

Northeast Florida Blueway Phase II - Tolomato and Matanzas Rivers Florida Forever Application

Submitted by
St. Johns County



Prepared by
Muller and Associates, Inc.
with
John R. Meyer, Ph.D., Consulting Biologist
St. Johns County Planning Division and GIS Division
LT GIS Services, Inc.

1	General Description
2	Resources
3	Additional Information
4	Ownership & Tax Information
5	Closing Comments
6	App. I. Photographs
7	App. II. Topo Maps
8	App. III. Natural Communities
9	App. IV. FNAI Ranks Explanation
10	App. V. Surveys

Northeast Florida Blueway Phase II - Tolomato and Matanzas Rivers

I. General description

Introduction

The Atlantic Intracoastal Waterway (ICW) of northeast Florida winds its way through vast expanses of saltmarsh punctuated occasionally by small, slightly elevated hammocks. The marshes fringe both islands and the mainland, an enticing interplay of sea, land, and air. One feels an almost primeval draw to this area and its sea.

The waterway pulses from Georgia's Golden Isles across the St. Marys River and on through the Amelia and Nassau Rivers. It flows across the St. Johns River and courses down Pablo Creek into the Tolomato then Matanzas Rivers, forming a blueway connection between the present and past. A traveler can experience the full range of this area's history, as he passes through the primordial marshes and hammocks to Timucuan Indian sites and 16th century St. Augustine, from historic Fernandina Beach to metropolitan Jacksonville.

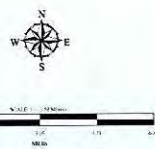
The natural and historic value of this area is reflected in the establishment of state parks, aquatic preserves, a national ecological and historic preserve, a national memorial and monuments, state historic sites, a wildlife management area, and a national estuarine research reserve. However, these efforts alone are not sufficient safeguard for the character and vitality of the area. This proposal continues the effort for the establishment of a Northeast Florida Blueway. Similar in concept to the Indian River Lagoon Blueway, the Northeast Florida Blueway will bridge the protection gaps to help secure the ecological character of the region and ensure recreation opportunities for residents and visitors.

The initial phase of the Northeast Florida Blueway, Phase I - Pablo Creek, was approved by the Acquisition and Restoration Council in 2000 and is a Category A project. Also approved by the Council last year was the Tiger Island proposal, which contains important gateway properties to the Blueway on the Georgia/Florida border. The Northeast Florida Blueway Phase II proposal addresses the next segment of the Blueway, the Intracoastal Waterway in St. Johns County, just south of Phase I. The Tolomato and Matanzas Rivers define the majority of this stretch of the Intracoastal. As with Phase I, the Phase II lands are threatened by burgeoning development. The draw of Jacksonville, Ponte Vedra Beach, St. Augustine, and the coast in general has resulted in a near build-out of lands between the Intracoastal Waterway and the ocean, with a few exceptions - the public lands. Development of the remaining uplands along the Intracoastal Waterway in St. Johns County does not lag far behind.

The remaining undeveloped habitats in St. Johns County adjacent to the Intracoastal Waterway and the tributaries flowing into it are proposed as Phase II of the Northeast Florida Blueway

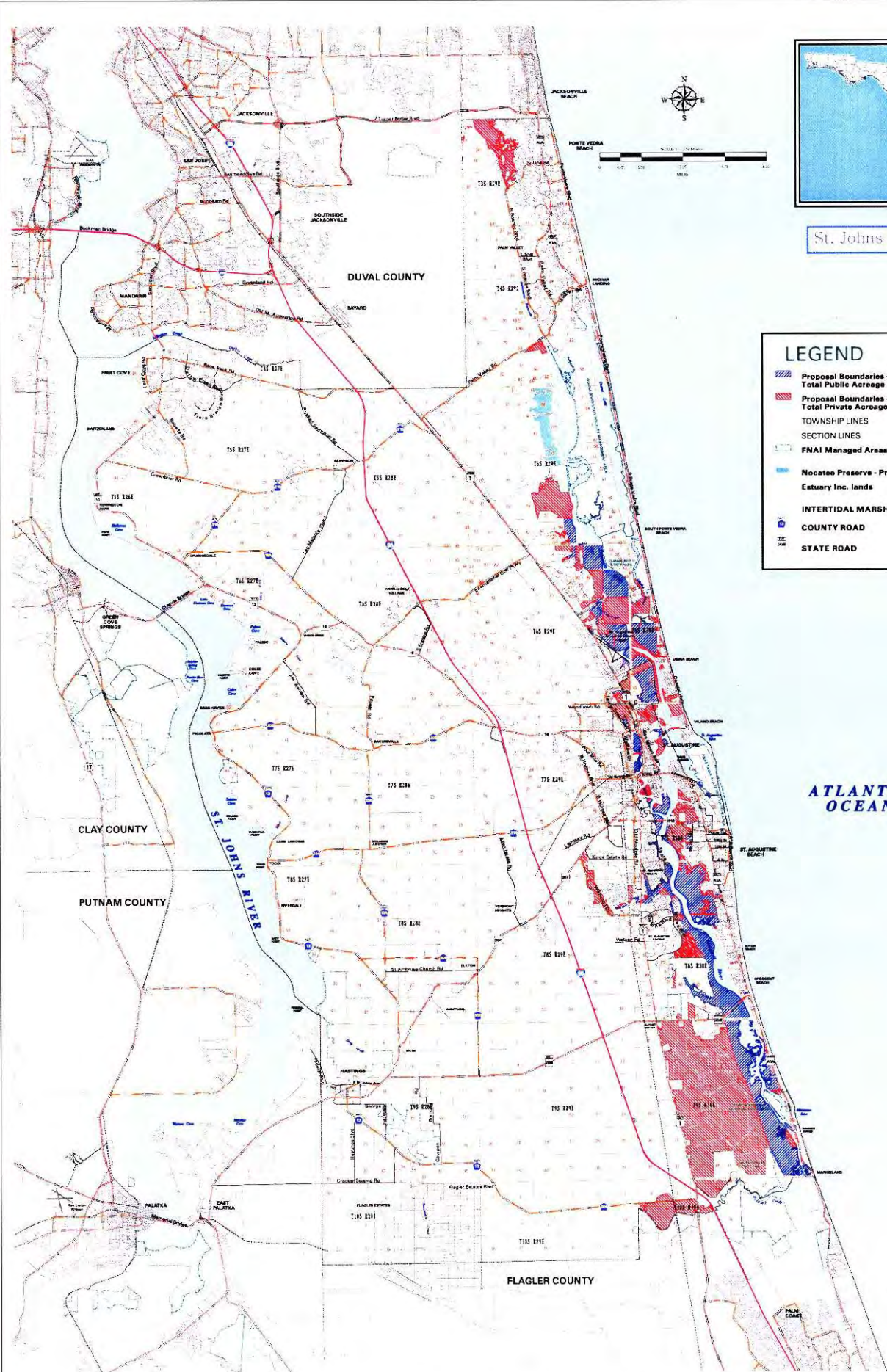


St. Johns County



LEGEND

- Proposal Boundaries - Public Lands
Total Public Acreage = 9,842.23
- Proposal Boundaries - Private Lands
Total Private Acreage = 18,213.41
- TOWNSHIP LINES
- SECTION LINES
- FNAI Managed Areas
- Nocatee Preserve - Proposed
Estuary Inc. lands
- INTERTIDAL MARSH
- COUNTY ROAD
- STATE ROAD



ATLANTIC OCEAN

St. Johns County Blueway Project

Northeast Florida Blueway Phase II
Toledo and Matanzas Rivers
Florida Forever/ARC Proposal
June 2001



DISCLAIMER
This map is for informational purposes only. It is not intended to be used as a legal document. The St. Johns County Board of Commissioners reserves the right to modify or cancel this proposal at any time without notice.



Florida Forever Project. Private lands are included within the proposed boundaries, as are some government and authority lands that possess important natural resource values but are primarily managed for other purposes. The private lands are proposed for acquisition with Florida Forever funding. Both fee simple and less-than-fee approaches are recommended, taking into consideration the level of protection needed and the owner's desire. By identifying the government and authority lands as significant to the native character and ecological integrity of the region, it is hoped that the managing agencies will realize their control over the fate of rapidly disappearing natural assets and will voluntarily protect the resources. Some of the controlling authorities on the public lands include the Florida Inland Navigation District, the St. Augustine Port Authority, and the St. Augustine Airport Authority. Also included are some lands held in trust for the State by the Trustees for the Internal Improvement Trust Fund, which are apparently not leased to any agency.

The proposal includes the undeveloped lands on the east and west sides of the Intracoastal Waterway in St. Johns County. The Tolomato and Matanzas Rivers make up the majority of this stretch. When the ICW was created, a short segment in the north was dredged through Cabbage Swamp to connect Pablo Creek with the Matanzas River, and this area is included in Phase II. The proposal also includes undeveloped lands along the tributaries of the Tolomato and Matanzas rivers.

As was true for the Pablo Creek Phase I segment, the Phase II properties are also under tremendous development pressure. St. Johns County experienced a 47% increase in population from 1990 to 2000 (U.S. Census). Northern St. Johns County, in particular, is experiencing explosive growth, in part due to pressures from Jacksonville's growth. Areas bordering the Northeast Florida Blueway (NEFB) Phase II proposal are among the fastest growing in the County. The population of Palm Valley (east of the ICW in the northernmost part of St. Johns County) almost doubled between 1990 and 2000 (99.4% increase). The population of the Sawgrass area increased by 65% and Vilano Beach by 36% during the past decade. Progressing further south, the population of St. Augustine South (west of the ICW) increased by 19% and Butler Beach by 31%. The growth is not expected to stop anytime soon. The Marshall Creek and Nocatee Developments of Regional Impact (DRIs), south of Palm Valley and north of St. Augustine, are indicators of significant future population growth. Marshall Creek is predicted to add 6600 people to the local population by 2011, and Nocatee is predicted to increase the population by 31,000 by 2025 (Teresa Bishop, St. Johns County, pers. comm.). A drive through any of the coastal areas of St. Johns County reveals active construction on most uplands not already in conservation.

Approval of the Northeast Florida Blueway Phase II application will augment substantial land management and coordination efforts already in place for this region. Several managed areas already anchor protection efforts in the area; this project will protect additional lands that help secure the existing investment. In the north, the Guana River State Park and Guana River Wildlife Management Area protect resources on the oceanside of the waterway. In the center of the project, Anastasia Island State Park protects coastal resources. Toward the southern end of the project, St. Johns River Water Management District's Moses Creek and Faver-Dykes State Park are solid starts in protection of these resources.

Much of the proposal area has received national recognition through its designation as a National Estuarine Research Reserve (NERR). This program is designed to sustain the environmental integrity of relatively undisturbed estuarine ecosystems. Reserves are intended to promote, implement and coordinate opportunities for scientific research, environmental education, public stewardship and nature appreciation on uplands and submerged lands. Established in 1999, the Guana/Tolomato/Matanzas NERR was chosen as a national example of the temperate Carolinian biogeographic province. The area's overall quality and relatively undeveloped character played a large role in its selection. Conservation of the lands within the Blueway Phase II proposal will help to protect the water quality which is vital to the success of the NERR.

The area is also part of the Northern Coastal Basins Program, an effort of the St. Johns River Water Management District established in response to water quality concerns related to anticipated growth impacts on the coastal resources. The District hopes to maintain healthy estuarine ecosystems that support the economic, recreational and educational resources of the communities in the Northern Coastal Basins (NCB). Created in 1995, the NCB Program coordinates local, regional and state management efforts and resources to evaluate conditions of the estuary in response to current issues and to prepare for the future management needs. Water quality of shellfish areas, stormwater management, and pollution load targets are some of the issues being addressed by the NCB Program.

