

Representative Species Model: American Oystercatcher (*Haematopus palliatus*)

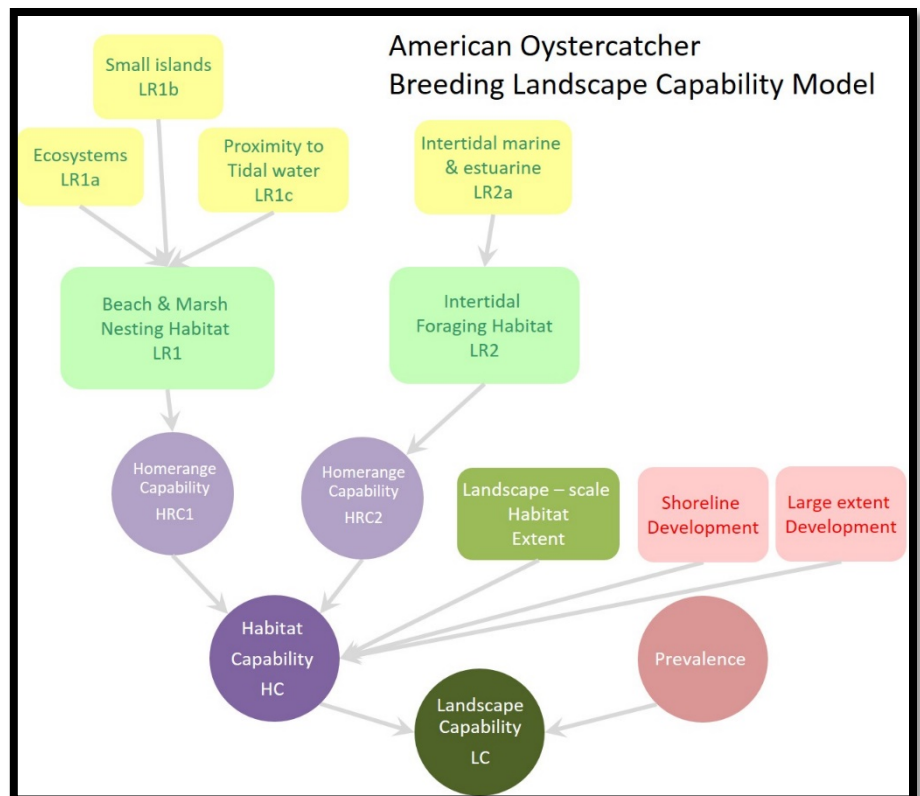
American Oystercatcher

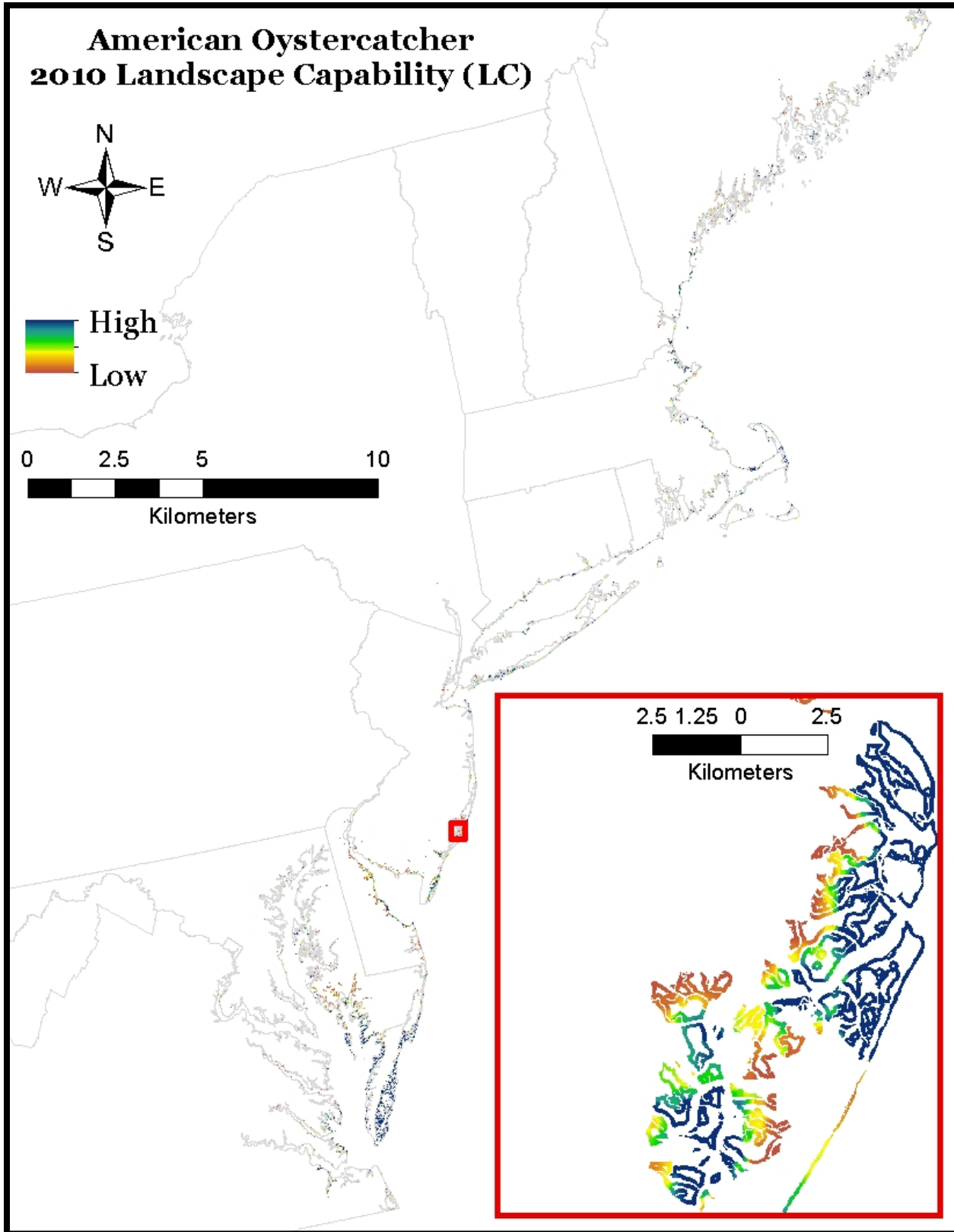
American Oystercatcher was selected as a representative species for the Designing Sustainable Landscapes project of the North Atlantic LCC (https://scholarworks.umass.edu/designing_sustainable_landscapes/). The habitat clusters (ecological systems) and associated wildlife species that it represents are marine intertidal rocky coasts, mudflats and sand throughout the NA LCC. The *Landscape Capability (LC)* index integrates habitat capability 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 seven factors representing: (1) intertidal beach and marsh systems for nesting, (2) small islands for nesting, (3) proximity to water, (4) intertidal marine and estuarine systems for foraging, (5) large extent development, representing the effects of human-mediated landscape change that accumulate over a larger geographical area, (6) small extent development, representing edge predators and anthropogenic disturbances, and (7) landscape-scale habitat extent. The *HC* index represents the relative capacity of a site to provide the habitat needed by the species based on current scientific knowledge.

Climate niche (CN) - The *CN* index uses six climate variables representing: (1) growing season precipitation, (2) annual precipitation, (3) annual temperature, (4) maximum summer temperature, (5) minimum daily temperature and (6) growing degree days. The *CN* model is based on a statistical model derived from 3,937 absent eBird locations and 3,937 present eBird locations distributed through 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.

Landscape Capability (LC) - The *LC* index is computed as the product of the *HC* and *CN* indices (see map). 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 was performed using 4,000 present and 4,000 absent eBird data points that were held out of the *CN* model dataset. Model performance was determined to be acceptable (Kappa = 0.66, Deviance explained=19%, AUC = 0.89).





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