

the advent of tetraploid daylilies, with double number of chromosomes, the progress in breeding has accelerated.

In near-tropical areas such as the southern tip of Florida, the breeding of extra-evergreen, or tropical daylilies has added the possibility of long-term, in-the-ground beauty to area gardeners, although few examples are to be found. Only very old cultivars and a popular, small flowered daylily rather like a wild flower, are available in nurseries. Although there exist dozens of beautiful named daylilies which are known to perform well here, few know how to get them, and many are unaware of their existence. Although there have been a number of articles in both popular and professional publications, research facilities and the plant industry have shown little interest in daylilies.

The daylily is adaptable to pot culture, can be brought to bloom and sold in pots. The dwarf habit, very attractive flowers and arching foliage of many of the smaller daylilies make a very appealing pot plant. Wrapped with foil and adorned with a bow, such plants compare favorably in beauty with most other pot plants, and after serving time as pot plants they can go in the ground and will probably produce another flush of bloom in the season. Daylilies have been sold bare-root for years. The chance to choose them in bloom, buy them in active growth in soil and plant them in the ground without planting shock make them a real bonus for the gardener.

In my growing I use six and a half inch white azalea pots and a sterile planting mix of silica sand, perlite, peat moss, and pine bark mulch. The white pots keep the root zone noticeably cooler than dark pots, and the very light mix provides both good drainage and aeration. Osmocote has proved to be the most efficient fertilizer for pot culture, though I use a citrus fertilizer for plants in the ground. Treflan sprinkled over newly potted plants and at intervals

thereafter inhibits weed growth. A multiple purpose spray mix prevents most fungus and insect problems (1) except grasshoppers; these, when newly hatched may be dispatched with a can of house and garden spray, but when mature are more satisfactorily annihilated singly. The two most important points in care of potted daylilies are adequate but not over-watering and some shade. Small "Areca" palms set among the daylily plants provide light shade in my garden.

The fact that each daylily bloom lasts just one day has tended to preclude their use as cut flowers. However, they are prized for Oriental type arrangements. In mixed bouquets for table, church, or cemetery use they are stunning. Colors can be singularly vibrant. Since some are evening openers, they can be used for dinner table arrangements. They have even been used for wedding bouquets and corsages.

If grown without systemic insecticides they may be used for food. Buds dipped in batter and deep fried have long been considered a delicacy in the Far East. The roots are considered there to have medicinal value.

Daylilies continue to find their highest beauty planted in the ground. They offer a long-season display of color and lush beauty which improves from year to year. The entire plant is handsome as a landscape accent or mass. Moreover, as the daylily has gained in tolerance of tropical weather, it has not lost its hardiness to cold. It should be recognized for its multiple potentials for gardeners of both climates.

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Proc. Fla. State Hort. Soc. 92:221-223. 1979.

USING ECOLOGICAL COMMUNITIES IN ENVIRONMENTAL EDUCATION WORK

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Additional index words. conservation plan, The Nature Conservancy.

Abstract. The USDA, Soil Conservation Service, helped prepare a detailed conservation plan for environmental education in 320 acres (130 hectares) in Florida for The Nature Conservancy (TNC). The ecological community was the basis for inventorying soil, plant, and animal resources; determining the kinds and possible locations of endangered and threatened plants and animals; making soil interpretations; and developing projects and practices for environmental education. This approach established clear alternatives and assisted TNC in developing an effective plan.

Introduction

In the summer of 1977, The Nature Conservancy (TNC) requested assistance from the Soil Conservation Service (SCS) and appropriate soil and water conservation districts

Proc. Fla. State Hort. Soc. 92: 1979.

(SWCD's) in preparing stewardship plans for TNC properties in Florida.

TNC is a national, nonprofit conservation organization that has worked to preserve hundreds of thousands of acres. TNC accomplishes this work through accepting gifts of land, purchasing land, and acquiring land for conservation agencies. Acquisition monies are provided through the organization's own contributed revolving funds, donations, lines of bank credit, and loans from financial institutions.

About 60 percent of all TNC projects remain in TNC ownership, and most are managed by volunteers. The other areas are transferred to government agencies, universities, or other conservation organizations for protection. The lands held by TNC are open to the public for scientific, educational, and passive recreation use. The types of use allowed are determined after a master plan for each area is completed.

TNC develops stewardship plans on lands they own and manage. These plans include a description of the preserve; an inventory of the natural resources; objectives for preservation; and methods for implementation of the plans. They are similar to conservation plans prepared by SCS. The conservation plan was used as the basis for the stewardship plan.