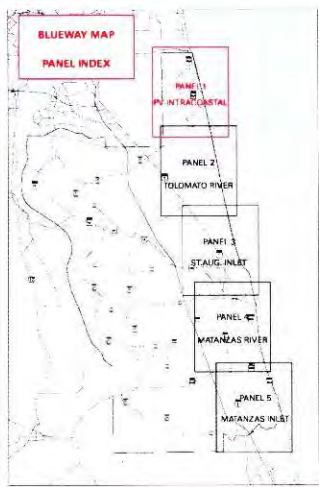
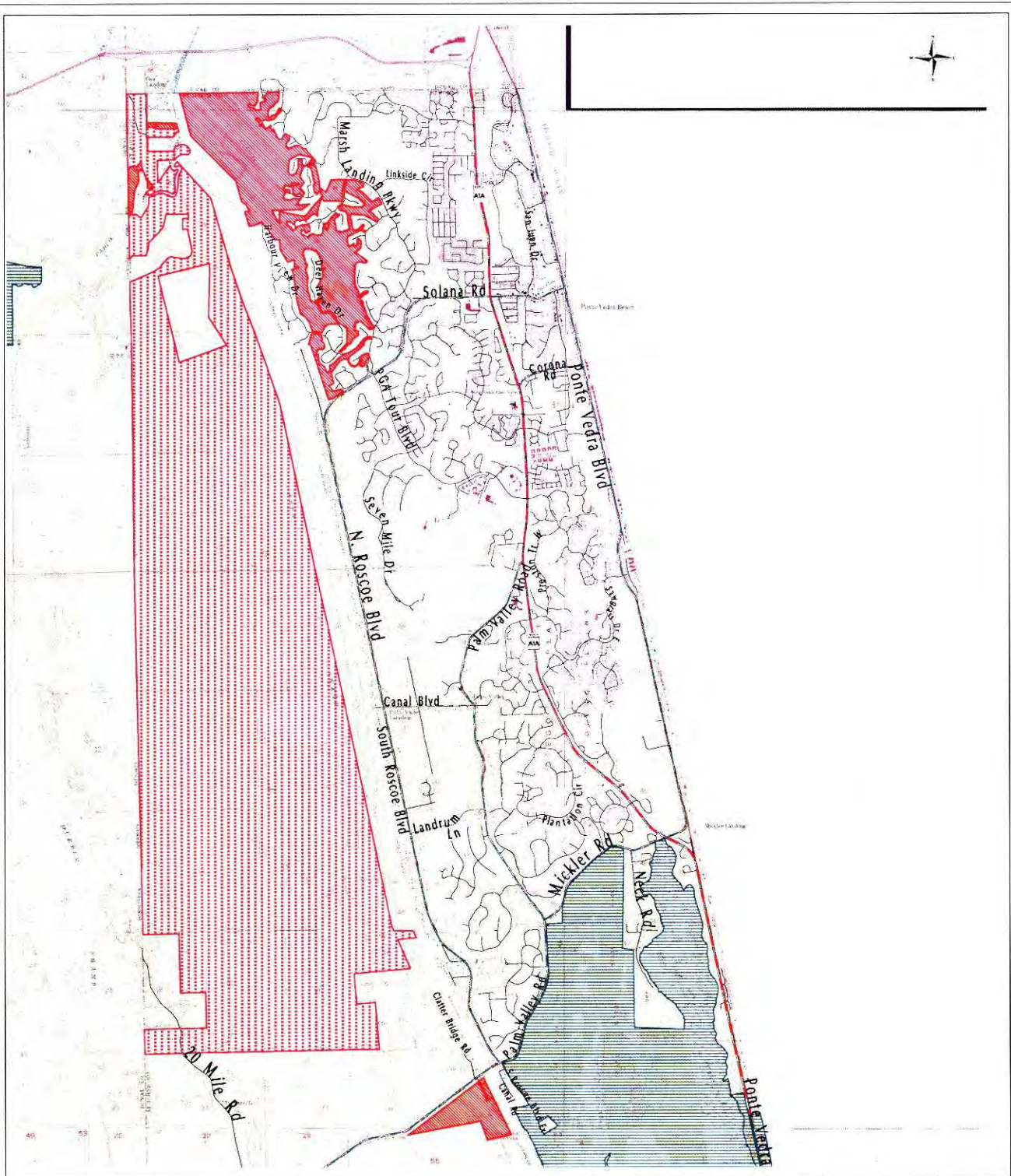
Public support for protection along this area is evidenced by the County commitment of funds for a FCT project within the Blueway Phase II boundary, action on establishing a wetlands buffer ordinance, and results of community vision efforts (see "Related community efforts", below).

The proposal includes about 18,170 acres (1413 parcels) of private lands and 9985 acres (259 parcels) in public ownership. Some landowners possess more than one parcel; approximately 285 private landowners control land within the proposal. Six private landowners own about 12,000 acres.

Rich in diversity, the proposal includes the remaining waterfront uplands and wetlands along the ICW in St. Johns County. Approximately 17 types of natural communities possibly supporting 70 or more Florida Natural Areas Inventory (FNAI) listed species are included in the proposal. Recognized by both FNAI's Potential Natural Areas analysis and the Florida Fish and Wildlife Conservation Commission's Strategic Habitat Conservation Area efforts, this proposal would afford protection to wildlife and natural communities against the unyielding pressure of rapid development. The Northeast Florida Blueway Phase II - Tolomato and Matanzas Rivers Project offers an opportunity for Florida Forever to provide lasting protection for a regionally significant resource for the benefit and enjoyment of Florida citizens.

Directions to site

The proposed project is in St. Johns County, along the Tolomato and Matanzas Rivers from the Duval/St. Johns County line to the St. Johns/Flagler County line. Access to some sites is via



**ST. JOHNS COUNTY
BLUEWAY LAND ANALYSIS PROJECT**

*Northeast Florida Blueway Phase II
Tolomato and Matanzas Rivers
Florida Forever/ARC Proposal
June 2001*

The purpose of this study is to evaluate lands
for conservation along the Intracastal
Waterway in St. Johns County, Florida.

Land Acquisition
Study Done By:
Muller and Associates, Inc.
E-mail: muller@mullerassoc.com
Web Address: www.MullerAssoc.com
3838 Sally Lane
Tallahassee, FL 32312-1019
Voice: 904/668-4905
Fax: 904/668-7728

Map Prepared By:
St. Johns County
GIS Division
4510 Bruce Johnson, Rm 404
4620 Lewis Speedway
PO. Drawer 345
St. Augustine, FL 32084
Voice: 904/823-2627
Fax: 904/823-2585

LEGEND

1:24,000 USGS QUADRANGLE

This map is a portion of the Public Lands and the Water Quality
District City Government.

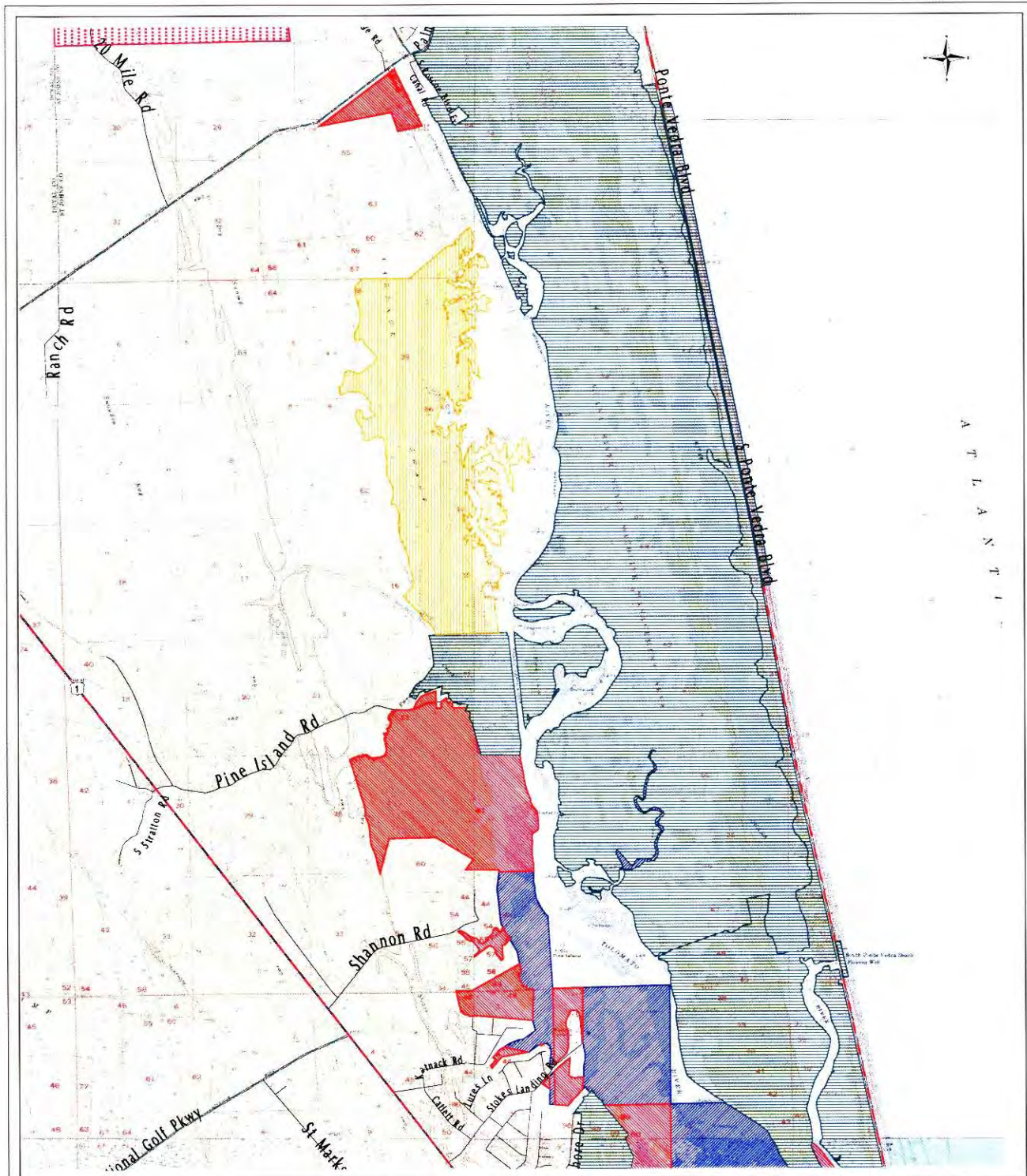
-  Proposal Boundaries - Public Lands
Total Public Acreage = 9,942.23
-  Proposal Boundaries - Private Lands
Total Private Acreage = 18,212.41
-  FWA Managed Areas
-  Noctua Preserve - Proposed
-  Estuary Inc. lands



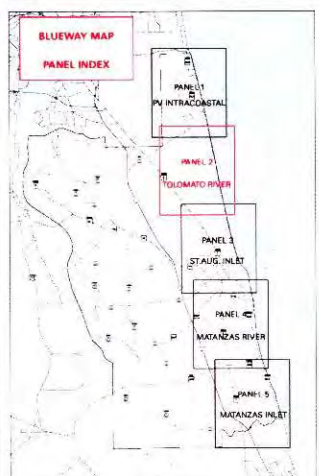
**PANEL NAME: PV-INTRACASTAL
MAP: QUADRANGLE**



10/01/02
This map is a portion of the Public Lands and the Water Quality District City Government.



