Railhead Scrub Preserve

Land Management Plan

Managed by

Conservation Collier Program
Collier County
September 2021 – September 2031 (10-yr plan)

Updated: August 2021

Originally Prepared by:
URS Corporation, with the cooperation of
The Institute for Regional Conservation
September 2007

Revised by:
Conservation Collier Program Staff
May 2010 & August 2021

Railhead Scrub Preserve

Land Management Plan Executive Summary

Lead Agency: Collier County Board of County Commissioners, Conservation Collier Program

Properties included in this Plan: "Railhead Scrub Preserve" 135-acres.

Folio numbers 00143120009 and 00152600002
*** Full legal description provided in Appendix 1**

Management Responsibilities:

Agency: Collier County - Conservation Collier Program
Preserve Manager: Designated Collier County Environmental Specialist

Designated Land Use: Conservation and natural resource-based recreation

Unique Features: Xeric uplands habitat

Archaeological/Historical: N/A

Management Goals:

Goal 1: Continue to significantly reduce human impacts to indigenous flora and fauna

Goal 2: Continue to develop baseline monitoring reports

Goal 3: Continue to remove or control populations of invasive, exotic, or problematic flora and fauna to restore and maintain natural habitats

Goal 4: Continue to implement prescribed fire program

Goal 5: Continue to restore native vegetation

Goal 6: Maintain native and listed species management

Goal 7: Continue to evaluate potential for access and public use

Goal 8: Facilitate uses of the site for educational purposes

Goal 9: Maintain plan for security and disaster preparedness

Public Involvement:
Future public meetings will be held before major management activities such as prescribed burning. Staff will also keep working with Mediterra Community, Railhead Industrial Park property owners and Collier County Sheriff's Department to control trespass issues.

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1.0 Introduction

The Railhead Scrub Preserve is an approximately 135-acre natural area located in the northwest corner of Collier County, south of the Railhead Industrial Park and East of Old US 41 (Section 10 Township 48 Range 25 and Section 30 Township 51 Range 27). The preserve protects significant areas of xeric upland habitat surrounded by a rail line as well as industrial and commercial developments to the west and north, a residential community to the east, and Krehling Industries, Inc to the south. Current physical access to the preserve is from Old US 41 through Sun Century Road, a private road.

The Conservation Collier Program acquired the northern 80 acres of the preserve in July 2004 and the southern-most "RR Land Trust" property in June 2007. The RR Land Trust property has been incorporated into the existing preserve; therefore, this plan applies to both properties, and both properties are collectively referred to as the Railhead Scrub Preserve. The preserve includes approximately 117 acres of upland habitat, primarily Pine Flatwoods and Xeric Uplands (Scrub/Scrubby Flatwoods), and 19 acres of wetland habitat including Cypress and Hydric Pine Flatwoods. The preserve was purchased with funds from the Conservation Collier Program. The County holds fee simple title to the Railhead Scrub Preserve. The Conservation Collier Program manages these lands under authority granted by the Conservation Collier Ordinance (2002-63, as amended) (2007-65; available from www.municode.com). Conservation, preservation and public use and enjoyment consistent with conservation are the designated uses of the property.

Management activities allowed include those necessary to preserve, enhance, restore, conserve, and maintain environmentally sensitive lands for the benefit of present and future generations. Uses of the site must be consistent with these management goals. Grant funding will continue to be sought for management.

This site management plan is divided into four main sections including an introduction, which describes the location, zoning, land acquisition, significance, management authority, and extent of public participation. Section two describes the current condition of natural resources existing in the preserve; section three discusses the historic, existing, and proposed use of the property; and finally, section four presents the set of goals and objectives of the plan and describes the management actions needed to meet those goals and objectives.

1.1 Purpose and Scope of the Plan

The purpose of the plan is to facilitate management of the environmentally sensitive lands in the Railhead Scrub Preserve for the preservation of some of Collier County's most threatened plant communities. These lands are important for ensuring the long-term survival of endemic and listed species and plant communities, preserving imperiled wildlife species habitat, protecting water resources, and enhancing local ecological awareness. The preserve will be managed for conservation, protection, and enhancement of natural resources and for public outdoor recreation compatible with natural resource management. The scope of this plan is to provide management direction for the Railhead Scrub Preserve by identifying the goals and objectives necessary to eliminate or minimize any threats to the resource base and integrity of the site, and to identify management actions to achieve those goals and objectives. Key management objectives outlined below are provided in order of priority:

- Removal and exclusion of invasive exotic plants;
- Securing of boundaries to eliminate dumping and ORV trespass and to facilitate Collier County Sheriff's Office (CCSO) monitoring;
- Removal of solid waste;
- Restoration of damage caused by ORV use on the site;
- Management of wildlife, including surveys and habitat management to benefit wildlife;
- Application of prescribed fire or prescribed fire alternatives to mimic natural fire frequency in fire dependent communities;
- Determination of public use needs; and
- Promotion of maximum biological diversity.

The current and future land-use designation of Railhead Scrub Preserve is Industrial; however, Conservation Collier lands are considered similar to Essential Services in the Land Development Code (Section 2.01.03) and conservation uses on acquired lands are permitted in all zoning districts. A "protection" in the Conservation Collier Ordinance (2002-63, as amended, Section 14.7) permanently extinguishes development rights on a parcel once purchased under the Conservation Collier Program. These actions were taken to avoid the need for and cost of rezoning individual properties.

This management plan is a working document, which is submitted to the Collier County Board of County Commissioners (BCC) for its approval. Upon approval, this plan shall replace the final management plan that was approved by the BCC in June 2010. No use, infrastructure, or improvement shall be permitted on any property acquired or managed under the Conservation Collier Program that is inconsistent with the purposes of the program or that is not provided by an approved management plan for the property.

All development and resource alteration encompassed in this plan are subject to the granting of appropriate permits, development plan approvals, easements, licenses, and other required legal instruments. Approval of the management plan does not constitute an exemption from complying with the appropriate local, state, or federal permitting agencies.

1.2 Regional Significance of the Railhead Scrub Preserve

Collier County has approximately 68% of its area (more than 879,820 acres) protected in conservation areas (FNAI 2021) (Figure 1). Despite this vast acreage of protected land, Collier County has lost most of its xeric upland communities. Most preserve areas are dominated by wetlands or mesic uplands. Xeric communities such as Scrubby Flatwoods and scrub have always been rare in Collier County. The Vegetation Map of South Florida by Davis (1943) shows only about 2,217 acres of "scrub" in the county (Figure 2), although he seems to have not mapped some areas, including Railhead Scrub Preserve.

Because of its high elevation, scrub is well suited for development. Most of the scrub and Scrubby Flatwoods of Collier County have been developed. Less than 200 acres are protected in the Rookery Bay National Estuarine Research Reserve. Rookery Bay and Railhead Scrub Preserve contain the last significant areas of Xeric Uplands in the County.

Xeric uplands in Collier County contain several species of rare plants and animals, including showy dawnflower (*Stylisma abdita*) which is a rare Florida endemic, Lakela's pinweed (*Lechea lakelae*) which was probably endemic to Marco Island and may now be extinct, and gopher tortoises (*Gopherus polyphemus*). Protection and management of their habitat is critical to their long-term existence not only in Collier County, but also throughout their range.

1.3 Land Acquisition Program and Management Authority

The Conservation Collier program was originally approved by voters in November 2002 and subsequently confirmed in the November 2006 and November 2020 ballot referendum. The three voter-approved referendums enable the program to acquire, preserve, restore, and maintain vital and significant threatened natural lands, forest, upland, and wetland communities located in Collier County, Florida for the benefit of present and future generations (Ordinance 2002-63, as amended). Properties must support at least two of the following qualities to qualify for consideration: rare habitat, aquifer recharge, flood control, water quality protection, and listed species habitat. The BCC appointed a Land Acquisition Advisory Committee to consider any selected or nominated properties that an owner has indicated a willingness to sell. The committee recommends property purchases for final approval by the BCC.

Lands acquired with Conservation Collier funds are titled to "COLLIER COUNTY, a political subdivision of the State of Florida, by and through its Conservation Collier program." The BCC established the Conservation Collier program to implement the program and to manage acquired lands. As such, Conservation Collier holds management authority for the Railhead Scrub Preserve. Table 1 below summarizes relevant acquisition benchmarks.

Table 1: Acquisition History and Status for Railhead Scrub Preserve

Year	Benchmark
2003	Appraisal and Assessment to Determine Compliance with Initial Screening Criteria, including Biological and Hydrological Characteristics
2004	Railhead Scrub Preserve property (northern 80 acres) purchased by Conservation Collier
2006	RR Land Trust (55 acres) property initially assessed
2007	RR Land Trust parcel purchased and incorporated into Railhead Scrub Preserve

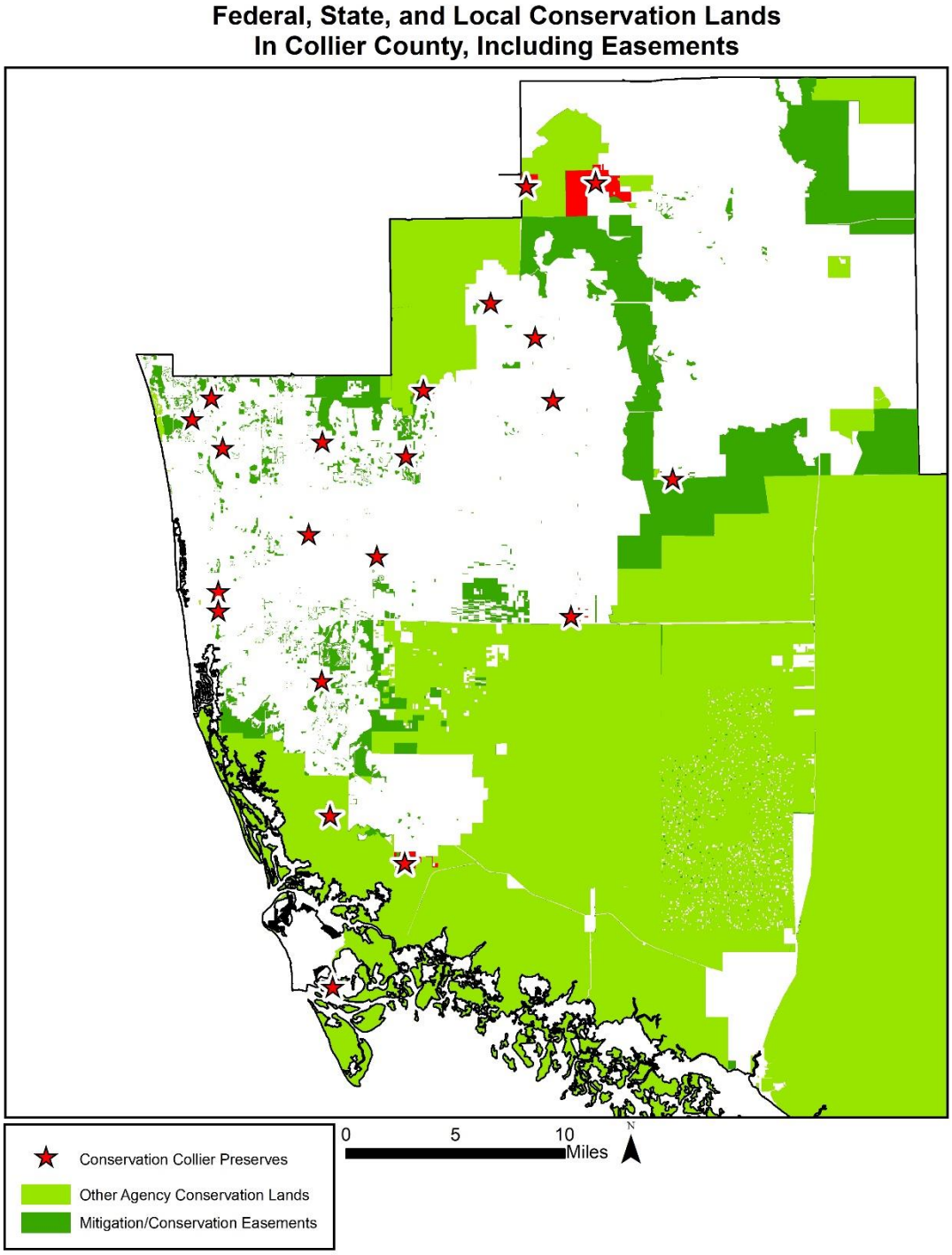

Figure 1: Federal, State, and Local Conservation Lands in Collier County, Including Easements

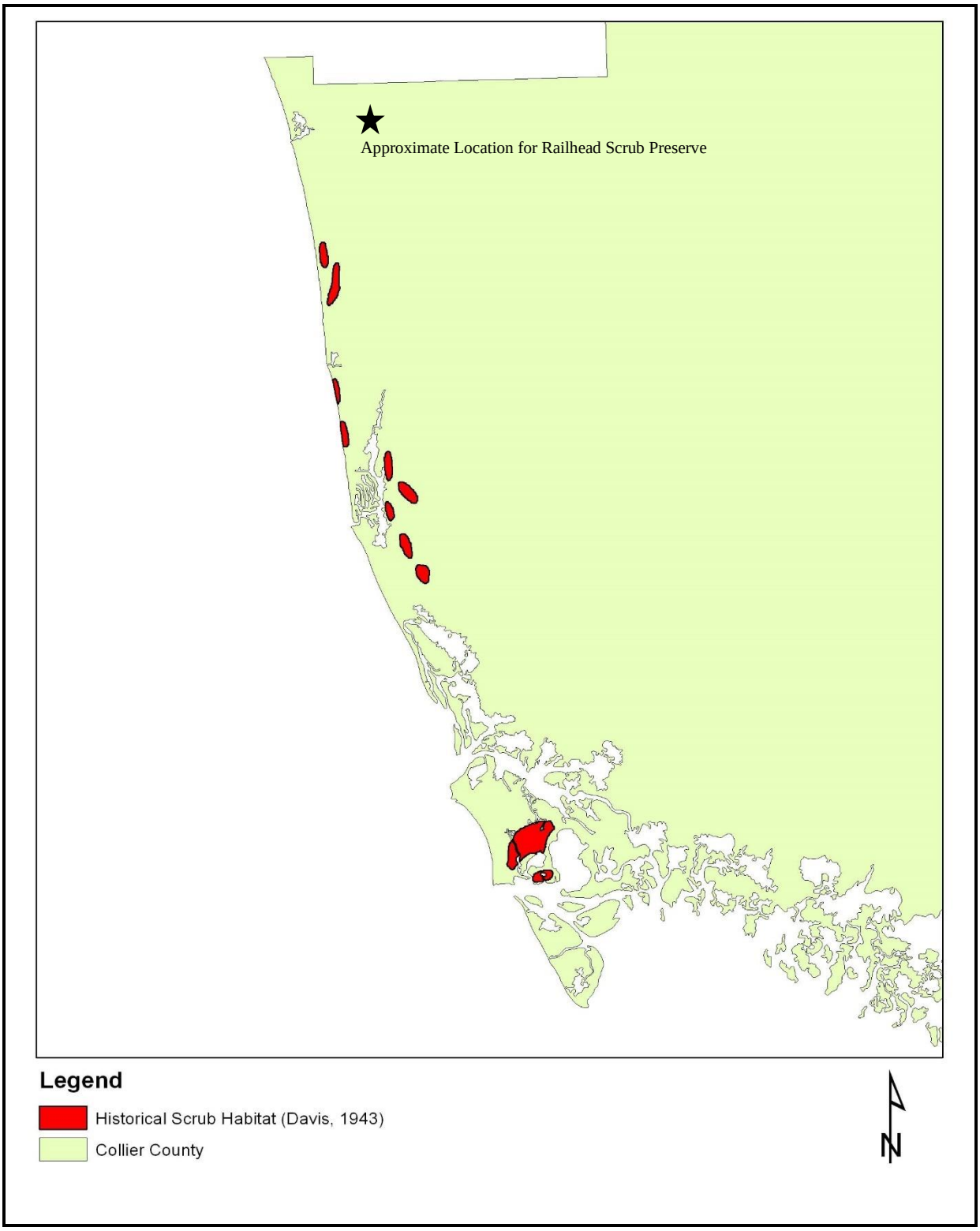

Figure 2: Previous Distribution of Scrub Habitat in Collier County

1.4 Nearby Public Lands and Designated Water Resources

The closest preserve to Railhead Scrub Preserve is Wet Woods Preserve, a 27-acre natural area within the urban boundary of Collier County. Other preserves, in order of increasing distance, are provided in Table 2. Many areas identified as South Florida Water Management District Conservation Easements are very close to Railhead Scrub Preserve. No nearby public lands contain Xeric Uplands (scrub or scrubby flatwoods). The closest preserve that does is Rookery Bay National Estuarine Research Reserve 14 miles away.

Table 2: Public Lands Located near the Railhead Scrub Preserve

Preserve	Distance (miles)	Direction	Type
Wet Woods Preserve	0.69	SW	Conservation Collier
Barefoot Beach Preserve	2.3	W	Collier County
Delnor-Wiggins Pass State Park	2.4	SW	State
Corkscrew Regional Ecosystem Watershed	2.9	E	State
Imperial River Preserve	3.2	E and NE	Lee County
Pine Lake Preserve	3.3	NE	Lee County
Estero Bay State Buffer Preserve	3.7	NW	State
Picayune Strand State Forest	12.7	SE	State
Rookery Bay National Estuarine Research Reserve	14.0	S	State

1.5 Public Involvement

Neighborhood involvement will be supported by meetings with the community organized by the County. Meeting topics may include proposed uses, management actions, progress reports, and implementation of site management activities. Staff will seek to coordinate management actions, such as exotic plant removal and prescribed fire with owners of any adjoining lands.

2.0 Natural and Cultural Resources

This section briefly describes the existing conditions at the Railhead Scrub Preserve. It includes general descriptions of the natural and cultural resources of the preserve giving particular attention to the issues that are relevant for conservation. A general view of the preserve is included in Figure 3.

2.1 Physiography

The Railhead Scrub Preserve lies within the Gulf Coastal Lowlands physiographic province, characterized by low elevations and poor drainage. The landforms that make up these coastal lowlands include coastal and sand dune ridges and relic spits and bars with intervening coast-parallel valleys consisting of poorly drained swampy areas with little recharge. Relic coastal dune ridges are the most prominent geographic feature in the general vicinity of this site.

2.1.1 Topography and Geomorphology

The site is located in the Southwestern Slope region of the South Florida Water Management District. According to the Bonita Springs, Florida USGS 7.5 Minute Topographic Quadrangle, the topography of the area is relatively flat with an average elevation of 15 feet above sea level and slopes gently westward toward the Gulf of Mexico. Surface water percolates directly into the uncovered ground or it collects in natural depressions and manmade ponds on adjacent properties.

