

North American Land Trust

CONSERVATION MANAGEMENT PLAN

LAKE SHORE RESORT

Horry County ♦ South Carolina

Lakeshore Resort Conservation Area

Conservation Management Plan

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Date: June 20, 2017

Lakeshore Resort

Conservation Management Plan

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I. Property Overview and Regional Context

The Lakeshore property is located in North Myrtle Beach, Horry County, South Carolina and consists of approximately 44 acres that are protected by a perpetual conservation easement. This tract is located off Old Sanders Rd. and Bourne Trail, just off the Hwy 31 exit at Robert Edge Parkway. Although rural at one time, this area is slated for intensive development as the highway has made the area easily accessible. Some tracts along this road have already converted to single family residential development. The property has a forested area and an open grass field. The property is adjacent to a man-made freshwater lagoon which has established young successional trees and shrubs along the banks, creating a diverse and emerging habitat.

This Conservation Management plan is being prepared for the conservation area. One of the primary conservation values from this property is simply that of removing the threat of conversion to residential development. The SC Department of Natural Resources in its State Wildlife Action Plan indicates that:

“Increased population growth accompanied by unplanned and uncontrolled industrial, residential, and commercial development is a serious threat to aquatic resources in the Pee Dee-Coastal Plain Ecobasin. The majority of the growth and the greatest threat to aquatic resources is expected to occur along the eastern portion of the ecobasin near the coast...Residential and resort communities along the “Grand Strand” will strain the already significantly degraded aquatic habitats.”

In this context, removal of future development is the best conservation tool for this tract.

In addition to this, the tract has numerous habitats and values from a conservation perspective. NALT is recommending specific conservation management objectives for this tract as follows:

NALT recommends the long-term goals and objectives for Lakeshore Resort be:

- Water quality protection
- Preservation and enhancement of biodiversity
- Implementation of a conservation management strategy
- Create a functional access for future users
- Scenic viewshed protection/Aesthetics, particularly from public roads

All plans should be adaptive, recognizing that factors may change over-time, and this plan should evolve accordingly. Listed below are practices that are recommended by North American Land Trust to achieve the long-term and short-term goals of an integrated conservation management plan:

1. Protect and/or expand non-riverine hardwood forest
2. Transition open field into a native warm season grass meadow
3. Allow naturalization of freshwater lagoon edge (on easement area) to create nesting habitat, and create a long-term plan for edge maintenance
4. Create a trail network for management and access
5. Continue biological surveys of the property, adapting plan as necessary

By protecting the Lakeshore Property, the owners have ensured that ecologically valuable lands will forever remain intact.



II. Management Goals and Objectives

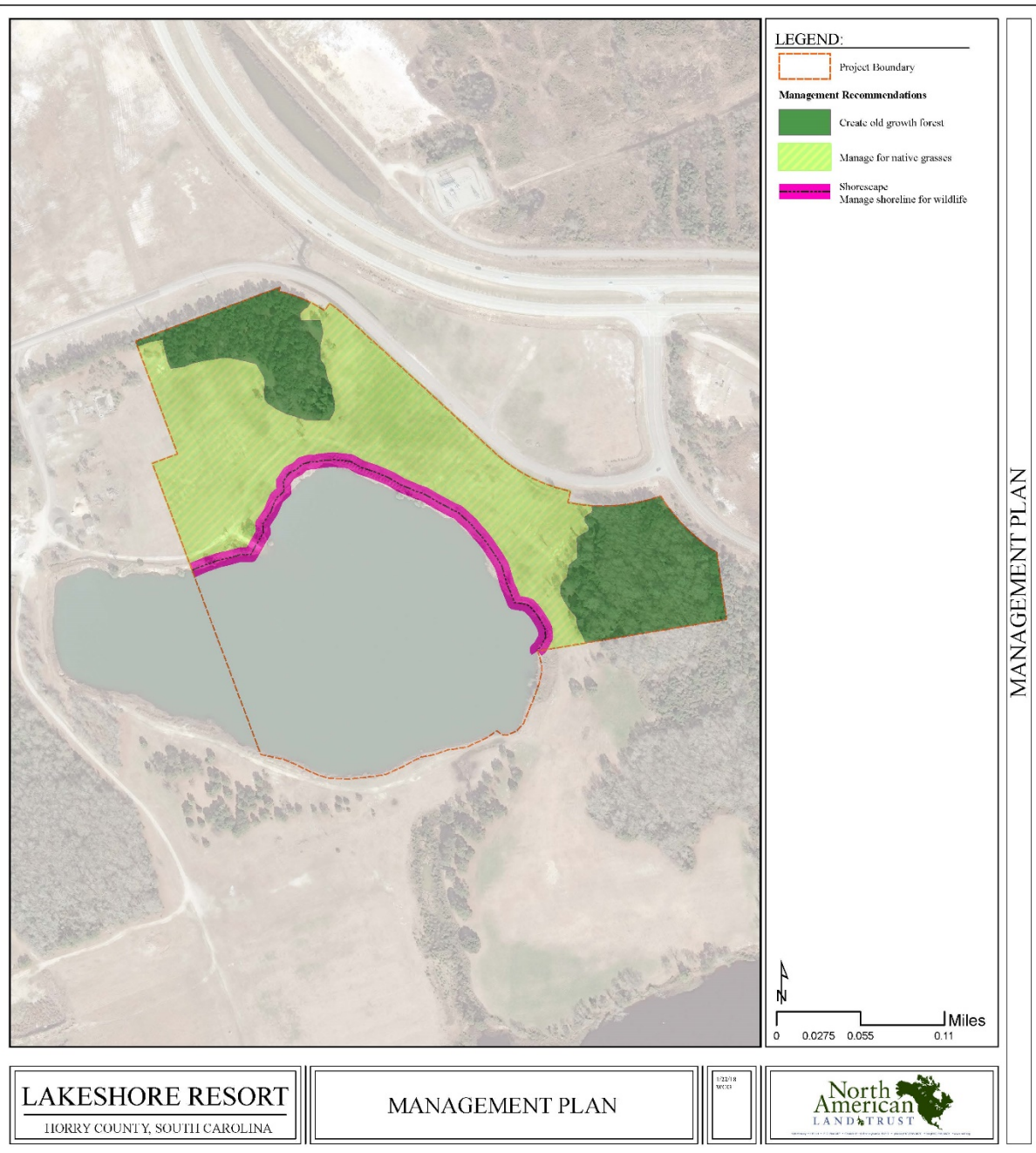
Although Lakeshore is not a large site, two distinct habitats exist on the property including a hardwood forest with diverse canopy species and shrub understory, and an open field managed as grass habitat. Additionally, a well-established man-made lagoon is part of the easement area, which provides high quality freshwater habitat for numerous species. The property is located in the Coastal Sampit watershed.

This variation in habitats allows for high biodiversity. Additionally, the proximity of the preserved area, which is located in the Town of North Myrtle Beach—a highly developed and developing area—makes the natural communities associated with this site even more important as refuge for a variety of wildlife species, as well as for water quality protection.

Management recommendations for the property include:

1. Protect water quality by reducing impervious coverage and allowing for natural filtration
2. Protect scenic values of the property
3. Protect/expand the Non-Riverine Hardwood Forest
4. Transition open field into a warm season grass meadow
5. Establish and maintain trails/firebreaks for the property
6. Continue biological surveys and botanical inventories

III. Management Recommendations for Habitat or Species



Management recommendation #1: Scenic view protection

Overview: Contrary to what many landowners might consider to be true, this management recommendation is to protect the scenic qualities currently existing on the Lakeshore property from people viewing the property from roadways. This is particularly needed in the Myrtle Beach region, one of the most rapidly developing areas in South Carolina and the East Coast. This pressure is acute on beaches, creeks and waterways. With each high rise condominium, multi-family housing complex, commercial venture or even golf course, natural habitats are lost. First and foremost this impacts the flora and fauna of the area, but there is also a negative impact to residents and visitors to the area due to the loss of natural landscapes to visually enjoy.

This property, conserved in a natural state without intense development, will benefit the larger public, residents and visitors alike.

