

Land Management Plan
For
Long Bay Marina Parcel
Horry County, SC

Prepared for
North American Land Trust
Chadds Ford, PA

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LONG BAY PARCEL

The Long Bay Marina parcel is located on the northwest bank of the Pine Island Cut section of the Atlantic Intracoastal Waterway and is directly across from the Grand Strand Airport in Horry County, South Carolina. The property will soon be placed under a conservation easement by the North American Land Trust (NALT). NALT staff has produced a baseline document and site visit reports that accurately describe the current ecological condition of each parcel. I refer to that information and have not reiterated it here, except for the broad description of the Long Bay Marina parcel as predominantly upland pine forest.

LONG BAY MANAGEMENT OBJECTIVES

This parcel will likely be purchased and used by a single owner; therefore, the management options should be geared for outdoor recreational pursuits. The acreage of this parcel is suitable for limited deer hunting, walking, and horseback riding. Given these potential uses, the ecological land management plan should create a diversity of habitats for ecological and aesthetic benefit and seek to control fuel loads for mitigation against wildfires.

LONG BAY MANAGEMENT LIMITATIONS

There are several limitations to the management of this property and they are listed below.

1. ***Prescribed fire can not be used on site.*** The parcel is located approximately ½ mile north of the Grand Strand Airport runway. This precludes use of prescribed fire anywhere on the property. This is a pyrogenic habitat and other means must be used to manage fuel loads.
2. ***Irregular grade in pine stand.*** The loblolly pines were planted approximately 20+ years ago. During this planting operation the site was “bedded.” A bedding operation places strips of topsoil onto adjacent topsoil. This creates greater organic content per unit area and pine seedlings experience increased growth rates, especially on sandy sites like the Long Bay parcel. Bedding is also used to elevate pine seedlings above the water table. Bedding results in an irregular topography and one that is difficult to walk casually. During my site inspection, I noticed beds that were elevated nearly 1 foot above adjacent grade. This poses a limitation for a property that will be used for outdoor recreation. The bedding will need to be addressed during road and trail construction. Addressing this elsewhere on the parcel should be discussed.
3. ***Invasive species control.*** Several acres of kudzu are present on the southern corner of the property and have extirpated native plant species. This is a limitation in that control and eradication measures should be enacted as soon as possible and will preclude more ecologically beneficial land management until kudzu control is achieved. This acreage should be treated before it is utilized in an ecologically more beneficial manner (e.g., food plot, tree planting, etc.).
4. ***Limited hunting.*** Hunting on Long Bay should be limited to white tailed deer. Deer hunting is typically done from an elevated position and shot direction is

LONG BAY MANAGEMENT RECOMMENDATIONS BY COMPARTMENT

There are several suggested management recommendations across the Long Bay parcel. For simplicity, these will be discussed collectively and applied on the landscape in different areas. As a caveat,

Management recommendation #1 – silvicultural timber harvest

This pine stand was established approximately 20+ years ago. A mid story of less desirable hardwood (e.g., water oak) and softwood (e.g., sweetgum) species are present in the midstory. Areas of ericaceous species are also present across the planted pine stand. I recommend a basal area reduction of 30-40% across the stand. This harvest rate would not be applied evenly but rather unevenly to create heterogeneity across the stand. Areas nearest the property boundary should be left denser than those at the center of the property. Less dense forests along the parcel boundary would open a viewscape out of and into the parcel. The future owner would likely desire privacy and timber density can achieve this. Less desirable midstory species can be minimized during the timber harvest while areas of ericaceous plant species should be preserved. The timber harvest could also be used to create a road/trail network and openings for eventual plantings.

Management recommendation #2 – road and trail construction

Connectivity across the property will contribute to a future owner's ability to enjoy and utilize the property; however, too many roads will make the property seem quite small. I suggest one primary access route to provide for ingress and egress at two different points. I have suggested a layout in the attached management map. This road would initially be used for the timber harvest. In fact, clearing trees from the roadway (and other trails) would be cash positive since they would be merchandized. The roadway would then need to be graded.

I have also suggested a network of trails for pedestrian, equestrian, and/or off-road vehicle access. These trails would allow access to different food plots, tree plantings, perimeter of the property, etc. These trails will be utilitarian but their layout can also contribute to the enjoyment of the property. As an example, trails should avoid long straight stretches that, in this case, would permit a line of sight from one property line to another. Gentle curves when appropriately placed can allow a parcel to feel like a much larger acreage. After the timber harvest contractors would need to remove stumps and level the road and trail paths. The stumps can be taken to the central logging deck where other logging slash would also be burned.

Management recommendation #3 – creation of openings for habitat diversity

The Long Bay parcel habitat can be improved and diversified by creating a series of openings in the planted pines. These openings could be used for traditional food plots

(e.g., winter wheat, clover, etc.), hardwood tree establishment (e.g., live oak grove), groves of fruit producing shrubs (e.g., plums, crab apples, persimmon), or wildflowers. A diversity of these types of openings will create greater ecological and visual diversity across the property. Similar to the roads, each of these areas would require the stumps to be removed post harvest and the opening leveled.

Management recommendation #4 –management of understory vegetation and fuel loads

Pine habitat in Horry County is pyrogenic. This results from fuel accumulation and either intentional or unintentional fire application. Prescribed fire is not possible on the Long Bay parcel because of the proximity to the Grand Strand Airport, but fuel loads still need to be controlled such that unintentional fire would not result in a stand-destroying fire. Fuel loads also need to be controlled to maintain valuable habitat for wildlife.