2.1.2 Geology

The geology of northern Collier County, where the Railhead Scrub Preserve is located, is characterized by complex sequences of interbedded sands, clays, and limestones. Closest to the surface is the Holocene aged Pamlico Sand Formation, approximately 10 feet thick and composed primarily of unconsolidated quartz sand and some silt. The Pamlico Sand unconformably overlies the Pleistocene aged Fort Thompson and Caloosahatchee Formations, which vary from a few feet to more than 20 feet in thickness and are characterized by shelly and sandy limestones with vugs and solution cavities (Miller, 1986).

Further below are the Ochopee and Buckingham Members of the Pliocene aged Tamiami Formation, which is at least 200 feet thick in the surrounding areas (Oaks and Dunbar, 1974). The Ochopee Limestone unconformably overlies the Buckingham Limestone and/or the equivalent Cape Coral Clay. This unconformity marks the bottom of the surficial aquifer separating it from the brackish underlying aquifer below. Then the Hawthorn Formation, rich in phosphate and other heavy minerals (Scott, 1988), overlies the Oligocene age Suwannee Limestone and Eocene age Ocala Limestone that form the Floridan Aquifer System in Southwestern Florida.

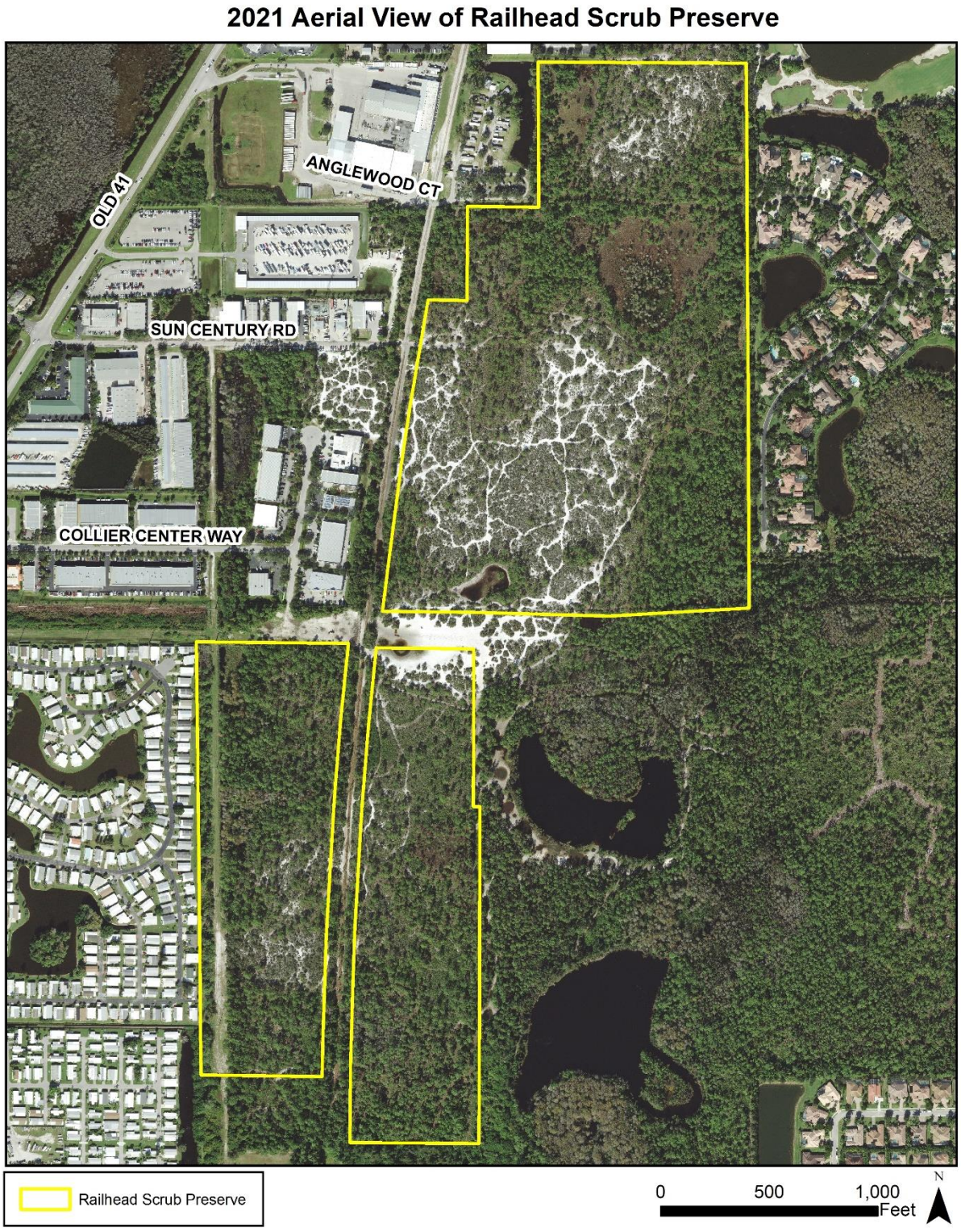

Figure 3: Railhead Scrub Preserve – 2021 Aerial

2.1.3 Soils

According to the Soil Survey of the Collier County Area (Liudahl et al. 1990)., soils mapped at the Railhead Scrub Preserve include (in descending order by extent) Satellite Fine Sand; Basinger Fine Sand; Immokalee Fine Sand; Riviera Fine Sand, Limestone Substratum; Urban Land Holopaw Basinger Complex; and Boca, Riviera, Limestone Substratum and Copeland Fine Sand, Depressional (Figure 4). The areas mapped as Satellite Fine Sand units are situated on low-lying coastal ridges and correspond to the Xeric Uplands ecosystem located at the site. Basinger and Riviera Fine Sands are hydric soils typical of slightly depressional drainage-ways with poorly defined outlets such as flats and sloughs. Areas mapped as Immokalee Fine Sand units are associated with pine flatwoods communities.

2.1.4 Hydrology/Water Management

Near the surface, the aquifer is highly permeable and the groundwater flows toward the west. However, permeability decreases downward from a porous limestone into poorly indurated sandstone cemented by micrite. The aquifer grades from freshwater downward into brackish water due to the proximity of the Gulf of Mexico to the west and the brackish water in the intermediate aquifer made primarily of Miocene aged sediments. Below that, the Hawthorne formation typically marks the upper boundary of the Floridan aquifer, which is contained within the underlying Oligocene age Suwannee Limestone.

Groundwater levels have gone down during the recent decades due to drainage on a regional scale and water management for development purposes. This trend may be very difficult to control and will gradually reduce the extent of the preserve that floods during the summer months and reduce the period of time the preserve wetlands are flooded during the year.

2.2 Climate

The Railhead Scrub Preserve is located in an area of Florida where humid subtropical and tropical savanna climatic patterns overlap, with temperatures moderated by winds from the Gulf of Mexico and the Atlantic Ocean. Sharply delineated wet and dry seasons and average monthly temperatures greater than 64º Fahrenheit characterize a tropical savanna climate. Monthly rainfalls may exceed ten inches during the wet season. On the other hand, humid subtropical climates typically show less extreme rainfall fluctuations between wet and dry seasons and average monthly temperatures is less than 64º Fahrenheit in some months.

The average annual temperature for the coastal portion of Collier County is approximately 75º Fahrenheit. The warmest months are usually July and August. The humidity is high during these months, but frequent afternoon thunderstorms prevent excessively high temperatures.

Two-thirds of the annual rainfall occurs in the wet season from May to October. Thunderstorms are frequent during the wet season occurring every two out of three days between June and September. Rainfall records for the area indicate that there is not significant variation in the annual rainfall throughout much of the county; however, large variations often occur during a single year. The hurricane season extends from June through November with peak activity occurring in September and October when ocean temperatures are highest.

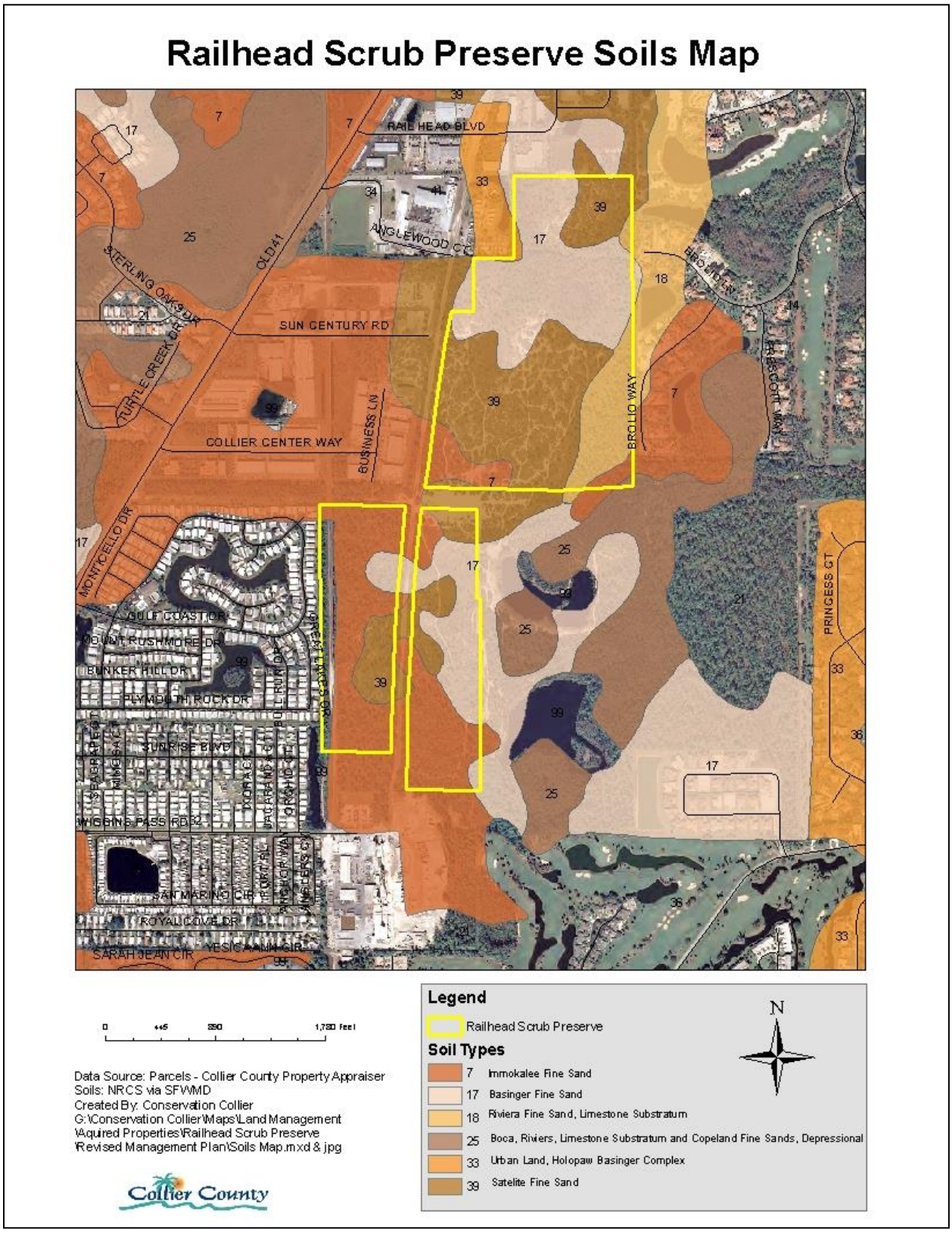

Figure 4: Railhead Scrub Preserve Soils Map

2.3 Natural Communities

Vegetative association types on Railhead Scrub Preserve were delineated by Johnson Engineering, Inc. through on-site field -investigations (transects throughout the property) in 2005 and 2008 and digital aerial photographs (2009).The vegetation assemblages were classified based on the nomenclature of the Florida Land Use Cover and Forms Classification System (FLUCFCS - FDOT 1999) to identify habitats on site. The vegetation was re-classified by Conservation Collier staff in 2015, following several years of invasive, exotic plant management.

Historical aerial photos from 1953, 1962, and 1995 (Figure 5) were geo-referenced and examined to understand historical vegetation types and changes in the last 6 years. Site-specific history and conditions for each community are discussed and a summary of relevant information is included in Table 3. The distribution of these natural communities in the Railhead Scrub Preserve is depicted in Figure 6.

Table 3: Land Use/Vegetative Association (FLUCFCS) within Railhead Scrub Preserve

FLUCFCS Code	Description	Acreage (approx.)	% of Area
321	Saw Palmetto	0.32	.23
411	Pine Flatwoods	62.42	45.39
421	Xeric Oak Scrub	49.23	35.80
512	Ditch	0.63	0.46
514 E2	Swale	0.46	0.33
621	Cypress	7.89	5.73
624	Cypress-Pine-Cabbage Palm	2.25	1.64
625	Hydric Pine	5.75	4.18
643	Wet Prairie	2.84	2.07
721	Bare Sand	3.82	2.78
742	Borrow Pit	0.06	0.04
832	Electrical Power Transmission Line	1.86	1.35
	Total	**137.53**	**100.00**

Descriptions of the land uses and plant communities on the subject property are provided below.

FLUCFCS Code 321: Saw Palmetto
This vegetative community surrounds a small wet prairie in the southwest portion of property. It lacks a canopy and is comprised of dense saw palmetto (*Serenoa repens*). Other groundcover vegetation present includes wiregrass (*Aristida spp*.) and broom sedge (*Andropogon virginicus*). This habitat is infested with exotic and invasive vegetation, specifically downy rose-myrtle (*Rhodomyrtus tomentosa*) and Caesar's weed (*Urena lobata*), which comprise 5-10% of this habitat.

FLUCFCS Code 411: Pine Flatwoods
This upland community is located throughout the property

Pine Flatwoods community in the Railhead Scrub Preserve - Photo by Conservation Collier Staff

Pine Flatwoods occurs in the northeastern corner and south along the eastern edge, embedded in the center of the property, and northwest of the property. Inspection of 1953, 1962, and 1995 aerial photographs (see Figure 5) does not conclusively reveal historical vegetation types in areas now occupied by Pine Flatwoods. Most Pine Flatwoods areas on the site occurred between Xeric Oak Scrub and wetlands (marshes or cypress areas- i.e., occurring on slopes intermediate between xeric and hydric plant communities). Based on current conditions, a saw palmetto dominated flatwoods community, probably with slash pines in the canopy, dominated the slope between uplands and wetlands. Saw palmetto often forms dense stands in such areas, which do not burn frequently because of their proximity to two communities which burn very infrequently. Logging activities before 1952 probably removed most slash pines, leaving only a few scattered seed trees. Pine stumps observed in the Xeric Oak Scrub provide evidence of past logging, even though no logging roads were seen on historical aerials. The Pine Flatwoods in the northwestern portion of the property, surrounded by Xeric Oak Scrub on three sides and a cypress area, which was cleared of melaleuca (*Melaleuca quinquenervia*), is in very good condition. The area seems to have experienced some localized fires, as evidenced by burn scars and the understory conditions, which have kept the height and cover of understory saw palmettos and hardwoods low. The herb layer is diverse and dense.

The plant community in the southeast and central portions of the property is more xeric and scrubby in nature compared to other pine flatwoods on the property. The subcanopy in the more xeric areas is sparse, and where present, comprised of dwarf live oak (*Quercus minima*) rusty lyonia (*Lyonia ferruginea*), and tarflower (Bejaria racemose). Groundcover in the more xeric pine flatwoods of the property consist of saw palmetto and herbaceous/forb areas. The subcanopy of the remainder of the pine flatwoods on the site is more overgrown with dense saw palmetto. Groundcover in the remainder of the pine flatwoods is limited by the extent of saw palmetto.

Exotic vegetation is still present in very low densities throughout the southern portion of the property. The exotic vegetation re-growth is predominantly comprised of downy rose-myrtle. Other exotic vegetation found in this community includes scattered ear leaf acacia (*Acacia auriculiformis*), Brazilian pepper (*Schinus terebinthifolius*), and rosary pea (*Abrusprecatorius*).

FLUCFCS Code 421: Xeric Oak Scrub

At Railhead Scrub Preserve, the Xeric Oak Scrub is intermediate between scrub and Scrubby Flatwoods, as defined by FNAI & FDNR (1990). These two communities are closely related and can be found in association along elevation gradients, with scrub occupying higher elevations. At Railhead Scrub Preserve, the Xeric Oak Scrub does not develop into classic scrub as is found on Florida's high sand ridges, such as the Lake Wales Ridge or the Atlantic Coastal Ridge. The sands at Railhead Scrub Preserve, while well drained, are very close to the water table at the peak of the summer-wet season. Because of this, South Florida slash pine (*Pinus elliottii* var. *densa*) is present at the preserve instead of sand pine (*Pinus clausa*), and some Pine Flatwoods species are present in the herb layer (e.g., *Lachnocaulon anceps*). Some of the higher elevations lack these Pine Flatwoods species, and more closely approach the composition of scrub flora, except for the presence of sand pine. The Xeric Oak Scrub at Railhead Scrub Preserve are typical of ecosystems that have been classified as "scrub" in much of Collier County.

A general view of the existing conditions of the Xeric Oak Scrub community in the Railhead Scrub Preserve - Photo by Conservation Collier Staff

This community is located in the northern, central, and southern portions of the property. The vegetation in all of these areas is similar. The exotic and invasive vegetation in this community is sparsely present (less than 5% coverage).

FLUCFCS Code 514E2: Swale

A view of the swale community at Railhead Scrub Preserve- Photo by Conservation Collier Staff

This FLUCFCS category designates the swale that parallels the west side of the electrical power transmission line at the western extent of the property. Occasional willow (*Salix caroliniana*), saw palmetto, and wax myrtle are present in the canopy and subcanopy. Groundcover is sparse due to the dense canopy of Brazilian pepper that was removed in 2009 by FPL and where present ground cover consists of swamp fern (*Blechnum serrulatum*). Muscadine grapevine is present in dense patches throughout this FLUCFCS category. Guinea grass (*Panicum maximum*), natal grass (*Rhynchelytrum repens*), and castor bean (*Ricinus communis*) continue to be a problem in this area. There are also small amounts of Brazilian pepper regrowth and some air potato (*Dioscorea bulbifera)*.