Management recommendations:

1. The protection of this property with a conservation easement will largely protect this property as a scenic view from the adjacent upland and roads.
2. Careful consideration should be given to any structures and their placement, orientation and size to minimize visual impact to the surrounding area.
3. Wherever possible create or maintain “nature curtains” or natural buffers of 30-100’ from roadways and/or waterways.
4. Consider natural solutions for erosion control or streambank stabilization in lieu of riprap or bulkheads. If these are necessary, native landscaping should be used to naturalize the site.
5. Avoid large scale clearings of forests in viewshed areas.
6. If exercising the reserved right for homesites, remove only vegetation required for the homesite, gradually increasing any further clearing to minimize disruption.



Management Recommendation #2: Promote Old-Growth Forest in Hardwoods

Lakeshore Preserve contains mixed hardwood forests. This habitat becomes particularly valuable due to its proximity to the grasslands and freshwater lagoon systems. Additionally, wetlands are contained within the forest, that provide fishless habitat that is vital as breeding grounds and nurseries for reptile and amphibians, and provides nesting habitat for bats. This vital habitat should be protected.

Management recommendations:

1. No active management should occur in the forest.
2. Trails for recreational useage can be constructed with NALT approval, however, all specimen trees should be avoided.
3. If understory control is desired, mechanical/chemical application can be considered.

Management Recommendation #3: Convert open field to warm season grass meadow

Native grasslands are one of the most endangered ecosystem in the South. Historically, the region contained vast acreages of native grassland and savannas with scattered trees and shrub cover, which was maintained by fire. Today, that acreage has been replaced with non-native grasses (e.g., tall fescue, orchardgrass and bermudagrass), agricultural crops, forest cover and suburban development. As a result, several wildlife species dependent upon quality early successional habitat have experienced significant declines in population.

This region of SC would likely have contained many such grasslands, savannas, or native grass openings. Due to the construction of the AIW, and alteration of topography, restoring a true native landscape for this property is unlikely. However, restoring native habitats to the practicable extent should always be a goal.

One piece of this would be to establish openings/meadows that provide edge for wildlife. If planted and managed as wildlife habitat using native grasses, even without a natural fire regime, numerous species will benefit. NALT suggests consideration of native grass mixes and species that include: switchgrass (*Panicum virgatum*), indiagrass (*Sorghastrum nutans*), eastern gamagrass (*Tripsacum dactyloides*), big bluestem (*Andropogon gerardii*), and little bluestem (*Schizachyrium scoparium*) for this site.

Management recommendations:

Native grasses are already occurring in the fields/meadows. Essentially managing to promote them is the best start. The primary strategy for this is to mow in the early fall with the blade set to 10-12". This will keep sunlight from reaching non-native species, and allow the natives to thrive. Consider rotating compartments to allow for variety in field succession.

After one year, monitor the grass species present. If non-natives are continuing consider herbicide application for unwanted species. You may also consider supplemental plantings using high quality native grass seeds. Recommendations for planting native grasses is below:

Native warm season grass may need special attention given for purchasing and planting seed, and for management of established stands. The following features are important to note, as warm-season grass planting differs from other traditional plantings:

1. Purchasing Seed

- a. It is best to purchase certified seed of varieties adapted to the region of planting. Certified seed is guaranteed to be true to a variety, and use of certified seed may lead to a more reliable planting.
- b. It is best to order different species and varieties separately instead of pre-mixed because seeding and management specification will differ between species.
- c. Warm season grass species should be purchased on a pure live seed (PLS) basis. Do not confuse 12 lb PLS/acre with 12 bulk lb/acre.

- d. If you do purchase mixed seed consider using a short mixture of seeds and forbs that provide quality cover for ground-nesting and brood rearing birds.

2. Time Of Planting

- a. Plant seeds in March or early April at the latest.
- b. Irrigate if possible to help seed establishment.
- c. Use tilling or herbicide on undesired weed species.

3. Preparing to plant

- a. Conduct a soil test prior to planting (ideally in the fall). The pH should be adjusted to a range of 5 - 6 if needed. Incorporate lime in the fall to allow it time to adjust pH before planting in the spring. Fertility up to medium levels for phosphorous (P), and potassium (K). Incorporate P and K into the soil at planting time. Do not apply nitrogen (N) at or before planting time.
- b. Seedbeds should be adequately plowed, disked and packed prior to planting. A cultipacker works well for firming the seedbed. If a prepared hard seedbed is rained on before planting, harrow and cultipack again before planting.
- c. Till soil to a depth of 3 inches prior to seeding. Follow the procedures described above for seedbed preparation.

4. Equipment Needed

- a. Ideally seed will be drilled into a prepared seedbed.
- b. Switchgrass may be planted with a conventional drill because it has a hard, smooth seed coat. Conventional drills equipped to seed alfalfa work well.
- c. Eastern gamagrass seed is about the size of corn seed and is best planted with a corn planter.
- d. Big and little bluestem and indiangrass seed have appendages with fine hair and will not pass through conventional equipment unless they can be ordered as "debearded" or brushed seed. Most likely a drill with a specialized seed box containing "picker wheels" is necessary or the fluffy seed of these grasses will lodge in the seed chute. These drills often are available for use through state wildlife agencies, soil conservation districts, or the Natural Resources Conservation Service Seed drills, which are advertised as "native grass drills", such as a Tye or Truax drill, and have special boxes equipped with picker wheels and augers to help prevent seed from sticking together and move the seed to the drilling mechanism. Native seed drills have multiple boxes, which allow for the planting of both switchgrass and fluffy seeded species at the same time.
- e. Switchgrass, indiangrass, and big and little bluestem should be seeded at $\frac{1}{4}$ to $\frac{1}{2}$ inch deep.
- f. If a seed drill is not available, seed may be broadcast over a site.
- g. Broadcast fluffy seed (bluestem and indiangrass) with a drop spreader or cyclone spreader and then drag to lightly cover seed.

5. After Planting the Meadow

- a. Ideally, native grasses meadows would be managed with prescribed burning to mimic natural processes. Size of the property and proximity to the airport makes

this unlikely on this site. As a result, routine mowing/bush-hogging will likely be the maintenance regime, with herbicide treatment for non-native competition.

- b. The best time of year to mow is during the fall through late winter.
 - c. Mow on a three-year cycle where 1/3 of the area is mowed each year.
 - d. Do not mow during the spring or summer months because of the nesting season.
 - e. When mowing, cut grass no lower than 6 inches and allow stubble to remain until spring to help insulate plant roots and provide cover for wildlife.
6. Weed Control
- a. Post-planting weed control requires prompt attention especially during the establishment year. Inspect the planting every two to four weeks for weed pressure.
 - b. A combined program of mowing and herbicides will likely be necessary to control weeds. Use a herbicides labeled for most native grass restoration plantings, such as Plateau™.
7. Long-term Management of Native Warm-Season Grass Fields
- a. Periodically disking (once every 2 years) should maintain open structure at ground level.



Management recommendation #4: Lagoon edge management

Overview: A portion of the conservation easement area borders a man-made freshwater lagoon. The owners of Lakeshore Resort will have partial management authority over the lagoon itself, and will determine the nature of the lagoon edge/buffer. There is a significant slope and gradient between the upland and waters edge along for this portion of the Lake which has thick shrub vegetation that creates ecological value for day roosts or foraging access for wading birds. This vegetation should be maintained and enhanced. Some clearing in areas with gentler slopes could be considered for wading birds.

“Shorescaping” is a landscaped shoreline that uses attractive plants to protect and beautify the waterfront. A well designed shorescape uses native plants to provide a functional solution to problems such as shoreline erosion, poor water quality, invasive weeds, and wildlife management.

Most shorescaping addresses vegetation at each of the ecological zones associated with a freshwater lagoon. Slope will determine the appropriate management strategies listed below, and not all recommendations will apply for every section of the lagoon edge. These should be applied as necessary and if erosion or clearing occurs for any reason.

Management recommendation:

The Emergent Zone – the part of the bank slope that lies below the water line but is shallow enough to allow emergent aquatic plants to root in the submerged soil and grow upward above the water’s surface. The emergent zone is usually less than 12 inches deep. Avoid emergent plants that have a “creeping” lateral growth habit such as water primrose and alligatorweed. Vertical plants are easier to manage in the emergent zone.

