

Land Management Plan  
For  
Carolina Bay Resort Parcels  
Horry County, SC

*Prepared for*  
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## **CAROLINA BAY PARCEL**

The Carolina Bay's Resort 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 North American Land Trust (NALT). NALT staff has produced several baseline documents and site visit reports that accurately describe the current ecological condition of the parcel. I refer to that information and have not reiterated it here, except for the broad description of the Carolina Bay Resort parcel as hardwood forest with wetland and upland habitat.

## **CAROLINA BAY MANAGEMENT OBJECTIVES**

Similar to Long Bay, 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 and turkey hunting, walking, and horseback riding. Portions of this parcel are, however, wetlands and should be given special consideration in management. Given these potential uses, the ecological land management plan should create a diversity of habitats for ecological and aesthetic benefit.

## **CAROLINA 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.*** Several portions of the parcel are upland mixed pine-hardwood stands. Typically, these can be managed with dormant season prescribed fire. The Carolina Bay parcel is located approximately ¼ mile north of the Grand Strand Airport runway. This precludes use of prescribed fire anywhere on the property.
2. ***Invasive species control.*** Several invasive species were detected on the property. They include kudzu, privet, Chinese tallow, and pampas grass. These should be addressed through herbicide control before other land management actions are considered in these areas. Future management will be hindered if invasive species are not adequately controlled.
3. ***Limited hunting.*** It is recommended that hunting be limited to white tailed deer and eastern wild turkey. Other types of hunting (i.e., quail, waterfowl) are limited by the lack of suitable habitat or the small acreage available.
4. ***Road/trail access during wet weather.*** Portions of the parcel are wetlands and will be difficult to traverse in wet weather, especially in winter. Wet weather will make some of the existing roads impassable; however, existing roads through wetlands can be improved. These actions are covered by the Corps of Engineers Nationwide permit #3 (Maintenance of Existing Structures) and #14 (Linear Transportation Projects). Additional state certifications would be required from SC Department of Health and Environmental Control but these are routine certifications. Unless improved, the current condition of these roads will limit access and utilization of the property in wet weather.

## **CAROLINA BAY MANAGEMENT RECOMMENDATIONS BY COMPARTMENT**

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

### ***Management recommendation #1 – selective silvicultural timber harvest for openings***

Much of this parcel is forested with hardwood and pine species. While many hardwood and pine species are valuable for wildlife, some species are not as critical for and ecologically valuable landscape. For example, sweetgum is prevalent across the parcel and of limited wildlife value. I suggest targeted openings be created through a silvicultural timber harvest. Openings should be away from wetlands and created in areas of high sweetgum density. Openings of this type adjacent to hardwoods would benefit several passerine species (e.g., Hooded warbler, Kentucky warbler, White-eyed Vireo). I also suggest several openings on the southern portion of the parcel. This area is higher in elevation and easier to access as compared to the northern, wetter portion of the parcel. These openings will require stumps to be removed and grade leveled after the timber harvest.

The proposed timber sale would be small and would only be logistically possible if connected to the Long Bay timber sale. Frequently, timber on small acreage parcels can be sold collectively with larger parcels. This possibility would need to be addressed with the timber buyer prior to signing a timber sale contract.

Once openings are established, they will provide opportunity for a variety of wildlife plantings which could include: fruit-producing shrubs, live oaks, annual wildlife plantings, fallow field management, etc. A diversity of these types of openings will create greater ecological and visual diversity across the property.

### ***Management recommendation #2 – road and trail construction***

Several remnant roads exist across the parcel and should be improved for all weather access. Additional roads should be limited to trail-sized paths suitable for equestrian, pedestrian or off road vehicle access. These paths could be cleared during the timber harvest and would provide connection across the parcel and to the proposed openings. Similar to the Long Bay recommendation, layout of these trails can contribute significantly to the enjoyment of the property. Long, straight portions of trails should be avoided. Rather trails should seek to avoid valuable trees and have gentle curves. These trails could also provide valuable wildlife plantings with short portions planted with wildlife valuable crops like winter rye, oats, wheat, and clovers.

### ***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, crabapples, persimmon), or wildflowers. 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***

Many of the forested areas on the Carolina Bay parcel have a valuable understory. These areas are typically composed of several grass species (e.g., *Chasmanthium* spp.), shrubs (e.g., American beautyberry), and small trees (American hophornbeam). Some areas though have excessive loblolly regeneration that is minimizing more valuable understory species. Currently most loblolly regeneration is less than 10' and could easily be cut with a bush hog or Browns-wood mower. The forest is open enough such that a tractor could easily maneuver and selectively target areas of loblolly. Elimination of these loblolly seedlings would then permit more valuable regeneration. Once cut, attention should be given to these areas in future growing seasons to ensure additional loblolly regeneration is not occurring.