A
T
L
A
N
T
I
C



**ST. JOHNS COUNTY
BLUEWAY LAND ANALYSIS PROJECT**

*Northest Florida Blueway Phase II
Tolomato and Matanzas Rivers
Florida Forever/JARC Proposal
June 2001*

*The purpose of this study is to evaluate lands
for conservation along the Intracoastal
Waterway in St. Johns County, Florida.*

*Land Acquisition
Study Done By:
Miller and Associates, Inc.
E-mail: miller@mlaassociates.com
Web Address: www.MLAassociates.com
3628 Sally Lane
Tallahassee, FL 32312-1019
Voice: (850)668-4905
Fax: (850)668-7728*

*Map Prepared by:
St. Johns County
GIS Division
gis@stjohns.fl.us
40177 Lewis Countyway
PO Drawer 3451
St. Augustine, FL 32084
Voice: (904)823-2627
Fax: (904)823-3585*

LEGEND

1:24,000 USGS QUADRANGLE

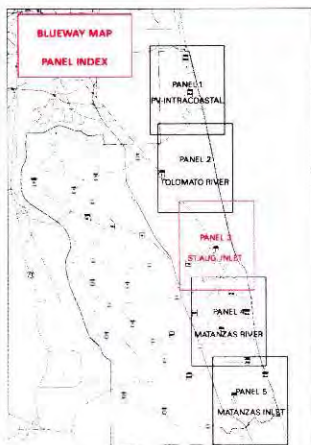
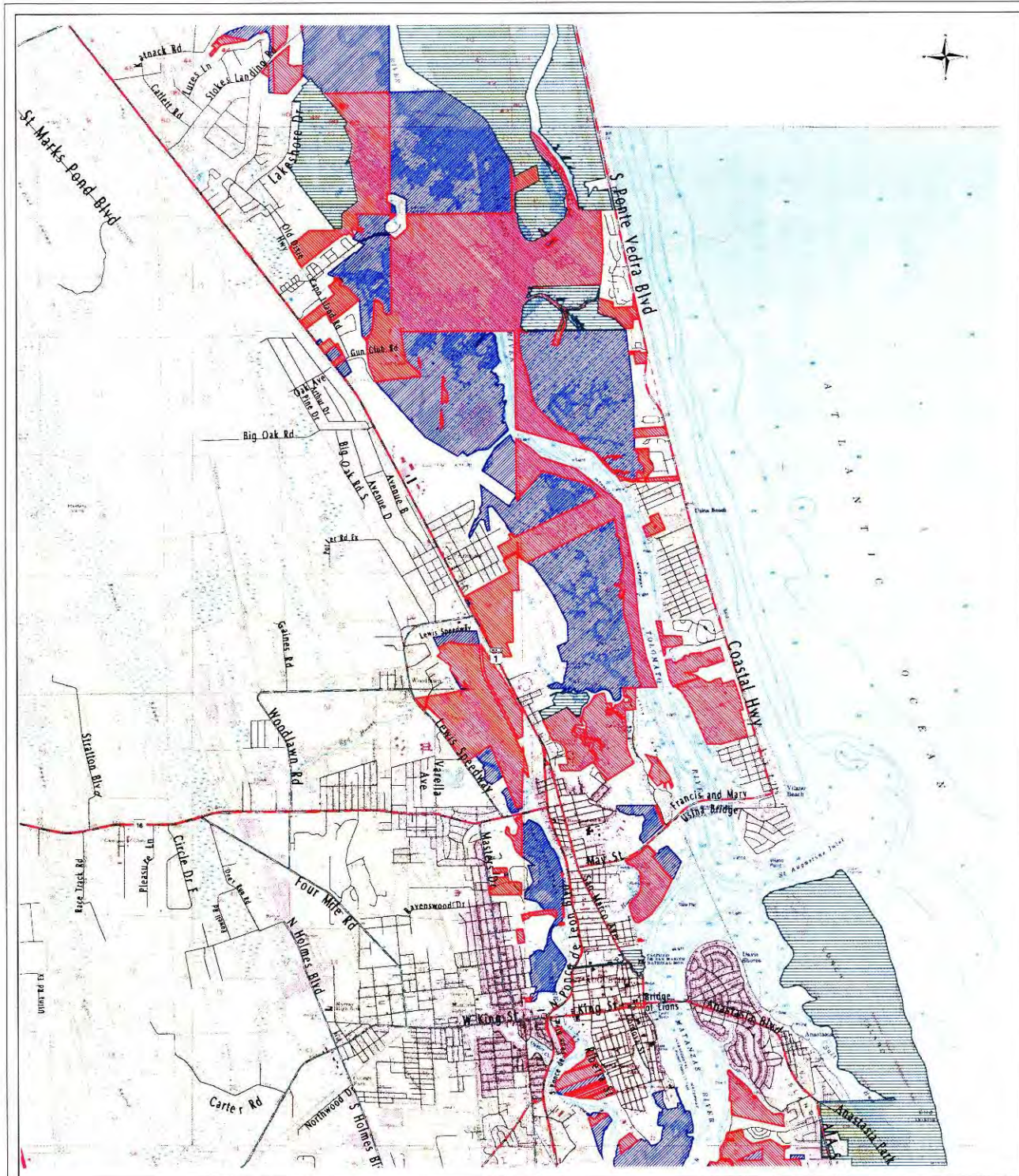
The map depicts portions of the Florida and Santa Fe de Matanzas
1847 U.S.G.S. Quadrangle.

-  Proposal Boundaries - Public Lands
Total Public Acreage = 2,062.23
-  Proposal Boundaries - Private Lands
Total Private Acreage = 18,213.47
-  FRAJ Managed Areas
-  Wetlands Preserve - Proposed
-  Estuary Inc. lands



PANEL NAME: TOLOMATO_RIVER
MAP: QUADRANGLE





**ST. JOHNS COUNTY
BLUWAY LAND ANALYSIS PROJECT**

*Northeast Florida Blueway Phase II
Tolomato and Matanzas Rivers
Florida Forever/ARC Proposal
June 2001*

The purpose of this study is to evaluate lands for conservation along the Intracoastal Waterway in St. Johns County, Florida.

Land Acquisition
Study Done By:
Muller and Associates, Inc.
E-mail: muller@mullerassoc.com
Web Address: www.MullerAssoc.com
3800 Sally Lane
Tallahassee, FL 32312-1019
Voice: (850) 668-4908
Fax: (850) 668-7728

Map Prepared by:
St. Johns County
GIS Division
John DeLoe, GIS Analyst
40251 Lewis Street
PO Drawer 348
St. Augustine, FL 32084
Voice: (904) 823-2627
Fax: (904) 823-2686

LEGEND

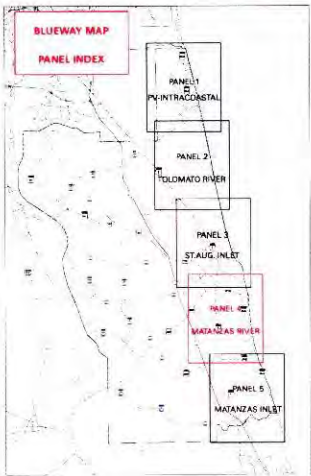
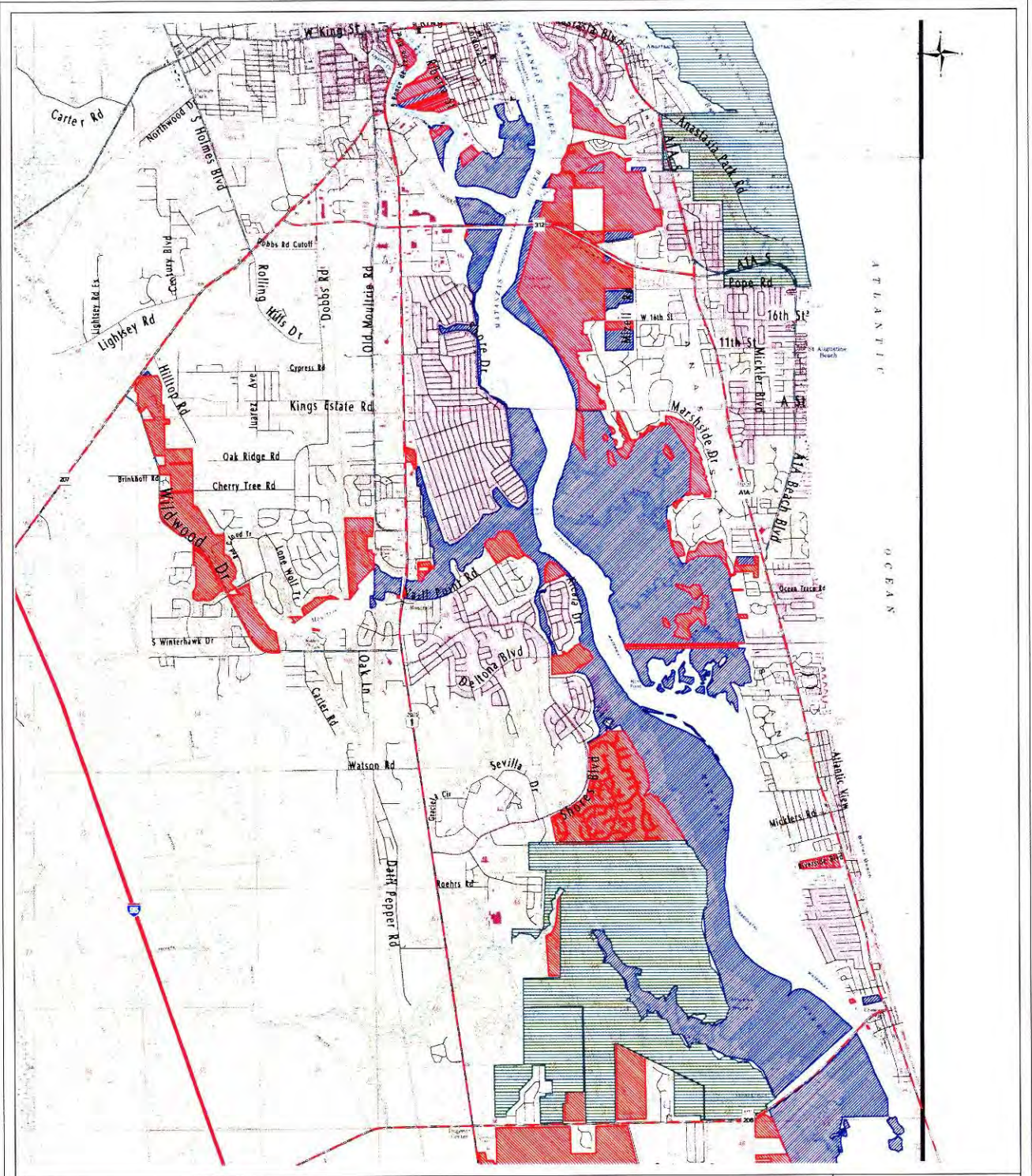
1:24,000 USGS QUADRANGLE

This map depicts portions of the National Wetlands Inventory (NWI) and the Florida Wetlands Inventory (FWI).

