

Naturalization at Carolina National Golf Club

One course's path to full certification in the Audubon Cooperative Sanctuary Program.

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CAROLINA National Golf Club at Winding River Plantation in Bolivia, North Carolina, received full certification in the Audubon Cooperative Sanctuary Golf Course Program in the fall of 1998. As part of our participation in the program, we naturalized 30 acres to create wildlife habitat, decrease maintenance, and enhance the look of the golf course.

Built in 1997, the 1,100-acre residential community and public golf course is located in the scrub oak and pine forests of southeastern coastal North Carolina. The primary native vegetation includes wild blueberry, lovegrass, wiregrass, broomsedge, little bluestem, bracken and cinnamon ferns, wax myrtle, various oak and pine trees (including live oaks), and spartina. Because these plant species are so abundant, we chose to highlight and continue using these species as our primary landscape feature.

Even after building the golf course and residential areas to blend with the surrounding environment, we found additional areas that could be naturalized to showcase native vegetation. Before we began to naturalize, we established two important goals:

1. Continue to create and enhance the naturalized areas on our course.
2. Utilize native species, such as wiregrass, broomsedge, and big and little bluestem, in naturalized areas.

Naturalizing Designated Areas

Many of the areas we chose to naturalize were set aside during the construction phase of the golf course. The set-aside areas were not sprigged or sodded. These areas were seeded primarily with lovegrass, but the mix also included meadow foxtail; switchgrass; big and little bluestem; tall, hard, and sheep fescue; and wildflowers.

In order to establish this foundation mix as soon as possible, we followed directly behind the construction contractor with our seeding program. The



This tree snag was found in another location on the golf course and then "planted" on number 14. Birds have used the numerous holes to establish homes.

entire golf course, including the natural areas, was limed with four tons of lime per acre to enhance our sandy, acidic soils, and all non-sod areas were pre-plant fertilized with an 18-18-18 (50% SCU, 1 lb. N/1,000 sq. ft.) fertilizer. The areas to be seeded were scratched with a Gill Pulverizer, seeded, and dragged with a metal drag mat.

Constrained by the progress of the contractor, we seeded when each area was ready. We generally like to seed warm-season grass species and wildflowers in late March through early April. Cool-season species, like the fescues, should be seeded in late August and early September.

Naturalizing Existing Turfgrass

In contrast to the set-aside areas, naturalization of former bermudagrass turf areas was all done by hand planting. These areas were marked and the sod was stripped and used elsewhere. The remaining root and vegetative material was then treated with glyphosate and allowed to sit for 24 to 48 hours. The plants were then installed on 8" to 12" centers and mulched. These plantings included such species as wiregrass, big and little bluestem, spartina, broomsedge, Mexican hairgrass, fountaingrass, and wild blue rye. Follow-up treatments of glyphosate were usually needed to eliminate weeds.

We also harvested native plants such as wiregrass and broomsedge from our property to use in our naturalized areas, and we purchased thousands of plants, including miscanthus, fountaingrass, and spartina to create large grass beds.

Committed for the Long Haul

One important consideration when undertaking a project like this is the time it takes to establish these species. A year or more may be necessary before the desired look is achieved. This point is especially true for seeded



Naturalization of former turf area was accomplished by hand planting. The sod was removed and the remaining vegetative material was sprayed with a non-selective herbicide. After a 48-hour waiting period the area was planted.

switchgrass and little and big bluestem. These species produce very little above-ground growth the first year in favor of root growth. The second season is much more productive. For some course officials this is a hard reality to accept. Failure to see quick results is a common reason most people decide to discontinue the project or refuse the initial effort altogether. Patience is key to a successful project.

Maintenance

Maintenance of these areas primarily includes periodic weeding and burning. Everyone on the crew participates in pulling weeds by hand. When the density of the native plantings gets great enough, most weeds will be shaded out.

Each March we burn all of the large prairie expanses to control weeds and encourage top growth and flower production. The difference between burned and unburned flower production is significant. At the same time, hand plantings are cut back to approximately 6 inches.

Results: Maintenance Savings

We have naturalized approximately 30 acres to date and will continue to increase that number with the construction of our third nine holes. We estimate that it cost \$10,000 to implement our natural areas, and we calculate our savings to be about \$15,000 annually.

The savings from naturalization are significant. If you reduce manicured turfgrass by 30 acres, you can save up

to \$1,800 (if your treatment costs are \$60 per acre) by eliminating pre-emergent herbicides. Add to this the cost of fertilizer (\$40 per acre) and mowing (\$15 per acre), etc., and you can see that over time this can result in significant savings. This does not include the cost of added wear on equipment or time lost for other maintenance duties.

We have greatly decreased the amount of man-hours needed to main-

tain these areas and also decreased the amount of wear and tear on our equipment. Savings are significant when you consider that mowing, fertilization, chemical controls, and cultivation are eliminated and the costs associated with them are not included in the budget.

Enhanced Wildlife Populations

One of our main goals in establishing the natural areas was to attract more wildlife to our property. As a result of our efforts we believe we have added greatly to our animal population. We have observed many birds of prey, including a bald eagle, ospreys, and barred owls. We also see kingfishers and both little and great (white and blue) herons on the golf course property.

Many mammals also make Carolina National Golf Course their home. We have recorded sightings of beavers, fox, rabbits, fox squirrels, raccoons, bobcats, and deer. We have inventoried many different snakes as well, including black snakes, copperheads, rat snakes, garter snakes, and king snakes.

Golfer/Employee Response

We have received positive responses from golfers concerning our naturalization projects, both from an aesthetic viewpoint and from the increased



The number-one tee surround has been established with lovegrass to minimize maintenance.



Broomsedge, lovegrass, and sedges were used in a low-lying area on number eight of Carolina National Golf Club.

amount of wildlife in these areas. We communicate our actions with signage throughout the course and brochures available at the pro shop explaining our participation in the Audubon Cooperative Sanctuary Program.

Perspective and Recommendations

If we were to begin this project now, the only thing we would do differently would be to increase the amount of areas to be naturalized. We are continuing to increase and supplement the naturalized areas we currently have, but it would have been better to set aside more native areas during the construction phase.

With urban expansion and the ever-increasing destruction of plant and animal habitat, the need to preserve and expand native habitats becomes even more important. That is why we are so excited about the Audubon Cooperative Sanctuary Program at Carolina National. Not only does it enhance the plant and animal species at the golf course, but it also improves the golfing and living experience.

We recommend the following pointers to other golf courses that wish to implement this kind of project:

1. Try to allocate natural areas during construction, if possible.

2. When creating native areas, make sure all of the turfgrass is removed. This will decrease the amount of maintenance needed.

3. Try a small, out-of-the-way area first, making every effort to guarantee its success, before implementing large-scale projects. Show off all of the positives and let it become the golf course's or owner's idea to expand the program. On older, established golf courses, golfers may not initially like the changes and may perceive them as unnecessary new hazards. Use the look sparingly at first; bring it into play slowly, if at all.

4. Choose plants that are best suited for your particular location. These plants will thrive best once established and will help attract beneficial wildlife. We have gone through a tremendous learning curve here and have transplanted and replanted many times. In

order to find the best place for each species, you may need to try different plants or techniques. Some initial sources of this information can be found at local nurseries, extension service publications, and books such as *The Landscape Restoration Handbook* by Donald Harker.

5. Clearly mark naturalized areas to minimize concern over lost balls.

6. Be responsive to golfers' needs. As we determine those areas that do not fit in well to the golfers' play, we either reduce or eliminate them altogether. Fortunately, we have had minimal need to reduce natural areas at Carolina National.

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