FLUCFCS Code 621: Cypress

A view of the Cypress community at Railhead Scrub Preserve- Photo by Conservation Collier Staff

This community is composed primarily of cypress, which is dominant in the canopy and is present in both the north and south portions of the property. A cypress dome in the center of the northern portion of the property was once heavily disturbed. Inspection of 1952 and 1962 aerials show that the dome was historically about 0.9 acres. It was ringed with depression marsh and probably a fringe of saw palmetto against Xeric Uplands. This dome was dominated by a dense canopy and understory of melaleuca. The melaleuca invasion probably occurred as the result of drainage and fire suppression. The melaleuca was cleared using a Brontosaurus clearing machine in May/June 2007. Grazing, once common in such habitats in Collier County, may have also occurred here. Many native groundcover species have recruited back into this habitat since the mowing of the melalueca. The dome is too small to be attractive for logging operations and no evidence of past logging was observed.

In the southwestern portion of the property, dahoon holly, willow, cabbage palm, and wax myrtle occur in the subcanopy. Ground cover species include swamp fern, shield fern (*Thelypteris spp.*), blue flag iris (*Iris virginica*), broom sedge, maidencane (*Panicum hemitomon*), chalky bluestem (*Andropogon capillipes*), marsh fleabane (*Pluchea rosea*), wax myrtle, and downy rose-myrtle. Exotic vegetation in this habitat is being maintained at low levels and includes melaleuca, Brazilian pepper, downy rose-myrtle, and old-world climbing fern.

FLUCFCS Code 624: Cypress-Pine-Cabbage Palm

This community is comprised of a mix of cypress, pine, and cabbage palm in the canopy (in which none of the species achieve dominance). Vegetation in the subcanopy and groundcover is similar to that found in the cypress community. In the northern portion of the property, the southeastern corner had dense stands of melaleuca which were treated in place in 2007.

A view of the Hydric Pine community at Railhead Scrub Preserve- Photo by

FLUCFCS Code 625: Hydric Pine

These areas are located in the southeastern portion of the property and are dominated by a slash pine canopy. The subcanopy is predominantly comprised of myrsine and wax myrtle. Groundcover species include wiregrass, yellow-eyed grass, broom sedge, swamp fern, umbrella grass (*Fuirena scirpoidea*), pineland heliotrope (*Heliotropium polyphyllum*), torpedo grass (*Panicum repens*), big carpet grass (*Axonopus furcatus*), semaphore thoroughwort (*Eupatorium mikanioides*), marsh thoroughwort (*Eupatorium leptophyllum*), finger grass (*Eustachys glauca*), smooth buttonweed (*Spermacoce assurgens*), lacy bracken fern (*Pteridium aquilinum*), beakrush (*Rhynchospora microcarpa*), florida tickseed (*Coreopsis floridana*), bog-buttons (*Lachnocaulon spp*.), panic grass (*Panicum dichotomiflorum Michx*.), and blue maidencane (*Amphicarpum muhlenbergianum***).**

FLUCFCS Code 643: Wet Prairie

Views of the pond area during dry and wet seasons showing the effect that ORV have had over vegetation. Photos by Conservation Collier

Large depression marshes formerly occurred at the northwest portion of the property, as well as surrounding the cypress dome. Thick melaleuca that once dominated the marsh in the northwest corner and the marsh surrounding the cypress dome was cleared using a Brontosaurus clearing machine in May/June 2007. Several, mostly very small (<0.1 acre) depression marshes are the only ones with native plant species, including marsh fern (*Blechnum serrulatum*), bloodroot (*Lachnanthes caroliana*), giant whitetop (*Rhynchospora latifolia*), and Virginia chain fern *(Woodwardia virginica).* The 1952 aerial photography of the property shows that the depression marsh in the center of the property, was connected hydrologically to the west, probably only during peak summer water levels, to a large marsh which ended at the southwest corner of the site. The marsh along the south edge of the northern portion that was used for many years by off road vehicle riders was almost completely devoid of vegetation. In 2011, funds from the USFWS Partners for Fish and Wildlife Program were used to plant the marsh with native vegetation.

In the southern portion of the property, this vegetative community includes two isolated wet prairie areas located in the southwestern section of the site. They lack a canopy or subcanopy. Groundcover is comprised of broom sedge, blue maidencane, and yellow-eyed grass.

FLUCFCS Code 721: Bare Sand

The area of Bare Sand between Railhead Scrub Preserve Parcels. Photo by Conservation Collier staff.

This area is located at the center of the property and borders the proposed future road (Veterans Memorial Boulevard). It is at a higher elevation than the rest of the site and is comprised of unvegetated sand dunes. Inspection of 1953 aerials indicates that this area was once vegetated. Vegetative cover most likely resembled Xeric Oak Scrub. When the southern fence was installed in 2010, the northern fence line was located south of the property line, so that trespassers could still access the area east of Railhead without cutting the fence. In 2014 the northern boundary of the southern fence was moved north to the property line, in an attempt to assist the Collier County Sheriff's Office with trespass. The bare sand is now enclosed within a fence. The area will be monitored for native recruitment.

FLUCFCS Code 742: Borrow Pit 0.06

This feature is located in a depressional area at the northeastern extent of the property. It is at a much lower elevation than the surrounding sand dune areas and holds water during the wet season. It is unvegetated.

FLUCFCS Code 832: Electrical Power Transmission Line

This land use is along the western edge of the property. It has been cleared of canopy and subcanopy vegetation to accommodate an electrical power transmission line. Groundcover

vegetation includes bahia grass (*Paspalum notatum*), torpedo grass, natal grass, Caesar weed, beggar-ticks (*Bidens alba*), and creeping oxeye (*Wedelia trilobata*). Vines include love vine (*Cassytha filiformis)* and morning glory (*Qpomoea indica*).

Railhead Scrub Preserve 1953 aerial

Source: Parcels - Collier County Property Appraiser
1953 aerial - USDA via University of Florida
G:Conservation Collier/maps/acquired properties/Railhead Scrub/
land management/Revised Management Plan/1953.mxd
9/1/09

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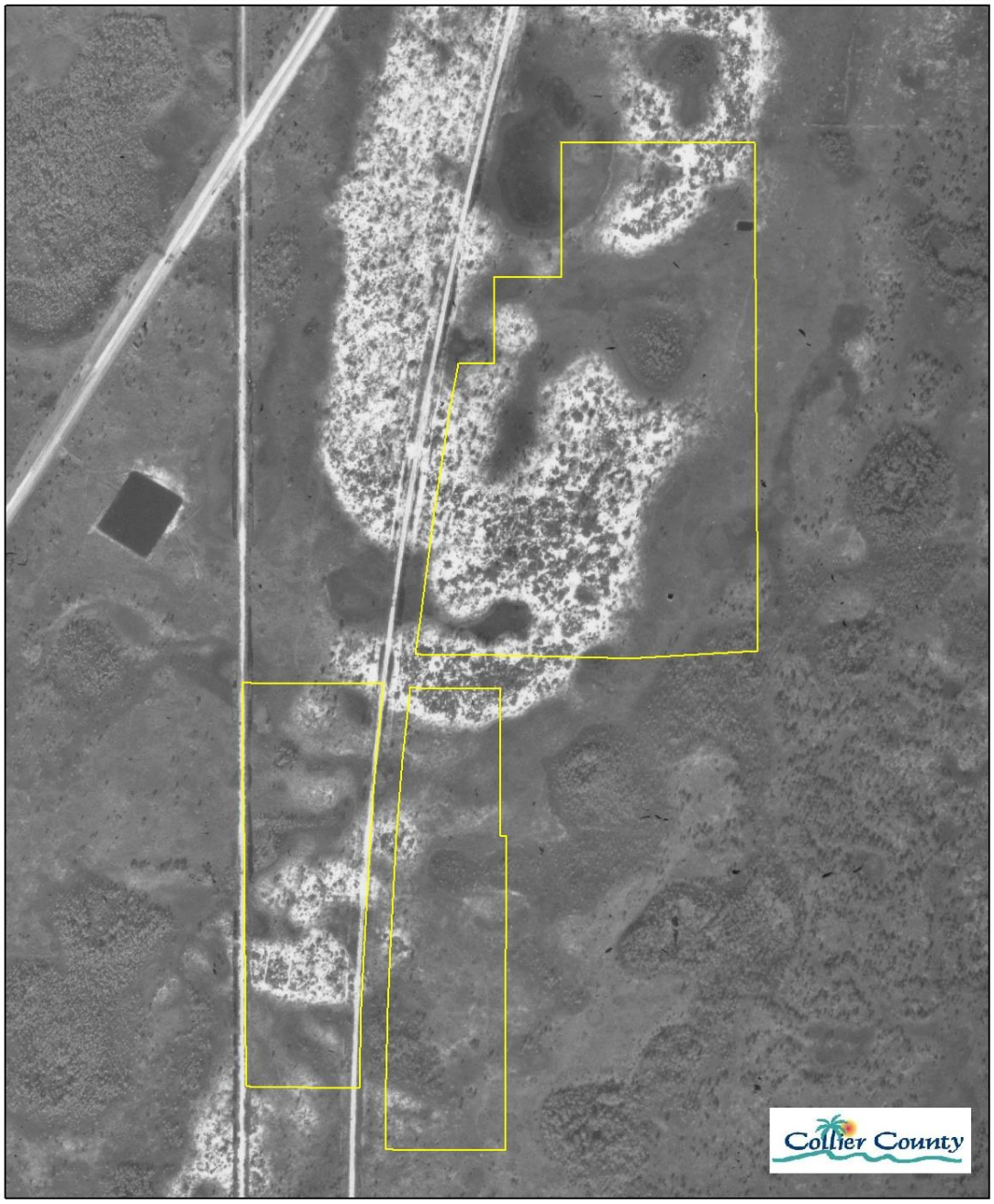
Railhead Scrub Preserve 1962 aerial



Source: Parcels - Collier County Property Appraiser
1962 aerial - USDA via University of Florida
G:Conservation Collier/maps/acquired properties/Railhead Scrub/land management/Revised Management Plan/1962.mxd
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0 320 640 Feet

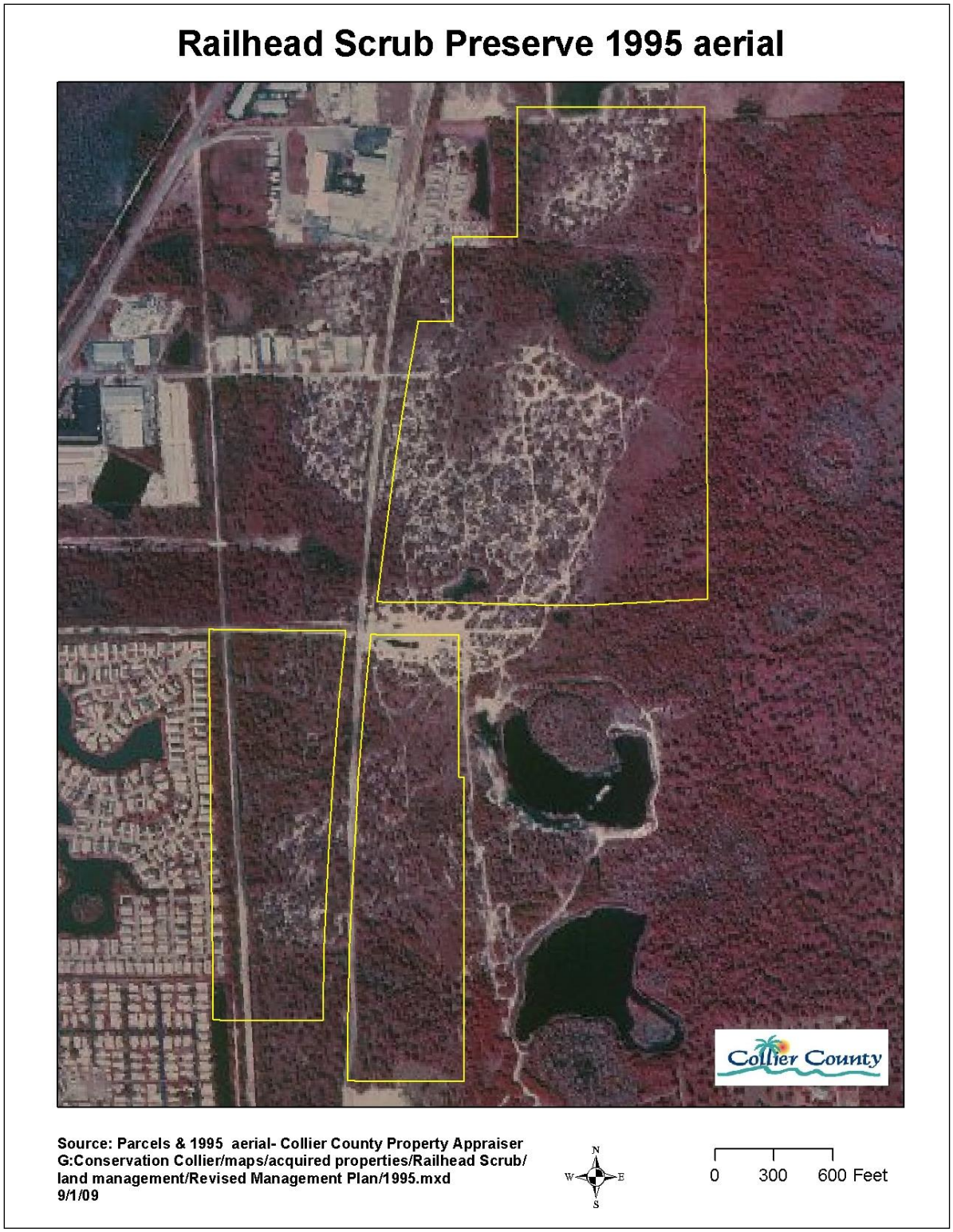

Figure 5: Historical Aerial Photographs

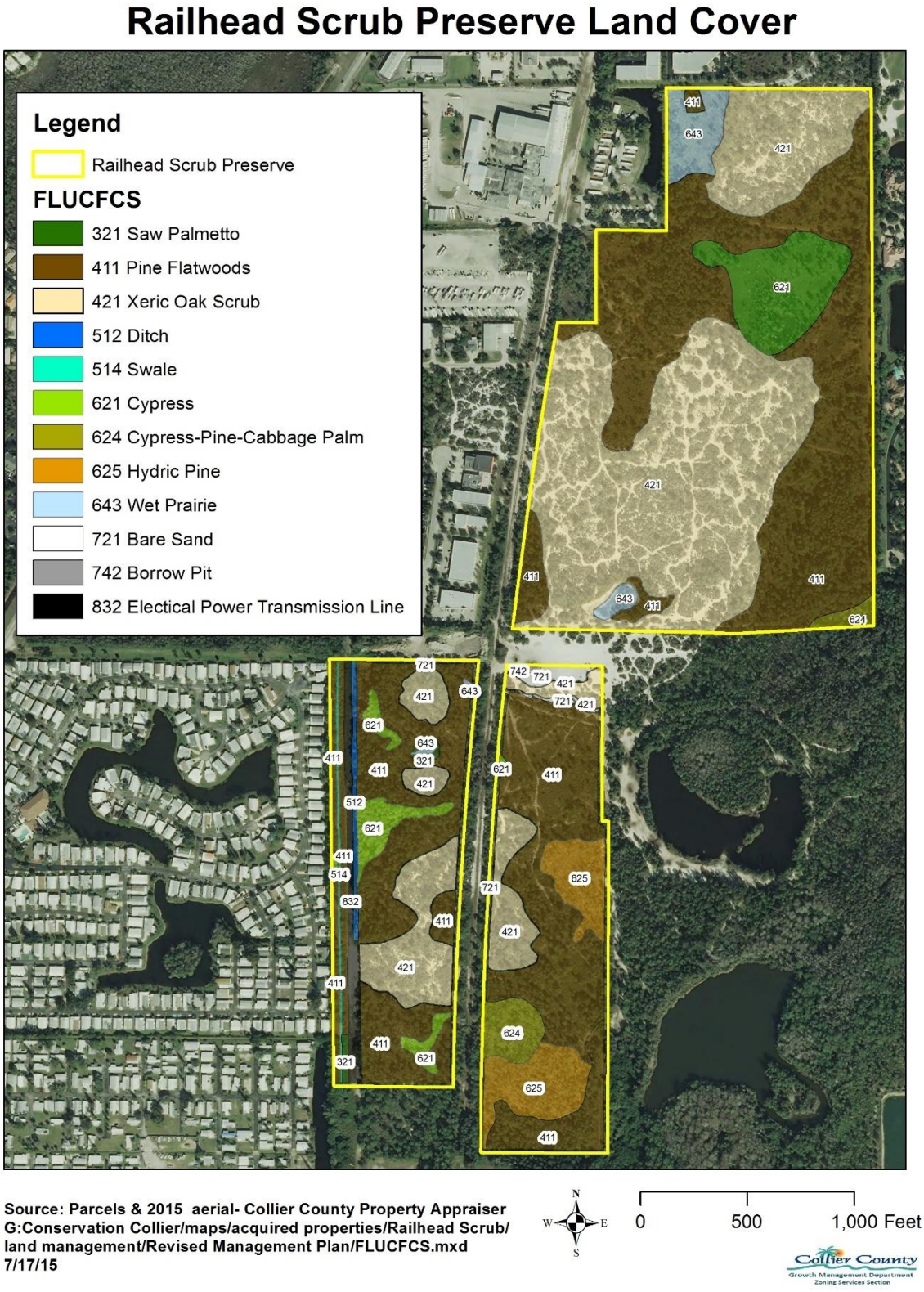

Figure 6: Railhead Scrub Preserve Land Cover

2.4 Native Plant and Animal Species

The approximate 135-acre Railhead Scrub Preserve with its large area of Xeric Uplands dominated by xeric oaks and saw-palmetto that, along with pine flatwoods communities, wetland communities cleared of melaleuca, seasonal ponds, and small areas of herbaceous wetland, provides habitat for resident and migratory species of animals that typically use such plant communities.

Four hundred nine (497) plant species have been recorded at Railhead Scrub Preserve (Appendix 2). Data has been collected by Maureen Bonness in November 2020 with assistance from Jean McCollom and Michael J. Barry, Bradley in 2006 (one spring and one summer visit) and 2007 and by Jim Burch in 1990, 1991, and 1994. Of these 497 species, 385 (77.4%) are native to the site and 112 are exotic (22.5%). 6 species are considered Imperiled or very rare/restricted according to Florida Natural Areas Inventory (FNAI) while 13 species are considered state endangered or threatened.