Plants for the Emergent Zone:

- Pickerelweed *Pontederia cordata*
- Arrowheads *Sagittaria latifolia*, *S. lancifolia*
- Arrow Arum *Peltandra virginicus*
- Lizard’s Tail *Saururus cernuus*
- Alligator Flag *Thalia geniculata*
- Golden Canna *Canna flaccida*
- White Star Sedge *Dichromena colorata*

The Riparian Zone – the part of the bank slope that lies above the water surface but where the soil remains permanently wet and saturated. The riparian zone often is inundated with water when pond levels rise during storms. Plants that thrive in this zone need moist soils and can withstand extended periods submerged under water but prefer to grow at or just above the water line.

Plants for the Riparian Zone:

Soft Rush *Juncus effusus**
Bulrush *Scirpus spp.**
Louisiana Iris *Iris (hexagonae group)*
Blue/Yellow Flag *Iris virginica, I. pseudocoris*
Spider Lily *Hymenocallis palmeri*
Mallow Hibiscus *Hibiscus moscheutos**
Swamp Sunflower *Helianthus angustifolius**
Cardinal Flower *Lobelia cardinalis*
Bog Lily *Crinum americanum*
River Oats *Chasmanthium latifolium**
White-top Sedge *Dichromena colorata**
Lizard's Tail *Saururus cernuus**

The Upland Zone – the part of the bank slope above the riparian zone where soils do not stay permanently moist. This zone often is very dry because the slope forces water to runoff rather than seep into the ground. Upland zones with very steep slopes will need plants that are very drought tolerant. In most cases, the ornamental plants that are commonly used in the home landscape are useful in this zone. Residents that live next to stormwater ponds in residential neighborhoods should avoid planting trees and large shrubs on the bank slopes. Perennials and grasses are best in this zone.

Plants for the Upland Zone:

Native Grasses* (Weeping Love Grass, Big Bluestem, Muhly Grass, Switchgrass, Indian Grass)
Native Perennials (Butterfly Weed, False Indigo*, Tickseeds, Coneflower*, Hardy Ageratum, Blazing Star, Verbena*, Goldenrod)
Other Perennials (Sunflower *Heliopsis*, Daylily*, Bearded Iris*, Red Hot Poker, Lantana*, Lavender*, Creeping Phlox, Salvia, Stonecrop, Purple Heart)

Management recommendation #5: Create Trail/firebreak Network

Wildfires are a serious threat in the North Myrtle Beach area. Given that, the fuel load for Lakeshore is not problematic. Although NALT generally encourages the reintroduction of prescribed burning to any property to mimic natural conditions, and to reduce the threat of wildfire, that is unlikely on this property.

NALT does recommend that a naturalized trail network be established to serve multiple purposes: access for management activities, potential access for future homesites, passive recreational use for the property, and to act as a firebreak in the unlikely event that a wildfire were to occur.

Management recommendations:

1. Establish logical trail network as identified.
2. Roads should be placed on a long-term maintenance rotation.

Management Recommendation #6: Eradicate Invasive Species

Invasive species are non-native plant, insect or animal species that have been introduced into an area outside of their original range and compete with native species for resources. Invasive species reproduce and spread rampantly because they have no natural enemies in their new homes. Invasive species are recognized as one of the leading threats to biodiversity and impose enormous costs to agriculture, forestry, fisheries, and other human enterprises, as well as to human health.

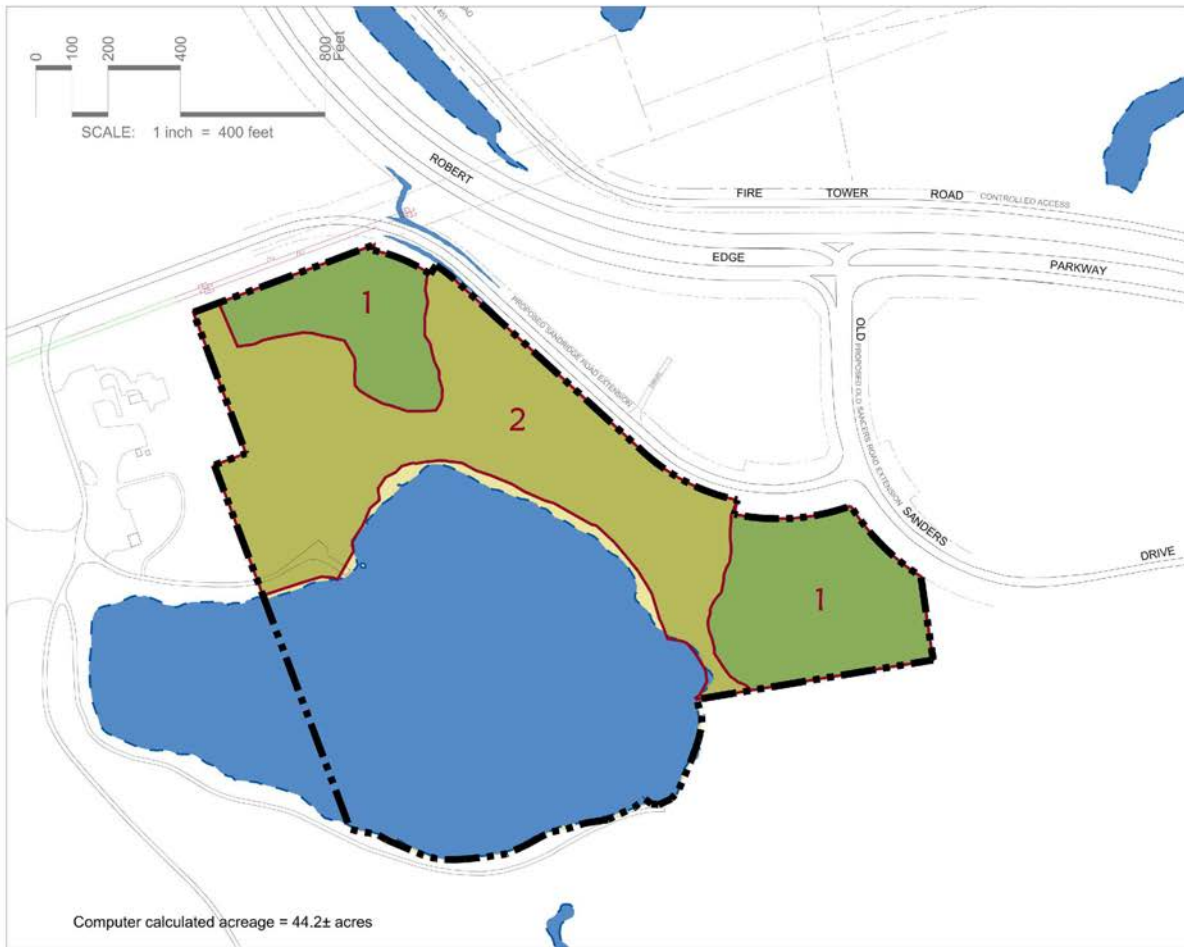
There is one notable non-native invasive species occupying the tract, Japanese honeysuckle (*Lonicera japonica*) is abundant throughout the wooded area. Management recommendations:

1. Use a glyphosate product that contains a nonionic surfactant labeled for use in aquatic environments with at least 41% glyphosate. Do not use glyphosate formulations that are called “Ready to Use” because they generally do not contain enough glyphosate to be effective. Mix the herbicide with water, preparing a 2.5 to 5% solution (4 to 6 fluid ounces of herbicide product per gallon). If the label recommends additional surfactant, add a nonionic surfactant at 0.5% (0.6 fluid ounces per gallon).
1. Alternatively, apply a 2% concentration of triclopyr (e.g., Garlon 3A) plus water to foliage.
2. A 25% glyphosate or triclopyr solution mixed with water can be applied to cut stem surfaces any time of year as long as the ground is not frozen.
3. Treatment in the fall, when many non-target plants are going dormant, is best. Apply using a single nozzle backpack sprayer, spraying the foliage to wet, but not to the point of runoff.
4. Ensure Plan for at least two treatments per year in the first three years.
5. Ideally, the optimal timing for glyphosate treatment is late fall to early winter (November through early January) to minimize impact to other species. Spring and summer treatments tend not to be as effective and risk surrounding vegetation.
6. When applying glyphosate, volatility and soil activity are not a concern. Drift, however, can be a serious problem, especially on windy days. Be very careful where spray drift can damage or kill nearby desirable vegetation.

