University of Florida Conservation Area Land Management Plan

Bivens Rim Forest

Introduction

The Bivens Rim Forest Conservation Area is a 114 acre Conservation Area (including sovereign submerged land) located on the southern portion of campus, adjacent to the northern shoreline of Bivens Arm Lake, south of Archer road and west of US 441. Along with the natural areas around Lake Alice, Hogtwon Creek Woods and the Natural Areas Teaching Lab, this Conservation Area has the most significant and diverse environmental resources on the main campus. This determination is based on the relatively large size of the area, mix of community types, undeveloped shoreline buffer and proximity to a large water body.

Mixed hardwood forest communities dominate the upland portions of the area. Wetlands on site are, primarily, represented by the bottomland forest associated with Tumbling Creek and with the hardwoods and marsh vegetation that ring the northern half of the lake. The 2000-2010 Master Plan recommended preservation of this area (Preservation Areas P5 and P6), due to its proximity to the lake, diversity and abundance of wildlife, ability to provide watershed protection and biological treatment of stormwater runoff. Additionally, the Master Plan also stated that development activities including, but not limited to agriculture, earthwork, silviculture and construction, will be limited within these areas in order to protect the natural resources and habitat benefits they provide.

Natural Areas Inventory

Water Resources

Bivens Arm Lake is the receiving body of Tumbling Creek, which is a creek that runs though the University's laboratory school, P.K. Yonge, and through the eastern boundary of this Conservation Area. Other more intermittent tributaries are present to the north of the lake, adjacent to the College of Veterinary Medicine and to the west by IFAS's facilities, crops and pastures. Most of the University's properties south of Archer Road drain into Bivens Arm from intermittent streams during storm events.

According to data from the Florida Department of Environmental (FDEP) protection, Tumbling Creek's water quality suffers from the following constituents: fecal coliforms, dissolved oxygen, in-stream erosion and downstream sedimentation. Additionally, the creek is on the FDEP 305 (b) list for not meeting water quality standards, with a water quality rating of poor and on the 303(d) list as impaired waters. Bivens Arm Lake is listed by the FDEP impaired for nutrients and is listed with a poor water quality rating.

The City of Gainesville and the University are working on cooperative solutions that will help enhance the creek and improve water quality entering Bivens Arm Lake. The University of Florida's Wetlands Club has adopted the University property along Tumbling Creek as a trash clean up site and has committed to doing two cleanups per year.


Tumbling Creek flowing through the University's bottomland hardwood forest.

Natural Communities

Bivens Rim Forest is comprised, primarily, of three natural community types. These communities begin at the lake's edge with a sliver of floodplain marsh that grades up into bottomland hardwoods, which in turn grades into a mesic mixed-hardwood forest. The marshes associated with this area are wetlands of herbaceous vegetation and low shrubs. Moving up the slope, the bottomland forest is characterized as a low-lying, closed-canopy forest of tall, straight trees with a dense shrubby understory and little ground cover. The upland forested areas are comprised primarily of a mesic / upland-mixed hardwood forest. Mesic forests typically support significant wildlife and plant diversity, which result from the nutrient rich nature of hardwood forests and flowering and fruiting plants. An inventory on mammals, reptiles, amphibians, birds and plants will be completed for the final revision of this plan.