Railhead Scrub Preserve supports a significant population of upland dependent wildlife species. Wildlife sightings include observations by Conservation Collier staff, remote camera studies, and data collected through partnership with Florida Gulf Coast University (FGCU) research students and faculty. Wildlife species noted utilizing the preserve are listed in Table 4:

Table 4: Wildlife Species Observed Utilizing Railhead Scrub Preserve

Mammals		**Designation**
bobcat	*Lynx rufus*	
Eastern cottontail	*Sylvilagus floridanus*	
Eastern gray squirrel	*Sciurus carolinensis*	
Eastern mole	*Scalopus aquaticus*	
Florida black bear	*Ursus americanus floridanus*	
gray fox	*Urocyon cinereoargenteus*	
hispid cotton rat	*Sigmodon hispidus*	
marsh rabbit	*Sylvilagus palustris*	
nine-banded armadillo	*Dasypus novemcinctus*	
raccoon	*Procyon lotor*	
Virginia opossum	*Didelphis virginiana*	
white-tailed deer	*Odocoileus virginianus*	
Reptiles		
black racer	*Coluber constrictor*	
brown anole	*Anolis sagrei*	*non-native
common five-lined skink	*Plestiodon fasciatus*	
corn snake	*Pantherophis guttatus*	
Eastern coachwhip	*Masticophis flagellum*	
Eastern diamondback rattlesnake	*Crotalus adamanteus*	
Eastern ratsnake	*Pantherophis alleghaniensis*	
Florida box turtle	*Terrapene carolina*	
Florida gopher tortoise	*Gopherus polyphemus*	*State-threatened
Florida red-bellied cooter	*Pseudemys nelsoni*	

Florida softshell turtle	*Apalone ferox*	
six-lined racerunner	*Aspidoscelis sexlineatus*	
Amphibians		
cane toad	*Rhinella marina*	*non-native
Cuban treefrog	*Osteopilus septentrionalis*	*non-native
greenhouse treefrog	*Eleutherodactylus planirostris*	*non-native
oak toad	*Anaxyrus quercicus*	
pinewoods treefrog	*Hyla femoralis*	
Southern toad	*Anaxyrus terrestris*	
squirrel treefrog	*Hyla squirrella*	

Observations of wildlife tracks and remote camera photos indicate wildlife species move regularly between the three separately fenced parcels of the preserve, crossing private property and field fencing along the way. Tracks are routinely observed of Florida black bear with cubs as well as adult bobcats with kittens travelling through the preserve, as well as photos collected of new white-tailed deer fawns indicating these species likely use the preserve or immediate surrounding area for denning and\or raising young. Florida gopher tortoise tracks observed between the North and South units of the preserve indicate preserve tortoises use seasonal burrows throughout the separately fenced units and travel beneath the fencing to reach them.

Remote camera wildlife observations at Railhead Scrub Preserve. Photos by FStop Foundation and Conservation Collier staff.

Track observations throughout the three preserve parcels indicate frequent wildlife movement between parcels and through private property separating them. Photos by Conservation Collier staff.

Bird species observed perching, foraging, or exhibiting nesting behavior at the preserve include the northern mockingbird (*Mimus polyglottos*), brown thrasher (*Toxostoma rufum*), eastern towhee (*Pipilo erythrophthalmus*), northern cardinal (*Cardinalis cardinalis*), boat-tailed grackle (*Quiscalus major*), blue jay (*Cyanocitta cristata*), pine warbler (*Dendroica pinus*), blue-gray gnatcatcher (*Polioptila caerulea*), great crested flycatcher (*Myiarchus crinitus*) red-bellied woodpecker (*Melanerpes carolinus*), common nighthawk (*Chordeiles minor*), mourning dove (*Zenaida macroura*), common ground dove (*Columbina passerina*), eastern bluebird (*Sialia sialis*), wild turkey (*Meleagris gallopavo)*, belted kingfisher (*Ceryle alcyon*), Cooper's hawk (*Accipiter cooperii*), red-shouldered hawk (*Buteo lineatus*), and great egret (*Ardea alba*). In addition, several bird species were observed flying over the preserve but were not observed utilizing the habitats within the preserve, including red-winged blackbirds (*Agelaius phoeniceus*), fulvous whistling-ducks (*Dendrocygna bicolor*), mottled ducks (*Anas fulvigula*), great blue herons (*Ardea herodias*), tricolor herons (*Egretta tricolor*), and white ibis (*Eudocimus albus*).

Bird observations by staff from the Collier County Environmental Services Department were conducted in 2004 and 2006 and 2018. The lists for each campaign are included in Appendix 3 As many as 19 species are probable breeders at the Railhead Scrub Preserve site.

Table 5. Bird Species Observed at Railhead Scrub Preserve			
Common Name	***Scientific Name***	**Common Name**	***Scientific Name***
American crow	*Corvus brachyrhynchos*	house sparrow	*Passer domesticus*
American kestrel	*Falco sparverius*	house wren	*Troglodytes aedon*
barn swallow	*Hirundo rustica*	killdeer	*Charadrius vociferus*
belted kingfisher	*Megaceryle alcyon*	laughing gull	*Leucophaeus atricilla*
black vulture	*Coragyps atratus*	Least bittern	*Ixobrychus exilis*
black-bellied whistling duck	*Dendrocygna autumnalis*	Least Tern	*Sternula antillarum*
black-whiskered vireo	*Vireo altiloquus*	Limpkin	*Aramus guarauna*
blue jay	*Cyanocitta cristata*	little blue heron	*Egretta caerulea*
blue-gray gnatcatcher	*Polioptilia caerulea*	loggerhead shrike	*Lanius ludovicianus*
boat-tailed grackle	*Quiscalus major*	mottled duck	*Anas fulvigula*
broad-winged hawk	*Buteo platypterus*	mourning dove	*Zenaida macroura*
brown thrasher	*Toxostoma rufum*	muscovy duck	*Cairina moschata*
carolina wren	*Thryothorus ludovicianus*	Northern cardinal	*Cardinalis*
cattle egret	*Bubulcus ibis*	Northern flicker	*Colaptes auratus*
chimney swift	*Chaetura pelagica*	Northern mockingbird	*Mimus polyglottos*
chuck-will's-widow	*Caprimulgus carolinensis*	Northern parula	*Setophaga americana*
common grackle	*Quiscalus quiscula*	osprey	*Pandion haliaetus*
common ground dove	*Columbina passerina*	palm warbler	*Setophaga palmarum*
common moorhen	*Gallinula chloropus*	pileated woodpecker	*Dryocopus pileatus*
common nighthawk	*Chordeiles minor*	pine warbler	*Setophaga pinus*
common yellowthroat	*Geothlypis trichas*	prairie warbler	*Setophaga discolor*
cooper's hawk	*Accipiter cooperii*	purple martin	*Progne subis*
double-crested cormorant	*Phalacrocorax auritus*	red-bellied woodpecker	*Melanerpes carolinus*
downy woodpecker	*Picoides pubescens*	red-shouldered hawk	*Buteo lineatus*
Eastern bluebird	*Sialia sialis*	red-tailed hawk	*Buteo jamaicensis*
Eastern phoebe	*Sayornis phoebe*	red-winged blackbird	*Agelaius phoeniceus*

Eastern screech owl	*Megascops asio*	roseate spoonbill	*Platalea ajaja*
Eastern towhee	*Pipilo erythrophthalmus*	sharp-shinned hawk	*Accipiter striatus*
Eurasian collared-dove	*Streptopelia decaocto*	Southern bald eagle	*Haliaeetus leucocephalus*
European starling	*Sturnus vulgaris*	swallow-tailed kite	*Elanoides forficatus*
fish crow	*Corvus ossifragus*	tricolored heron	*Egretta tricolor*
glossy ibis	*Plegadis falcinellus*	tufted titmouse	*Baeolophis bicolor*
gray catbird	*Dumetella carolinensis*	turkey vulture	*Cathartes aura*
great blue heron	*Ardea herodias*	white ibis	*Eudocimus albus*
great crested flycatcher	*Myiarchus crinitus*	white-eyed vireo	*Vireo griseus*
great egret	*Ardea alba*	wood stork	*Mycteria americana*
green heron	*Butorides virescens*	yellow-bellied sapsucker	*Sphyrapicus varius*
hairy woodpecker	*Leuconotopicus villosus*		

Invertebrates observed on-site include two butterfly species: the Gulf fritillary (*Agraulis vanillae*) and white peacock (*Anartia jatrophae*). An additional two butterfly species were identified at the preserve in September 2006: the cloudless sulphur (*Phoebis sennae*) and the soldier (*Danaus eresimus*). Florida harvester ants (*Pogonomyrmex badius*) were common in the Scrubby Flatwoods habitat at the preserve. Cicadas (Cicadidae) were prevalent in the Scrubby Flatwoods habitats at the preserve. Tiger Beetles (*Cicindela trifasciata*), Ant lion (*Myrmeleontidae*) funnels and evidence of mole crickets (*Scapteriscus* spp.) in the form meandering raised ridges in the sand were prevalent in Scrubby Flatwoods habitat. Arachnids observed include the black-and-yellow garden spider (*Argiope aurantia*) and an unidentified crab spider (*Thomisidae*).

Other wildlife species that have not been recorded undoubtedly occur at the Railhead Scrub Preserve. During the migration periods, transient bird species would be expected to utilize this area for short periods of time. The developed character of the adjacent areas may inhibit transient use by many mammal, reptile, and amphibian species limiting the utilization of the preserve to resident individuals or inhibit the dispersal of many species to and from the preserve.

2.5 Listed Species

Official listings of rare and endangered species are produced at the federal level by the U.S. Fish and Wildlife Service and the National Marine Fisheries Service, and at the state level by the Florida Fish and Wildlife Conservation Commission and the Florida Department of Agriculture and Consumer Services. FNAI produces a list of rare and endangered species and maintains a database of occurrences of these species in Florida. The Institute for Regional Conservation (IRC) also ranks native plant species by conservation status in the 10-county area of South Florida.

Ophioglossum nudicaule, a rare fern observed during fieldwork for this plan at the Railhead Scrub Preserve. Photo by Keith Bradley

2.5.1 Listed Plant Species

There are 12 plant species at Railhead Scrub Preserve that are listed by the Florida Department of Agriculture and Consumer Services (FDACS), five (5) as Endangered, six (6) as Threatened, and one (1) as Commercially Exploited. The Florida Natural Areas Inventory (FNAI) lists five (5) species as Imperiled to Critically Imperiled in Florida. The Institute for Regional Conservation (IRC) lists four (4) species as Critically Imperiled in South Florida (Gann et al., 2002). There are no species listed as Endangered or Threatened by the U.S. Fish and Wildlife Service. In total there are fifteen (15) plants at Railhead Scrub Preserve that are listed by at least one of these groups (Table 5).

One other listed plant that was reported for Railhead Scrub Preserve in the 2004 Interim Management Plan is fuzzy wuzzy airplant (*Tillandsia pruinosa*). The photo taken of this plant is a related, but common species, potbelly airplant (*Tillandsia paucifolia*). Fuzzy wuzzy airplant has not been confirmed to occur on the site and is unlikely to be found there because its preferred habitat, strand swamp, does not exist on the property. Wild coco (*Eulophia alta*) was also reported as a listed species in the 2004 Interim Management Plan. This species is present on the site but is not listed as rare by any agency or organization – it is widespread and frequent in peninsular Florida. Jim Burch reported two additional species of rare plants, *Polygala polygama*, and *Digitaria filiformis* var. *dolichophylla*, which were not confirmed by the URS Team during the site visits.

Some of the listed plant species are actually not particularly rare in Florida or in Collier County. The four *Tillandsia* species on the site, for example, are listed mainly because of the threat of infestation from an introduced weevil, the Mexican bromeliad weevil (*Metamasius callizona*). They are still quite common to abundant in most of South Florida. Each of the thirteen listed plant species is briefly described below.

Table 6: Listed Plant Species at Railhead Scrub Preserve

Scientific Name	Common Names	IRC	State	FNAI
Asclepias curtissii	Curtiss' milkweed		E	S3
Chamaesyce cumulicola	Sand-dune spurge; Coastal dune sandmat		E	S2
Encyclia tampensis	Florida butterfly orchid		C	
Lechea cernua	Nodding pinweed		T	S3

Lilium catesbaei	Cateby's lily		T	
Lipocarpha maculata	American halfchaff sedge	SF1		
Ophioglossum nudicaule	Slender adder's tongue	SF1		
Orthochilus ecristatus	Giant orchid, non-crested Eulophia		T	S2
Scleria ciliata var. *curtissii*	Curtiss' nutrush	SF1		
Stylisma abdita	Showy dawnflower	SF1	E	S2S3
Swietenia mahagoni	West Indian mahogany		T	S3
Tillandsia balbisiana	Reflexed wild-pine, Northern needleleaf		T	
Tillandsia fasciculata var. *densispica*	Stiff-leaved wild-pine, Cardinal airplant		E	
Tillandsia flexuosa	Banded wild-pine, Twisted airplant		T	S3
Tillandsia utriculata	Giant wild-pine, Giant airplant		E	

E: Endangered, **T:** Threatened, **C:** Commercially Exploited, **SF1:** Critically Imperiled, **S2:** Critically Imperiled, **S3:** Imperiled

Curtiss' Milkweed *(Asclepias curtissii)*

This herb is endemic to peninsular Florida where it has been reported from 21 counties (Wunderlin and Hansen, 2006). It is apparently extremely rare in Collier County where it has only been reported from two preserves - Railhead Scrub Preserve and Rookery Bay National Estuarine Research Reserve (IRC, 2006). Jim Burch recorded this species at this site in Xeric Uplands in the early 1990s. It was recorded very rarely in Xeric Uplands on the site by Bradley. Several specimens have been observed seeding on the preserve more recently by researcher Kara Driscoll in 2019, 2020, and 2021.

Sand-dune spurge (*Euphorbia cumilicola)*

This herb is endemic to Florida where it has been reported from 12 counties (Wunderlin and Hansen, 2006). In Collier County it has only been recorded from two preserves, Railhead Scrub Preserve and Rookery Bay National Estuarine Research Reserve (IRC, 2006). It has also been recorded in the past from Marco Island and Horrs Island, but may no longer exist in those places due to habitat destruction. In southwest Florida it has also been recorded from Cayo Costa State Park in Lee County. Jim Burch recorded this species at Railhead in Xeric Uplands in the early 1990s. Additional observations have been made during plant surveys in 2006, 2009, and 2020.

Florida butterfly orchid (*Encyclia tampensis*)

This epiphytic orchid is common throughout peninsular Florida. It is endemic to Florida where it has been recorded in 32 counties. It has been found at most preserves in Collier and Lee counties. It is listed as Commercially Exploited by the State of Florida because poachers frequently collect it for its showy flowers. At Railhead Scrub Preserve, it occurs in both Xeric Uplands and in the cypress dome. In Xeric Uplands, sparse populations exist on some larger scrub oaks, especially sand live oak. In the cypress dome it was found to be rare on melaleuca (*Melaleuca quinquenervia*). A survey of all the melaleuca prior to the clearing located six butterfly orchids. The melaleuca limbs on which these orchids were rooted were cut and affixed to a cypress tree that was flagged with pink tape. Observation of this species on the preserve were made in 2006, 2009, and 2020 plant surveys.

Nodding pinweed (*Lechea cernua*)

This subshrub is endemic to peninsular Florida. It has been recorded in 18 counties (Wunderlin and Hansen, 2006), where it has declined due to development of scrub and Xeric Uplands other than Railhead Scrub Preserve. It has been recorded from a number of sites in Collier County, but only two preserves, Rookery Bay National Estuarine Research Reserve and Delnor-Wiggins State Park (IRC, 2006). While it was formerly known from Lee County, no populations are now known to exist there in preserves (it may still persist for now on private lands). This species is common in Xeric Uplands at Railhead Scrub Preserve.

Catesby's Lily (*Lilium catesbaei*)
This herb is endemic to the U.S. southeastern coastal plain and is found nearly throughout Florida (Wunderlin and Hansen, 2006). It has been recorded in 50 counties (Wunderlin and Hansen, 2006). In Collier County it has only been found at Railhead Scrub Preserve, Big Cypress National Preserve, Collier Seminole State Park, Florida Panther National Wildlife Refuge, and Picayune Strand State Forest. It was found at the preserve by Alexandra Sulecki in October 2006 in Mesic Flatwoods.

American halfchaff sedge (*Cyperus neotropicalis*)
This small sedge is widespread in the eastern United States but is Critically Imperiled in South Florida (Gann et al., 2002). It has been recorded in 41 counties nearly throughout Florida, but only in 3 counties in South Florida – Collier, Lee, and Hendry. At Railhead Scrub Preserve, Bradley observed it in disturbed ground on the edge of a trail in 2006.

Slender adder's tongue (*Ophioglossum nudicaule*)
This small terrestrial fern is known from the southeastern United States to South America and the old world. It is Critically Imperiled in southern Florida (Gann et al., 2002). It has been recorded from 23 counties nearly throughout in Florida (Wunderlin & Hansen, 2006). Prior to the discovery at Railhead Scrub Preserve by Bradley in 2006, it was previously extant in South Florida only at one site in Palm Beach County (Gann et al., 2002). It has never before been seen in Collier County. At Railhead Scrub Preserve it was found along the edges of a sandy trail next to disturbed flatwoods.

Curtiss' nutrush (*Scleria ciliata* var. *curtissii*)
This sedge is known from Florida, Georgia, and Cuba. In Florida, it has been found in only four counties, three of them in South Florida (Gann et al., 2002) and is considered Critically Imperiled. In Collier County it was formerly reported only from Marco Island where it was collected in 1966 and 1968. It was observed at Railhead Scrub Preserve in Mesic Flatwoods in the center of the site by Bradley in 2006.

Showy dawnflower (*Stylisma abdita*)
This tiny herb is endemic to peninsular Florida. It has been recorded in 10 counties (Wunderlin & Hansen, 2006). It has been recorded in a number of scrub fragments in Collier and Lee counties in the past, but may only remain at a few in Collier because of development. All populations in Lee County have probably been destroyed. It is known to be present in two preserves in Southwest Florida, Railhead Scrub Preserve and Rookery Bay National Estuarine Research Reserve. It is otherwise absent from South Florida, with the closest populations in Highlands County (Gann et al., 2002, Wunderlin & Hansen, 2006). This herb is rare in Xeric Uplands at Railhead Scrub

Preserve. It is known to be present in both the northern and southern portions of the site. Railhead Scrub Preserve is extremely important to the long-term existence of this species in South Florida.

***Tillandsia* spp.**
Four species of wild pines have been found at Railhead Scrub Preserve, *T. balbisiana, T. fasciculata* var. *densispica, T. flexuosa,* and *T. utriculata*. All of these species except *T. flexuosa* are abundant throughout southern Florida. *T. flexuosa* is less common, but still frequent, especially in coastal habitats. They are threatened by the introduced Mexican bromeliad weevil. *T. flexuosa* was recorded at Railhead Scrub Preserve by Jim Burch in the early 1990s, but has not been found by Bradley. The other three species, frequent at Railhead, often form dense colonies in larger sand live oaks in Xeric Uplands. Both *T. balbisiana* and *T. fasciculata* var. *densispica* were also found to be rare in cypress dome.