Management Recommendation #7: Continue Biological Surveys/Manage for Species of Concern (current/future)

Overview: NALT recommends that biological inventories and botanical surveys be continued each season, and management strategies refined accordingly. Whether hiring experts in a particular biological discipline, engaging with natural resource agencies, or partnering with universities and coalitions, NALT recommends continued documentation of this property. The priority species listed in the next section should be a starting point for inventories.

Any species identified should be input into a Priority Species Map when discovered. Overall management techniques should be adapted and refined as new priority species are discovered.



LEGEND:

Subject Property

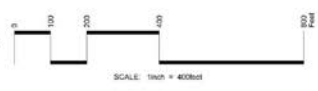
Vegetation Legend:

Non-Riverine Hardwood Forest

Agricultural Fields

NOTES:

1. Property boundaries from a survey by The Briggman Company, Conway, SC, dated 4.22.2016.
2. Aerial photograph from Apollo Mapping, date from January 18, 2016.
3. Topography digitized from DEM (2-foot contour intervals).
4. Soils information from USDA - NRCS National Soil Information System Database (NASIS).
5. Surveyed wetlands by The Briggman Company, April 20, 2016.
6. Floodplain Zone X per FEMA Map Panel 45041C0579H.



Computer calculated acreage = 44.2± acres

LAKESHORE RESORT

HORRY COUNTY, SOUTH CAROLINA

VEGETATION MAP

PROJECT NO. 17-021-01-001
DATE: 4/27/16



VEGETATION MAP

IV. Existing Habitats and Species of Concern

Nonriverine Wet Hardwood Forest

Habitat overview: This habitat is generally considered a broad transitional habitat between pine flatwoods and maritime forest.

The wooded portion of the property is best described as a Nonriverine Wet Hardwood Forest community. Canopy dominants include poplar (*Liriodendron tulipifera*), sweetgum (*Liquidambar styraciflua*), red maple (*Acer rubrum*), American elm (*Ulmus americana*), oaks (*Quercus* spp.), hickories (*Carya* spp.), and others. The subcanopy- shrub layer is quite dense supporting sweet bay (*Magnolia virginiana*), cane grass (*Arundinaria tecta*), pawpaw (*Asimina triloba*), dwarf palmetto (*Sabal minor*), swamp bay (*Persea palustris*), and others.

The herb layer ranges from sparse to dense supporting little brown jugs (*Hexastylis arifolia*), Jack in the pulpit (*Arisaema triphyllum*), yellow jessamine (*Gelsemium sempervirens*), sedges (*Carex* spp.), lizards tail (*Saururus cernuus*), and others.

Several small depression ponds were observed in the forested areas. Their origin is unknown but they appear to be a natural feature of the landscape. These are notable as they represent excellent breeding and foraging habitat for a variety of herpetofauna and macoinvertabrate insect species.

Management recommendations:

1. The long-term management objective is to create an old-growth forest. For this tract, that entails continued protection of this area. Monitoring should continue to document any changes to the habitat caused by climate, storm events, infestations, etc. However, no active management should be necessary for this habitat.
2. Further documentation of depressional wetlands, both location and/or composition would be beneficial.
3. Avoid clearing or converting this area.
4. This forest is critical to the scenic conservation purpose for Lakeshore from the adjacent roadways (Management recommendation #1).
5. Eradicate invasive species as identified (Management recommendation #6).
6. Establish firebreak/trail (Management recommendation #5).
7. Continue biological surveys of this area (Management recommendation #7).

Habitat Importance: Species of Concern associated with Nonriverine Hardwood Forest (Using SC DNR SWAP Coastal Plain Mesic Forest):

SCIENTIFIC NAME	COMMON NAME	G-RANK	S-RANK	LEGAL STATUS	PRIORITY	SPECIFIC HABITAT REQUIREMENTS	
<u>MAMMALS</u>	-	-	-	-			
<i>Corynorhinus rafinesquii</i>	Rafinesque's Big-eared Bat	G3/G4	S2?	State Endangered	Highest	X	T-beam and I-beam bridges, abandoned buildings, old bunkers and tunnels, cavity trees, rock outcrops, mines, caves
<i>Eptesicus fuscus</i>	Big Brown Bat	G5	SNR		Highest	X	buildings, cavity trees, under bridges and in bat boxes; forage in open fields or forest gaps
<i>Lasionycteris noctivagans</i>	Silver-haired Bat	G5	SNR		Highest	X	roosts include tree cavities, under loose bark, rock crevices, under tree foliage, and occasionally in buildings, stacks of firewood, and bird boxes; forage over water
<i>Lasiurus borealis</i>	Red Bat	G5	SNR		Highest	X	thinned stands; roost on smaller branches or twigs, often in the hardwood tree canopy; may roost in leaf litter
<i>Lasiurus cinereus</i>	Hoary Bat	G5	S?		Highest	X	tree cavities, trunks, tree foliage, squirrel nests, and Spanish moss
<i>Lasiurus intermedius</i>	Northern Yellow Bat	G4/G5	S?	Of concern, State	Highest	X	forage over open areas such as fields, pastures, golf courses, marshes, and along lake and forest edges; roost in clumps of Spanish moss or under old palm fronds
<i>Lasiurus seminolus</i>	Seminole Bat	G5	SNR		Highest	X	roost in large pines located near forested corridors; may roost in leaf litter
<i>Myotis austroriparius</i>	Southeastern Bat	G3/G4	S1	State Threatened	Highest	X	caves (including limestone sinks), mines, abandoned buildings, and large hollow trees; prefers to feed and roost over water
<i>Neotoma floridana</i>	Eastern Woodrat	G5	S3/S4	Of concern, State	Moderate	X	wide variety of habitats
<i>Perimyotis subflavus</i>	Tri-colored Bat	G5	SNR		Highest	X	abandoned mines and caves, bridges, buildings
<i>Ursus americanus</i>	Black Bear	G5	S3?	Of concern, State	Moderate	X	early successional habitat and forest interior; den sites
<u>REPTILES & AMPHIBIANS</u>	-	-	-	-	-	-	
<i>Ambystoma cingulatum</i>	Flatwoods Salamander (Frosted)	G2/G3	S1	Federal Threatened; State Endangered	Highest	X	isolated, temporary wetlands with no fish that have open canopy above and abundant grasses and sedges
<i>Ambystoma tigrinum</i>	Tiger Salamander	G5	S2/S3	Of Concern, State	Highest	X	isolated, temporary wetlands with no fish that have open canopy above and abundant grasses and sedges
<i>Crotalus adamanteus</i>	Eastern Diamondback Rattlesnake	G4	S3	Of Concern, State	High	X	underground refugia such as stump holes and rodent burrows
<i>Crotalus horridus</i>	Timber Rattlesnake	G4	SNR	Of Concern, State	High	X	dry, south-facing slopes at high elevations; rock outcrops or logs for den sites with south face exposed to sun
<i>Eurycea chamberlainii</i>	Chamberlain's Dwarf Salamander	G4	SNR		Highest	X	wetland types like seepages near small streams; leaf litter and small debris
<i>Micrurus fulvius</i>	Coral Snake (Harlequin)	G5	S2	Of Concern, State	Highest	X	underground refugia such as stump holes and rodent burrows; loose soil for burrowing

