Bald Head Island Deer Habitat Characterizations

Background
On July 18, 2009, 12 sites on Bald Head Island were visited (see Appendix and associated photographs) where white-tailed deer (*Odocoileus virginianus*) had been observed regularly by technician Brandon Sherrill. Each of these habitats will be described as to community classification and floristics.

Bald Head Island contains excellent examples of barrier island plant communities as classified by Schafale and Weakley (1990), whose nomenclature is followed in this report with taxonomy according to Weakley (2008). Mayes (1984) completed a floristic study of the Smith Island complex, which includes Bald Head Island, that used analogous community types. Other descriptions of island vegetation were done by Cooper and Satterwaite (1964), Parnell and Adams (1970), and the Coastal Reserve Program (1999).

Habitat Descriptions (follows list given in the Appendix)
1.) Maritime Shrub - Dune Grass: This site represented a transitional area between small dunes dominated by sea oats (*Uniola paniculata*) and scattered maritime shrub species such as wax myrtle (*Morella cerifera*), yaupon (*Ilex vomitoria*), red bay (*Persea borbonia*), and southern red cedar (*Juniperus virginiana var. silicicola*). Also, sporadic patches of catbrier (*Smilax auriculata*) and dune bluecurls (*Trichostema* sp. 1), a state-listed species with significantly rare-limited status (Franklin and Finnegan, 2008), grew among the sea oats.

2.) Disturbed Area: Common reed (*Phragmites australis ssp. australis*) grew in a dense stand throughout a tract surrounded by maritime shrub and maritime evergreen forest communities. Local topography was slightly lower than adjacent areas, but it appeared the site had been cleared and the soil disturbed in a manner that allowed invasion by this rhizomatous grass. Other herbs included dog fennel (*Eupatorium capillifolium*) and paspalum grass (*Paspalum* sp.), plus peripheral and scattered interior occurrences of shrubs and vines such as buckthorn (*Bumelia lycioides*) and peppervine (*Ampleopsis arborea*).

3.) Maritime Evergreen Forest - Dune Grass: Similar to the first habitat, there was a contrasting mixture of sea oat patches and clusters of woody species; however, trees were present such as live oak (*Quercus virginiana*), sand laurel oak (*Q. hemisphaerica*), and introduced white poplar (*Populus alba*) plus scattered small trees/shrubs of red bay, yaupon, and wax myrtle.

4.) Maritime Shrub with Vines: This dense thicket was situated behind the secondary ocean dune system. Shrubs included wax myrtle, red bay, yaupon, southern red cedar,
and silverling (*Baccharis halimifolia*) that were covered with the following vine species: catbrier, greenbrier (*Smilax bona-nox*), Virginia creeper (*Parthenocissus quinquefolia*), morning glory (*Ipomoea sagittata*), muscadine (*Vitis rotundifolia*), and summer grape (*V. aestivalis*). Herbs that grew in open patches and along the edges of the community were pennywort (*Hydrocotyle bonariensis*), wild rye grass (*Elymus virginicus*), and broomsedges (*Andropogon* spp.).

5.) Disturbed Maritime Wet Grassland: Common reed invaded a backdune swale and spread throughout most of the area formerly occupied by native species. However, small colonies or scattered individuals of wild rye grass, broomsedges, catbrier, small saltmeadow cordgrass (*Spartina patens*), false nettle (*Boehmeria cylindrica*), and winged sumac (*Rhus copallinum var. copallinum*) were also present.

6.) Interdune Pond: Although dry at the time of visitation, this local depression obviously held standing water in the recent past judging from a surrounding remnant waterline. Such habitats can change dramatically in floristic composition, even within the same calendar year, as a function of water table fluctuations (Schafale and Weakley, 1990; Bellis, 1995). The majority of the area was occupied by tall colonies of dog fennel, but wetland herbs were also present -- false nettle, bottomweed (*Diodia virginica*), narrowleaf whitetop sedge (*Rhynchospora colorata*), eastern bishopweed (*Ptlimnium capillaceum*), and giant foxtail (*Setaria magna*) -- plus vines/subshrubs of blackberries (*Rubus* spp.).

7.) Maritime Evergreen Forest: Live and sand laurel oaks dominated a somewhat open stand of maritime forest with scattered yaupon and young cabbage palmetto (*Sabal palmetto*) plus muscadine in the shrub layer. Partridge berry (*Mitchella repens*) was the only herb present.

8.) Maritime Evergreen Forest: A rather dense forest canopy contained a significant amount of loblolly pine (*Pinus taeda*), often indicative of past canopy disturbance (Bellis, 1995), in addition to live and sand laurel oaks. Young specimens of cabbage palmetto, red bay, and yaupon were present in the shrub layer.

9.) Estuarine Fringe Loblolly Pine Forest: A small (ca. 0.5 ha) island was located within a salt marsh complex along Bald Head Creek and dominated by mature loblolly pines with sporadic southern red cedar and wax myrtle shrubs plus patches of grasses and forbs: small saltmeadow cordgrass, broomsedges, prickly pear (*Opuntia humifusa var. humifusa*), and southern seaside goldenrod (*Solidago sempervirens var. mexicana*). This island was connected to the main island by a public boardwalk that was likely used by deer too. The site was surrounded by colonies of black needlerush (*Juncus roemericanus*), salt grass (*Distichlis spicata*), and saltmarsh cordgrass (*Spartina alterniflora*) with a narrow transitional fringe of salt shrub species -- sea ox-eye (*Borrichia frutescens*) and marsh elder (*Iva imbricata*).  