After the timber harvest, numerous tree and shrub species will regenerate and these will be the target of fuel control. Initially less desirable species, like sweetgum and water oak, will be controlled by hand application of herbicide (likely 3% of Garlon 4 and 1% MSO surfactant). Herbicide will likely need to be applied two or three years with diminishing effort required in subsequent years. Simultaneous to the herbicide application mechanical control of the understory will be required. Some areas with more open canopy might regenerate in herbaceous species and require mechanical control while other areas might be shrubbier. In general, herbaceous dominated understory will require mechanical control every 1-2 years and areas of greater shrub component require mechanical control every 2-3 years.

Mechanical control will be with a bush hog or heavier piece of equipment. There is a major caveat to mechanical control: it is more difficult in areas that have been bedded. I mentioned this previously as a limitation to management. This should be discussed prior to the timber harvest. Leveling some or all of the beds would create a parcel that would be easier to manage than one with the beds left in place.

Management recommendation #5 –control of invasive, exotic plant species

Kudzu was observed on the southern corner of the parcel and should be treated immediately. This can be controlled through use of livestock or herbicide; however, both approaches aim to exhaust the nutrient stores in the root system. Kudzu is an aggressive plant and exhaustion of the nutrient stores in the root system is the only way to eradicate in an area. Livestock would involve rotation of a goat herd onto and off of the parcel. This should be timed such that new growth is subject to grazing pressure and new leaves are not able to photosynthesize and rebuild nutrient stores in the root system. The herbicide called Veteran should be used for this parcel. It is rated to apply in proximity to wetlands and is effective at kudzu control. I suggest treatment at 3 gallons per acre with Veteran 720, 1% surfactant. I would also assume two treatments per year in the first three years. Multiple treatments in the first several years will help to better reduce the nutrient stores of kudzu.

Common reed (*Phragmites australis*) was observed on the opposite bank of the Intracoastal Waterway at this parcel. This is a highly invasive species and the bank edge should be monitored for its eventual invasion. This is a highly invasive species and best treated immediately upon detection.

LONG BAY MANAGEMENT BUDGET

#1 timber harvest

Revenue from the timber harvest will vary in multiple ways. First, the approved volume of wood to harvest would influence the stumpage rate. Second, fluctuations in the timber market would influence ultimate timber revenue. Timber on the property would be harvested for chip and saw (i.e., dimensional lumber and paper pulp), pulpwood, and potentially “super pulp.” This tree classification is new and results in one or two dimensional boards out of a pulpwood tree. Super pulp prices have been relatively high over the last several years.

Were timber harvests approved for ecological objectives, timber prices and harvest volumes could be computed to generate expected income from the harvest. Given these variables, a timber harvest could be expected to generate \$15,000 to \$20,000.

#2 road and trail construction

This type of work is typically specified by the acre. It involves stump removal, leveling grade, potential addition of material to the road way, removal of slash, and revegetating for erosion control. The attached sketch includes 3.2 acres of road way (5600’ long and 25’ wide) and 1.3 acres of trail (3600’ long and 15’ wide), a total of 4.5 acres. An excavator would be required to pull stumps, a dump truck to move stumps to the burn pile, a bulldozer to level the grade, and an excavator to burn and then bury the debris pile. Costs per day for these machines is approximately \$2000. This project would be expected to take 1.5 to 2 weeks. Approximate cost is \$30,000-\$40,000. This does not include a final application of road material. These prices vary tremendously and would need to be determined for final cost estimate. Additional work for the openings could also reduce overall job costs by allowing stumps and debris to be moved to nearby openings and not transported to one central log deck. Minimization of machine travel time will greatly reduce overall project costs.

#3 creation of openings

This dimension of the management plan has the greatest flexibility and therefore the most difficult to price. Prices below are general guidelines that may help guide decision making. All options, however, would require stump removal and that the grade be leveled. The attached sketch suggests 4.2 acres of openings. **Using values from above, estimated costs for these openings could be \$30,000;** however, the ability to remove and burn stumps in each small opening will eliminate transport costs across the tract. (I assumed above that all stumps would be relocated to the central log deck, which would be necessary were the openings not created.)

In projects of this type we typically suggest planting 1 or 3 gallon plant material which can cost on average \$3 to \$9, respectively. Prices of this level would include native oak species, magnolia species, fruiting shrub species. Installation cost can be twice the cost of the plant. **Therefore, approximate costs for 100 plants could range between \$2000 for 1 gallon specimens to \$10,000 for 3 gallon material.** Larger plant sizes typically have greater survival rates than smaller plant sizes and have already attained a greater size. Smaller plant sizes are more economical. More detailed costs estimates can be provided were greater specification provided.

#4 understory control

Mechanical control will involve use of a light bush hog (@\$75/hour) or heavier duty brown tree cutter (@ \$95/hour). If we assume that ½ to 1/3 of the acreage will be cut per year and that either cutter could go through approximately ½ acre per hour, **expected annual expenditure for cutting would be \$5250 to \$6000.** These numbers are high because of the difficulty of access due to bedding for the pine seedlings. Were the beds leveled, the cost could decrease by half or greater.

#5 Kudzu control

Veteran should be applied at 3 gallons to the acre by a 10 man hand crew for an 8 hour day, each treatment would be approximately \$3000. The total cost over five years for 8 total treatments is **\$24,000.**

LONG BAY COST SHARE OPPORTUNITIES

Many of the activities discussed above could qualify for cost share assistance from state and federal natural resource agencies. Common granting agencies are SC Forestry Commission, US Fish and Wildlife Service, and Natural Resource Conservation Service. Many of these cost share programs will provide 35-50% of the land management cost. Applications are typically developed for a multi-year period and would cover multiple activities at once. This property would be especially eligible because of kudzu control. This is a highly invasive plant species and one that all natural resource agencies wish to eradicate. Funding levels vary in relation to the agency's annual budget and competitiveness of other cost share applications.