Plant Species

The mesic upland canopy is dominated by *Liquidambar styraciflua* (Sweetgum), *Pinus taeda* (Loblolly Pine), *Quercus hemisphaerica* (Upland Laurel Oak), *Quercus laurifolia* (Diamond Leaf Oak), *Quercus nigra* (Water Oak), and *Quercus virginian*a (Live Oak). Also present are *Carpinus caroliniana* (American Hornbeam), *Carya glabra* (Pignut Hickory), *Celtis laevigata* (Hackberry), *Diospyros virginiana* (Common Persimmon), *Fraxinus americana* (White Ash), *Magnolia grandiflora* (Southern magnolia), *Prunus caroliniana* (Carolina Laurelcherry), *Prunus serotina* (Black Cherry), *Quercus michauxii* (Basket Oak), and *Sabal palmetto* (Cabbage Palm), *Salix caroliniana* (Carolina Willow). The understory is dominated by a variety of native species. Shrubs, herbaceous plants and vines documented in this natural area include *Asplenium platyneuron* (Ebony Spleenwort), *Bignonia capreolata* (Crossvine), *Callicarpa americana* (American Beautyberry), *Campsis radicans* (Trumpet Creeper), *Clematis catesbyana* (Satin Curls), *Erythrhina herbacea* (Coralbean), *Gelsemium sempervirens* (Yellow Jessamine), *Hypericum hypericoides* (St. Andrew's Cross), *Lepidium virginicum* (Virginia pepperweed), *Lonicera sempervirens* (coral honeysuckle), *Mitchella repens* (Partridgeberry), *Myrica cerifera* (Wax Myrtle), *Phytolacca americana* (American Pokeweed), *Rubus argutus* (sawtooth blackberry), *Rubus trivialis* (Southern Dewberry), *Sanicula candensis* (Canadian Blacksnakeroot), several *Smilax* species (Greenbriar), *Stachys floridana* (Florida betony) *Tillandsia recurvata* (Ballmoss), *Tillandsia usneiodes* (Spanish moss), *Vitis*

aestivalis (Summer Grape), and *Vitis rotundifolia* (Muscadine Grape). *Juncus effusus* subsp. *solutus* (Soft Rush), *Ligustrum lucidum* (Glossy Privet), *Prunus umbellata* (Flatwoods Plum) *Parthenocissus quinquefolia* (Virginia Creeper), *Pleopeltis polypodioides* (Ressurection Fern), *Rubus argutus* (sawtooth blackberry),

The hydric bottomland forest is dominated by *Acer negundo* (Box Elder), *Acer rubrum* (red maple), *Cornus foemina*, (Swamp Dogwood), *Fraxinus caroliniana* (Carolina Ash), *Nyssa sylvatica var. biflora* (Swamp Tupelo), *Quercus laurifolia* (Diamond Leaf Oak), *Quercus nigra* (Water Oak), and *Sabal palmetto* (Cabbage Palm). *Itea virginica* (Virginia willow), *Salix caroliniana* (Carolina Willow), *Taxodium distichum* (Bald Cypress), *Tilia americana* var. *caroliniana* (Carolina Basswood), and *Ulmus alata* (Winged Elm) are also present. Understory shrubs, vines and herbaceous plants include *Apios americana* (Groundnut), *Arundinaria gigantea* (Switchcane), *Carex comosa* (Longhair Sedge), *Carex fissa* (Hammock Sedge), *Chasmanthium laxum* (Slender woodoats), *Cephalanthus occidentalis* (Common Buttonbush), *Decumaria barbara* (Climbing Hydrangea), *Mikania scandens* (Climbing hempvine), *Myrica cerifera* (Wax Myrtle), *Osmunda cinnamomea* (Cinnamon Fern), *Osmunda regalis* var. *spectabilis* (Royal Fern), *Sabal minor* (Bluestem Palm, a characteristic species of floodplains), *Sambucus nigra* subsp. *canadensis* (Elderberry), *Saururus cernuus* (Lizard's Tail), *Smilax* species (Greenbriar), *Thelypteris kunthii* (Southern Shield Fern), *Thelypteris palustris* (Marsh Fern),*Toxicodendron radicans* (Eastern Poison Ivy) and *Woodwardia areolata* (Netted Chain Fern).

The small strip of marsh lying just north of the lake is typified by species including *Acer rubrum* (Red Maple), *Acer negundo* (Boxelder, small trees only), *Colocasia esculenta* (Wild Taro), *Hydrocotyle ranunculiodes* (Floating Marshpennywort), *Hydrocotyle umbellata* (Manyflower Marshpennywort), *Lemna* sp. (Duckweed), *Myrica cerifera* (Wax Myrtle), *Nuphar advena* (Spatterdock), *Salix caroliniana* (Carolina Willow), *Sambucus nigra* subsp. *canadensis* (Elderberry), *Typha latifolia* (Broadleaf Cattail) and *Zizaniopsis miliacea* (Southern Wild Rice). *Nuphar advena* (Spatterdock), *Pontederia cordata* (Pickerelweed),