<i>Ophisaurus attenuatus</i>	Slender Glass Lizard	G5	S4		Moderate	X	underground refugia such as stump holes and rodent burrows; open canopied forests or fields
<i>Pituophis melanoleucus</i>	Pine Snake (Northern)	G4	S2/S3	Of Concern, State	Highest	X	pine sites with dry soils; underground refugia such as stump holes and rodent burrows
<i>Pituophis melanoleucus mugitus</i>	Pine Snake (Florida)	G4	S2	Of Concern, State	Highest	X	pine sites with well-drained soils; underground refugia such as stump holes and rodent burrows
<i>Pseudacris feriarum</i>	Upland Chorus Frog	G5	S3/S4	Of Concern, State	Moderate	X	isolated, temporary wetlands with no fish
<i>Rana capito capito</i>	Gopher Frog (Carolina)	G3/G4	S1	Federal Threatened; State Endangered	Highest	X	isolated, temporary to semi-permanent wetlands with no fish that have open canopy above and abundant grasses and sedges
<i>Rhadinea flavilata</i>	Pine Woods Snake	G4	SNR	Of Concern, State	High	X	moist pine flatwoods with many rotten logs; underground refugia such as stump holes and rodent burrows
<i>Terrapene carolina</i>	Eastern Box Turtle	G5	SNR		Moderate	X	moist woodlands; sandy or loamy soils in open for egg laying; loose soils and leaf litter for burrowing
BIRDS	-	-	-	-			
<i>Buteo lineatus</i>	Red-shouldered Hawk	G5	SNR		Moderate	X	wet or moist hardwood forests for nesting and foraging
<i>Caprimulgus carolinensis</i>	Chuck-will's-widow	G5	S4		High	X	openings for nocturnal feeding; mixed forests with light to moderate understory
<i>Caprimulgus vociferus</i>	Whip-poor-will	G5	S4		High	X	openings for nocturnal feeding; mixed forests with light to moderate understory
<i>Coccyzus americanus</i>	Yellow-billed Cuckoo	G5	S4		High	X	closed canopy deciduous forests with thick tangles
<i>Contopus virens</i>	Eastern Wood-Pewee	G5	S5		High	X	open forests with sparse midstory
<i>Dryocopus pileatus</i>	Pileated Woodpecker	G5	SNR		Moderate	X	extensive mature forests with dead snags for nest cavities; probably prefer riverbottom hardwoods
<i>Hylocichla mustelina</i>	Wood Thrush	G5	S3?		High	X	moist understory of shrubs or saplings in deciduous woodlands; leaf litter
<i>Limnithlypis swainsonii</i>	Swainson's Warbler	G4T4	S4		High	X	in mountains: deciduous or mixed forest ravines with thick understory of rhododendron or mountain laurel; at coast: cane stands in hardwoods
<i>Melanerpes carolinus</i>	Red-bellied Woodpecker	G5	SNR		Moderate	X	open, mature woods with dead snags for nest cavities; man-made poles with cavities
<i>Melanerpes erythrocephalus</i>	Red-headed Woodpecker	G5	SNR		Moderate	X	open, mature woods with dead snags for nest cavities; man-made poles with cavities
<i>Mniotilta varia</i>	Black-and-white Warbler	G5	SNRB,SNRN		High	X	mature hardwood forests; coves
<i>Oporornis formosus</i>	Kentucky Warbler	G5	S4		High	X	moist hardwood forests with rich understory
<i>Parula americana</i>	Northern Parula	G5	SNRB		Moderate	X	mature, moist forests; hemlock forests in mountains and swamps or bottomlands with Spanish moss near coast
<i>Picoides pubescens</i>	Downy Woodpecker	G5	SNR		Moderate	X	middle-aged to mature woodlands; prefer hardwoods; dead snags for nest cavities
<i>Pipilo erythrophthalmus</i>	Eastern Towhee	G5	SNR		High	X	brushy areas; woodland margins and understory
<i>Piranga rubra</i>	Summer Tanager	G5	S?		Moderate	X	dry, mixed woodlands

<i>Poecile carolinensis</i>	Carolina Chickadee	G5	SNR		Moderate	X	mature woodlands with dead snags for nest cavities; will use bird boxes
<i>Protonotaria citrea</i>	Prothonotary Warbler	G5	S3B		Moderate	X	near standing water; open swamps with cavities for nesting; willow thickets near lakes and ponds; old stumps and other rotting logs
<i>Regulus satrapa</i>	Golden-crowned Kinglet	G5	S4		Moderate	X	winter in coniferous or mixed woodlands
<i>Seiurus motacilla</i>	Louisiana Waterthrush	G5	S4		High	X	deciduous or mixed forests with rocky streams
<i>Thryothorus ludovicianus</i>	Carolina Wren	G5	SNR		Moderate	X	woodland thickets; leaf litter; cavities or ledges for nesting; will use bird boxes and many other human material
<i>Toxostoma rufum</i>	Brown Thrasher	G5	SNR		High	X	moderate to dense brush and saplings
<i>Vireo flavifrons</i>	Yellow-throated Vireo	G5	S3?B		Moderate	X	open, moist, mature, deciduous woodlands with tall trees; near water
<i>Vireo griseus</i>	White-eyed Vireo	G5	S4?B		Moderate	X	dense, moist thickets
<i>Wilsonia citrina</i>	Hooded Warbler	G5	S4?B		Moderate	X	mature, moist deciduous forests; some mixed forests; rich understory layer
<u>INSECTS</u>							
<i>Acanthametropus pecatonica</i>	"A Mayfly"					X	mesic forests near water
<i>Dolania americana</i>	American Sand Burrowing Mayfly	G4	S3			X	mesic forests near water
<i>Homoeoneuria dolani</i>	"A Mayfly"					X	mesic forests near water
<i>Siphonurus decorus</i>	"A Mayfly"					X	mesic forests near water
<i>Somatochlora calverti</i>	Calvert's Emerald	G3	SNR			X	boggy forest seepages for breeding; forest openings for foraging
<i>Taeniopteryx robinae</i>	Savannah Willowfly	G1	SNR			X	mesic forests near water
<i>Toxorhynchites rutilus rutilus</i>	"An Elephant (Tree Hole Mosquito)"					X	tree holes and artificial basins for breeding; nectar producing plants for foraging
<i>Toxorhynchites rutilus septentionalis</i>	"An Elephant (Tree Hole Mosquito)"					X	tree holes and artificial basins for breeding; nectar producing plants for foraging

Grasslands/Meadows

Habitat description: Although not a natural community per se, this open field does have biological importance. The field provides important “edge” habitat. In ecology, edge effects refer to the changes in populations or community structures that occur at the boundary of two habitats. Though the relationship can have both positive and negative outcomes, in this situation the field likely offers opportunities for foraging and bugging for some species of wildlife.

Management recommendations:

1. This meadow also is critical to the scenic conservation purpose for Lakeshore from the adjacent roadways (Management recommendation #1).
2. Convert this field into a native warm season grass meadow (Management recommendation #3).
3. Continue biological surveys of this area (Management recommendation #7).

Species of concern associated with this habitat:

Early Secessional Terrestrial Priority Species							
SCIENTIFIC NAME	COMMON NAME	G-RANK	S-RANK	LEGAL STATUS	PRIORITY		SPECIFIC HABITAT REQUIREMENTS
<u>MAMMALS</u>	-	-	-	-			
<i>Eptesicus fuscus</i>	Big Brown Bat	G5	SNR		Highest	X	buildings, cavity trees, under bridges and in bat boxes; forage in open fields or forest gaps
<i>Microtus pennsylvanicus</i>	Meadow Vole	G5	SNR	Of concern, State	High	X	tall grass prairie habitats
<i>Neotoma floridana</i>	Eastern Woodrat	G5	S3/S4	Of concern, State	Moderate	X	wide variety of habitats
<i>Ursus americanus</i>	Black Bear	G5	S3?	Of concern, State	Moderate	X	early successional habitat and forest interior; den sites
<u>REPTILES & AMPHIBIANS</u>	-	-	-	-	-	-	-
<i>Crotalus horridus</i>	Timber Rattlesnake	G4	SNR	Of Concern, State	High	X	dry, south-facing slopes at high elevations; rock outcrops or logs for den sites with south face exposed to sun
<i>Heterodon simus</i>	Southern Hognose Snake	G2	SNR	Of Concern, State	Highest	X	friable soils; underground refugia such as stump holes and rodent burrows; abundance of toads
<i>Ophisaurus attenuatus</i>	Slender Glass Lizard	G5	S4		Moderate	X	underground refugia such as stump holes and rodent burrows; open canopied forests or fields
<i>Terrapene carolina</i>	Eastern Box Turtle	G5	SNR		Moderate	X	moist woodlands; sandy or loamy soils in open for egg laying; loose soils and leaf litter for burrowing