Additional rare plant species may be found at Railhead Scrub Preserve following further field surveys. Confirmation of rare plant identifications should be made by a qualified botanist.

2.5.2 Listed Animal Species

The Florida Natural Areas Inventory (FNAI) maintains a database of occurrences of rare, threatened, and endangered species in Florida. Within the Railhead Scrub Preserve, FNAI has documented the occurrence of the gopher tortoise (Appendix 4, FNAI Managed Area Tracking Record and Element Occurrence Summary). In addition, the FNAI database report indicated two other listed species that have the potential to occur at the preserve based on the known or predicted range of the species. They are the eastern indigo snake (*Drymarchon couperi*) and the gopher frog (*Rana capito*). The xeric upland communities at the site provide habitat for all three species. A brief description of these species and their status is included in the following paragraphs.

Gopher tortoise (*Gopherus polyphemus*)
This medium-sized native land turtle is listed by the State as a Threatened. Gopher tortoises are typically found in dry upland habitats including scrub, xeric oak hammock, sandhills, and dry pine flatwoods. Burrows are excavated for protection from weather, fire, and predators; they also provide refugia for more than 300 other species of animals that have been recorded in them. More than half of the Railhead Scrub Preserve, primarily the Xeric Uplands community, provides habitat for the gopher tortoise.

Gopher Tortoise (Gopherus polyphemus)
Photo by Molly DuVall

A gopher tortoise burrow survey was conducted within the northern portion of the preserve (Johnson Engineering, 2005) in November and December 2005, and within the southern portion of the preserve in February and March 2008. According to the reports, the northern portion of the preserve had a total of 85 active, 139 inactive, and 43 abandoned gopher tortoise burrows. The southern portion of the preserve had a total of 89 active, 40 inactive, and 27 abandoned gopher tortoise burrows. Calculations based on the number of active and inactive burrows identified and the acreage of the preserve indicated that 172 gopher tortoises occupied the property at a density of approximately 2.5 tortoises per acre in the northern portion of the preserve. Calculations based

on the number of active and inactive burrows identified and the acreage of the preserve indicated that 165 gopher tortoises occupied the property at a density of approximately 2.17 tortoises per acre in the southern portion of the preserve. Track observations and radio-telemetry studies by FGCU researchers indicate there is regular movement and genetic flow occurring between tortoises in the north and south portions of the property. In recent years, staff have observed several juvenile tortoises within and surrounding the preserve area indicating reproduction and recruitment is occurring within this population. The density of gopher tortoises within an off-site recipient area can be no greater than two times the number of acres of suitable tortoise habitat, or two tortoises per acre, according to FWC. The Railhead Scrub Preserve tortoise population currently exceeds the carrying capacity for off-site recipient areas. Current threats to the tortoise population include the illegal ORV activity that has taken place at the site during the recent past and potential poaching for pets or consumption.

Eastern indigo snake (*Drymarchon couperi*)

This large, Federally and State-listed Threatened snake inhabits a broad range of habitats but requires very large tracts of appropriate natural habitat unfragmented by roads to support viable populations. Although it was not directly observed on the preserve, it may occur at the site based on its range and habitat preferences (i.e., the close association with gopher tortoise burrows). If this species occurs in the preserve, it is not likely that it can maintain a viable population due to the relatively small area of natural habitat available within an area surrounded by development that is relatively isolated from other natural habitats

From: Florida Cooperative Extension Service, Institute of Food and Agricultural Sciences, University of Florida. http://edis.ifas.ufl.edu/UW063

Gopher frog (*Rana capito*)

This amphibian is listed by the State as a Species of Special Concern. The gopher frog is a chunky medium-sized, boldly spotted frog that normally inhabits gopher tortoise burrows in dry sandy uplands that are within one mile of ephemeral or seasonal ponds and wetlands. Although the frog was not directly observed, its presence is possible given its association with gopher tortoise burrows.

Gopher frogs migrate to ponds during the breeding season (summer in southern Florida). A seasonal pond located in the southern portion of the site may provide breeding habitat if this frog occurs at the preserve. Maintaining the gopher tortoise population and enhancing the ephemeral wetland will benefit gopher frogs at the Railhead Scrub Preserve.

2.6 Invasive Non-native and Problem Species

Several invasive, non-indigenous species are known to occur within Railhead Scrub Preserve. A list of plant species is available from the Florida Exotic Pest Plant Council (FLEPPC). Although Florida does not have an official invasive non-indigenous animal species list, at least 400 exotic fish and wildlife animal species have been reported in Florida, and approximately 125 species are established.

2.6.1 Invasive and Problem Plant Species

A total of 81 introduced plant species have been found at Railhead Scrub Preserve, 19.8% of the existing flora. Of these, 24 are considered Category I: Invasive, and 4 are considered Category II: Potentially Invasive by the Florida Exotic Pest Plant Council (FLEPPC) (see Table 7).

Table 7: Invasive Plant Species at Railhead Scrub Preserve

Scientific Name	Common Names	FLEPPC 2009
Abrus precatorius	rosary-pea, crab-eyes	I
Acacia auriculiformis	earleaf acacia	I
Albizia lebbeck	woman's tongue	I
Ardisia elliptica	shoebutton ardesia	I
Bauhinia variegata	mountain ebony, orchidtree	I
Bischofia javanica	Bishopwood	I
Casuarina equisetifolia	Australian pine	I
Cupaniopsis anacardioides	Carrotwood	I
Dioscorea alata	white yam	I
Dioscorea bulbifera	air potato	I
Ficus microcarpa	laurel fig, Indian laurel	I
Hymenachne amplexicaulis	west Indian marsh grass	I
Lantana camara	Shrubverbena	I
Leucaena leucocephala	white leadtree	II
Lygodium microphyllum	old world climbing fern	I
Melaleuca quinquenervia	Melaleuca	I
Momordica charantia	balsam apple	II
Nephrolepis multiflora	Asian sword fern	I
Panicum maximum	Guineagrass	II
Panicum repens	torpedo grass	I
Psidium cattleianum	strawberry guava	I
Pteris vittata	China brake	II
Rhodomyrtus tomentosa	downy myrtle, rose-myrtle	I
Rhynchelytrum repens	rose natalgrass	I
Ricinus communis	Castor-bean	II
Sansevieria hyacinthoides	bowstring-hemp, mother-in-laws tongue	II
Schinus terebinthifolius	Brazilian pepper	I
Schefflera actinophylla	Australian umbrellatree	I
Solanum viarum	tropical soda-apple	I
Urena lobata	Caesarweed	I
Wedelia trilobata	creeping oxeye	II

The most problematic invasive plant species at Railhead Scrub Preserve are downy rose-myrtle, earleaf acacia, rose natalgrass, Guineagrass, torpedo grass, and old-world climbing fern. The entire preserve is currently in a maintenance state. Torpedo grass is invading wetlands throughout the site, and old-world climbing fern continues to re-sprout within the southwestern section of the

property, just south of the existing right of way, where it used to be growing high up into the canopy. Rose natalgrass and Guineagrass are invading within and along the edges of the firebreaks – particularly in the southeastern and southwestern portions. Most of the other species in Table 6 are either restricted to property edges and disturbed areas, not yet problematic in natural areas on the site, or occur at low densities.

Under certain conditions, especially following soil disturbance or drainage, some native plant species can become invasive. There are no native plants species at Railhead Scrub Preserve that are currently a management problem on the site. Management actions may cause some species to become problematic.

2.6.2 Invasive and Problem Animal Species

An obvious problem with invasive and problem animal species was not observed at the Railhead Scrub Preserve. However, several species have the potential to impact the Railhead Scrub Preserve to varying degrees.

Feral domestic cat (*Felis catus*)

Domestic cats originated from an ancestral wild species, the European and African wildcat (*Felis silvestris*). Humans facilitated the global distribution of cats due to their highly efficient predatory skills. Egyptians took cats with them on shipping vessels to keep rodent populations down, and they likely introduced domestic cats to Europe. Today, the impact of feral cats on wildlife is difficult to quantify; however, literature (FFWCC 2001; Karim 2007; Masterson 2007) strongly indicates that they are a significant factor in the mortality of small mammals, birds (including migratory birds), reptiles, and amphibians in Florida. Because free-ranging cats often receive food from humans, they may reach abnormally high numbers. An increase in the population of feral cats may lead to increased predation rates on native wildlife. When the wildlife prey is a threatened or endangered species, the result may be extirpation or extinction. Regular monitoring should include the presence of feral cat colonies near the Railhead Scrub Preserve and their impacts to native fauna.

Red imported fire ant (*Solenopsis invicta*)

The red imported fire ant (RIFA) was introduced into the U.S. from Brazil into either Mobile, Alabama or Pensacola, Florida between 1933 and 1945 (Collins and Scheffrahn, 2001). RIFA have been documented to cause harm to humans and wildlife as well as economic harm (Stimac and Alves, 1994; Collins and Scheffrahn, 2001; Willcox and Giuliano, 2006). RIFA are omnivorous, but they tend to prefer insects as their primary food source (Willcox and Guiliano, 2006). *S. invicta* have a number of impacts on wildlife. They have eliminated many areas of native ant populations through competition and predation and have eliminated food sources utilized by some wildlife species. Ground-nesting wildlife is especially susceptible to RIFA. Within the Railhead Scrub Preserve, *S. invicta* have the potential to affect ground-nesting birds; small mammals; reptiles such as gopher tortoise and native lizard and snake species; and native invertebrates (Willcox and Giuliano, 2006).

Coyotes (*Canis latrans*)

Although coyotes are not an exotic species, they are not indigenous to Florida, having moved eastward from their original range in the western United States as a result of anthropogenic changes to the countryside favoring their habitat requirements. Evidence of the presence of coyotes has

been observed at the preserve in the form of tracks and scat, and recently, an excavation that appears to have been a former gopher tortoise burrow enlarged for use by coyotes was observed in the northern portion of the site. Coyotes commonly enlarge burrows made by other animals such as armadillos or gopher tortoises to use as dens. Coyotes may have a negative influence on indigenous wildlife as direct predators or as potential competitors for other predators that may occur at the preserve such as foxes or bobcats; however, this species may prove beneficial in controlling potential problem species such as feral cats..

Feral pig *(Sus scrofa):*

Hogs were first brought to Florida in the mid 1500's to provision settlements of early explorers. Their high rate of reproduction and their ability to adapt to Florida's natural areas has led them to populate every county in the state. Today, Florida is second only to Texas in its feral hog population (Giuliano & Tanner 2005*a*; 2005*b*). While feral pigs are able to survive in a variety of habitats, they prefer large, forested areas interspersed with marshes, hammocks, ponds, and drainages; cover in the form of dense brush; and limited human disturbance (Giuliano & Tanner 2005*b*). Dense cover is used as bedding areas and provides protection from predators and hunters. Feral pigs are omnivorous, opportunistic feeders consuming grasses, forbs, and woody plant stems, roots, tubers, leaves, seeds, fruits, fungi, and a variety of animals including worms, insects, crustaceans, mollusks, fish, small birds, mammals, reptiles, amphibians, and carrion. Their propensity for digging for foods below the surface of the ground (rooting) destabilizes the soil surface, resulting in erosion and exotic plant establishment. Additionally, this behavior uproots or weakens native vegetation (Giuliano & Tanner 2005*a*; 2005*b*). If feral hogs are present on the property, then a feral hog management program will be developed.

Other potential problem species

Pine bark beetles (*Dendroctonus frontalis, Ips* spp.) may exhibit nuisance tendencies as a result of anthropogenic or natural disturbances of the ecosystem. Alterations of the existing community structure by disturbances may facilitate severe outbreaks by native species such as the pine bark beetle. Both pine bark beetles and turpentine beetles have invaded mature pine trees within the northwest section of the preserve. Several trees are standing dead within this area of the northern preserve. Staff will monitor all pine trees in this area and coordinate with IFAS and Department of Forestry to employ the most beneficial management practices (which may include removal) to reduce the effects of the beetles to the remaining pine population.

The **lobate lac scale** (*Paratachardina lobata lobata*), a scale insect native to India and Sri Lanka, was observed in the northeastern portion of the site. The lobate lac scale infests the woody portions of twigs and small branches and less frequently main stems less than one inch in diameter. Fire will help to reduce infestations and chemical treatment can protect landscape and agricultural plants. Biological control would be the most likely management approach for natural areas, but biological control agents for this exotic insect are not available at this time. The lobate lac scale was first documented in Florida (Broward County) in 1999 and has since become widely spread in southern Florida.

A colony of **honeybees** (*Apis mellifera*) was observed within a cavity in a pond cypress located in a wetland in the north-central portion of the preserve. The presence of this colony may represent a hazard to visitors, particularly if the bees are Africanized.

2.7 Archaeological, Historical and Cultural Resources

According to studies done for the County by Coastal Engineering Consultants, published April 2000, there are no known archaeological "finds" on this site. The property is not within an area of historical and archaeological probability, and no historical or archaeological sites appear to be present in the property.

The County will notify the Division of Historical Resources immediately if evidence is found to suggest any archaeological or historic resources are present at the Railhead Scrub Preserve. If any artifacts are observed on-site, staff shall cordon off the area, and a professional survey and assessment shall be instituted. The archaeologist shall prepare a report outlining results of the assessments and issue recommendations to County staff about management of any sites discovered, per provisions of the Land Development Code Section 2.2.25. This report shall be sent to the Division of Historical Resources. The County shall cooperate fully with direction from the Division of Historical Resources on the protection and management of archaeological and historical resources. The management of these resources will comply with the provisions of Chapter 267, Florida Statutes, specifically Sections 267.061 2 (a) and (b).

The collection of artifacts or the disturbance of archaeological and historic sites within the Railhead Scrub Preserve is prohibited unless prior authorization has been obtained from the Collier County Board of County Commissioners and the Department of State, Division of Historical Resources.

2.8 Scenic Resources

There are many scenic opportunities in the preserve, including views of scrub and wetland communities which will be enhanced through time and appropriate management.

3.0 Use of the Property

3.1 Previous and Current Use

Aerial photography taken 1940, 1952, 1962, 1975, 1985, 1989, 1993, 1996, and 1997 and recent physical visits to the site show that there has never been any development of the site. The photographs are available in the public records and available at the Collier County Property Appraisers Office.

Railhead Scrub Preserve – Current entrance through Sun Century Road.
Photo by Keith Bradley

Currently, there is no sanctioned public use of the site. The only paved roadway accessing the site is Sun Century Road, a privately owned roadway. Even if it were public, vehicular access could not legally be accomplished, as the railroad parcel presents a significant barrier. To allow the public to cross the railroad parcel in vehicles would mean bringing any crossing up to federal railroad crossing standards, including grade elevation changes and installation of a railroad crossing signal. While not legally sanctioned, this entry is a major access point for ORVs and dumping. Signage clearly describes the site as off limits to trespassers, however, the use by vehicular traffic and the dumping of refuse continues. Pedestrian/bicycle railroad crossings do not require the same standards as vehicular crossings. Conservation Collier staff has investigated the possibility of allowing pedestrian/bicycle access to the preserve prior to vehicular access; however, the cost would be over $100,000.

3.2 Planned Uses and Assessment of their Impacts

Future planned use will be consistent with the primary goals of conservation, preservation, restoration, and maintenance of the resource. Details of planned uses for the Railhead Scrub Preserve and an assessment of their potential impacts are provided in the following sections.

3.2.1 Identification of Public Uses Consistent with Preservation, Enhancement, Restoration, Conservation and Maintenance of the Resources

As defined in Ordinance 2002-63, as amended, Section 5.9 the following are uses consistent with the site's classification:

- **Hiking**: Consistent with the nature of the site and its purpose;
- **Nature Photography**: There is potential for photography of wildlife and plant life; and
- **Bird Watching**: There is potential for birdwatching on the site.

Other uses that may be in principle compatible with preservation goals that are not feasible in this preserve include:

- **Kayaking/Canoeing**: There is no potential for boating of any kind on this site;
- **Swimming**: There is no potential for swimming;
- **Hunting**: The site is not large enough or remotely located enough to allow hunting; and
- **Fishing**: There is no potential for fishing on this site.

3.2.2 Planned Public Uses and Assessment of Impacts

Trail Network: A trail network will be installed to allow for hiking and nature observation within the preserve. The trails will incorporate former ORV trails where practical to minimize the impact of the construction

Parking Lot: In partnership with Collier County Public Schools, a future parking area is in development within the shared parking area of the future "GGG Highschool" which is currently under construction along with the expansion of Veteran's Memorial Blvd. Once completed, visitors to the preserve will be able to park and travel along a sidewalk along the boardwalk to access the conceptually planned trails in the southern units of the preserve.

Easements, Concessions, and Leases: A 130' railroad line property owned by CVX, a national railway line, and leased to Gulf Seminole Railway, a local railroad company, runs north-south adjacent to the northern portion of the preserve and down the center of southern portion of the preserve. The tracks are not active at this time, but the leaseholder, advises that there is potential to make the rail active again in the future. Providing vehicular crossing over this railroad property (which includes bicycles) would be extremely expensive and will eventually be incorporated into the future Veterans Memorial Blvd. Pedestrian access would cost over $100,000.

Florida Power and Light (FPL) has a 50' minimum active easement that runs north-south through the southern portion of the property 30' east of the western property line, and Collier County maintains a 30'stormwater drainage easement east of, adjoining, and parallel to the FPL easement. The FPL easement may be utilized as a public trail. FPL stipulates that the easement must remain clear so that FPL property can be maintained and any plantings along the edges of the easement must remain under 14 ft. in height. Staff will research whether the stormwater drainage easement can be vacated.

In accordance with the management goals of the preserve, no future easements, concessions, or leases are appropriate in association with this site, other than conservation related easements.

Landscaping: Future landscaping and natural area restoration of Railhead Scrub Preserve should include only site-specific native plant material that has been determined to be non-problematic at the site and whenever possible, site-specific seed sources should be utilized. In addition, hardwoods that may invade the natural areas should not be planted. An appropriate list of native species is attached as Appendix 5.

3.3 Adjacent and Future Land Uses

Surrounding the preserve is a mixture of industrial, residential and office properties. Within the residential properties, there are a mixture of mobile home rental properties on the northwest corner, the residential community of Landmark Naples on the southwestern perimeter, and the residential community of Mediterra on the eastern perimeter. Undeveloped properties exist to the south. There is a trail just south of the northern section of the preserve and Mediterra that connects to a network of access trails. On the south side of the site, there is Cemex, Inc. The west boundary of the preserve is abutting a railroad parcel. The rail line is not currently in use and would need substantial repair to make functional.. There is a Right of Way (ROW) for the future Veterans Memorial Blvd., anywhere from 130' to 200' wide thru the middle of the site. The ROW is the principal point of intrusion for off road vehicles.