Noteworthy species found in the mesic upland hammock understory include *Dioscorea floridana* (Florida Yam, an uncommon species), the Florida endangered *Matelea floridana* (Florida Milkvine) and *Rivina humilis* (Rougeplant, at the northern edge of its range). The hydric hammock houses a number of noteworthy species: *Arisaema dracontium* (Greendragon, an uncommon species), *Commelina virginica* (Virginia Dayflower, near the southern edge of its range), *Iris hexagona* (Dixie Iris, one of our most showy natives), *Orontium aquaticum* (Goldenclub, uncommon and very showy) and *Tillandsia bartramii* (Bartram's airplant, uncommon and characteristic of undisturbed hydric hammocks). *Zizaniopsis miliacea* (Southern Wild Rice, an uncommon species), occurs along the lake edge.

Invasive non-native plant species

Future management of the site will need to address invasive plant management. The following invasive non-native plants have been documented on site: The eastern edge of the property was the most disturbed, with large populations of *Ardisia crenata* (Scratchthroat), *Macfadyena unguis-cati* (Catclaw Vine), *Ruellia tweediana* (Britton's Wild Petunia) and *Tradescantia fluminensis* (Small-leaf Spiderwort) found just west of Hope Lodge. Also encountered, but in lesser numbers, were *Albizia julibrissin* (Mimosa), *Citrus x aurantium* (Sour Orange), *Disocorea bulbifera* (Air Potato), *Elaeagnus pungens* (Silverthorn), *Eriobotrya japonica* (Loquat), *Imperata cylindrica* (Cogongrass), *Lantana camara* (Lantana), *L*igustrum *lucidum* (Glossy Privet), *Ligustrum sinense* (Chinese Privet), and *Syngonium podophyllum* (American Evergreen). Four species that have not been documented

as naturalized in Alachua county were found growing on the east side of the property in the vicinity of Hope Lodge: *Asparagus virgatus* (Tiki Fern, may be a new record for the state), which appears to be persisting and spreading vegetatively from a neighboring property, *Ilex cornuta* (Chinese Holly), *Ligustrum japonicum* (Japanese Privet), and *Viburnum odoratissimum* (Sweet Viburnum). *Colocasia esculenta* (Wild Taro), *Eichhornia crassipes* (Common Water-hyacinth) and *Landoltia punctata* (Dotted Duckweed) and *Pistia stratiotes* (Water Lettuce, native to Florida but considered an EPPC(I) invasive species) were common in the marsh along the lakeshore., *Cinnamomum camphora* (Camphortree), *Ludwigia peruviana* (Peruvian Primrosewillow, along creek) and *Sonchus asper* (Spiny Sowthistle, along creek).

Animal Species

A bald eagles nest is present on the northwestern portion of Bivens Arm, adjacent to the university's Environmental Horticulture building. Other animals that have been identified on site include: Gray Squirrel, Raccoon, Feral Cat, Armadillo, Gray Fox Pig Frog, Black Racer(1), Anolis carolinensis, Brown anole, Common Ground Skink, Leopard Frog, Southern Toad, Squirrel Tree Frog(7), Unidentified Water Snake, Florida Box Turtle, Common Snapping Turtle, American Goldfinch, American Robin, American Redstart, Anhinga, Baltimore Oriole, Black and White Warbler, Belted Kingfisher, Blue-Gray gnatcatcher, Brown-headed cowbird, Blue-headed Vireo, Blue Jay, Blackpoll Warbler, Brown Thrasher, Boat-tailed Grackle, Carolina Chickadee, Carolina Wren, Cedar Waxwing, Common Grackle, Common Yellowthroat, Double-Crested Cormorant, Downy Woodpecker, Eastern Bluebird, Eastern Phoebe, Eastern Tohee, Eastern Tufted Titmouse, Great Blue Heron, Great Crested Flycatcher, Gray Catbird, Great Egret, Hermit Thrush, House Finch, House Wren, Mourning Dove, Northern Cardinal, Northern Flicker, Northern Mockingbird, Northern Parula, Osprey, Ovenbird, Painted Bunting, Palm Warbler, Pine Warbler, Pileated Woodpecker, Red-bellied Woodpecker, Ruby-crowned Kinglet, Red-eyed Vireo, Red-Shouldered Hawk, Red-winged Blackbird, White-eyed Vireo, Yellow-bellied Sapsucker, Yellow-rumped Warbler, Yellow-throated Vireo, Yellow-throated Warbler

Bivens Rim hardwood forest.