- Proposal Boundaries - Public Lands
Total Public Acreage = 8,842.23
- Proposal Boundaries - Private Lands
Total Private Acreage = 18,213.41
- FMAJ Managed Areas
- Nocatee Preserve - Proposed
- Estuary Inc. lands



**PANEL NAME: ST.AUG. INLET
MAP: QUADRANGLE**



ST. JOHNS COUNTY
BLUEWAY LAND ANALYSIS PROJECT

*Northeast Florida Blueway Phase II
 Tolomato and Matanzas Rivers
 Florida Forever/ARC Proposal
 June 2001*

The purpose of this study is to evaluate lands for conservation along the Intracoastal Waterway in St. Johns County, Florida.

Land Acquisition
 Study Done By:
 Muller and Associates, Inc.
 E-mail: muller@mulleassociates.com
 Web Address: www.MullerAssoc.com
 3000 Sally Lane
 Tallahassee, FL 32312-1019
 Voice: (850)688-4305
 Fax: (850)688-7228

Map Prepared By:
 St. Johns County
 GIS Division
 gis@stjohns.fl.us
 4070 Lewis Speedway
 P.O. Drawer 348
 St. Augustine, FL 32084
 Voice: (904)823-2827
 Fax: (904)823-2850

LEGEND

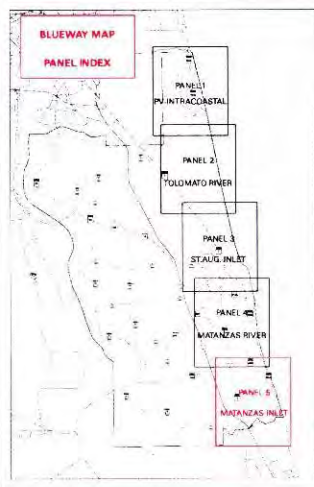
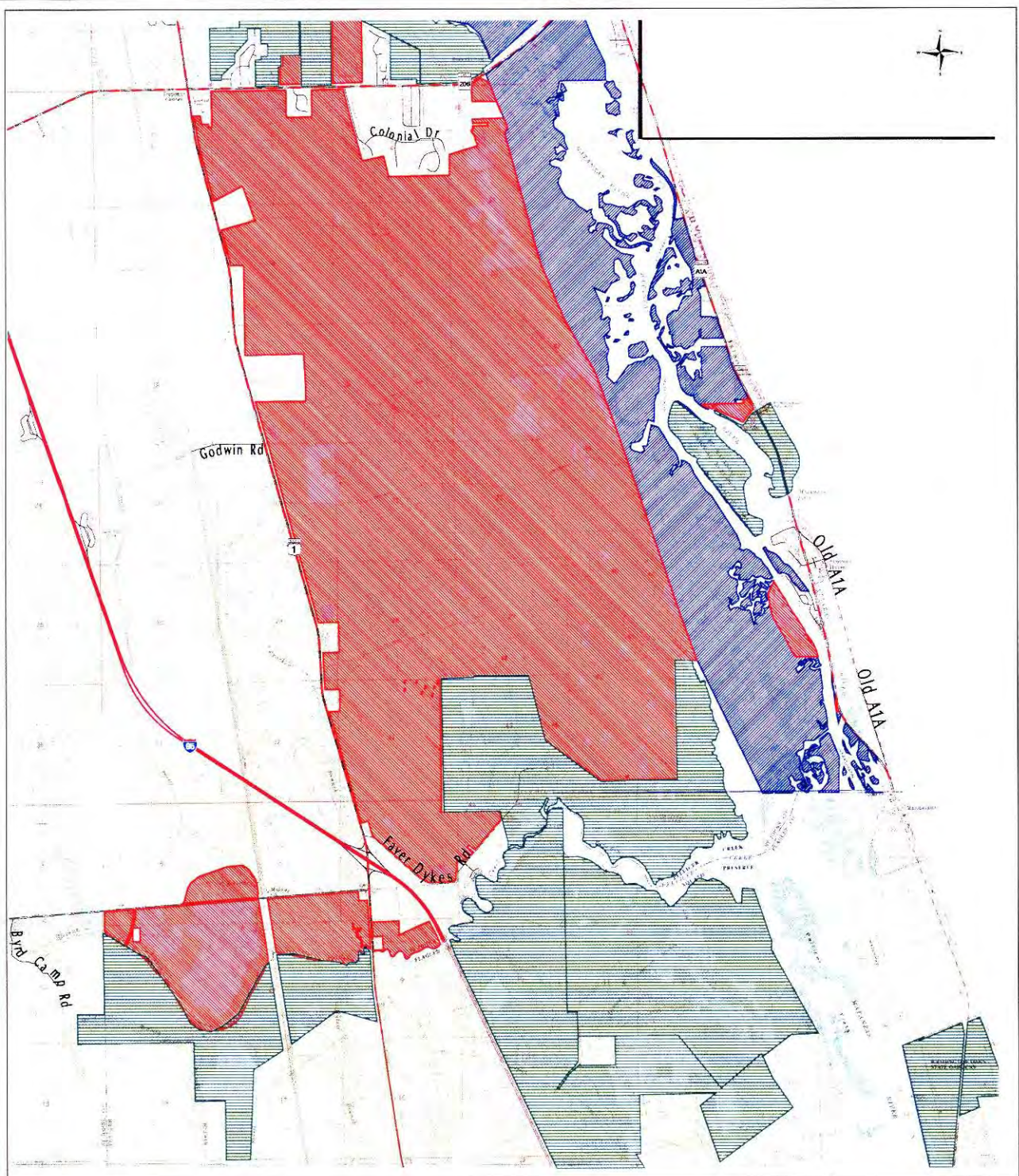
1:24,000 USGS QUADRANGLE

This map depicts portions of the Wetlands of St. Augustine Bay
 (Wetlands of St. Augustine Bay)

- Proposal Boundaries - Public Lands
Total Public Acqrage = 5,042.23
- Proposal Boundaries - Private Lands
Total Private Acqrage = 18,212.41
- FWA Managed Areas
- Noctive Preserve - Proposed
- Estuary Inc. Lands

PANEL NAME: MATANZAS_RIVER
MAP: QUADRANGLE





ST. JOHNS COUNTY
BLUEWAY LAND ANALYSIS PROJECT

Northeast Florida Blueway Phase II
 Tolomato and Matanzas Rivers
 Florida Forever/ARC Proposal
 June 2001

*The purpose of this study is to evaluate lands
 for conservation along the Intracoastal
 Waterway in St. Johns County, Florida.*

Land Acquisition
 Study Done By:
 Muller and Associates, Inc.
 E-mail: muller@mullerassociates.com
 Web Address: www.MullerAssoc.com
 3800 Sawy Lane
 Tallahassee, FL 32312 1019
 Voice: (904) 668-4985
 Fax: (904) 668-7728

Map Prepared by:
 St. Johns County
 GIS Division
 gis@stjohns.fl.us
 4020 Lawli Spurway
 P.O. Drawer 349
 St. Augustine, FL 32084
 Voice: (904) 823-2827
 Fax: (904) 823-2828

LEGEND

1:24,000 USGS QUADRANGLE

This map depicts portions of the Florida Inland and Wetland and
 Water Use (FIAWI) boundaries.

- Proposal Boundaries - Public Lands
Total Public Acreage = 8,842.23
- Proposal Boundaries - Private Lands
Total Private Acreage = 18,213.41
- FNAI Managed Areas
- Nonstate Preserve - Proposed
- Estuary Inc. lands

PANEL NAME: MATANZAS_INLET
 MAP: QUADRANGLE

roads, while other sites are accessible only by boat. From north to south, the eastern portion borders Ponte Vedra Beach, South Ponte Vedra Beach, Vilano Beach, St. Augustine Beach/Anastasia Island, Crescent Beach, and the Fort Matanzas area. The western portion borders Dee Dot ranch, the proposed Nocatee development, St. Augustine, and areas south of St. Augustine. From the north, the ICW is crossed by Palm Valley Road (CR 210), Vilano Road/US A1A, The Bridge of Lions/US A1A, State Road 312, and SR 206 in the project area. U.S. A1A, Roscoe Boulevard/CR 210A, Palm Valley Road/CR 210, and SR 3 are major north-south roads on the eastern side of the proposal; US 1 is the major north-south road along the west portion of the proposal.

In all cases access to private property is only by prior permission from the owners.

Legal description

Much of the proposal has irregularly-shaped sections and irregular section numbers. The proposal includes all or portions of the following sections:

Township	Range	Section(s)
3S	28E	40
3S	29E	16-21, 38
4S	29E	28
5S	29E	28, 45, 48
6S	29E	2, 3, 36
6S	30E	17-20,29,30
7S	29E	12, 34, 35
7S	30E	5, 6, 20, 21, 28, 29, 31, 32, 34
8S	29E	2, 3, 10, 11, 13, 29
8S	30E	1, 3-5, 7, 9, 10, 12, 13, 15, 16, 18, 22, 23, 26, 33, 35
9S	30E	2-6, 8-11, 13, 15-17, 20-22, 27-29,32, 33
10S	30E	3-9, 34

Refer to the aerial photographs, maps, and tax card information (submitted to the ARC/Florida Forever program under separate cover) for more details.

II. Resources

Introduction

St. Johns County is situated on Florida's east coast in the northeastern region of the state. Its entire eastern edge fronts upon the Atlantic Ocean, while its western boundary is the natural course of the St. Johns River. To the north it adjoins Duval County/Jacksonville, while its southern boundary is partially defined by the course of Pellicer Creek, which separates it from adjacent Flagler County. In total area, the county encompasses 609 square miles, with a coastline of 43 miles. Geologically, the county surface rests upon Pleistocene deposits primarily resulting from the effects of fluctuating sea levels, such that the eastern side of the county represents a series of alternating ancient dunelines and intervening swales. This recent geological history has for the most part shaped the current geographic features and biological communities.

Climatically, St. Johns County (and particularly the eastern half) is influenced greatly by the proximity of the Atlantic Ocean and the offshore Gulf Stream. For January, St. Augustine's average high temperature is 66° F and the average low is 45° F; for July, the average high is 89° F and the average low is 71°. Average annual precipitation is 48.9 inches, coming in the form of rainfall with a peak during the summer months.

The ocean-fronting eastern edge of the county represents almost in its entirety a series of narrow barrier islands, interrupted in two places by St. Augustine Inlet and Matanzas Inlet, which provide for tidal flush of the waters between the islands and the mainland. Between the barrier islands and the mainland lay the Tolomato River in the north and the Matanzas River in the south, two large bodies of water which are in actuality estuaries rather than rivers. They encompass extensive Estuarine Tidal Marsh communities, and receive the fresh waters of numerous eastward flowing creeks. Westward of the "rivers" on the mainland, the natural communities exhibit a variety of types, dependent to a large degree (prior to modern human influence) upon soils and drainage patterns. Nearest to the coast are admixtures of Maritime Hammock, Shell Mound, Mesic Flatwoods, and Hydric Hammock communities. Farther inland from, or interspersed with, these communities are Xeric Hammock, Scrub, Mesic Flatwoods, Wet Flatwoods, Hydric Hammock, Bottomland Forest, Dome Swamp, Depression Marsh, and Baygall communities. Aquatic-based communities found in the project area, in addition to the Estuarine Tidal Marsh, are Freshwater Tidal Swamp, Freshwater Tidal Marsh, Mollusk Reef, Unconsolidated Substrate, and Consolidated Substrate communities. Along the barrier islands, naturally occurring communities are Beach Dune, Coastal Strand, Maritime Hammock, Xeric Hammock, Scrub, and Mesic Flatwoods communities. These are generally linear communities, replacing one another in relation to proximity to the open ocean. More detailed descriptions of these communities, based upon excerpts from the Guide to the Natural Communities of Florida (FNAI/DEP, 1990), can be found in Appendix III.