BIRDS	-	-		-			
<i>Ammodramus savannarum</i>	Grasshopper Sparrow	G5	SNRB,SNRN		Highest	X	broomsedge fields and other openings
<i>Caprimulgus carolinensis</i>	Chuck-will's-widow	G5	S4		High	X	openings for nocturnal feeding; mixed forests with light to moderate understory
<i>Caprimulgus vociferus</i>	Whip-poor-will	G5	S4		High	X	openings for nocturnal feeding; mixed forests with light to moderate understory
<i>Chaetura pelagica</i>	Chimney Swift	G5	SNRB		High	X	open areas for foraging; cavity for nesting (often chimneys)
<i>Colinus virginianus</i>	Northern Bobwhite	G5	S4		Highest	X	brushy areas and grasslands, thickets, woodland margins
<i>Columbina passerine</i>	Common Ground-Dove	G5	SNR	State Threatened	Highest	X	shrubs near openings for nesting; sandy bare ground or short grass for foraging
<i>Dendroica discolor</i>	Prairie Warbler	G5	S4		High	X	open old fields with scattered saplings; open woodlands with shrub-scrub
<i>Elanoides forficatus</i>	Swallow-tailed Kite	G5	S2	State Endangered	Highest	X	open savannahs for foraging; mature trees for nesting near swamps and marshes
<i>Empidonax virescens</i>	Acadian Flycatcher	G5	S4B		High		Riverbanks, streams, banks, alder zones
<i>Falco sparverius paulus</i>	American Kestrel	G5	SNR		Highest	X	nest cavity in large open area; extensive open areas with high perches for foraging
<i>Gallinago gallinagodelicata</i>	Wilson's Snipe	G5	SNRN		High	X	boggy areas; wet meadows with short grass; along pond and marsh margins for probe foraging
<i>Icteria virens</i>	Yellow-breasted Chat	G5	S4B		High	X	old fields, briar thickets, dry woodland margins;
<i>Icterus spurius</i>	Orchard Oriole	G5	S5?B		Moderate	X	orchard-like stings; woodland margins
<i>Junco hyemalis</i>	Dark-eyed Junco	G5	SNRB,SNRN		Moderate	X	short grass openings near conifer woodlands
<i>Lanius ludovicianus</i>	Loggerhead Shrike	G4	S3	Of Concern, State	Highest	X	open areas with perches
<i>Passerina caerulea</i>	Blue Grosbeak	G5	SNRB		Moderate	X	hardwood saplings or shrubs for nesting; open areas
<i>Passerina cyanea</i>	Indigo Bunting	G5	SNRB		Moderate	X	woodland margins; shrubby thickets in openings
<i>Pipilo erythrophthalmus</i>	Eastern Towhee	G5	SNR		High	X	brushy areas; woodland margins and understory
<i>Progne subis</i>	Purple Martin	G5	SNRB		High	X	forage over open areas near or over water; nest in man-made houses or gourds
<i>Scolopax minor</i>	American Woodcock	G5	S4		Moderate	X	moist soils and leaf litter for probe foraging; woodlands for nesting; openings for mating displays

<i>Spiza americana</i>	Dickcissel	G5	SNRB		Moderate	X	open, grassy areas
<i>Spizella pusilla</i>	Field Sparrow	G5	S5?		High	X	saplings and shrubs in weedy thickets and woodland margins
<i>Sturnella magna</i>	Eastern Meadowlark	G5	SNR		High	X	short to medium-height grasses for nesting and foraging
<i>Toxostoma rufum</i>	Brown Thrasher	G5	SNR		High	X	moderate to dense brush and saplings
<i>Tyrannus tyrannus</i>	Eastern Kingbird	G5	SNRB		High	X	open areas with scattered trees and other perches
<i>Tyto alba</i>	Barn Owl	G5	S4	Of Concern, State	Moderate	X	grasslands or marshes for foraging; nest cavities; dense roosting cover
<u>INSECTS</u>							
<i>Atrytone arogos</i>	Arogos Skipper					X	specialist in seasonally wet to dry grassland and pine savannah habitats; regenerating burn sites; host plants: Little Bluestem, Pine Barrens Reed Grass, and Lopsided Indian Grass; nectar plants
<i>Dorymyrmex bureni</i>	"A Pyramid Ant"					X	prefer sandy soils in highly disturbed areas like pastures, open fields, open scrub, sandhills, dunes, lawns, and roadsides
<i>Dorymyrmex medeis</i>	"A Pyramid Ant"					X	prefer sandy soils in highly disturbed areas like pastures, open fields, open scrub, sandhills, dunes, lawns, and roadsides

Freshwater Lake

Habitat description: Freshwater ecosystems are a subset of Earth's aquatic ecosystems. They include lakes and ponds, rivers, streams, springs, and wetlands. They can be contrasted with marine ecosystems, which have a larger salt content. Freshwater habitats can be classified by different factors, including temperature, light penetration, and vegetation. The manmade lake at Lakeshore Preserve was created as coquina and sandy material were mined for roads and development in the region. The lake is reportedly deep and boasts numerous freshwater fish species. Both the aquatic habitat as well as the naturalized shore provide important habitat for numerous species.

Management recommendations:

1. The lake is well established and little management is necessary. Having said that a routine monitoring routine should be established to monitor water quality and habitat parameters.
2. Continue biological surveys of this area (Management recommendation #7).

Species of concern associated with this habitat:

Coastal Plains Streams, Rivers and Lakes						Streams /Rivers/ Lakes	
SCIENTIFIC NAME	COMMON NAME	G-RANK	S-RANK	LEGAL STATUS	PRIORITY	SPECIFIC HABITAT REQUIREMENTS	
<u>REPTILES & AMPHIBIANS</u>	-	-	-	-	-	-	-
<i>Alligator mississippiensis</i>	American Alligator	G5	S5	Federal Threatened	Moderate	X	large river swamps, lakes, ponds, coastal impoundments, abandoned rice fields, brackish water marshes, and estuarine tidal creeks; juveniles will use Carolina bays and other seasonal wetlands; shallow waters preferred
<u>BIRDS</u>	-	-		-			
<i>Actitis macularia</i>	Spotted Sandpiper	G5	SNA		Moderate	X	tidal to freshwater systems; primarily coastal but occurs inland
<i>Aix sponsa</i>	Wood Duck	G5	SNRB, SNRN, SNRM		High	X	nest cavities near fresh water; emergent vegetation; ponds, lakes, rivers, swamps, BEAVER PONDS
<i>Anas acuta</i>	Northern Pintail	G5	SNRN		Highest	X	shallow open water with accessible plants and invertebrates
<i>Anas discors</i>	Blue-winged Teal	G5	SNRB, SNRN		Moderate	X	shallow open water with accessible plants and invertebrates
<i>Anas fulvigula</i>	Mottled Duck	G4	S?		Moderate	X	shallow open water with accessible plants and invertebrates
<i>Anas platyrhynchos</i>	Mallard	G5	SNRB, SNRN		Highest	X	freshwater boides for foraging; shallow water with accessible plants and invertebrates
<i>Anas rubripes</i>	American Black Duck	G5	SNRN		Highest	X	shallow open water with accessible plants and invertebrates
<i>Anhinga anhinga</i>	Anhinga	G5	SNRB, SNRN		Moderate	X	fresh or brackish water for foraging; trees over or surrounded by water for nesting