Stewardship plans for TNC properties in Florida will

cover 11 preserves totaling 8,272 acres (3,532 hectares). The first plan was prepared for the 320-acre (130 hectares) Janet Brooks Preserve in west-central Florida. It will serve as a guide for preparing the other plans.

Materials and Methods

SCS personnel initially met with the director of TNC's Land Stewardship program for the southeast and the Stewardship Committee chairman of TNC's Florida Chapter to discuss planning guidelines for the preserves. Formal requests were made to SWCD's for assistance. The Janet Brooks Preserve was selected for the first planning effort because of the availability of assistance from an active local TNC membership.

The next step was to define objectives for preservation and use. SCS personnel and Gulf SWCD officials met with the local members of TNC who were managing the preserve on a day-to-day basis. A plan of action was established to complete flora, fauna, and soils inventories; determine ecological communities; develop resource data according to ecological communities; and determine the specific practices needed to achieve TNC's objectives and preservation and use.

The local SCS district conservationist, SCS environmental coordinator, and a local TNC member worked together with the TNC committee on the inventory, alternatives, and plan preparation. Final approval of the plan was made by the total membership.

Inventory

The plant community on a particular site is determined mostly by soil conditions if climate and topography are held constant. The species of wildlife that will use the site vary depending on the plant community. This interrelationship forms an ecological community.

Florida's ecological communities were first described by William Bartram in 1791 (1). The most recent work on ecological communities has been by Florida's Department of Natural Resources (2) and the University of Florida's Center for Wetlands (5). The latter works formed the basis for the SCS descriptions of Florida's ecological communities.

The published soil survey of Hernando County (4) identified 11 soil series and phases on the preserves. The 11 soil types support 4 of the 26 ecological communities identified by the SCS in Florida. Descriptions of these communities include their location; predominant soils, plants, and animals; and interpretations.

The Upland Hardwood Hammocks made up 50 percent of the preserve. This community is considered to be the climax vegetation of ecological succession in the lower southern Coastal Plains. Moist or mesic conditions occur on rolling terrain. The vegetation consists of shade-tolerant hardwoods, scattered shrubs, vines, and hardwood mast. The hardwoods provide good food sources for deer, turkeys, squirrels, and many birds.

The Longleaf Pine-Turkey Oak Hills make up 43 percent of the preserve. Dry or xeric conditions occur on the rolling terrain. The vegetation consists of open stands of longleaf pine and turkey oak with a few shrubs, grasses, and herbaceous plants. Animals utilizing this community are adapted to the sandy, droughty soils and high temperatures.

The South Florida Flatwoods cover about 6 percent of the preserve. Moist or mesic conditions occur on flat terrain. The vegetation consists of pine with a few scattered oaks. The understory is dense stands of saw palmetto, gallberry, and fetterbush. Typical animals of the flatwoods are deer, turkey, raccoons, foxes, rabbits, and birds.

The Freshwater Marsh and Ponds make up about 1

percent of the preserve. The wet or hydric conditions support herbaceous plants such as pickerelweed, arrowhead, smartweed, duckweed, and ferns. The areas serve as valuable water sources for wildlife. Herons, egrets, and wood ducks use the area along with many species of amphibians and reptiles.

Plants were categorized by growth forms: trees, shrubs, herbaceous plants and vines, grasses and grasslike plants. Animals were categorized as: mammals, reptiles, amphibians, and birds. Tables 1 and 2 are examples of the tables used to show the plant and animal inventories.

Table 1. Example of table used to show herbaceous plants according to ecological communities.

Plant name	ECOLOGICAL COMMUNITY				Remarks
	Upland Hardwood Hammock	Longleaf Pine-Turkey Oak Hills	South Florida Flatwoods	Fresh-water Marsh and Ponds	
Air plants, <i>Tillandsia spp.</i>	X				
Arrowhead, <i>Sagittaria spp.</i>				X	Edible plant; used by Indians to treat shock
Blackberry, <i>Rubus spp.</i>	X				Edible berries; Indian medicinal plant
Bracken fern, <i>Pteridium aquilinum</i>		X			Edible plant; Indian medicinal plant
Cinnamon fern, <i>Osmunda cinnamomea</i>	X				
Coontie, <i>Zamia integrifolia</i>		X			Threatened or endangered; Used by Indians for food
Creep beggar-weed, <i>Desmodium canum</i>			X		Excellent quail food

Threatened or endangered plants and animals were identified. This information was presented in the plan, and sightings in specific ecological communities were given in tables in a form similar to Table 3. Plants and animals that occur but were not sighted were also listed.