Occupation of the county goes back several thousand years to the early arrival of prehistoric

humans in Florida. Historically, the region was inhabited by the Timucuan Indians, who tended to aggregate in independent polities, scattered throughout the area in favorable situations. In St. Johns County, those living close to the coast depended to a large degree upon marine resources, as evidenced by extensive mollusk trash shell mounds, while those further inland depended to a greater degree upon agriculture, especially the cultivation of corn, for their diet. This dichotomy has carried through to the present, as the western side of the county is home to extensive food crop farms, while to the east, along the coast, the economy until very recently was geared towards utilization of marine and estuarine fisheries. In between, where vast tracts of pines were to be found, logging was the mainstay, and continues to this day in the form of several large-scale pine plantations managed for pulpwood.

Prior to the final decades of the 20th century, the human population showed either a gradual increase or periods of stagnation ever since the founding of St. Augustine by the Spanish in 1565. A look at the county's population since 1930 is illustrative of the rapid growth experienced in the last two decades of the century. Between 1930 and 1970, the population less than doubled in size, but from 1970 to 2000 it has quadrupled. The growth rate for the county between 1980 and 2000 was 55%, and between 1990 and 2000 it ranked only second, behind Flagler County, among east coast Florida counties at twice the overall Florida rate. This rapid development, especially along sensitive coastal and estuarine lands, will continue to put demands upon the natural systems involved and potentially affect the long-term health of the marine and estuarine systems and their associated upland natural communities.

The focus area for much of the mushrooming development and population growth in recent years has been the Intracoastal Waterway (ICW). Initially constructed between 1883 and 1912 by the Florida Coast Line Canal and Transportation Company, the waterway was acquired by the U.S. government in 1927, which remains responsible for its maintenance today. This inland waterway made it possible to travel through protected waters from Jacksonville to Miami, a move that was initially undertaken to promote commerce. In addition to dredging and maintaining a passageway through the existing waters of the Tolomato and Matanzas rivers, the greatest ecological effect of the project was to dig a canal connecting the waters of upper Pablo Creek with those of the upper Tolomato River in the northern part of the county. This is the only part of the project in St. Johns County that did not make use of existing estuarine waters, but rather cut a passageway through existing upland or freshwater marsh communities. With the rapid growth of the pleasure boat community in the later half of the 20th century, the ICW has become a major recreational boating thoroughfare, facilitating the residential development of its banks, particularly along the eastern, or ocean, side. A majority of the private lands along this eastern side have been or are in the process of being developed, paving the way for the expansion of development to the relatively undeveloped western side. If extensive and uncontrolled, this potential development poses a threat to the natural communities, both terrestrial and aquatic, which lie adjacent to the ICW. It is for this reason that the Northeast Florida Blueway - Phase II: Tolomato and Matanzas Rivers project was undertaken to evaluate the general ecological health of the area and to assess the potential for land acquisition for conservation purposes.

In order to make a preliminary assessment of that part of St. Johns County lying along or within the watershed of the Intracoastal Waterway, field activities were undertaken during the months of April and May 2001. An overview trip to the southwest part of the project was conducted on 26 April. On 10 May, an aerial overview of the project area was made with the assistance of the St. Johns County Sheriff's Department, utilizing the department's helicopter. On 12-13 May, ground observations were made in various parts of the project area where access was possible, and photos were taken to document the natural communities. An additional day of ground surveys took place in the southern part of the project area on 20 May, which was followed by a day of observations and photo-documentation by boat on 24 May along virtually the entire length of the ICW. Two more days of ground observations and photo-documentation were undertaken on 25 May and 31 May, primarily in the southern half of the project area.

Project area and ecological resources

Because of the ecological diversity encountered in the Blueway Phase II project area, the course of the ICW provides a convenient dividing line for assessment of the status of the natural communities within the watershed. It is more than a matter of convenience, however, as the ICW also separates, with the exception of the St. Augustine area, the highly developed from the area of low to moderate development with respect to residential expansion. On the ocean side of the ICW, the northern part between the Duval County line and Palm Valley and Mickler roads is highly developed over virtually all of the land surface, primarily in golf courses and expensive residences maintained within gated communities. South of here begins the Guana River State Park and Guana River Wildlife Management Area, large managed areas that have protected estuarine and, to a much lesser degree, coastal areas from the encroachment of development. On the aquatic side, these areas provide refuge for a wide variety of vertebrate and invertebrate inhabitants of the marine and estuarine waters, while on the terrestrial side, protection and refuge is afforded to numerous species of vertebrate and invertebrate animals, especially resident and migratory birds. Especially important natural communities within these managed areas are the Coastal Strand, Maritime Hammock, Mesic Flatwoods, and Estuarine Tidal Marsh communities.

South of the Guana River managed areas, development once again becomes prominent, especially in the Vilano Beach area, where numerous new residences are in evidence lying within gated communities. This relatively recent development has especially impacted the Coastal Strand and Maritime Hammock communities in this area. One important piece of undeveloped land in this area is Hat Island, a medium-sized island surrounded by Estuarine Tidal Marsh to the south of Guana River State Park. This island is covered by what appears to be Maritime Hammock community, and has special interest as a probable breeding locality for several resident bird species, as well as potentially being an important stopover point for migrating birds in the spring and in the fall of the year. The isolation of this island by the surrounding marsh makes it unlikely that feral cats or dogs are present to prey upon the bird population.

Beyond St. Augustine Inlet, the natural coastal communities between Highway A1A and the

ocean are afforded protection by the presence of the Anastasia State Park. This managed area is especially important in that it provides protection to the Coastal Dune community, virtually the only extensive stretch of coast in the county where this is true. Continuing southward, coastal development has mushroomed over the last decade, and virtually all of the beachfront property has been developed. One of the few areas of limited development of the ICW side is the region known as Fishers Island, which appears to be a group of islands and a narrowly connected peninsula, all of which is apparently covered with Maritime Hammock community. This property represents a probable important stopover point for migrating birds, as well as an extensive forested area for resident breeding birds. Additionally, its size appears to be sufficient to support a number of amphibians and reptiles. Further to the south, a property adjacent to the entrance to Ft. Matanzas National Monument encompasses a large tract of Estuarine Tidal Marsh surrounded on the shore by Maritime Hammock and Coastal Strand communities. The marsh on this property is penetrated for some distance by a canal originally dug as part of a fish farming enterprise, and its presence would make this parcel particularly desirable for a developer. This basically undeveloped parcel would make a valuable addition to the managed lands encompassed by the national monument. South of Matanzas Inlet, for the rest of the way to the Flagler County line and beyond, virtually all of the non-marsh habitat has been developed as residential.

Starting in the north on the western side of the ICW, there currently exists a wide dichotomy between the impact of development on this side versus the eastern side of the ICW. From Pablo Creek at the northern end of the county and extending southward to the Palm Valley Road bridge, there exists almost no development in the ICW drainage (the small exception along the ICW is just north of the bridge). Virtually all of this land is privately owned by the Davis family. Because of the narrow character of the ICW and the lack of wetlands buffers in this stretch (due to its having been dug through historically non-submerged lands), maintenance of the natural state of these lands is especially critical for the ecological health of the ICW and the Tolomato River. Natural communities observed or assumed to be encompassed by this area stretching from the ICW to Highway U.S. 1, are Xeric Hammock, Mesic Flatwoods, Hydric Hammock, Wet Flatwoods, Depression Marsh, and Baygall. Because of the ecological diversity of these lands and their low human presence, they are important as potential home and refuge for a wide variety of invertebrates and vertebrates, including the Florida black bear, which faces rapidly increasing threats to its survival in St. Johns County.

Continuing on the west side of the ICW south of the Palm Valley Bridge, a different set of ecological conditions is encountered. Once again the ICW is contained within previously existing estuarine waters in the form of the Tolomato River. For a considerable distance, from the Palm Valley Road Bridge to Deep Creek at Pine Island Road, the lands to the west of the ICW are currently essentially uninhabited all the way to Highway U.S. 1. Most of this land is under private ownership, primarily by the Davis family, encompassing various enterprises, including timbering. The proposed Nocatee Reserve, eastward of the proposed Nocatee Development of Regional Impact (DRI), lies within this region. It encompasses several natural communities, including Freshwater Tidal Marsh, Freshwater Tidal Swamp, and Estuarine Tidal Marsh. Much of the area south of Nocatee is also slated for development, including the Marshall Creek DRI. Because of the extensive drainage of these lands by streams entering the Tolomato

River, it is critical that any development takes place in such a manner as to minimize impact upon the health of the estuarine ecosystem, an important system for marine life and humans who utilize it for various activities, including sport fishing. Estuarine Tidal Marsh, Unconsolidated Substrate, and Mollusk Reef communities are extensive in this region, providing breeding and nursery grounds for many invertebrate and vertebrate species, as well as feeding grounds for fishes, birds, and marine mammals. Dolphins were observed utilizing this area during the survey, and just south of the Palm Valley Road Bridge a group of three manatees, an endangered species, was observed during the boat survey. On land, the primary natural communities to be found are Xeric Hammock, Maritime Hammock, Mesic Flatwoods, Wet Flatwoods, Hydric Hammock, Wet Flatwoods, Bottomland Forest, Depression Marsh, and Baygall. These communities are potential home or refuge to a wide variety of invertebrates and vertebrates, including many migrating birds, the Florida black bear, the Florida Threatened gopher frog, and the Federally Threatened eastern indigo snake.

Beyond Pine Island Road, land ownership becomes more complex, with an admixture of managed lands and private ownership. Residential developments increase as St. Augustine is approached, some of which fronts directly upon the edges of the Estuarine Tidal Marsh community. Outside of the managed areas, scattered remnants of Maritime Hammock, Xeric Hammock, and Mesic Flatwoods provide home and refuge to many invertebrate and vertebrate species, and conservation of these areas may be important in the maintenance of movement corridors for terrestrial organisms. Just to the north of the airport, privately-owned Capo Island is largely undeveloped; to the west is SJRWMD's Stokes Landing. All of this area is heavily forested with Maritime Hammock and Mesic Flatwoods communities, and its acquisition for conservation purposes would alleviate the increasing impact of an expanding St. Augustine on the natural environment. Not only would terrestrial natural communities be preserved to protect plant and animal species, but additional impacts upon the surrounding estuarine communities would be minimized. One hint of this increasing impact is the observation that in the past 2 ½ years one Florida black bear was killed by a vehicle near the Highway 312 bridge over the Matanzas River, while a second was darted and removed from downtown St. Augustine (J.B. Miller, pers. comm.). The burgeoning human population and shrinking wildlands are combining to produce these effects. Within the city of St. Augustine there are still a few remnant natural communities, particularly around the San Sebastian River, a tributary of the Matanzas River, and north of the airport between it and Gun Club Road. An undisturbed tract of Maritime Hammock, Hydric Hammock, and Bottomland Forest communities separates the airport from Gun Club Road, and a swallow-tailed kite was observed overhead at this spot during surveys. The forested area is large enough to support a variety of resident breeding birds, as well as other species during the migration seasons.

South of St. Augustine and beyond the Highway 312 bridge, there is a considerable amount of residential development to the east of Highway U.S. 1 along the Matanzas River up to the mouth of Moultrie Creek, although there is some remaining undeveloped land around the mouth of this creek on the south side at Vaill Point. St. Johns County is preparing an FCT application for this tract. Below Moultrie Creek, development continues southward to the vicinity of Shores Boulevard. Beyond this point development is replaced by the Moses Creek Conservation Area,

managed lands under the control of the St. Johns River Water Management District (SJRWMD), which continue southward to encompass the drainage of Moses Creek . However, there is some undeveloped, privately-owned land south of Shores Boulevard and north of the SJRWMD property which is proposed for acquisition. A small amount of development has sprung up around Highway 206, which crosses the Matanzas River to the south of Moses Creek, but beyond this development stops.

