

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 (*Ptilimnium 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 roemerianus*), salt grass (*Distichlis spicata*), and saltmarsh cordgrass (*Spartina alterniflora*) with a narrow transitional fringe of salt shrub species -- sea ox-eye (*Borrchia 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 [*Leersia 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

- Bellis, V. J. 1995. Ecology of maritime forests of the southern Atlantic coast: a community profile. Biological Report 30. U.S. Department of the Interior/National Biological Service. Washington, DC.
- Cooper A.W. and S. Satterwaite. 1964. Smith Island and the Cape Fear Peninsula: a comprehensive report on an outstanding natural area. Wildlife Preserves, Inc. Raleigh, NC.

- Coastal Reserve Program. 1999. Management plan for the Bald Head Woods component of the North Carolina Coastal Reserve. North Carolina Department of Environment and Natural Resources/Division of Coastal Management. Wilmington, NC.
- Franklin, M.A. and J.T. Finnegan. 2008. Natural Heritage Program list of rare plant species of North Carolina. North Carolina Department of Environment and Natural Resources, Natural Heritage Program. Raleigh, NC. Available online: <<http://www.ncnhp.org/Images/2008%20Rare%20Plant%20List.pdf>>. Accessed 3 August 2009.
- Mayes, C.H. 1984. The flora of Smith Island, Brunswick County, North Carolina. M.S. Thesis. University of North Carolina at Wilmington, Department of Biological Sciences. Wilmington, NC.
- Parnell, J.F. and D.A. Adams. 1970. Smith Island: a resource capability study, interim report. University of North Carolina at Wilmington and Coastal Zone Resources Corporation. Wilmington, NC.
- Schafale, M.P. and A.S. Weakley. 1990. Classification of the natural communities of North Carolina. Third approximation. N.C. Department of Environment and Natural Resources, Division of Parks and Recreation, N.C. Natural Heritage Program. Raleigh, NC.
- Vangilder, L.D., O. Torgeson, and W.R. Porath. 1982. Factors influencing diet selection by white-tailed deer. *J. of Wildl. Manage.* 46(3): 711-718.
- Weakley, A.S. 2008. Flora of the Carolinas, Virginia, Georgia, northern Florida, and surrounding areas. Working draft of 7 April 2008. University of North Carolina Herbarium, North Carolina Botanical Garden, University of North Carolina at Chapel Hill. Chapel Hill NC. Available online <http://www.herbarium.unc.edu/WeakleyFlora_2008-Apr.pdf>. Accessed 20 July 2009.
- Webster, W.D., J.F. Parnell, and W.C. Biggs. 1985. Mammals of the Carolinas, Virginia, and Maryland. University of North Carolina Press. Chapel Hill, NC.

APPENDIX – BALD HEAD ISLAND

DEER HABITATS

Habitat Type/Photo #	Dominant(s)	Latitude/Longitude
1. Maritime Shrub – Dune Grass	Evergreen Shrubs - <i>Uniola paniculata</i>	N 33.87257 / W 78.00389
2. Disturbed Area	<i>Phragmites australis</i> ssp. <i>australis</i>	N 33.87180 / W 78.00136
3. Maritime Evergreen Forest-Dune Grass	<i>Quercus virginiana</i> / evergreen shrubs - <i>Uniola paniculata</i>	N 33.87123 / W 78.00307
4. Maritime Shrub with Vines	Evergreen Shrubs/Mixed Vines	N 33.86719 / W 78.00672
5. Disturbed Maritime Wet Grassland	<i>Phragmites australis</i> ssp. <i>Australis</i>	N 33.86448 / W 78.00750
6. Interdune Pond	<i>Eupatorium capillifolium</i>	N 33.86057 / W 77.99699
7. Maritime Evergreen Forest	<i>Quercus virginiana</i> - <i>Q. hemisphaerica</i> /evergreen shrubs	N 33.86488 / W 78.00124
8. Maritime Evergreen Forest	<i>Quercus virginiana</i> - <i>Pinus taeda</i> /evergreen shrubs	N 33.86719 / W 77.99577
9. Estuarine Fringe Loblolly Pine Forest	<i>Pinus taeda</i> /evergreen shrubs	N 33.86051 / W 77.98425
10. Maritime Evergreen Forest	<i>Quercus virginiana</i> - <i>Q. hemisphaerica</i> /evergreen shrubs	N 33.85229 / W 77.97987
11. Maritime Evergreen Forest	<i>Quercus virginiana</i> - <i>Q. hemisphaerica</i> - <i>Sabal palmetto</i> /evergreen shrubs	N 33.85147 / W 77.96637
12. Interdune Pond	<i>Setaria magna</i> - <i>Fimbristylis</i> spp.- <i>Cyperus</i> spp.- <i>Leersia virginica</i> - <i>Paspalum</i> spp.	N 33.85418 / W 77.98446



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