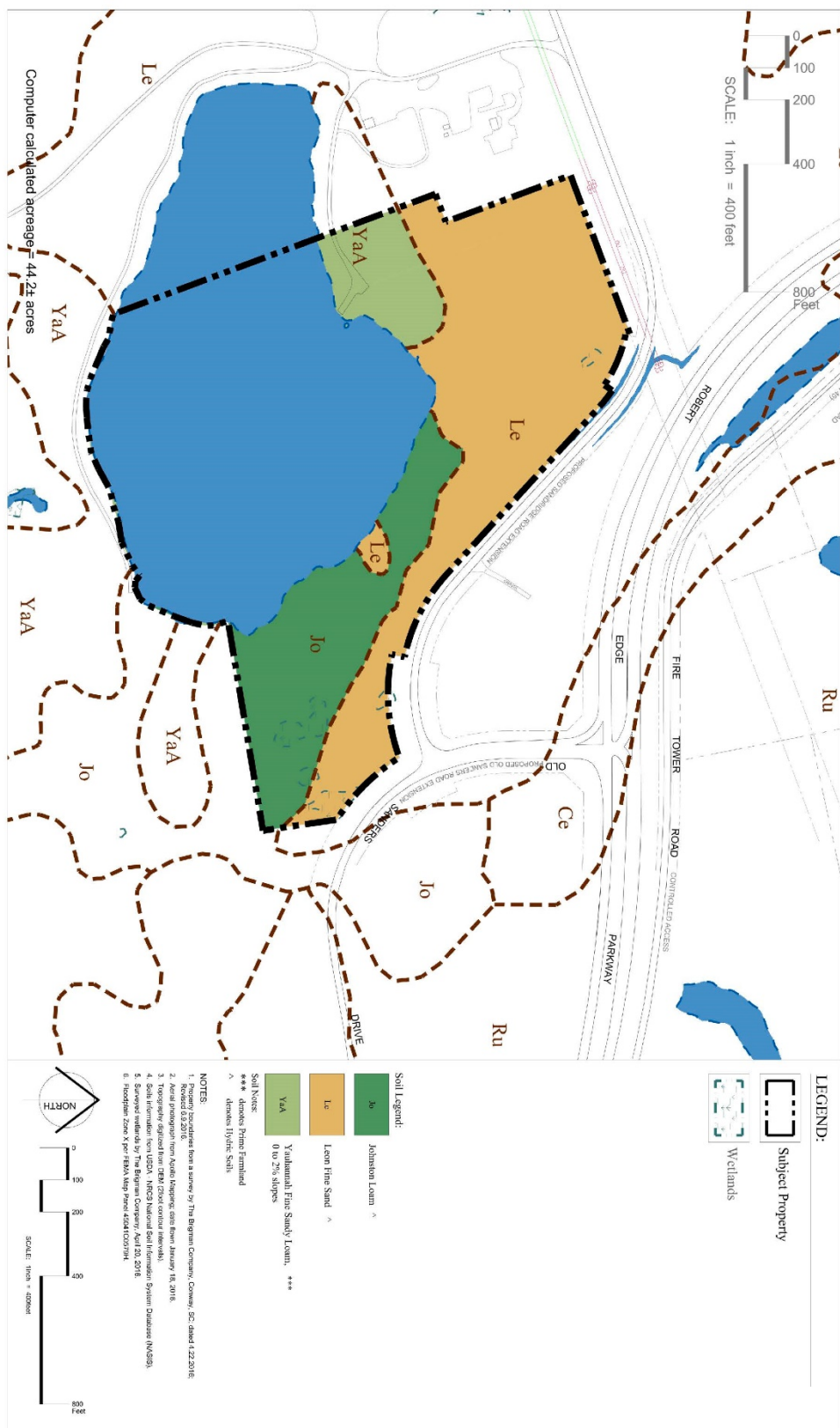
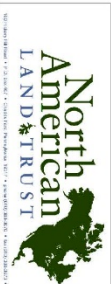
<i>Ardea alba</i>	Great Egret	G5	SNRB,SNR N		High	X	shallow water bodies or shorelines for foraging; trees over or surrounded by water for nesting
<i>Ardea herodias</i>	Great Blue Heron	G5	SNRB,SNR N		Moderate	X	shallow water bodies or shorelines for foraging; trees over or surrounded by water for nesting
<i>Botaurus lentiginosus</i>	American Bittern	G4	SNRN	Of Concern, State	Highest	X	extensive freshwater marshes with grasses>3ft. Tall
<i>Butorides virescens</i>	Green Heron	G5	SNRB,SNR N		Highest	X	shallow water bodies and shorelines for foraging; dense shrubs and thickets near water for nesting
<i>Calidris fuscicollis</i>	White-rumped Sandpiper	G5	SNA		Moderate	X	most frequent in managed impoundments
<i>Calidris himantopus</i>	Stilt Sandpiper	G5	SNA		High	X	most frequent in fresh to brackish ponds/impoundments
<i>Calidris melanotos</i>	Pectoral Sandpiper	G5	SNA		Moderate	X	more common away from coast
<i>Calidris minutilla</i>	Least Sandpiper	G5	SNRN		High	X	forages in clumps of marine vegetation; common on coast
<i>Egretta caerulea</i>	Little Blue Heron	G5	SNRB,SNR N	Of Concern, State	Highest	X	shorelines, shallow water, or mudflats for foraging; shrubs or trees over or surrounded by water for colonial nesting
<i>Egretta thula</i>	Snowy Egret	G5	SNRB,SNR N		Moderate	X	shorelines, shallow water, or mudflats for foraging; shrubs or trees over or surrounded by water for colonial nesting
<i>Egretta tricolor</i>	Tricolored Heron	G5	SNRB,SNR N		High	X	shorelines, shallow water, or mudflats for foraging; shrubs or trees over or surrounded by water for colonial nesting
<i>Eudocimus albus</i>	White Ibis	G5	SNR		Highest	X	shallow water or mudflats for foraging on crustaceans; wet meadows or mudflats for probing; thickets or trees over or surrounded by fresh water for colonial nesting
<i>Limnodromus scolopaceus</i>	Long-billed Dowitcher	G5	SNRN		Moderate	X	most common in fresh coastal wetlands
<i>Mycteria americana</i>	Wood Stork	G4	S1S2	Federally Threatened and State Endangered	Highest	X	shallow water with concentrated prey (6-10 in. deep) for foraging; trees over or surrounded by water for colonial nesting, particularly cypress swamps and trees on small islands
<i>Nyctanassa violacea</i>	Yellow-crowned Night Heron	G5	SNRB,SNR N		Highest	X	shorelines of water bodies for foraging, especially for crustaceans; trees or thickets near water for colonial nesting, will nest in trees that are on dry lands
<i>Platalea ajaja</i>	Roseate Spoonbill	G5	SNR		Moderate	X	shallow water for tactile feeding; shrubs or trees over or surrounded by water for colonial nesting, particularly thickets of small trees on coastal islands
<i>Plegadis falcinellus</i>	Glossy Ibis	G5	SHB,SNRN		Moderate	X	shallow water, mudflats, or wet meadows for probing and foraging; shrubs or trees over or surrounded by water for colonial nesting, particularly dense thickets on coastal islands
<i>Pluvialis dominica</i>	American Golden Plover	G5	SNA		Highest	X	rare migrant
<i>Podiceps auritus</i>	Horned Grebe	G5	SNRN,SNR M		Highest	X	small fish as prey
<i>Podilymbus podiceps</i>	Pied-billed Grebe	G5	SNRB,SNR N		Highest	X	fresh or slightly brackish water with emergent vegetation within used for nesting; open water in winter for foraging

<i>Porphyrio martinica</i>	Purple Gallinule	G5	S4	Of Concern, State	Highest	X	freshwater marshes with emergent and floating vegetation for foraging and nesting
<i>Tryngites subruficollis</i>	Buff-breasted Sandpiper	G4	SNA		Highest	X	may be seen in pastures and golf courses; rare migrant; most common in interior
<u>INSECTS</u>							
<i>Acanthametropus pecatonica</i>	"A Mayfly"					X	mesic forests near water
<i>Dolania americana</i>	American Sand Burrowing Mayfly	G4	S3			X	mesic forests near water
<i>Homooneuria dolani</i>	"A Mayfly"					X	mesic forests near water
<i>Siphonurus decorus</i>	"A Mayfly"					X	mesic forests near water
<i>Somatochlora calverti</i>	Calvert's Emerald	G3	SNR			X	boggy forest seepages for breeding; forest openings for foraging
<i>Taeniopteryx robiniae</i>	Savannah Willowfly	G1	SNR			X	mesic forests near water
<i>Toxorhynchites rutilus rutilus</i>	"An Elephant (Tree Hole Mosquito)"					X	tree holes and artificial basins for breeding; nectar producing plants for foraging
<i>Toxorhynchites rutilus septentionalis</i>	"An Elephant (Tree Hole Mosquito)"					X	tree holes and artificial basins for breeding; nectar producing plants for foraging
<u>TERRESTRIAL LEECHES</u>							
<i>Haemopsis septagon</i>	"A terrestrial leech"				High	X	moist areas near water sources; feeds on earthworms; only known from Georgetown County but probably more widespread in Pee Dee region of Coastal Plain

IV. Mapping

- A. Soils
- B. Aerial Imagery
- C. Concept Plan

Horry County, South Carolina

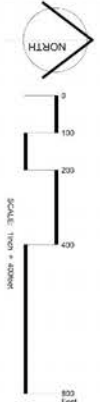




LEGEND:

 Subject Property

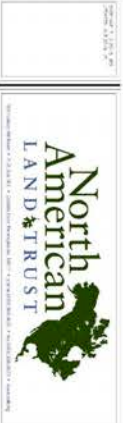
- NOTES
1. Property boundaries from a survey by The Bigham Company, Conway, SC, dated 4-22-2016.
 2. Aerial photograph from Google Maps, taken from January 16, 2016.
 3. Topography obtained from NOAA 2500 contour interval.
 4. Spot elevations from USGS, NED3 National Spot Elevation Database (NASED).
 5. Surveyed wetlands by The Bigham Company, April 20, 2016.
 6. Floodplain Zone X per FEMA Map number 40441C03194.