I previously suggested creating a series of openings suitable for wildlife valuable plantings. These mowed areas could be viewed through a similar lens: they could be targets of understory plantings valuable for wildlife. Species selection would need to focus on species able to survive in heavy shade. Site appropriate species include: strawberry bush, American beautyberry, dwarf palmetto, American hornbeam, red buckeye, redbud, flowering dogwood. Numerous other species could be considered and could create an ecologically and aesthetically valuable feature of the parcel.

***Management recommendation #5 – impoundment of large drainage canal for fish habitat***

A large drainage ditch passes through the property from the adjacent sand mine to the Intracoastal Waterway. It appeared to be 8-10' throughout and approximately 25-30' wide at top. Approximately 200 feet before the canal discharges to the ICW, an internal road crosses the canal with a large diameter aluminum culvert passing under the road. The purpose of the ditch is ostensibly to serve as an emergency runoff for the adjacent sand mine. This canal could be impounded at the road crossing and create aquatic habitat corridor through the property. An aluminum riser could easily be attached to the upstream side of the existing culvert and allow manipulation of water level. Impoundment would create an approximately 1.2 acre pond. This could be stocked with sunfish species and provide a valuable recreational opportunity. Impoundment edges could also be planted with select shrub and tree species (e.g., buttonbush) to provide wood duck brood habitat. Addition of wood duck nest boxes along the impoundment would be valuable as well. Previous permitting (if extant) would need to be reviewed to ensure this new land use would be compatible with previous permit allowances.

***Management recommendation #6 –control of invasive, exotic plant species***

Chinese tallow and pampas grass were observed in only several discrete locations. Herbicide eradication of these would be relatively easy to achieve.

Kudzu, on the other hand, was observed across the larger opening on the southern portion of the parcel. 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 it 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 ounces 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.

Privet was also observed in the understory across the parcel. This is a difficult species to eradicate, and it eliminates most of the understory plant species when it becomes established in an area. Control can be applied several ways. First, the thickets of privet could be bush hogged and then resprouts sprayed with 4% solution of Garlon or glyphosate. Alternatively, a basal treatment could be applied to existing stems with 30% Garlon and 70% basal oil treatment.

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 establishment. Once detected, a 5% solution of the herbicide Habitat should be applied by hand during the summer or early fall months. Multiple applications will be required.

## **CAROLINA BAY MANAGEMENT BUDGET**

### ***#1 timber harvest***

Revenue from a timber harvest on this parcel will be negligible because the volume and value of what would be removed is small. The timber harvest could be viewed as a service to prepare openings.

### ***#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. It is possible to 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***

The openings on Carolina Bay will provide a range of management alternatives. The attached sketch contains 3.6 acres of proposed openings. Using estimates from above, removal of stumps and leveling of grade would cost approximately \$25,000. Because of

the surrounding hardwoods, I would suggest all burning be conducted in the largest opening on the southern portion of the property.

Plant costs are identical as above: **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 and planting***

Understory control on this property would be variable. Based on my site visit, a minority of the property has excessive loblolly regeneration. Assuming 30-40 acres would require control and a light bush hog at \$75/hour, **an estimate of cost for control is \$5000 to \$6000.**

Additional planting costs would be similar to that at Long Bay: **approximate costs for 100 plants could range between \$2000 for 1 gallon specimens to \$10,000 for 3 gallon material.** I would suggest larger plant material in this case because growth rates will not be high in the understory.

#### ***#5 impoundment***

The existing pipe could be used and have a riser attached to it. I would **estimate \$15,000 for construction and installation of the riser.** This price is high primarily because of the large size of the existing culvert.

#### ***#5 invasive plant control***

Although multiple species require control, I would estimate herbicide control at similar rates for the Long Bay parcel. Kudzu control treatment may cost **approximately \$24,000 for 8 treatments across five years.** Control of privet is difficult to estimate but a similar estimate as kudzu could be used (i.e., **approximately \$24,000 for 8 treatments across five years).**

#### **CAROLINA 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. Typically, applications are developed for a multi-year period and would cover multiple activities at once. This property would be especially eligible because of kudzu control and management of hardwoods. This is a highly invasive plant species and one that all natural resource agencies wish to eradicate. Hardwoods are not a commonly managed habitat type in the area and would be seen as uncommon and therefore fundable. Funding levels vary in relation to the agency's annual budget and competitiveness of other cost share applications.