During the winter of 2021, work began in the area to the east of Railhead Scrub Preserve to extend Veteran's Memorial Blvd to the planned entrance of a new Collier County Highschool, termed "GGG High School". Land clearing and construction activities are currently ongoing as part of Phase I of the Veteran's Memorial Blvd Extension Project which includes completing the roadway extension and high school. Phase I is anticipated to be complete by Fall of 2023. Based on communications with Collier County Transportation, Phase II of this project which includes extending Veteran's Memorial Blvd through the middle of the Railhead Scrub Preserve parcels is anticipated to take place between 2022-2027 depending on funding availability.

Figure 7. View of the ROW where future road construction will take place between the North and South parcels of the preserve.

While a large area of bare sand exists in the ROW directly adjacent to the North and South preserve parcels, xeric oak scrub plant community species are present throughout the future roadway site and include a number of active gopher tortoise burrows. Conservation Collier staff will be working with members of the FWC Gopher Tortoise Management Team and Collier County Growth Management to pursue the potential of relocating tortoises within the ROW into the preserve as track, scat and telemetry data indicates these tortoises currently move throughout the protected lands seasonally and may have additional burrows within the preserve parcels.

Based on the anticipated segmentation, habitat corridor disruptions and vehicle mortalities roadways can pose to wildlife, staff are recommending that wildlife underpasses and underpass fencing should be incorporated into the construction design for the portion of the road extension that passes through the center of the three preserve parcels. Underpass design should avoid the area that seasonally floods on the western side of the ROW and should be suitable for a wide range of species from Florida gopher tortoise to white-tailed deer and Florida black bear.

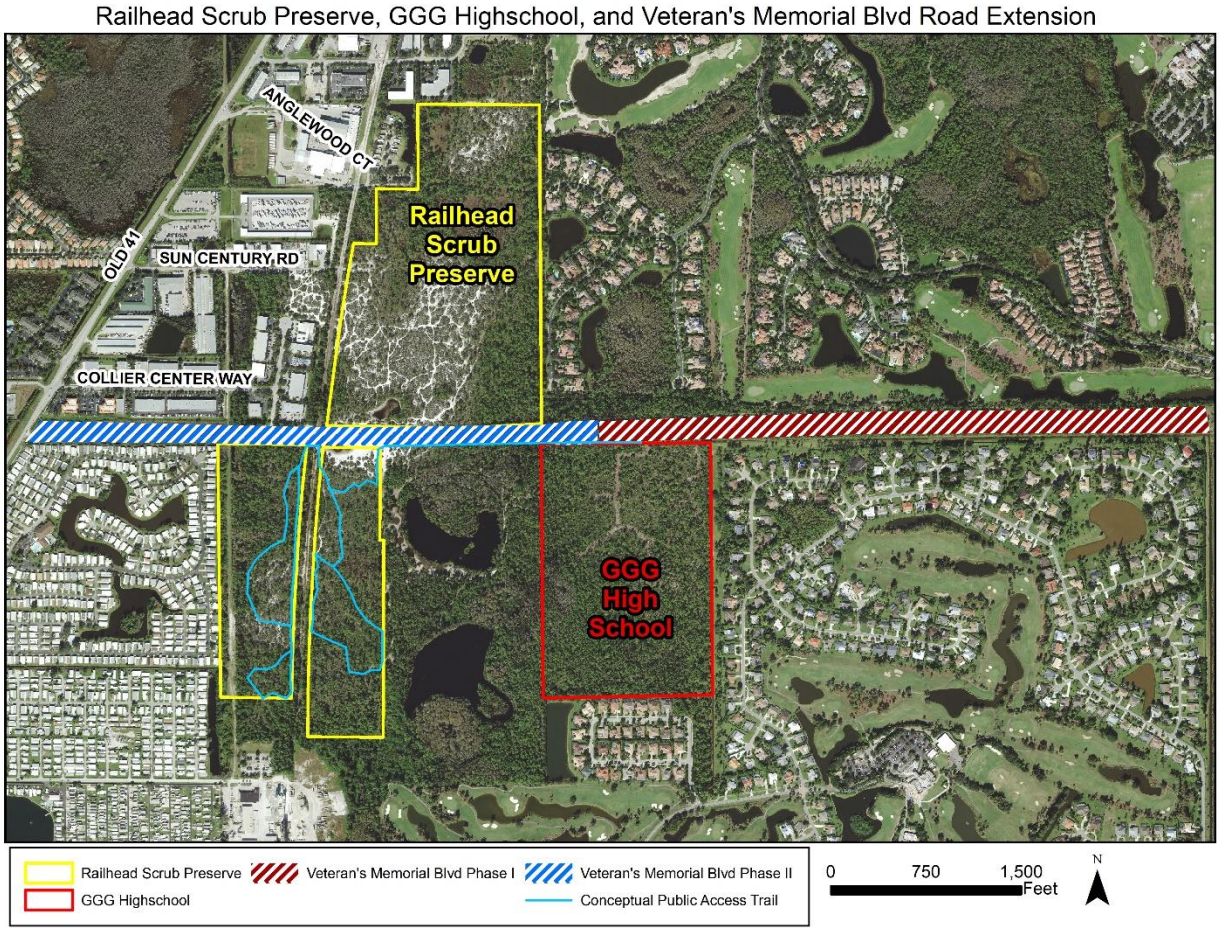

Figure 8. Preserve Location, Veteran's Memorial Road Expansion Project and Future Site of GGG High School.

3.4 Potential Surplus Lands

There are no potential surplus lands at Railhead Scrub Preserve. The Conservation Collier Ordinance (2002-63, as amended, Section 6, 1(f)) states that any resale or lease of Conservation Collier lands must be in accordance with the goals of the Program, specifically, to conserve, protect, restore and manage environmentally sensitive lands.

3.5 Prospective Land Acquisitions

In the spring of 2021, the Conservation Collier Land Acquisition Advisory Committee (CLAAC) identified two potential acquisition parcels adjacent to Railhead Scrub Preserve (Folios: 00153160004, 00152960001). Following approval by the Board of County Commissioners, in June of 2021 letters were mailed to property owners with instructions for applying for acquisition if property owners were willing sellers. No applications were received for these parcels during the Cycle 10 application period.

3.6 Analysis of Multiple-Use Potential

Although the Railhead Scrub Preserve encompasses lands that the public has historically accessed via trespass to use ORVs and to gather for recreational purposes, future potential uses of this site

will be restricted to conservation, preservation, and restoration with controlled public access primarily for passive recreation. The Conservation Collier Ordinance (2002-63, as amended,) constrains the use of this property to "primary objectives of managing and preserving natural resource values and providing appropriate natural resource-based recreational & educational opportunities."

The Railhead Scrub Preserve will not provide opportunities for active outdoor recreation such as public camping, fishing, hunting, boating, or "sports," however, there is still opportunity for multiple public types of passive public use, such as hiking, nature photography, wildlife observation, bird watching, etc. The site may also serve as a learning lab to be used by local environmental educational programs and a research site for student environmental projects if such projects do not conflict with management goals.

4.0 Management Issues, Goals and Objectives

This section describes the main management issues, goals, and objectives for Railhead Scrub Preserve as well as the overall management framework. Central to the management of the preserve is the mission of the Conservation Collier Program, and the goals and objectives set forth in this management plan. As a preamble to the specific set of goals and objectives for the next ten (10) years, a vision of the desired future conditions for the preserve was developed.

4.1 Management Framework

Each property purchased by Conservation Collier shall have its own management plan. The Conservation Collier Ordinance requires that an "Interim" Management Plan be developed within 90 days of purchase and that a "Final" management plan be developed within 2 years. After that, property management plans must be updated every 5 years. Interim plans shall be concerned with basic items such as removal of invasive exotics and trash, establishing site security, developing management partnerships and planning for public access. All management plans start in the Lands Evaluation and Management subcommittee and must be approved by both the Conservation Collier Land Acquisition Advisory Committee (CCLAAC) and the Board of County Commissioners.

This property shall be managed only for conservation, protection, and enhancement of natural resources and for public outdoor recreation that will be compatible with the conservation, protection, and enhancement of the site. Public use of the site will not be possible until legal public access can be created. In September 2007, a Final Management Plan was developed for the property (URS. October 2007). The original plan identified the key management priorities and issues within the site and gave direction for management during the first ten years. The current plan is a revision of the original 2007 plan and includes the southern Railhead addition.
Collier County will be solely responsible for managing the Railhead Scrub Preserve but will seek to obtain grants and partnerships for management activities.

4.1.1 Preserve Manager

The site manager for Railhead Scrub Preserve will be a designated Collier County Environmental Specialist who may be contacted through e-mail:

ConservationCollier@CollierCountyFL.gov.

4.1.2 Preserve Rules and Regulations

This preserve operates under Collier County Ordinance 2011-38.

No dumping, use of unauthorized vehicles, or removal or destruction of natural resources shall be permitted within the preserve. The goal is to allow limited nondestructive public access to natural resource habitat and native plant communities and animal species.

4.1.3 Land Management Review and Revision Summary

Railhead Scrub Preserve was not acquired with any state or federal funds, and Collier County has not yet entered into any land management review process. Therefore, the only land management review to which the Railhead Scrub Preserve is constrained is the one required by the Conservation Collier Ordinance every 5 years.

4.2 Desired Future Conditions

This section includes a narrative of proposed future conditions for the site's natural areas. Management techniques to achieve these conditions are described in the following sections.

Following recommended management actions, and the results of adaptive management where needed, Railhead Scrub Preserve will have vegetative communities with a similar structure and composition to those that existed before non-indigenous people settled the region.

Xeric uplands on the site will not be fragmented by a mosaic of trails, but instead will have larger blocks of vegetated areas, fragmented by only a few management trails. Most ORV trails will be restored (some left for management access), with vegetation structure and composition resembling intact Xeric Uplands areas. The community will have undisturbed ecotones with Pine Flatwoods and other plant communities. Vegetation structure will vary naturally with time since fire; most shrubs will be top-killed or dead, with large areas of bare sand between hardwood patches. Shrub gaps will grow increasingly close together, reducing the size of open sand areas. When shrubs have grown sufficiently close together, fire will again be necessary.

Portion of the Xeric Oak Scrub community in the Railhead Scrub Preserve showing good conditions. This area provides a good example of management goals for the 49.23 acres of this community type. Photo by Conservation Collier Staff

Most Pine Flatwoods in the preserve will burn every 3-7 years. Pine Flatwoods will be managed to keep saw palmettos at heights of less than 3 feet and hardwoods and palm cover sparse (< 25%), allowing for a diverse and dense herb layer. Pine flatwoods on slopes around the edges of the property will have dense saw palmetto fringes, but fires will be used every 8-25 years, reducing the total area covered by dense palmettos to improve habitat for native herbs and grasses. Fires will be allowed to burn into surrounding plant communities, including Xeric Uplands and cypress, where they will extinguish themselves due to limiting vegetation structure and moisture levels.

The cypress will have a canopy of pond cypress trees, and an open canopy pond or marsh in the interior. Larger pond cypress trees and hardwoods will be present in the deeper water of the interior of the dome. The understory will consist of sparse native hardwoods and a diverse native herb layer. Melaleuca and other exotic plants will be eradicated. Fires will enter the edges of the cypress and other wetlands from the adjacent plant communities but will be extinguished by standing water or soil moisture levels.

A diverse assemblage of native plants will dominate the wet prairies. Exotic plants will not be present. Fires will enter the prairies as they burn from surrounding plant communities.

4.3 Major Accomplishments during Previous Years

Major accomplishments that have been achieved at Railhead Scrub Preserve since acquisition are listed in Table 8.

Table 8: Major Accomplishments during Previous Years

Accomplishment	Year(s)
Complete Interim Management Plan	2004
Install temporary signs	2004
Gopher tortoise surveys	2005, 2006, & 2008
Clear thick melaleuca using brontosaurus by way of DEP grant award	2006
Install fence along northern boundary	2007
Cleared firebreaks line along northern most boundary	2007
Cleared firebreaks southern portion of preserve	2010
Install fence along southern boundary	2010
Completed 100% initial treatment of exotics	2011
Applied and Received FWC Gopher Tortoise Habitat Management Funding	2013
Moved large boulders east of railroad to block ROW access	2014
Moved SE northern fence line north to property line.	2014
Maintenance Exotic Treatment 135 acres	2014
Maintenance Exotic Treatment 135 acres	2018
Maintenance Exotic Treatment FPL Easement	2019, 2020
FGCU Student Trash Cleanup	2019, 2020
FGCU gopher tortoise home range telemetry study	2020-2021
FGCU rare/endangered plants research study	2020, 2021
Maintenance exotics treatment 102 acres	2021

4.4 Goals for the 10-year period 2015-2025

A set of goals for Railhead Scrub Preserve were developed in conjunction with the drafting of this Management Plan. The goals in this plan are tailored specifically for the Railhead Scrub Preserve, based on the purposes for which the lands were acquired, the condition of the resources present, and management issues for the property. The preserve manager should be familiar with the entire Management Plan. Goals and objectives from the first final management plan for the Railhead Scrub Preserve were reviewed to determine if they remain meaningful and practical and should be included in this revised plan. The goals presented here reflect programmatic goals and ideas from Conservation Collier personnel in charge of managing and protecting the area, as well as input from cooperative managers, user groups, and other stakeholders from outside the program. Conservation Collier staff believes the goals are consistent with the various forms of guidance provided to managers.

Management issues are discussed below in separate sections. Within each section, approaches for dealing with these issues are described. The ability to implement the specific goals and objectives identified in this plan is dependent upon the availability of funding resources. The following goals have been identified for the Railhead Scrub Preserve:

Goal 1: Continue to significantly reduce human impacts to indigenous flora and fauna
Goal 2: Continue to develop a baseline monitoring report
Goal 3: Continue to remove or control populations of invasive, exotic, or problematic flora and fauna to restore and maintain natural habitats
Goal 4: Continue to implement prescribed fire program
Goal 5: Continue to restore native vegetation
Goal 6: Maintain native and listed species management;
Goal 7: Continue to evaluate potential for access and public use;
Goal 8: Facilitate uses of the site for educational purposes
Goal 9: Maintain plan for security and disaster preparedness

GOAL 1: *CONTINUE TO SIGNIFICANTLY REDUCE HUMAN IMPACTS TO INDIGENOUS FLORA AND FAUNA*

Action Item 1.1: Continue to eliminate trespass of off-road vehicles (ORVs);

Action Item 1.2: Continue to remove solid waste;

Action Item 1.3: Post and maintain no dumping and no trespass signs at all entry locations in preserve until the preserve is opened to the public, then remove the no trespass signs; and

Action Item 1.4: Participate in planning and design discussions of Veteran's Memorial Blvd Extension including recommendations for reducing impacts to preserve flora and fauna through wildlife underpasses, wildlife friendly fencing, imperiled species relocation into the preserve, and ORV access barriers.

Action Item 1.5 Security Management

Security recommendations are identified in the paragraphs below.

1. Site Security:

The entire perimeter of Railheads Scrub Preserve is fenced with 4-foot field fencing and staff continues to work with the Collier County Sheriff's office to address trespass incursions. County staff has had multiple fence breaches along the southern boundary to which staff has responded by erecting cables where the breaches occurred. Staff will continue monitoring all fencing and will employ different methods to secure the site if necessary –or placing large boulders or bollards along the boundaries. Staff will continue to research more wildlife friendly fencing materials that provide site security while ensuring wildlife have safe passage over, under, and through the fencing into the preserve.

Establishing a site visit schedule will allow staff to monitor ongoing activity. However, if this is not effective, additional solutions will be sought, up to and including utilizing volunteers and Friends organizations and contracting private security.

2. Emergency Response Access:

Management shall coordinate emergency pathways with emergency entryways around the preserve. Emergency management access may be accommodated by at-grade stabilized pathways.

Action Item 1.6 Control Dumping

In addition to removing the debris and litter, the site manager shall establish a strategy for the long-term control of illegal dumping. The strategy should include signs indicating the fines and penalties for illegal dumping, a phone number for reporting incidents, and other targeted enforcement efforts. In order to improve the effectiveness of the overall dumping control efforts all opportunities to increase community outreach and involvement shall be considered.

The key to controlling dumping successfully may be to increase public awareness of the problem and its implications. Illegal dumping control programs must use a combination of public education, citizen participation, site maintenance, and enforcement measures to address illegal waste disposal. Focusing on "win-win" scenarios may increase public interest and develop a neighborhood pride. For example, cleanup efforts followed by site appropriate landscaping and beautification efforts may discourage future dumping, as well as provide open space and increase property values.

Action Item 1.7 Control Impacts from Adjacent Land Development

It will be necessary to ensure that all site development occurring adjacent to the Railhead Scrub Preserve is properly permitted prior to the commencement of any construction activities. All existing local, state, and federal regulations should be strictly followed and enforced during any site development adjacent to the preserve.

It shall be the responsibility of the developer to establish and utilize turbidity and erosion control measures (i.e., rock bags, silt fences, turbidity barriers, appropriate landscaping, etc.), wildlife protection measures (e.g., protective fencing or barriers), and vegetation protection measures (i.e., protective fencing or barriers). If any site developer working in areas adjacent to the preserve does not take the necessary control measures, construction shall be immediately halted until control measures are put into place and mitigation and/or remediation will be the sole responsibility of the developer.

GOAL 2: *CONTINUE TO DEVELOP A BASELINE MONITORING REPORT*

Action Item 2.1**:** Establish a long-term biological monitoring program and conduct additional wildlife surveys.

Long-term management should be based on biological data. Changes following baseline conditions should be assessed as negative or positive, and management strategies changed appropriately. This section discusses information needs and long-term monitoring needs.

Railhead Scrub Preserve currently has a thorough plant inventory, based on data collected by Jim Burch in the 1990s and in 2006/2007 by Bradley and in 2020 by Bonness. The site should be inspected at regular intervals (ca. 5-10 years), to detect new invasions (of natives or exotics), and

extinctions. Areas undergoing extreme restoration should be assessed more frequently (at least annually). While some wildlife data has been collected, additional baseline data should be collected, especially on invertebrates, small mammals, reptiles, and amphibians. The site manager may contract this work out or enlist the assistance of local educators to coordinate student research projects. Wildlife sampling, like plant sampling, should take place at regular intervals (ca. 5-10 years) to detect long-term trends.

Photo points have been established in both the northern and southern portions of the property. Photo point locations have been marked with a rebar and the position recorded with a GPS. All photo points are taken at a standard height and angle of view.