LAKESHORE RESORT

HORRY COUNTY, SOUTH CAROLINA

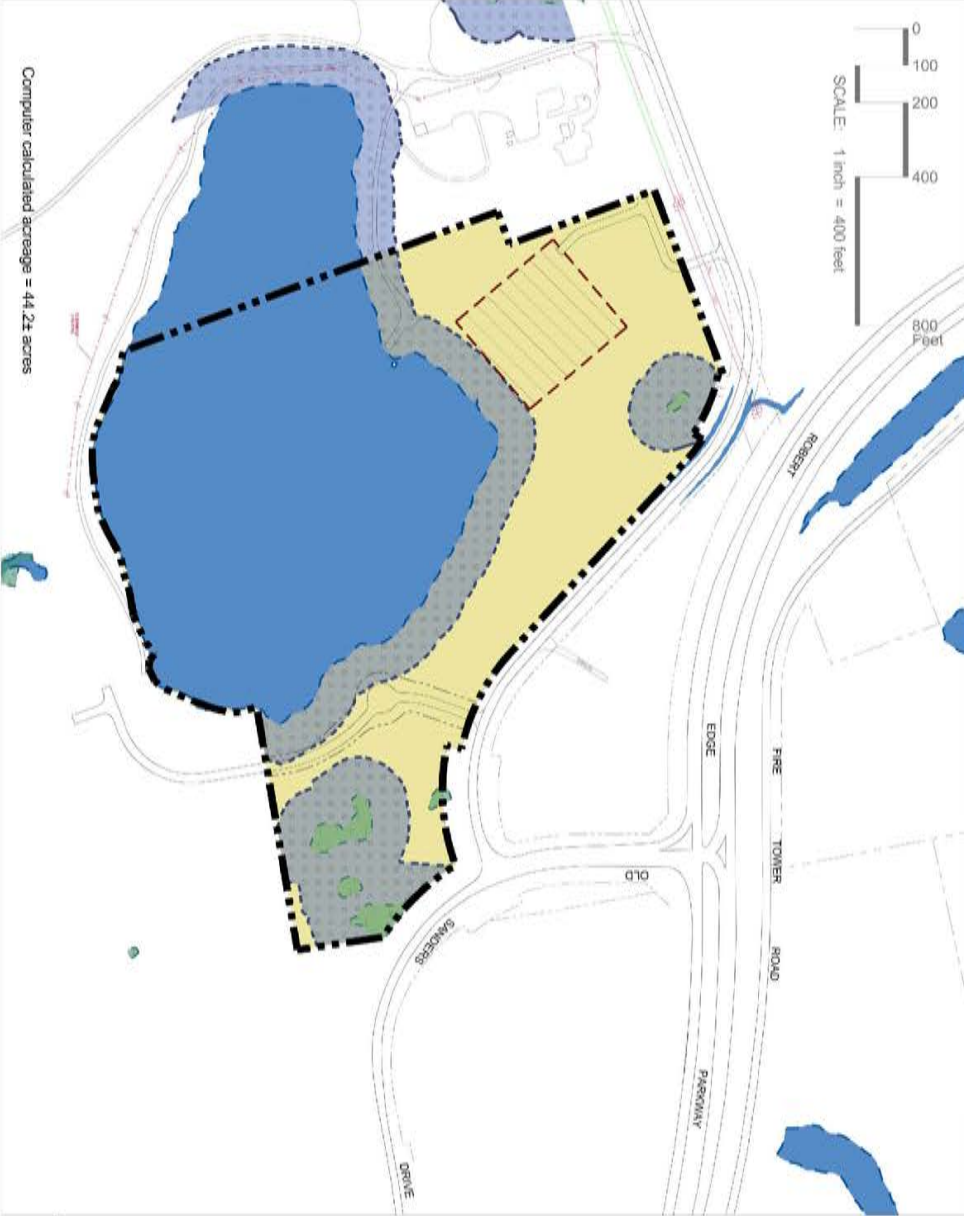
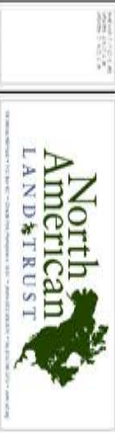
AERIAL PHOTOGRAPH



AERIAL PHOTOGRAPH

LAKESHORE RESORT HORRY COUNTY, SOUTH CAROLINA

CONSERVATION EASEMENT PLAN



Computer calculated acreage = 44.24 acres

LEGEND:

- Conservation Area - 44.24+ acres
- Wetlands
- Building Zone @ 2.43+ acres
- Wetland & Riparian Protection Area

NOTES:

1. Property boundaries from a survey by The Sigafer Company, Cornell, SC, dated 4.22.2016.
2. Revised 6.9.2016.
3. Aerial photograph from Google Maps, dated "New January 19, 2016".
4. Soil information from USDA - NRCS National Soil Information System (NASIS).
5. Surveyed wetlands by The Sigafer Company - April 20, 2016.
6. Acreage shown is per USDA Map from 2004 (N250794).

SCALE: 1 inch = 400 feet

0 100 200 400

800 Feet

ROBERT ROAD

FIRE TOWER ROAD

PARKWAY

OLD DRIVE

SANDPIPER DRIVE

CONSERVATION EASEMENT PLAN

V. Next Steps and Activity Timeline

NALT recommends the following tasks during the first year of operation:

1. Identify Conservation Management Team to include:
 - a. Forestry Management Contractor (for native grass work)
 - b. Road maintenance contractor (general)
 - c. Site improvement/repair contractor (construction)
 - d. Lagoon edge maintenance contractor (as necessary)
 - e. Biological expertise (as necessary)
 - f. Site security contractors (as necessary)
 - g. Natural resource agencies and partners
2. Develop a list of local partners/players to open dialogue as necessary:
 - a. Local government and planning departments
 - b. Academics or natural resource partners
 - c. Local NGO partners
3. Meet with contractors on CMP Plan components to obtain bids, determine timetable for implementation
4. Draft annual Management Budget for the property (begin 3-5 year projection)
5. Implement Conservation Management Plan to include
6. Modify budget and timetables for the next five-year period.

VI. Sample Budget (to be modified as bids are compiled)

Sample budget to be used for implementation					
Proposed 2015-2016 Budget					
	Proposed Cost	Committed	Discretionary	Notes	
Site Maintenance					
Securing site gate, locks, fencing, etc.)					
Misc (signs, hardware, etc.)					
Routine mowing					
Preserve					
ROW					
Drainage pipes					
Road repair/maintenance					
Habitat Enhancement/Land Mngmt					
Prescribed burning					
New firebreaks/trails					
Burning (labor, equip, etc.)					
Timber thinnings					
Improvement cut/transition					
Removal of regeneration stands					
Invasive species treatments					
Lagoon Management					
Water quality monitoring/treatment					
Fish stocking					
Native Grass/Prairie Restoration					
Wildlife Management					
Nuisance control (hogs, beavers, etc.)					
Healthy herd management					
Biological surveys/enhancements					
Wetland enhancement/restoration/monitoring					
Biological surveys					
Site improvement					
Building envelope/view shed ex.					
New trails					
Capital Expenditure/Amenity/Improvements					
Fishing dock/pier					
Boardwalks					
Docks					
Site inspection and management					
Total					
Total Committed					
Total Discretionary					

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Native Warm Season Grasses for GA, AL, SC;
http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs144p2_021520.pdf

Appendix 1: Baseline Biological Assessment

Appendix 2: Conservation Easement