the growing season, (3) annual mean temperature, and (5) maximum summer temperature. The *CN* is based on a statistical model derived from 6,029 absent locations and 6,869 present locations based on eBird data distributed throughout the Humid Temperate Domain. The *CN* index represents the probability of the climate being suitable for the species based on its current distribution in relation to current climate.

Prevalence index - The Prevalence index is based on the proportional presence of the species across space and is derived from the same eBird occurrence data as above. The prevalence index represents the species' current relative distribution without consideration of environmental determinants and is intended to address biogeographic factors not formally considered with *HC* or *CN* (e.g., disease and competition) that influence the species' current distribution.

Landscape Capability (LC) - The *LC* index is computed as the product of *HC*, *prevalence* and *CN*. Thus, the index computed for 2010 reflects the gradient of worst (0) to best (maximum value) sites within the landscape that support this species during the breeding season. Note, we also compute this index for the future (e.g., 2080) based on output from the landscape change model.

Model performance has not been evaluated for this species. We are currently working with the Black Duck Joint Venture to acquire suitable occurrence data to begin this evaluation.

American Black Duck (Breeding Season) Landscape Capability (LC) (2010)

High
Low
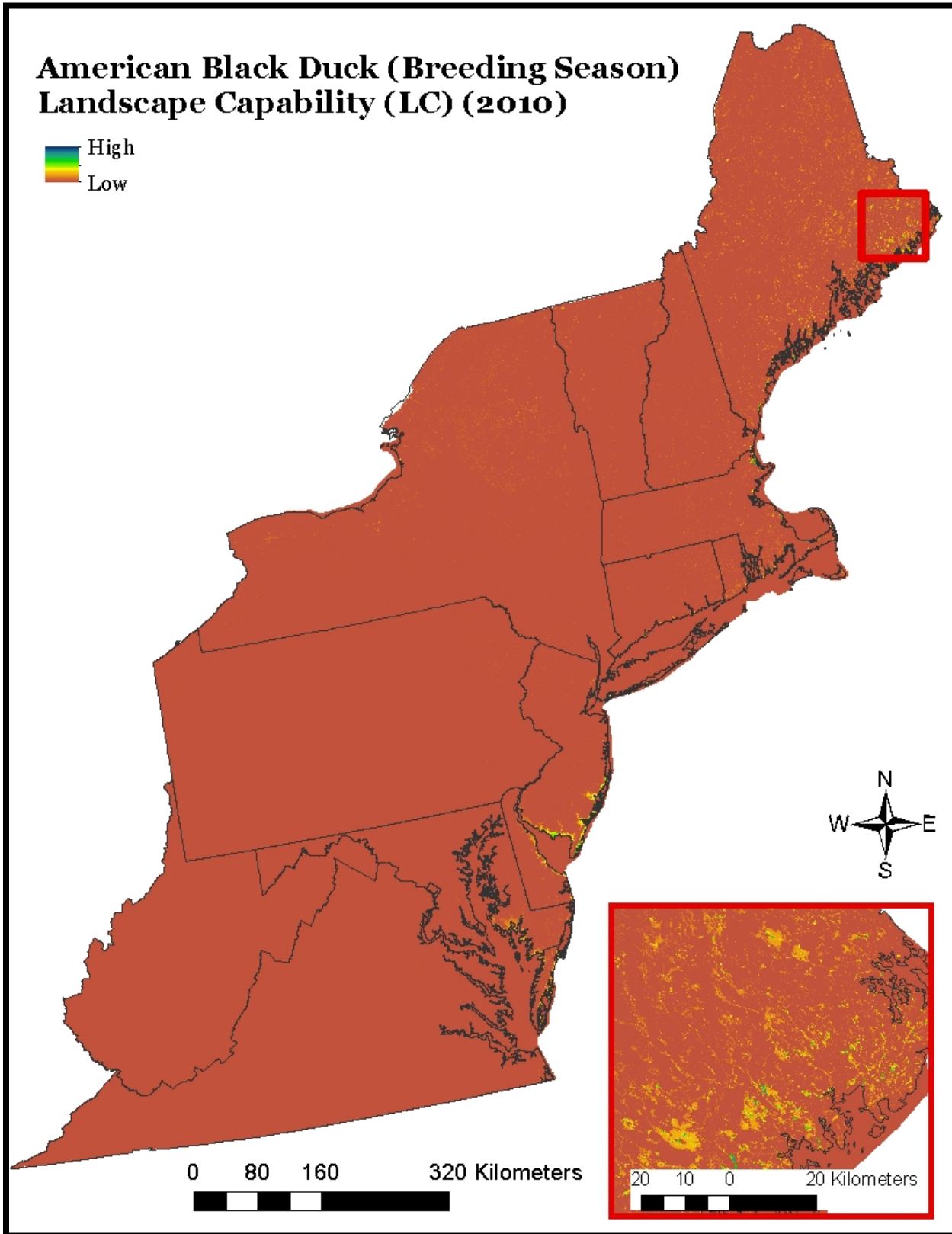
See technical document on species at https://scholarworks.umass.edu/designing_sustainable_landscapes/ for a detailed description of the Landscape Capability modeling process.