GOAL 3: *CONTINUE TO REMOVE OR CONTROL POPULATIONS OF INVASIVE, EXOTIC OR PROBLEMATIC FLORA AND FAUNA TO RESTORE AND MAINTAIN NATURAL PLANT COMMUNITIES*

Action Item 3.1 Eliminate Brazilian-pepper, Australian pine, and old-world climbing fern around perimeter, disturbed areas, and Pine Flatwoods;
Action Item 3.2: Remove by hand incipient populations of melaleuca in small depression marshes and other habitats;
Action Item 3.3: Ensure that control measures are not deleterious to native plants and animal species, particularly rare species;
Action Item 3.4: Develop and implement a surveillance program for potential problem species including invasive plant species; and
Action Item 3.5: Manage potential problem species populations.

1. Exotic Plant Control by Plant Community

This section provides management recommendations for invasive non-native plant species, in each community type. In addition, specific control techniques suitable for the preserve are provided. Staff will introduce bio-controls, when and if they are available.*Scrub/Scrubby Flatwoods*
There is currently limited densities of invasive plants in the Xeric Uplands, most notably earleaf acacia. Brazilian-pepper plants are rarely found. Some natal grass has been found along disturbed edges. Other ruderal species may sometimes be found in areas with soil disturbance. Natal grass should be pulled - and bagged if seeding. Any other exotic plants should be pulled killed with herbicides. The community should be continually monitored for new populations of exotic plants and these should be controlled immediately.

Hydric Flatwoods and Cypress-Pine-Cabbage Palm
Brazilian-pepper, melaleuca, and downy rose-myrtle are present in some parts of this community. These species should be controlled with herbicides and removed from the site if possible. Mechanical mowing of these areas is acceptable only if possible, without damage to mature native trees. The herb layer should be monitored for other exotic species as the palm and shrub layer is opened (with removal of exotic hardwoods and after prescription fires). Torpedo grass and other exotic herbs and grasses may invade. They should be treated with herbicides.

Pine Flatwoods

Downy rose-myrtle and melaleuca is present in some areas. These species should be controlled with herbicides as needed.

Cypress
Melaleuca resprouts are present at times in the cypress ecosystem. Re-sprouts should be pulled or treated with an appropriate herbicide on an as needed basis. .

Wet Prairies
Melaleuca re-sprouts should be pulled or treated with an appropriate herbicide on an as needed basis. Following removal, especially of dense stands, the herb layer should be monitored for establishment of other exotic species, especially torpedo grass.

2 Exotic Plant Control Methodology

Land managers in Florida have developed effective chemical control measures for most of the state's exotic plant species. Kline & Duquesnel (1996) provide a compilation of control techniques and appropriate herbicides for control of exotic plant species in Florida, and specifically discuss eight of the Florida Exotic Pest Plant Council (FLEPPC) listed plant species at Railhead Scrub Preserve.

Some exotic plant species can be kept at low densities or killed entirely by application of prescribed fire. In addition, habitats, which have natural fire regimes, are more resistant to invasion by exotic pest plants. Prescribed fire following recommendations in Section 4.9 should be used as much as possible to control exotic plants. In areas of the preserve where fire management is not possible, mechanical techniques may be used to simulate the effects of fire or be used in conjunction with fire to improve the effectiveness of maintaining habitat for imperiled species like gopher tortoise..

Trees and Shrubs
Exotic trees and shrubs that have been recorded at Railhead Scrub Preserve include Brazilian-pepper, downy rose-myrtle, earleaf acacia, laurel fig (*Ficus microcarpa*), woman's tongue *(Albizia lebbeck),* strawberry guava, *(Psidium cattleianum),* shoebutton ardesia *(Ardisia elliptica),* Australian umbrellatree *(Schefflera actinophylla),* white leadtree *(Leucaena leucocephala),* bishopwood *(Bischofia javanica),* Australian pine, carrotwood *(Cupaniopsis anacardioides),* orchidtree (*Bauhinia variegata*), melaleuca, and shrubverbena (*Lantana camara*).

These should be top priorities for removal. In general, saplings and adults of these species can be controlled with basal applications of Garlon 4; seedlings can be hand-pulled. Melaleuca should be controlled with a cut surface application of Garlon 3a.

Vines
Exotic vines that have been recorded at Railhead Scrub Preserve include old world climbing fern, rosary pea, white yam (*Dioscorea alata*), air potato and wild balsam apple (*Momordica charantia*). While all are invasive species, they are not all expected to become especially problematic. They will persist as more common species in disturbed areas. Rosary pea, air potato and white yam can be controlled with application of Garlon 4 or Garlon 3a. Climbing fern can be controlled with the poodle cut method and/or foliar method with Glyphosate. Wild balsam apple can be hand pulled.

Perennial Forbs

Introduced perennial forbs that have been recorded at Railhead Scrub Preserve include bowstring hemp (*Sansevieria hyacinthoides*), Caesar weed, century plant (*Agave angustifolia*), cochineal cactus (*Opuntia cochenillifera*), Colombian waxweed (*Cuphea carthagenensis*), common dayflower (*Commelina diffusa*), creeping oxeye, hairy indigo (*Indigofera hirsuta*), lima (*Sida cordifolia*), little ironweed (*Vernonia cinerea*), serpent fern (*Phymatosorus scolopendria*), shrubby false buttonweed (*Spermacoce verticillata*), smooth rattlebox (*Crotalaria pallida* var. *obovata*), threeflower ticktrefoil (*Desmodium triflorum*), tropical soda-apple (*Solanum viarum*), and wild bean (*Macroptilium lathyroides*). The most troublesome of these species at Railhead Scrub Preserve is caesarweed, which can invade fire suppressed Mesic Flatwoods, and increase in abundance after hardwood and exotic removal and fires. Caesarweed can be controlled with basal or foliar application of Garlon 4. The other species are primarily weeds of disturbed areas and are not expected to become especially problematic at Railhead Scrub Preserve (including tropical soda-apple). Century plant can be controlled by application of Garlon 4 to the terminal bud. Cochineal cactus can be hand pulled. Tropical soda-apple can be controlled with a basal application of Garlon 4. Common dayflower and creeping oxeye can be controlled with hand pulling and Roundup. There should be no need to treat the remaining species.

Annual and Short-lived Forbs

Introduced annual or short-lived forbs that have been recorded at Railhead Scrub Preserve include Dixie ticktrefoil (*Desmodium tortuosum*), flattop mille graines (*Hedyotis corymbosa*), grassleaf spurge (*Euphorbia graminea*), largeflower Mexican clover (*Richardia grandiflora*), lilac tassleflower (*Emilia sonchifolia*), Madagascar periwinkle (*Catharanthus roseus*), Malaysian false-pimpernel (*Lindernia crustacea*), spiny amaranth (*Amaranthus spinosus*), and tropical Mexican clover (*Richardia brasiliensis*). None of these is likely to become invasive in natural areas at Railhead Scrub Preserve. If control is ever desired, all can be treated with RoundUp.

Grasses and Sedges

Introduced grasses and sedges that have been recorded include: Awned halfchaff sedge (*Lipocarpha aristulata*), Bahia grass, Bermuda grass (*Cynodon dactylon*), crow's foot grass (*Dactyloctenium aegyptium*), guineagrass (*Panicum maximum*), hurricane sedge (*Fimbristylis cymosa*), Indian crabgrass (*Digitaria longiflora*), low flatsedge (*Cyperus pumilus*), Piedmont flatsedge (*Cyperus distans*), red lovegrass (*Eragrostis secundiflora* subsp. *oxylepis*), rose natalgrass (*Rhynchelytrum repens*), signal grass (*Urochloa subquadripara*), thalia lovegrass (*Eragrostis atrovirens*), torpedograss, West Indian marsh grass (*Hymenachne amplexicaulis*), and West Indian dropseed (*Sporobolus indicus* var. *pyramidalis*). Bermuda grass, crow's foot grass, rose natalgrass, and torpedograss are currently invasive or could become invasive following management activities. Control of all grasses can be achieved by application of RoundUp. Hand pulling and bagging of rose natalgrass or other species can be done in low density colonies.

3 Other Problem Species Management

There are currently no major native plant or animal species that are problematic at Railhead Scrub Preserve (see section 2.6). However, following restoration activities, some may become problematic. Which species will become problematic, if any, will not be known until several months after initial management activities.

In Pine Flatwoods, vines may become abundant following burns or exotic plant removal, particularly muscadine grape. This native vine, already present in Pine Flatwoods at low densities, can be aggressive after disturbances and form dense colonies, killing hardwoods and palms, climbing into pines, and persisting for years. It should be controlled with herbicides if its populations start to grow. In flatwoods, bracken fern (*Pteridium aquilinum*) can also become problematic, especially after high intensity fires. It should be controlled with herbicides, especially Asulox which is specific to bracken fern, other ferns, and some grasses. It should be applied to new growth, either soon after disturbance (including fire), or after the plants are cut manually. More than one application may be required.

In cypress, many plant species could potentially become pests following restoration activities, but it is hard to predict which will recruit after melaleuca removal.

GOAL 4: *CONTINUE TO IMPLEMENT PRESCRIBED FIRE PROGRAM*

Action Items 4.1: Develop fire management plan for the property by taking the suggestions herein as a point of departure;
Action Items 4.2: Delineate fire management and rescue access routes, and provide this information to the police department and emergency services;
Action Items 4.3: Conduct one or more prescribed fires in Xeric Uplands;
Action Items 4.4: Conduct one or more prescribed fires in depression marshes when native vegetation is established following melaleuca removal;
Action Items 4.5: Conduct one or more prescribed fires in Pine Flatwoods;
Action Items 4.6: Maintain firelines to facilitate fire management, utilizing practices to minimize impacts to ecotones and wildlife populations;
Action Items 4.7: Establish a system for notifying neighboring landowners in advance of prescribed burns (via email, phone trees, etc.) and use this system before each prescribed fire;
Action Items 4.8: Establish pre- and post-burning monitoring to assess fire effects
Action Items 4.9: Protect the Railhead Scrub Preserve from wildfires;
Action Items 4.10: Explore the use of alternatives to fire for those management units where prescribed burning appears impossible to achieve.

The use of prescribed fire as a management tool will be critical to the long-term health of the natural habitats and native species at Railhead Scrub Preserve. Every native habitat within Railhead Scrub Preserve requires periodic fires.

To prepare for fire management, fire lines were installed in 2009 on the northern portion and in 2010 in the southern portion. (Figure 7) Additionally, burn units will be established as recommended by the Division of Forestry Urban Fire Mitigation Team.

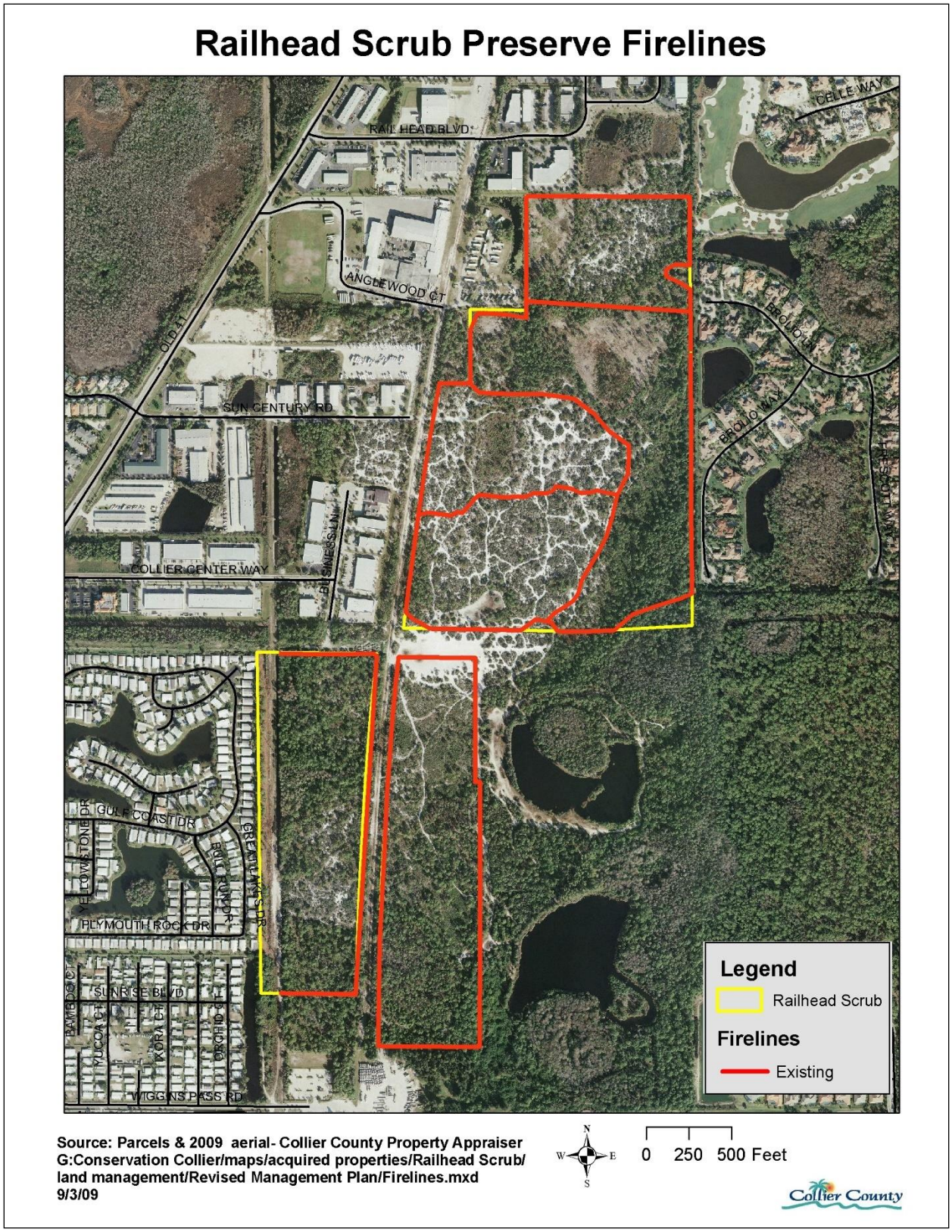

Figure 9: Preliminary Delineation of Fire Lines

Unless absolutely necessary, fire breaks should not be created along ecotones. Firebreaks along ecotones prevent fires from burning across the landscape between different habitat types, and the trails themselves destroy habitat for species that require specific ecotonal habitats.

Fire Frequency depends on the plant communities found at Railhead Scrub Preserve. (Table 8). Xeric Oak Scrub should be burned at an interval of 8-25 years. Summer headfires will probably be needed to ensure that most vegetation ignites and that the fire moves across the habitat. For best results, prescribed fire management in Xeric Oak Scrub at Railhead Scrub Preserve should begin after ORV activity has been eliminated and permanent firebreaks have been established. These trails would otherwise limit the ability of the fire to travel across the habitat.

Table 8 : Burn Table

Type of Habitat	Fire Frequency (Years)
FLUCFCS 321 Saw Palmetto	3 to 7
FLUCFCS 411 Pine Flatwoods	3 to 7
FLUCFCS 621Cypress	3 to 7
FLUCFCS 624 Cypress-Pine-Cabbage Palm	3 to 7
FLUCFCS 625 Hydric Pine	3 to 7
FLUCFCS 643 Wet Prairie	3 to 7
FLUCFCS 421 Xeric Oak Scrub	8 to 25

Pine flatwoods should be burned every 3-7 years, with the exception of those on slopes, which should be burned every 8-25 years. The fire should be allowed to burn into Xeric Oak Scrub.

Wet Prairie should be burned following restoration and re-establishment of native vegetation. Prescribed fires should be conducted every 3-7 years in the wet season to prevent the destruction of organic soils.

Prior to any prescribed fires, burn teams should assess fuel loads and conduct fuel reduction where necessary, conduct risk assessment for the planned burn, obtain appropriate permits, and coordinate with local fire officials. Exotic plant species in particular should be removed prior to fires. Additionally, a plan of action to notify surrounding residents should be established.

If the application of prescribed fire is absolutely impossible there are several alternatives that are available, although much less desirable. These options include herbicide application and mechanical treatment. Both herbicide application and mechanical treatments have the disadvantage of requiring that dead woody material be removed from the site following treatment, limiting the amount of decomposing vegetation that would create organic soils. Even with physical removal after treatment, organic matter from all plants on the sites will eventually accumulate, leaving an organic soil, and thereby reducing diversity of native herbs.

Staff will coordinate with the Florida Division of Forestry's Urban Fire Mitigation Team to create a burn plan for the site, conduct pre-fire fuel reduction and firebreak creation, and to conduct prescribed burns.

GOAL 5: *CONTINUE TO RESTORE NATIVE VEGETATION*

Action Item 5.1: Maintain a revised GIS map and description of FNAI natural communities and disturbed areas on the property;
Action Item 5.2: Reestablish soil levels and natural vegetation in the deep trails created by ORV use in the xeric upland habitat; and
Action Item 5.3: Plant native plant species in their appropriate habitats.

1 Soil Management

Soil management at Railhead Scrub Preserve requires several strategies. The elimination of off-road vehicles (ORV) is the most important. ORVs destroyed vegetation in the Xeric Oak Scrub and created wide trails. Sand from these trails eroded and created linear depressions in the plant community. ORV use should continue to be banned and the trails should be replanted if natural recruitment does not occur. Sand may have to be augmented in some areas.

Accumulations of leaf and pine needle litter in Pine Flatwoods (and eventually in Xeric Oak Scrub), changes soil chemistry and limits habitat quality for native herbaceous species. Periodic prescribed fires will eliminate organic soils and leaf litter and prevent their accumulation. Where there is already excessive accumulation of organic matter, prescription winter backing fires should be used. Restored wet prairies should only be burned when water is present to prevent burning of organic soils.

2 Natural Communities Management

Two management actions that are critical for preservation are the prevention of use of unauthorized ORVs and the control of exotic and invasive species. Specific recommendations applicable to each community type are included in the paragraphs below.

Xeric Oak Scrub
The trails and other areas that have been impacted by ORV use can be revegetated, if necessary. If natural recruitment fails to occur, shrubs can be planted in trails, including sand live oak, myrtle oak (*Quercus myrtifolia*), Florida rosemary (*Ceratiola ericoides*), hog-plum (*Ximenia americana*), and coastalplain staggerbush (*Lyonia fruticosa*). The trails should be monitored for invasion of exotic plants and native weedy (ruderal) species, which should be removed when found.

The Xeric Oak Scrub at Railhead Scrub Preserve have not burned in more than 54 years, much longer than the normal historical fire frequency. A summer prescription fire should be conducted when possible (see Goal 4).

Pine Flatwoods/Saw Palmetto
Two management strategies will be applied to *Pine Flatwoods/Saw Palmetto*. Exotic plants should be removed from all areas of *Pine Flatwoods/Saw Palmetto*. Exotics can be particularly problematic on slopes, where dense stands of melaleuca and Brazilian pepper had formed in the past.