10.) Maritime Evergreen Forest: While similar in floristic composition to #7 (above), this site contained younger trees that permitted more sunlight to reach the forest floor. In
addition to species listed under the aforementioned habitat, the forest had red bay, red mulberry (*Morus rubra*), and poison ivy (*Toxicodendron radicans var. radicans*) plus higher cover by young cabbage palmettos and partridge berry.

11.) Maritime Evergreen Forest: A fairly mature stand of live and sand laurel oaks distinguished by a dense fringe of maturing cabbage palmettos growing along the road. Scattered loblolly pine, red bay, and coastal American hornbeam (*Carpinus caroliniana var. caroliniana*) were present in the understory.

12.) Interdune Pond: This graminoid-dominated depression encompassed nearly a hectare and contained a diverse mixture of grasses (e.g., giant foxtail, white grass [*Leerzia virginica*], and paspalum grass) and sedges (e.g., *Carex* spp., *Cyperus* spp., *Fimbristylis* spp.). Other herbs included dog fennel and common water-purslane (*Ludwigia palustris*) with peripheral occurrences of vines and woody species such as poison ivy, peppervine, and beautyberry (*Callicarpa americana*).

**Discussion and Conclusions**

Plant communities frequented by deer on Bald Head Island ranged from open herb-dominated areas of dune grass, disturbed tracts, and interdune pond communities to variable densities of woody vegetation among maritime shrub thickets and maritime evergreen forests. This array of habitats is generally consistent with plant cover types associated with white-tailed deer in the Carolinas according to Webster et al. (1985):

“The white-tailed deer is at home in most of the natural communities of the region and may be encountered in coastal marshes as well as high mountain forests. Prime habitat, however, appears to be broken areas of mixed young forests, old fields, and crop lands typical of much of the rural portions of the region.”

The same authors further noted that while deer are primarily browsers, “… they are quite selective when choices are available, and show an astonishing ability to select the most nutritious foods from among those present.” Vangilder et al. (1982) found that deer diets in Missouri were correlated with easy digestibility and high levels of protein, calcium, phosphorus, and potassium, characteristics of many grasses and forbs. Thus the mixture of woody and herb-dominated habitats where deer were observed most frequently appeared to meet both shelter and nutritional requirements for successful survival on a residential barrier island.

**References**


## APPENDIX – BALD HEAD ISLAND DEER HABITATS

<table>
<thead>
<tr>
<th>Habitat Type/Photo #</th>
<th>Dominant(s)</th>
<th>Latitude/Longitude</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Maritime Shrub – Dune Grass</td>
<td>Evergreen Shrubs - <em>Uniola paniculata</em></td>
<td>N 33.87257 / W 78.00389</td>
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<tr>
<td>2. Disturbed Area</td>
<td><em>Phragmites australis ssp. australis</em></td>
<td>N 33.87180 / W 78.00136</td>
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<tr>
<td>3. Maritime Evergreen Forest-Dune Grass</td>
<td><em>Quercus virginiana</em> / evergreen shrubs - <em>Uniola paniculata</em></td>
<td>N 33.87123 / W 78.00307</td>
</tr>
<tr>
<td>4. Maritime Shrub with Vines</td>
<td>Evergreen Shrubs/Mixed Vines</td>
<td>N 33.86719 / W 78.00672</td>
</tr>
<tr>
<td>5. Disturbed Maritime Wet Grassland</td>
<td><em>Phragmites australis ssp. Australis</em></td>
<td>N 33.86448 / W 78.00750</td>
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<tr>
<td>6. Interdune Pond</td>
<td><em>Eupatorium capillifolium</em></td>
<td>N 33.86057 / W 77.99699</td>
</tr>
<tr>
<td>7. Maritime Evergreen Forest</td>
<td><em>Quercus virginiana</em> - <em>Q. hemisphaerica</em> / evergreen shrubs</td>
<td>N 33.86488 / W 78.00124</td>
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<tr>
<td>8. Maritime Evergreen Forest</td>
<td><em>Quercus virginiana</em> - <em>Pinus taeda</em> / evergreen shrubs</td>
<td>N 33.86719 / W 77.99577</td>
</tr>
<tr>
<td>9. Estuarine Fringe Loblolly Pine Forest</td>
<td><em>Pinus taeda</em> / evergreen shrubs</td>
<td>N 33.86051 / W 77.98425</td>
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<td>10. Maritime Evergreen Forest</td>
<td><em>Quercus virginiana</em> - <em>Q. hemisphaerica</em> / evergreen shrubs</td>
<td>N 33.85229 / W 77.97987</td>
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<tr>
<td>11. Maritime Evergreen Forest</td>
<td><em>Quercus virginiana</em> - <em>Q. hemisphaerica</em> - <em>Sabal palmetto</em> / evergreen shrubs</td>
<td>N 33.85147 / W 77.96637</td>
</tr>
</tbody>
</table>
Habitat 1. Maritime Shrub – Dune Grass

Habitat 2. Disturbed Area
Habitat 3. Maritime Evergreen Forest-Dune Grass

Habitat 4. Maritime Shrub with Vines
Habitat 5. Disturbed Maritime Wet Grassland

Habitat 6. Interdune Pond
Habitat 7. Maritime Evergreen Forest

Habitat 8. Maritime Evergreen Forest
Habitat 9. Estuarine Fringe Loblolly Pine Forest

Habitat 10. Maritime Evergreen Forest
Habitat 11. Maritime Evergreen Forest

Habitat 12. Interdune Pond