There is a large expanse of virtually uninhabited land south of Highway 206, bounded on the west by Highway U.S. 1, on the east by the Matanzas River, and on the south by Pellicer Creek. Most of this property is owned and utilized as a tree farm by the Rayonier Corp. Faver-Dykes State Park and lands of the SJRWMD are in the southern extent. This combined land area represents an extremely important area of regional significance, as it encompasses a variety of natural communities, especially Xeric Hammock, Maritime Hammock, Shell Mound, Mesic Flatwoods, Hydric Hammock, Bottomland Forest, Depression Marsh, Dome Swamp, and Baygall. Although fragmented in some areas by managed timber lands, which could be restored to their original state following acquisition, these communities support a wide variety of invertebrate and vertebrate species, ranging from transient migratory birds to large animals such as American black bear. The bird fauna is indicative of the richness of the area, as a two-hour search of the Hemming Point Maritime Hammock and Hydric Hammock communities in mid-May identified 19 species of birds utilizing the forest (Appendix V). Not only are these extensive unpopulated lands important for terrestrial fauna, but their continued existence in a natural state will help insure the ecological health of the Matanzas River and associated estuarine communities into which they discharge their waters. Manatees and dolphins are known to frequent this stretch of the river. The upper reaches of the marsh maintain good populations of the diamondback terrapin, which are known to frequent deep holes in the marsh, and also provide breeding, nursery, and feeding grounds for a wide variety of shellfish and finfish species.

The species diversity of many of the Rayonier Corp. lands is not always obvious, especially when cryptic or secretive animals such as amphibians and reptiles are in question. As an example, a two-year trapping study at Talbot Islands State Parks (Florida Park Service, 1993), just to the north in Duval County, produced the results indicated in Appendix V. Most of the species encountered in this study, plus several not recorded, are to be found in the Blueway Phase II project area, especially given the wide variety of natural communities present. These results illustrate the often unforeseen effects of development, where the true degree of biodiversity of an area may be hidden from cursory or rapid biological assessments of the area, resulting in the potential extirpation or emigration of a wide variety of invertebrate and vertebrate animals and the loss of many plant species. Other unforeseen effects may result in the alteration of downstream communities in the case of aquatic, and in particular estuarine, communities or an alteration in ground water levels that can ultimately change the natural surface communities.

Summary of biological communities and rare and endangered species

Natural communities:

Three of the 17 natural communities potentially found within the project area (Coastal Strand, Maritime Hammock, Scrub) are ranked by FNAI as S2 (Imperiled). All three are considered to be prime lands for development, and large parcels have already been developed in St. John's County. An additional three (Depression Marsh, Dome Swamp, Xeric Hammock) are ranked as S3 (Very Rare or Local throughout Range). Xeric Hammock is also prime real estate for development, while Depression Marsh and Dome Swamp communities are widespread, scattered, and vulnerable to drainage, pollution, or lowering of the water table.

Plants:

Sixteen species of FNAI-listed plants are reported or confirmed in St. Johns County from natural communities that occur within the proposed project boundaries. Seven of these are listed by the state of Florida as "Endangered", while an additional four species are listed by the state as "Threatened". Many of these imperiled species are restricted to some of the very natural communities that are being lost to development or the side-effects of development.

Fishes:

In addition to the several species of popular gamefish such as croaker (*Micropogon undulatus*), sea trout (*Cynoscion* spp.), flounder (Bothidae, Pleuronectidae), and redfish (*Sciaenops ocellata*), there are at least six species of FNAI-listed fishes that are reported or confirmed as occurring within the project boundaries. One of these, the shortnose sturgeon (*Acipenser brevirostrum*) is both federally and state listed as "Endangered" and FNAI-listed as S1. Two additional species (Atlantic sturgeon and river goby) are FNAI-listed as S1, and one (opossum pipefish) is listed as S2.

Amphibians:

Two FNAI-listed species occur within the project boundaries, the striped newt (*Notophthalmus perstriatus*), ranked S2S3 and the gopher frog (*Rana capito*), ranked S3 and state-listed as a Species of Special Concern. The striped newt potentially occurs in wetland/temporary pond situations on the western side of the ICW, while the gopher frog has been confirmed as occurring at Faver-Dykes State Park (J.B. Miller, pers. comm.), and is likely to be found in appropriate habitat northward on the western side of the ICW to the Duval County line. The proposed Northeast Florida Blueway Phase II project area lies within one of the richest areas of amphibian diversity outside of the tropics. Long-term observations on a twenty acre parcel of mixed Wet Flatwoods and Dome Swamp communities in Nassau County by J. Meyer has demonstrated the presence of 15 species of amphibians (14 anurans and 1 salamander), and the likelihood exists that these 15 species and several others occur within the project area. With much concern being voiced recently over the apparent world-wide phenomenon of amphibian population decline, conservation of these areas in St. John's County would aid greatly in protecting populations of these diverse animals.

Rare Species and Natural Communities Potentially Occurring in the Northeast
Florida Blueway Phase II: Tolomato and Matanzas Rivers
(Adapted from FNAI 1990, 1998)

Scientific Name	Common Name	Global Rank*	State Rank*	Federal Status*	State Status*
<u>FISH</u>					
<i>Acipenser brevirostrum</i>	shortnose sturgeon	G3	S1	LE	LE
<i>Acipenser oxyrinchus oxyrinchus</i>	Atlantic sturgeon	G3T?	S1	N	N
<i>Agonostomus monticola</i>	mountain mullet	G5	S3	N	N
<i>Awaous tajasica</i>	river goby	G5	S1S2	N	N
<i>Notropis cummingsae</i>	dusky shiner	G5	S4	N	N
<i>Petromyzon marinus</i>	sea lamprey	G5	SA	N	N
<u>AMPHIBIANS</u>					
<i>Notophthalmus perstriatus</i>	striped newt	G2G3	S2S3	N	N
<i>Rana capito</i>	gopher frog	G4	S3	N	LS
<u>REPTILES</u>					
<i>Alligator mississippiensis</i>	American alligator	G5	S4	T(S/A)	LS
<i>Clemmys guttata</i>	spotted turtle	G5	S3?	N	N
<i>Crotalus adamanteus</i>	eastern diamondback rattlesnake	G5	S3	N	N
<i>Drymarchon corais couperi</i>	eastern indigo snake	G4T3	S3	LT	LT
<i>Gopherus polyphemus</i>	gopher tortoise	G3	S3	N	LS
<i>Pituophis melanoleucus mugitus</i>	Florida pine snake	G5T3?	S3	N	LS
<u>BIRDS</u>					
<i>Accipiter cooperii</i>	Cooper's hawk	G4	S3?	N	N
<i>Aimophila aestivalis</i>	Bachman's sparrow	G3	S3	N	N
<i>Ajaia ajaja</i>	roseate spoonbill	G5	S2S3	N	LS
<i>Aramus guaranauna</i>	limpkin	G5	S3	N	LS
<i>Ardea alba</i>	great egret	G5	S4	N	N
<i>Charadrius melodus</i>	piping plover	G3	S2	LT	LT
<i>Egretta caerulea</i>	little blue heron	G5	S4	N	LS
<i>Egretta thula</i>	snowy egret	G5	S4	N	LS
<i>Egretta tricolor</i>	tricolored heron	G5	S4	N	LS
<i>Elanoides forficatus</i>	swallow-tailed kite	G4	S2S3	N	N
<i>Eudocimus albus</i>	white ibis	G5	S4	N	LS
<i>Falco columbarius</i>	merlin	G5	SU	N	N
<i>Falco peregrinus</i>	peregrine falcon	G4	S2	LE	LE
<i>Falco sparverius paulus</i>	southeastern American kestrel	G5T3T4	S3?	N	LT
<i>Haematopus palliatus</i>	American oystercatcher	G5	S3	N	LS
<i>Haliaeetus leucocephalus</i>	bald eagle	G4	S3	LT	LT
<i>Ixobrychus exilis</i>	least bittern	G5	S4	N	N
<i>Laterallus jamaicensis</i>	black rail	G4	S3?	N	N
<i>Mycteria americana</i>	wood stork	G4	S2	LE	LE
<i>Nyctanassa violacea</i>	yellow-crowned night-heron	G5	S3?	N	N
<i>Nycticorax nycticorax</i>	black-crowned night-heron	G5	S3?	N	N
<i>Pandion haliaetus</i>	osprey	G5	S3S4	N	LS**
<i>Pelecanus occidentalis</i>	brown pelican	G4	S3	N	LS
<i>Picoides borealis</i>	red-cockaded woodpecker	G3	S2	LE	LT
<i>Picoides villosus</i>	hairy woodpecker	G5	S3?	N	N
<i>Plegadis falcinellus</i>	glossy ibis	G5	S2	N	N
<i>Rynchops niger</i>	black skimmer	G5	S3	N	LS
<i>Sterna antillarum</i>	least tern	G4	S3	N	LT
<i>Sterna caspia</i>	Caspian tern	G5	S2?	N	N
<i>Sterna maxima</i>	royal tern	G5	S3	N	N
<i>Sterna sandvicensis</i>	sandwich tern	G5	S2	N	N

Scientific Name	Common Name	Global Rank*	State Rank*	Federal Status*	State Status*
<u>MAMMALS</u>					
<i>Corynorhinus rafinesquii</i>	Rafinesque's big-eared bat	G3	S3?	N	N
<i>Mustela frenata olivacea</i>	southeastern weasel	G5T4	S3?	N	N
<i>Mustela vison lutensis</i>	Atlantic salt marsh mink	G5T3	S2	N	N
<i>Neofiber alleni</i>	round-tailed muskrat	G3	S3	N	N
<i>Podomys floridanus</i>	Florida mouse	G3	S3	N	LS
<i>Sciurus niger shermani</i>	Sherman's fox squirrel	G5T2	S2	N	LS
<i>Sorex longirostris longirostris</i>	southeastern shrew	G5T5	S4	N	N
<i>Trichechus manatus</i>	manatee	G2?	S2?	LE	LE
<i>Ursus americanus floridanus</i>	Florida black bear	G5T2	S2	C	LT**
<u>VASCULAR PLANTS</u>					
<i>Asclepias viridula</i>	southern milkweed	G2	S2	N	LT
<i>Baptisia calycosa var calycosa</i>	Canby's wild indigo	G2T1	S1	N	N
<i>Calamovilfa curtissii</i>	Curtiss' sandgrass	G3	S3	N	LT
<i>Calydorea coelestina</i>	Bartram's ixia	G2	S2	N	LE
<i>Chamaesyce cumulicola</i>	sand-dune spurge	G2	S2	N	LE
<i>Cheiroglossa palmata</i>	hand fern	G4	S2	N	LE
<i>Ctenium floridanum</i>	Florida toothache grass	G2	S2	N	N
<i>Glandularia maritima</i>	coastal vervain	G3	S3	N	LE
<i>Nemastylis floridana</i>	fall-flowering ixia	G2	S2	N	LE
<i>Nolina atopocarpa</i>	Florida beargrass	G3	S3	N	LT
<i>Pteroglossaspis ecristata</i>	wild coco	G2G3	S2	N	LT
<i>Pycnanthemum floridanum</i>	Florida mountain-mint	G3	S3	N	N
<i>Rhynchospora punctata</i>	pineland beakrush	G1?	S1?	N	N
<i>Rudbeckia nitida</i>	St. John's Susan	G1G2	S1S2	N	LE
<i>Ruellia noctiflora</i>	white-flowered wild petunia	G2G3	S2	N	LE
<i>Verbesina heterophylla</i>	variable-leaf crownbeard	G2	S2	N	N
<u>NATURAL COMMUNITIES</u>					
Baygall		G4?	S4?	N	N
Bottomland Forest		G4	S4?	N	N
Coastal Strand		G3?	S2	N	N
Depression Marsh		G4?	S3	N	N
Dome Swamp		G4?	S3?	N	N
Estuarine Consolidated Substrate		G3	S3	N	N
Estuarine Mollusk Reef		G3	S3	N	N
Estuarine Tidal Marsh		G4	S4	N	N
Estuarine Unconsolidated Substrate		G5	S5	N	N
Freshwater Tidal Swamp		G3	S3	N	N
Hydric Hammock		G?	S4?	N	N
Maritime Hammock		G4	S2	N	N
Mesic Flatwoods		G?	S4	N	N
Sandhill		G2G3	S2	N	N
Scrubby Flatwoods		G3	S3	N	N
Scrub		G2	S2	N	N
Shell Mound		G3	S2	N	N
Wet Flatwoods		G?	S4?	N	N
Xeric Hammock		G?	S3	N	N
<u>OTHER</u>					
Bird rookery				N	N