Pine Flatwoods/Saw Palmetto should be burned every 3-7 years. Burns should be allowed to move across ecotones into adjacent plant communities. Burns are recommended during natural peak season (i.e., spring), but burns should also be conducted at other times of year if logistically advantageous. If the fire interval exceeds 3-7 years, mechanical methods such as should be considered no more than 9 months prior to a burn to reduce intensity of the fire and assist with recovering native forage plant diversity and habitat for Florida gopher tortoise.

Pine Flatwoods/Saw Palmetto on slopes on the site probably had historically dense understories of saw palmetto that occurred further down slope. Because of fire suppression at Railhead Scrub Preserve, the dense palmetto now reaches almost all the way upslope to Xeric Oak Scrub. Prescription fires should be conducted to minimize saw palmetto densities upslope to improve habitat for herbs and grasses but allow a dense zone of taller palmettos down slope. Prescribed fire crews should assess fuel loads before fires. Some areas may require manual removal of hardwoods. Fire frequency in these areas is probably similar to Xeric Oak Scrub, about every 8-25 years.

Cypress
The herb layer of the cypress has recovered through native recruitment. If exotic plants recruit then they should be treated with herbicides. An appropriate list of native species for the cypress dome habitat is included in Appendix 5 should planting become necessary.

Wet Prairie
Aside from drainage, which probably cannot be controlled, the two biggest threats to wet prairie habitats at Railhead Scrub Preserve are ORV activity and invasion of melaleuca. ORV activity has completely eliminated vegetation from the wet prairie at the center of the property.

Bare Sand
The biggest threat to the bare sand area at Railhead Scrub Preserve is ORV activity. ORV activity has completely eliminated vegetation.

A fence has been installed. The herbaceous layer should be monitored. Native plant species may naturally recruit. Exotic species, including herbs and grasses (especially torpedograss) may also appear and should be treated with herbicides. If recruitment of suitable natives does not occur then native species should be planted. An appropriate list of native species for the habitat is included in Appendix 5.

Borrow Pit
Exotic plants should be removed from the borrow pit. N. Native plant species may naturally recruit. Exotic species, including herbs and grasses (especially torpedograss) may also appear and should be treated with herbicides. If recruitment of suitable natives does not occur then native

species should be planted. An appropriate list of native species for the depression marsh habitat is included in Appendix 5.

GOAL 6: *MAINTAIN NATIVE AND LISTED SPECIES MANAGEMENT*

Action Item 6.1: Maintain an updated inventory and status of listed plant and animal species populations.
Action Item 6.2: Re-establish extirpated populations in restored, formerly occupied sites, using plants and animals from nearby populations.
Action Item 6.3: Reintroduce the banded wild pine bromeliad if extirpation is confirmed or enhance its population if found; and

1 Native Wildlife Management

Management of native animal species at the Railhead Scrub Preserve should correspond with the management goals of the Xeric Uplands, pine flatwoods, and wetland communities. Maintenance of viable populations of native animal species should be conducted by implementing management measures that maintain the viability of the natural communities at the preserve. Evidence of use of the preserve by white-tailed deer has been noted. Any fences constructed to exclude ORV use should provide wildlife movement over, through, or under. Staff are currently researching improved fencing methods such as smooth strand wire as the current field fencing has been observed to impact wildlife movement specifically for young fawns and Florida gopher tortoise.

2 Listed Species Management

Railhead Scrub Preserve should be managed to provide habitat for listed species found (or potentially found) on the site. Some of the management recommendations for state and federally listed plant and animal species found on the preserve are discussed below.

2.1 Management of Listed Plant Species

There are 13 rare plant species that have been recorded at Railhead Scrub Preserve (Table 5). All rare plants on the site occur in Xeric Uplands, so management of this ecosystem is the highest priority for the management of rare plants. Management of rare plant species at the preserve should in general consist of general vegetation management recommendations in Goal 5, exotic species control in Goal 3, and fire management in Goal 4. Other special needs and recommendations are listed below.

Off road vehicles pose a threat to rare plant species that occur in Xeric Uplands, including all rare plants recorded from the site. The most critically threatened species is showy dawnflower, which is known from only one other preserve in South Florida. ORVs can easily kill these small plants, and since ORV users commonly break new trails in open sand, the only habitat for this species, it is particularly sensitive. Management recommendations include locating rare plants and planning public and management access routes so as not to damage them.

Special care should be taken whenever management activities take place in the vicinity of rare plant populations. Herbicide applications should ensure that there is no off-target damage. Vehicles or other machinery should not be used in Xeric Uplands off established trails.

It may also be desirable in Xeric Uplands to remove some populations of orchids and bromeliads prior to prescribed fires and replant them in the restored cypress community. Epiphytes are currently common in the community, especially on larger oaks. Fires will probably kill these epiphyte populations, but historically, they probably recruited back into the ecosystem from seed blown in from adjacent cypress communities. Establishment in the cypress may provide a seed source for recruitment after fires.

One rare plant species recorded previously on the site may no longer be present - banded wild pine. If the species is not found in subsequent surveys, then it could be reestablished on the site. This species should be established in the Xeric Uplands communities using germplasm from nearby localities.

2.2 Management of Listed Animal Species

The Railhead Scrub Preserve should be managed to maintain or increase populations of rare animal species as appropriate. Management of rare animal species at the preserve should correspond with the natural communities' management goals.

The main priority shall be the management of the gopher tortoise population. Other priorities shall include monitoring of the occurrence of eastern indigo snake and gopher frog. The xeric upland communities at the Railhead Scrub Preserve provide suitable habitat for all three species and maintenance of habitat is the key for the protection of these listed species populations. Therefore, general management for this species at the site would be consistent with general vegetation management recommendations in Goal 5, exotic species control in Goal 3, and fire management in Goal 4.

To protect the tortoise population from direct take such as removal of tortoises for pets or consumption, the Railhead Scrub Preserve should be fenced in a manner that would inhibit easy access to more remote portions of the site occupied by gopher tortoise (e.g., the northern portion of the preserve). Limiting access by ORV also ensures that tortoises are protected from collisions and burrow collapses by ORV use.

Managing the preserve for the benefit of the gopher tortoise will also benefit eastern indigo snakes and gopher frogs if these species are present.

GOAL 7: *CONTINUE TO EVALUATE POTENTIAL FOR ACCESS AND PUBLIC USE*

Action Item 7.1 Develop access for intended public uses

Once legal vehicular access can be established from the proposed future road (Veterans Memorial Boulevard), facilities will be developed to provide the general public access to the preserve. These facilities will be limited to an entrance road and gate, a parking lot, , information kiosk and trail. Figure 10 provides a conceptual plan for a proposed walking trail that could be available upon completion of the Phase I and Phase II Veteran's Memorial Blvd Extension. Visitors to the preserve would be able to use several parking spots within the newly established GGG Highschool lot and travel along a proposed sidewalk to the trailhead located in the NE corner of the preserve. The trail utilizes mostly existing areas of impacted vegetation with a mix of historic trails, firebreaks, and a narrow hand cut loop in the Southwest parcel to bring visitors along the margins of scrub habitat. This conceptual plan was developed with special consideration to reducing as much impact as possible to the imperiled plant and animal species on the preserve while giving members of the community an opportunity for passive, nature-based recreation.

The proposed trail is approximately 2 miles long and it will follow existing areas lacking vegetation to the greatest extent possible. Educational, interpretive signage regarding the gopher tortoise and habitat shall be present along the trail.

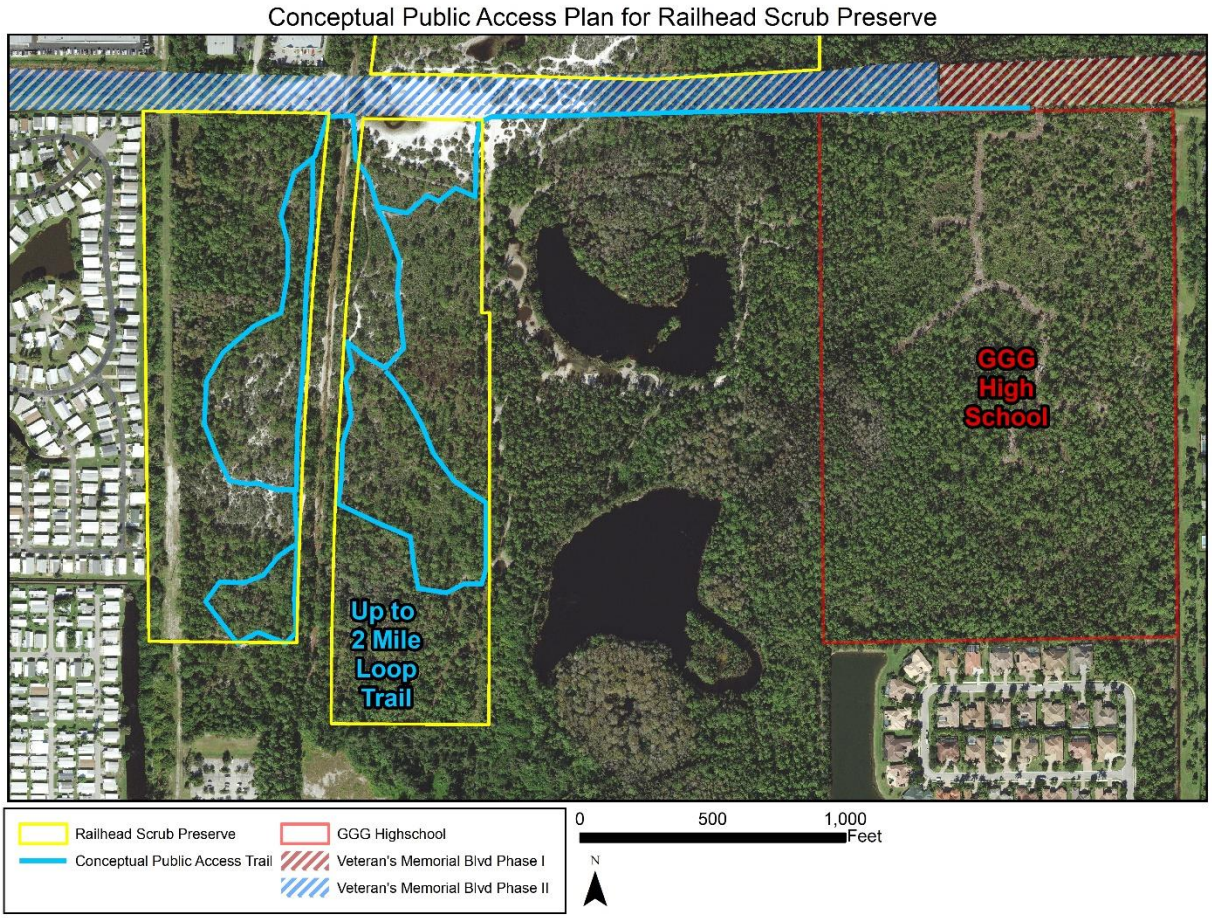

Figure 10. Conceptual Public Access Plan for Railhead Scrub Preserve

GOAL 8: *FACILITATE USES OF THE SITE FOR EDUCATIONAL PURPOSES*

One of the goals of this management plan is to educate the public and local governments concerning resources, issues, and management goals and objectives of Railhead Scrub Preserve. These objectives include:

Actions Item 8.1 Interaction with adjacent landowners via phone, mail, and direct contact regarding management issues, such as exotics, prescribed fire, and dumping;

Actions Item 8.2 Development of brochures and letters explaining the prescribed burning and exotic species removal programs;

Actions Item 8.3 Development of natural resource educational materials;

Actions Item 8.4 Encouragement of adjacent landowners to establish control programs for invasive exotic plants; and

Actions Item 8.5 Providing public service announcements to media contacts.

GOAL 9*: MAINTAIN PLAN FOR SECURITY AND DISASTER PREPAREDNESS*

Because the site is devoted to the maintenance of natural conditions, there has been no disaster plan required for the preserve area itself. Staff will visit the site as soon as possible after storms or other types of natural disasters to evaluate and address any damage that may have occurred, with emphasis on making sure trees from the preserve have not fallen and damaged properties on the perimeter. Second priority shall be on the firebreaks to make sure they are still passable and undamaged.

Action Item 9.1 Life Safety

A safety plan will be prepared for removal of visitors and personnel. The plan shall include specific actions when faced with a list of environmental and physical conditions such as wind, rain, fire and any physical danger arising from persons acting in an inappropriate manner.

1. Site Considerations

Because of the hazards of wind, water, and fire the site should be evaluated on a predetermined basis for the following items:

- Tree trimming plan for perimeter landscape to ensure that the material does not present a hazard to surrounding properties.
- Inspections of entry points, including gates, and security equipment.
- Inspections for loose perimeter trash both natural and man-made.

Action Item 9.2 Recovery Plan

A plan should be developed for the period after the disaster to insure as little confusion as possible. The priority in this plan shall consider a site inspection for assessing damage to vegetation and addressing the needs for removal of debris from a parking area and trails.

Action Item 9.3 Fire Department Emergency Response Plan

A plan will be developed to provide emergency fire responders with a map of access points and locations of listed species so they can avoid if possible. In addition, a strategy should be developed, such as, protect surrounding structures or specific areas first.

4.5 Establish an Operational Plan for the Railhead Scrub Preserve

This section provides management recommendations for operation of the Railhead Scrub Preserve. It discusses maintenance and budgeting needs, the possibilities for contracting the restoration activities, coordination, and other management issues.

4.5.1 Maintenance

The primary maintenance activities for the preserve will include control of dumping and littering within and around the preserve and trail and facilities maintenance. Particularly important are the security measures to keep intruders out and the maintenance measures to keep the fencing and signage in good condition. Signs that effectively convey the desired message provide an opportunity for increasing environmental education and awareness.

4.5.2 Estimated Annual Costs and Funding Sources

Preliminary budget estimates for Railhead Scrub Preserve include cost breakdowns associated with resource restoration and management. The funding source identified for the restoration and management activities is the Conservation Collier Program Management Trust Fund. Table 9 shows the activities planned for the next ten years and the initial and annual cost estimate of each activity.

Funding already secured for management activities at Railhead Scrub Preserve include a May 2007 grant from the state (FDEP - $50,600) to remove melaleuca in the northern portion, a 2005 grant from USFWS Partners for Fish and Wildlife Program ($10,000) for general exotic removal, a 2008 grant from USFWS Partners for Fish and Wildlife Program ($15,000) for native plants, financial assistance from the Florida Fish and Wildlife Conservation Commission ($20,000) for firebreak creation in March 2010, as well as FWC Habitat Management Funding Assistance in 2013. Similar alternative funding sources will continue be sought to supplement existing funding.

The budget in Table 10 represents the actual and unmet budgetary needs for managing the lands and resources of the preserve. This budget was developed using data from Conservation Collier and other cooperating entities, and is based on actual costs for land management activities, equipment purchases and maintenance, and for development of fixed capital facilities. The budget below considers available funding and is consistent with the direction necessary to achieve the goals and objectives for Railhead Scrub Preserve.

Table 10: Annual Land Management Budget (Amounts in $)												
			YEARS									
Item	**2020-21**	**2021-22**	**2022-23**	**2023-24**	**2024-25**	**2025-26**	**2026-27**	**2027-28**	**2028-29**	**2029-30**	**2031-32**	**Total**
Resource Restoration/Monitoring												
Remove exotics (acres) [1/]	$21,000	$15,000	$10,000	$15,000	$10,000	$15,000	$10,000	$15,000	$10,000	$15,000	$10,000	$146,000
Regular Maintenance												
Fireline Discing		4,000	2,500	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	**$22,500**
General Fencing Maintenance (month/yr) [2/]	$650	$25,000	1000	1000	1000	500	500	500	500	500	500	**$31,000**
Preserve Amenities		$10,000	$2000	500		500		500		500		
Grand Total	**$21, 650**	**$54,000**	**$15,500**	**$18,500**	**$13,000**	**$18,000**	**$12,500**	**$18,000**	**$12,500**	**$18,000**	**$12,500**	**$188,300**

4.5.3 Potential for Contracting Restoration and Management Activities by Private Vendors

A significant number of Railhead Scrub Preserve management operations and restoration activities can be considered for outsourcing. Restoration and management activities that can be considered for outsourcing to private entities are listed in Table 11.

Table 11: Potential Contracting for Restoration and Management Activities

Activity	Approved	Conditional	Rejected
Prescribed fire application	X		
Minor fireline installation	X		
Fireline, fence, and trail maintenance	X		
Fence installation	X		
Plant and wildlife inventory and monitoring		X	
Listed species mapping and needs assessment		X	
Restore/enhance encroachment and ruderal areas		X	
Reduce exotic species	X		
Literature development and printing		X	
Interpretive signs development and installation		X	
Trail installation	X		
Law enforcement and patrol	X		

4.6 Partnerships and Regional Coordination

There may be opportunities to collaborate with the Collier County Parks and Recreation Department. Other potential partnerships may include, but not be limited to:

- Surrounding residential and commercial property owner associations;
- The Conservancy of Southwest Florida;
- The Audubon Society;
- Naples Botanical Garden;
- Florida Wildlife Federation;
- Collier County Schools;
- Collier County Sheriff's Office;
- North Naples Fire Department;
- Florida Division of Forestry;
- U.S. Fish and Wildlife Service;
- Florida Department of Environmental Protection;
- South Florida Water Management District;
- Big Cypress Basin;
- Florida Fish and Wildlife Conservation Commission; and
- Other County Departments, as some goals and purposes will be similar.

4.6.1 Interdepartmental Partnerships and Agreements

Most, if not all, of the management activities on this preserve will be conducted through contract and by the Conservation Collier Program staff. Other Collier County Departments that may eventually be involved in management of Railhead Scrub Preserve include:

- Collier County Parks and Recreation Department; and
- Collier County Facilities Management Department

4.6.2 Cooperating Agencies

The preserve is managed in accordance with all applicable Florida Statutes and administrative rules. Agencies having a major or direct role in the management of the preserve are discussed in relevant portions of this plan. The Department of Agriculture and Consumer Services, Division of Forestry (DOF), will assist Conservation Collier staff in the development of wildfire emergency plans and provide some services and the authorization required for prescribed burning. In addition, the Florida Fish and Wildlife Conservation Commission (FFWCC) will aid Conservation Collier with wildlife management programs, including the development and management of Watchable Wildlife programs.

4.6.3 Land Use Coordination

The long-term health and connectivity of the preserve will be directly influenced by the surrounding land use. Conservation Collier will work with neighboring landowners and residents to inform the public, Collier County planning staff, and elected officials about the potential impact of proposed land use changes on the preserve.

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