Soil Inventory

The following soil information for on-site soils was gathered from the Soil Survey of Alachua County (1985).

Bivans Sand (5-8% slope)

This is a sloping, poorly drained soil on short breaking slopes and along hillsides of uplands. Typically, the surface layer is dark gray sand about 5 inches thick. The subsurface layer is light brownish gray sand about 5 inches thick. Permeability is moderate to moderately rapid in the surface and subsurface layers.

Blichton Sand (2-5% slope)

This gently sloping, poorly drained soil is on gently rolling uplands. Typically the surface layer is dark grayish brown sand about 6 inches thick. It is about 3 percent nodules of ironstone and fragments and nodules of phosphatic limestone.

Bonneau Sand (2-5%)

This series consists of deep, nearly level to sloping moderately well drained soils that formed these beds of loamy marine deposits. They are in broad areas of gently rolling uplands.

Monteocha Loamy Sand

This nearly level, very poorly drained soil is in wet ponds and shallow depressional areas in the flat woods. Slopes are less than 2 percent. Typically, the surface layer is black loamy sand about 12 inches thick. The subsurface layer is light brownish gray sand to a depth of 18 inches.

Cultural and Passive Recreational Resources

The properties that make up the Bivens Arm Conservation Area are not readily accessible, due in part to their somewhat remote location from the main campus. Additionally, site access is limited by fencing for lands within IFAS research areas, while forested areas along the lake are lacking trails and boardwalks to walk and view the lake. This remote location and limited use has led to use by homeless people as a periodic encampment location.

Three known archeological sites are present within the Bivens Arm Forest Conservation Area. The probability of additional Paleo-Indian sites within this area is high, due to the proximity of the lake. Future improvements to the site will take into account the location of known areas and follow guidelines by the Department of Historical Resources before sighting any new structures.

Future Improvements

Bivens Rim Forest is one of the campus Conservation Areas that can not be pigeon-holed into one category, because specific areas within the forest fit into one or two classifications of Academic Preserve or Nature Preserve. The floodplain forest on the eastern side, adjacent to Tumblin Creek, fits into the Nature Preserve category, due to the wetlands and probability of important nesting habitat. However, the area immediately around the creek may serve as an important research area for testing of BMPs and restoration efforts. The lake itself and the ecotone around it certainly offer opportunities for research by many different disciplines.

Future improvements to this forest should include: signage and fencing in order to identify the University's ownership and boundaries, bird and bat nesting boxes to enhance wildlife habitat and

efforts should be made to expand outdoor teaching opportunities. Additionally, the University has committed to cooperating with the City's restoration efforts at restoring natural floodplain function of Tumblin Creek within this Conservation Area. The City's preliminary planning is looking at de-channelizing the Creek in the areas west of U.S. 441. Finally, a major priority will be to secure an endowment for management and maintenance of the forest in coordination with the University Foundation.

Actions Since 2005

In 2007 the University successfully partnered with the City of Gainesville and Alachua County on a competitive grant to treat invasive exotics near and within the watershed that drains to Paynes Prairie. By working together these public entities were able to get the top ranked grant for the year. The primary treatment focus for UF's Bivens Rim portion of the partnership grant was coral ardisia that in many areas was at near 100% coverage in the understory. While, the treatment of coral ardisia and other upland invasive species was successful, treatment of bottomland wetland areas infested with *Ruellia tweediana* (Britton's/Mexican Wild Petunia) and *Tradescantia fluminensis* (Wandering Jew) were much less successful. In 2009, the partnership again successfully applied for follow-up retreatment of the same areas.

In 2009, 2.5 acres of lake frontage within the Conservation Area that is owned by the University of Florida Foundation had a permanent conservation easement placed on it by the St. Johns River Water Management District as mitigation for an accidental impact to a wetland at the new Shands Cancer Hospital. Additionally, a conservation area sign was placed at the main entrance to the forest at the intersection of Shealy Drive and Richie Road.

Maps on the following pages:

1. Aerial Photo
2. Water Resources
3. Natural Communities
4. Soils