* See Appendix IV *FNAI Rank Explanations* sheet for definitions of **Global and State Ranks**, and **State and Federal Status**

Reptiles:

Six species of reptiles known from St. John's County are listed by FNAI as rare species. All are known to occur or presumed to occur within the proposed Blueway II project boundaries. One of these, the federally and state "Threatened" eastern indigo snake (*Drymarchon corais couperi*) is known to occur in Faver-Dykes State Park, and has the potential to occur in large areas of relatively undisturbed habitat on both sides of the ICW northward to the Duval County line. Four additional species are FNAI-ranked as S3 species, three of which, the American alligator (*Alligator mississippiensis*), the gopher tortoise (*Gopherus polyphemus*), and the Florida pine snake (*Pituophis melanoleucas mugitus*), are state listed as Species of Special Concern. The gopher tortoise and Florida pine snake are confirmed residents of Faver-Dykes State Park, and most likely are to be found in suitable habitat northward on the western side of the ICW to the Duval County line.

Birds:

With its intricate mix of a variety of natural communities, the Blueway II project area is home to a large number of marsh and forest inhabiting birds. Thirty-one FNAI-listed species are known to occur or have the potential to occur within the proposed boundaries. Of these, five species (piping plover, peregrine falcon, bald eagle, wood stork, red-cockaded woodpecker) are federally listed as "Endangered" or "Threatened" and an additional two (southeastern American kestrel, least tern) are listed by the state as "Threatened". Nine more species are listed by the state as Species of Special Concern. A majority of these (24) listed rare species are closely associated and dependent upon aquatic communities for their livelihood, and the continued health of the Estuarine Tidal Marsh is especially important in this case. At least eight of these species, including swallow-tailed kites, wood storks, and least terns, were observed during the short time of the rapid surveys, and a more intensive search would undoubtedly have accounted for a majority of those listed species. The Florida Fish and Wildlife Conservation Commission reports the American oystercatcher, least tern, little blue heron, roseate spoonbill, wood stork, and bald eagle from within the project boundary (Gina C. Moultrie, FWC, pers. comm.). In addition to the FNAI-listed species, the natural communities within the project area are known to, or presumed to, provide feeding and/or breeding territory to a large number of resident and migrating bird species.

Mammals:

There are nine species of rare mammals listed by FNAI that are known to occur or presumed to occur within the Blueway II project area. One of these, the West Indian manatee, is federally and state listed as "Endangered", and an additional species, the Florida black bear, is state-listed as "Threatened". Six more of these listed species are ranked by FNAI as S2 or S3. Three of the species (southeastern weasel, salt marsh mink, round-tailed muskrat) are dependent upon aquatic communities, while three (big-eared bat, Sherman's fox squirrel, southeastern shrew) are dependent upon mature forests, and the Florida black bear requires relatively large, unpopulated areas for its existence. Three West Indian manatees were observed during the course of the present surveys in the ICW.

Biodiversity analyses

A review of the FWC Office of Environmental Services data bases shows that FWC considers a significant portion of this project to be part of the Strategic Habitat Conservation Area (SHCA) for the state. In the northern area, the SHCA addresses wood stork and other rare wading birds. The FWC considers the area including Guana River State Park and Wildlife Management Area to be important for Florida black bear, American swallow-tailed kite, little blue heron (rookery), wood stork (rookery), white ibis (rookery), eastern indigo snake, and Bartram's ixia. Further south near Pellicer Creek, the SHCA addresses wood stork and other rare wading birds, as well as American swallow-tailed kite (Gina Moultrie, FWC, pers. comm. and Cox et. al, 1994).

The FWC priority wetlands analysis represents wetland habitats critical to 33 wetland-dependant species of vertebrates listed as endangered, threatened, or species of special concern. This analysis shows a Blueway Phase II area next to the Intracoastal Waterway provides habitat for 1-3 wetland species, while the much of the uplands provide habitat for 1-3 upland species considered in this analysis.

The FWC also conducted analyses for "biodiversity hotspots" in the state. The results represent areas with a high degree of overlap for 54 declining species of wildlife plus known occurrences of flora, fauna, and natural communities. Much of the area within the Blueway Phase II project boundaries is designated as the highest category in the FWC analysis, representing habitat important for 7+ species (G. Moultrie, pers. comm., and FWC GIS layers description).

There is considerable common area between the project boundaries and four FNAI Potential Natural Areas (PNAs). The northern part of the project overlaps with the Cabbage Swamp North PNA, which includes tidal marsh, mesic flatwoods, and hydric hammock. Proceeding south, there is overlap between the project and the Pine Island Fish Camp PNA, featuring tidal marsh, hammocks, flatwoods, and dome swamps. The Cabbage Swamp/Stokes Landing/Capo Island PNA also overlaps with the project. This area has maritime hammock islands, hydric hammock, tidal marsh, and other natural communities. The Cowan Swamp/Fishers Island/Moutrie Creek PNA, coinciding with some of the southern areas of the project, features maritime hammock, hydric hammock, flatwoods, and tidal marsh.

Much of the project is also recognized by FNAI as Potential Habitat for Rare Species. There is a high degree of overlap in the project between lands satisfying this designation and the PNAs. Two different analyses were used to define these two categories. The PNAs were determined based on statewide analysis of natural communities using aerial photographs. The Potential Habitat was determined by creating occurrence-based habitat maps for 250 rare species with the greatest conservation need in Florida. This information was revised by a series of reviews and analyses (FNAI, 2000 and J. Oetting, FNAI, pers. comm.). The identification of much of the project in both of these categories illustrates the importance of these lands from both natural community and rare species perspectives.

Archaeological and historical features

A review of the Florida Master Site File of the Division of Historical Resources (DHR), Department of State, by township/range/section on June 20, 2001 disclosed the rich archaeological and historic character of this region. As expected in the St. Augustine area, given its rich natural resources attractive to Native Americans and its long European settlement, the archaeological and historic resources span numerous cultures over a wide time period.

Artifacts documented in the Master Site File attest to more than 15 cultures and 10 site types (excluding historic structures since the proposal targets undeveloped lands) for the project area. Cultures represented include Middle Archaic, Glades IIA and IIB, Orange, Prehistoric Ceramic, St. Johns I and II, First Spanish and Spanish First and Second Periods. The most frequently reported site types are Prehistoric Shell Midden (more than 25 sites), Historic Refuse (9), and Prehistoric Midden (7). Other types present include prehistoric Camp (6), Artifact Scatter (4), Mission (3), Historic Earthworks, and Plantation. Since the proposed area does not include all of each section reviewed in the Site File, it is likely that some of the archaeological sites are outside of the proposed boundaries. However, it is also likely that numerous undiscovered sites are included in the proposal boundary.

A more detailed review of the Master Site File is recommended, including an evaluation by the Division of the relative historic and archaeological significance of the features determined to be within the boundaries.

Potential recreational or other public uses of the land

The Tolomato and Matanzas Rivers are used extensively for recreation purposes, especially boating-related activities. The acquisition and protection of remaining uplands will help ensure this area continues to provide a quality outdoor experience. With the acquisition of Blueway Phase II, additional recreational amenities could be offered to residents and visitors. Of the recreation needs identified in the 1994 Statewide Comprehensive Outdoor Recreation Plan, the Blueway Phase II could provide biketrails, hiking, horesback trails, archaeological/historical sites, and non-boat saltwater and freshwater fishing opportunities. The archaeological and historic richness of the region makes it likely that some resources are located within the proposal and suitable for public interpretive sites.

Other activities compatible with the resources include nature study, picnicking, and canoeing. Hunting potential for the larger tracts will have to be evaluated, depending on tract size and proximity to highways and habitation, among other issues. Whether lands are acquired by fee simple or less-than-fee means will also affect the recreation potential for the project. Many of the smaller tracts near the developed areas could provide accessible interpretive nature and hiking trails to the rapidly increasing population. The larger tracts, especially the Rayonier lands, have the potential for offering many outdoor-based recreation activities.

Pellicer Creek is already one of 38 state-designated recreational canoe trails. Acquisition of additional properties along this creek would help ensure access to and natural buffers for this outdoor experience. The Deep Creek/Pine Island, Capos Island/Casa Cola Creek, Moultrie Creek, and Moses Creek are also potential canoeing areas. Although not as long as Pellicer Creek, these areas would offer birdwatching and fishing potential. With the purchase of additional lands along the creeks, bank fishing would also be more readily available to the public.

It is likely that a variety of agencies would manage lands acquired through the Northeast Florida Blueway Phase II. Where acquisitions are adjacent to or near existing managed areas, those managing agencies would be likely candidates to care for the acquisitions as additions. This includes the Florida Park Service (several managed areas), St. Johns River Water Management District (several managed areas), and the National Park Service (especially near Ft. Matanzas). Some of the tracts are sufficiently large that, if acquired in fee simple, additional managing agencies such as FWC and the Division of Forestry may be interested. Establishment of a buffer preserve for the GTM NERR is a logical approach to this project. However, the availability of management funds are particularly important in this case, since the Bureau of Coastal and Aquatic Managed Areas does not have a management funding source.

Florida Forever Goals and Criteria

The Northeast Florida Blueway Phase II - Tolomato and Matanzas Rivers contributes to at least five of the Florida Forever goals (A, B, C, E, and G), and possibly three additional goals (D, F, H). The project also satisfies at least five of the Florida Forever criteria (a, b, c, f, and g) and potentially three more (d, k, and l).

The proposal will provide vital additions to the significant land acquisition investments the State has made in the region. These additions to the landscape-level protection efforts will help shield the nationally-recognized coastal ecosystem of the area, one of the major goals of the Guana-Tolomato-Matanzas National Estuarine Research Reserve. Protection of the water quality and wetland systems is also a significant objective of the Water Management District's Northern Coastal Basin Initiative, which includes the proposal area. The acquisitions would also provide an increased opportunity for resource-based recreation and education. Given the rich history of the area, it is likely that significant archaeological resources would also be protected.

The project is also recognized in the significant landscapes, linkages, and conservation corridors analyses performed by the University of Florida. It contains prioritized surface water protection areas, fragile coastal resources, functional wetlands, and areas for sustainable forest management (FNAI, 2000). More detailed information illustrating the project's satisfaction of Florida Forever goals and criteria are contained throughout this application and in the Florida Forever Conservation Needs Assessment (FNAI, 2000).