Objectives and Plan for Implementation

A draft plan was reviewed by the local TNC Committee and objectives were further defined. The first objective was to use the preserve for environmental education by providing outdoor experiences relating people's dependence on the natural environment. The second objective was to prevent uncontrolled use of the preserve, which could degrade the natural systems through plant and wildlife destruction and soil erosion. The third objective was to encourage scientific uses within TNC's research policies. The last objective was to provide opportunities for passive recreation use in the form of nature studies.

The major use of the preserve will be environmental education. An interpretative map and related information about the ecological communities were assembled. The in-

Table 2. Example of table used to show mammals according to ecological communities.

Mammal name	ECOLOGICAL COMMUNITY				Remarks
	Upland Hardwood Hammock	Longleaf Pine-Turkey Oak Hills	South Florida Flat-woods	Fresh-water Marsh and Ponds	
Bobcat, <i>Lynx</i>					Not recorded, but may be in Upland Hardwood Hammock
Cotton rat, <i>Sigmodon hispidus</i>	X	X			
Cottontail rabbit, <i>Sylvilagus floridansu</i>			X		
Fox squirrel, <i>Sciurus nigra</i>		X			
Florida panther, <i>Felis concolor coryi</i>	X				Endangered animal, sighted on preserve by Bob Brill

Table 3. Example of table used to show threatened or endangered plants and animals that may occur.

Species	Recorded on preserve
<u>Plants</u>	
Auricled spleenwort, <i>Asplenium auritum</i>	Longleaf Pine-Turkey Oak Hills Community; SW $\frac{1}{4}$ of SW $\frac{1}{4}$ of Section 2, Range 2N, Township 7E
Dwarf spleenwort, <i>Asplenium pumilum</i>	
Sinkhole fern, <i>Blechnum occidentale</i>	
Coontie, <i>Zamia integrifolia</i>	
<u>Animals</u>	
Red cockaded woodpecker, <i>Dendrocopus borealis</i>	Sighted in Upland Hardwood Hammock Community
Little kestrel, <i>Falco sparverius paulus</i>	
Southern bald eagle, <i>Haliaeetus leucocephalus</i>	
Florida panther, <i>Felis concolor coryi</i>	

formation will include community descriptions and interpretations for educational uses.

Hiking trails will be built to provide access to the communities. Mulch will be used on trails in the Longleaf Pine-Turkey Oak Hills community to afford better traction and prevent erosion. Elevated trails are planned for the Fresh-water Marsh and Ponds community.

The Longleaf Pine-Turkey Oak Hills community is a climax community where fire exerts a primary control over the community. It requires periodic burning to maintain the predominate longleaf pine. Prescribed burning will be carried out each 5 years. Fire lanes will be constructed for safety in prescribed burning. A fire lane will also be constructed around the perimeter of the preserve to help prevent wildfires.

Areas that show erosion potential will be protected. Diversion and waterways will be constructed to intercept

runoff and carry it to suitable outlets at a nonerosive velocity.

Signs are to be erected in accordance with state posting law requirements to prevent uncontrolled use of the preserve. The preserve will be patrolled as appropriate. Local residents will be informed of the intended use and their assistance sought in protecting the area. Visitor use will be controlled and only maintenance vehicles will be allowed in the area. Parking spaces will be integrated into the landscape.

Scientific use of the preserve will be encouraged by the local TNC Research Committee. Research must be conducted in a scientific manner and must not endanger the preserve or its plants and animals.

Opportunities for recreation use in the form of wildlife observation and nature study will be provided to environmental groups. The interpretative map and related information developed for environmental education uses will be provided to denote trails, location of ecological communities, educational features, and soils.

Results and Discussion

Inventory information based on ecological communities was used to select alternatives to meet TNC's objectives. This allowed for a systematic presentation of the inventory information. The alternatives were then presented to the decision makers according to ecological communities. The conservation-oriented membership readily understood the ecological community concept and selection of an alternative and appropriate practices for implementation was quickly and properly made.

The use of ecological communities as a basis for developing a stewardship plan was proven to be better than use of conventional methods. The ecological community approach uses soil to determine ecological communities. This information is readily available through SWCD's. Lists of plant and animal species occurring in each ecological community have been developed by SCS, along with important information on rare and endangered plants and animals and ecological values. This information can be used to develop useful data for the landuser. This method replaces detailed onsite inventories required in conventional methods.

The ecological community approach can also improve the effectiveness of environmental education programs. Environmental education teachers can use this information to prepare individualized plans. This method will develop an appreciation of natural resources and promote the concern for preservation and improvement of the environment. In addition, it can be used for making interpretations such as those for wood products, livestock forage, recreation, and landscaping.

A decision was made to prepare plans similar to the one for the Janet Brooks Preserve for the 10 other TNC preserves in Florida using the ecological community approach. TNC will also use this approach to identify ecologically significant areas for future acquisitions.

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