III. Additional Information and Public Support

Boundary considerations

The project boundaries were determined through the selection of undeveloped lands east and west of the Intracoastal Waterway, including lands around the tributaries of the Tolomato and Matanzas Rivers. Boundaries were formulated based on examination of topographic maps and 1998 and 1999 aerial photographs; advice from St. Johns County staff, the St. Johns County Land Acquisition and Management Program (LAMP) board members, staff of the GTM NERR; a helicopter overflight of the area; and field assessments by land and water. Many areas originally included in the proposal were excluded when field work showed they were developed, especially on the western side of the project. Other parcels were deleted when examination of tax records revealed development of parcels. Properties with habitable structures are not intended to be included in the proposal. In certain cases, less-than-fee acquisition of lands with structures may be desirable, depending on further development potential of the land, condition of the land, and potential for serving as a buffer.

The Davis family lands, including Dee Dot Ranch (Estuary Corporation) and Nocatee DRI were not included in the project at the request of a family representative (J. Skelton, DDI Inc., pers. comm.). These lands are important components of the Blueway effort, and it is hoped that in the future at least a portion of them will be added to the project. However, the Nocatee DRI agreement includes a proposed Nocatee Preserve, approximately 1600 acres along the Tolomato River. Protection of these lands contributes substantially to the project. The Davis family representative also stated that the family intended to keep Dee Dot Ranch/Estuary Corporation lands in their present condition, and have structured their estate planning to ensure this. Dee Dot is especially important to the health of the northern part of the Blueway Phase II. Dee Dot is west of the Intracoastal Waterway; almost all lands east of the Intracoastal have been developed.

South of Nocatee, part of Flagler Development and Marshall Creek DRI lands are included in the project. Company representatives were noncommittal when contacted. Retention of these lands in the project is important. Less-than-fee and fee simple approaches should be considered for these, as well as other, lands in the project. If an owner is not willing to sell their land outright, the ability to affect development density and placement of development through a less-than-fee purchase could make a significant difference in resource protection.

Along the San Sebastian River, some Florida East Coast Railroad lands are included in the project. A portion of these lands contains a working railroad. The intent is not to purchase the active railroad lands in fee simple, but to provide protection of undeveloped buffer areas around the San Sebastian River, which flows into the Matanzas River, south of St. Augustine.

Rayonier lands are a substantial portion of the southern end of the project. Lands west of the Matanzas River to U.S. 1 are included in the project. If purchased in fee simple, these lands would provide a large area for public use, and also provide a buffer to the Matanzas River. If fee simple purchase of the entire tract is not possible, fee simple or less-than-fee simple purchase of

an appropriate buffer along the Matanzas River would also be a substantial contribution to the goal of this project.

As was done in the Blueway Phase I, some significant public lands not managed by natural resource agencies are included in the project boundaries. Permanent protection and management of these lands are important to the goals of the project. Inclusion of these lands is intended to provide impetus for coordination between the agencies managing these lands, natural resource agencies managing lands in the area, and this project. Lands under control of the Airport Authority are critical to the continued operation of the airport. These lands can also provide important buffer areas for the waterway. Development of additional lands near the airport could prove troublesome for airport operations. Cooperation between the Airport Authority and those involved with the Blueway project could produce mutually beneficial results for the airport operation and natural resource protection. In general, non-natural resource agencies should be engaged to see what degree of permanent protection can be given to resources within the project boundaries while still fulfilling agency mandates.

The project also includes State-owned lands under the control of the Trustees for the Internal Improvement Trust Fund and apparently not leased to a managing agency. Most of these lands are estuarine marshes. With the presence in the region of major managed areas, such as the Guana complex, and widespread management efforts, such as the Guana-Tolomato-Matanzas National Estuarine Research Reserve, it may make sense to lease these areas to one or more of the managing agencies. This action would elevate the attention given to these lands and their perceived importance.

The project boundaries must be considered dynamic. Development is continuing at a rapid pace, and boundaries will have to be adjusted to exclude developed parcels. Some areas included in the proposal are more easily developed than others. Unbridged small islands were included because of the development pressure in the region; only outright acquisition will guarantee that these areas will escape development.

Nearby Managed Areas

As described in the introduction, the Northeast Florida Blueway partially contains or is contiguous with numerous federal and state managed areas. Phase II is adjacent to the Guana River Wildlife Management Area, Guana River Marsh Aquatic Preserve, Guana River Marsh Sanctuary, Guana River State Park, Deep Creek State Forest, Stokes Landing Conservation Area, Fort Mose, Anastasia State Park, Moses Creek Conservation Area, Ft. Matanzas National Monument, Faver-Dykes State Park, Pellicer Creek Aquatic Preserve, and the Pellicer Creek Corridor Conservation Area. The Guana-Tolomato-Matanzas National Estuarine Research Reserve extends over much of the proposal. This reserve serves a critical function by addressing the needs of the aquatic ecosystem of the area in a holistic manner. The Northeast Florida Blueway Phase II will augment the resource protection provided by the existing managed areas.

Related community activities

A variety of activities are underway in St. Johns County which complement the intentions of the Northeast Florida Blueway Phase II proposal. The Land Acquisition and Management Program (LAMP) has a County-appointed board which is responsible for the identification of key environmentally sensitive lands in the County and the recommendation of means for the acquisition of these lands. Active since June 1999, the LAMP Board was instrumental in convincing the Board of County Commissioners to fund preparation of the Northeast Florida Blueway Phase II proposal and to pre-acquire the Vaill Point FCT proposal located in the proposed Blueway boundaries. St. Johns County staff submitted an application for a FCT grant for Vaill Point in 2000. Due to the decrease in funds and the increase in number of applications, the Vaill Point property did not receive FCT funding. However, the Trust for Public Land (TPL) helped the County acquire the Vaill property this year, and the County staff is in the process of preparing a 2001 FCT grant application for this parcel.

In May 1999, St. Johns County commissioned a Wetland Buffer Study to establish an upland buffer zone ordinance based on scientific information derived from previous studies, types of environmental areas in the county, and sensitivity of the environmental areas. The report was completed in January 2000, and staff drafted an ordinance addressing upland buffers based on the study and a series of public workshops.

Currently for the Intracoastal Waterway, the County requires a 50' buffer for contiguous wetlands where a mean high water line can be set and a 25-foot buffer with a 25-foot building setback for the remaining contiguous wetlands. The proposed changes for the Intracoastal include: a 150 foot buffer for the contiguous wetlands of the two aquatic preserves, Pellicer Creek and Guana River Marsh; a 100 foot buffer for the contiguous wetlands associated with the Class II waters of the Matanzas River; a 75 foot buffer for the west bank of the Intracoastal waterway north of C.R. 210, and; a 50 foot buffer for all other contiguous wetlands which lie west of the Intracoastal waterway but west of U.S. 1 excluding the area which lies south of the Vilano bridge and north of Moultrie creek. These changes along with other proposed buffers for St. Johns County are scheduled to go to the Board of County Commissioners for the final public hearing in July 2001.

St. Johns County is conducting community vision projects in different areas of the county. Despite the perceived dissimilarities of various areas of the county, the citizens' visions for coastal St. Johns County expressed to date seem very similar. Residents support efforts to protect sensitive lands, including land acquisition programs.

Citizens of St. Johns County are also pursuing designation of the "Scenic and Historic A1A" as a FDOT State of Florida Scenic Highway. The primary purpose is to preserve and protect the intrinsic resource (historical, archaeological, natural resource, scenic, recreational and cultural) of the highway while allowing economic development. Once the "Scenic and Historic A1A" Corridor Advocacy Group has received its State Scenic Highway designation, they will be pursuing a Federal Scenic Byway or All American highway statue.

The County is in the process of allocating funds in its 2002 budget to hire a consultant to prepare a countywide Greenway Master Plan. The LAMP Board, through the process of identifying future lands to acquire in the County, is striving to connect the existing green spaces through a comprehensive Greenway Master Plan. This coastal area of St. Johns County is also part of the conceptual East Coast Greenway. This greenway is planned to be the nation's first long-distance, city-to-city, multi-modal transportation corridor for cyclists, hikers, and other non-motorized users. The goal is to "connect existing and planned trails that are locally owned and managed to form a continuous, safe, green route -- easily identified by the public through signage, maps, users guides, and common services." In September 2000 the Alliance designated Florida's first two segments of East Coast Greenway: the River to Sea Trail in Flagler County and the Flagler Drive Trail in West Palm Beach.

Potential funding sources and acquisition efforts

St. Johns County is submitting the Vaill Point Property on Moultrie Creek to the Florida Communities Trust Program. Although the County does not have a regular land acquisition fund, in the past they have set aside \$300,000 a year to acquire land. This year, through the TPL, the County is trying to establish a funding source to acquire additional lands in the County. In future years, the County Commission may be willing to provide some funds for acquisition of lands in the Northeast Florida Blueway Phase II Project.

The DEP Division of Recreation and Parks Inholdings and Additions List includes additions for Guana River State Park and Faver-Dykes State Park. These additions are also within the proposed Phase II boundaries. The Division would like to acquire approximately 200 acres of private lands within the optimum boundary for Faver-Dykes. The Division may be interested in acquiring other lands near Faver-Dykes, depending on the amount of land acquisition and land management funding available.

The National Park Service is interested in acquiring lands next to Fort Matanzas National Monument. Coordination with the Service could facilitate these acquisitions.

National Estuarine Research Reserves are eligible for federal funding to acquire lands to help protect the designated estuary. There is a good chance that federal funds would be available to assist in acquiring lands in Phase II. These funds are dependent on Congressional appropriations to the overall NERR program; priorities are established by the national NERR program.

As evidenced by the establishment of the Northern Coastal Basins program and acquisition of Stokes Landing, Moses Creek, land adjacent to Faver-Dykes, and the Princess Place (just south of Faver-Dykes in Flagler County), the SJRWMD is investing in the protection of the resources addressed by Blueway Phase II. The District has an established relationship with the Rayonier Corporation. The District may be willing to provide matching funds for some purchases in Phase II, and may be willing to take the lead in negotiations with Rayonier.

IV. Ownership and Tax Information

Tax plat maps and printouts from the St. Johns County Property Appraiser are being submitted under separate cover.

The proposal includes about 18,170 acres (1413 parcels) of private lands and 9985 acres (259 parcels) in public ownership. Some landowners possess more than one parcel; approximately 285 private landowners control land within the proposal. Six private landowners own about 12,000 acres. The Rayonier Timberland Corporation is a major private owner.

Owners within the proposed project boundaries have been contacted by mail, informing them of the inclusion of their property in this project.

Zoning/Comprehensive Planning

According to the St. Johns County 2015 Future Land Use Map, land uses in the private areas of the project include Residential Density A (1 unit/ac mainland, 0.4-1.0 coastal), Density B (2 units/ac), Density C (2-6 units/ac mainland, 2-4 coastal), Mixed Use District, Rural Commercial, Rural Silviculture, and Conservation. The project boundaries include portions of two DRIs, Caballos del Mar (mostly developed) and Marshall Creek (not yet developed).

Most of the proposed properties within the City of St. Augustine city limits are along the San Sebastian River. Future land uses are primarily industrial, commercial medium intensity, residential medium density mixed use (maximum 16 units/acre), and open land. The "Open Land" category is primarily intended for conservation, but some commercial activities are allowed, such as marinas, bait and tackle shops, churches, schools, government use, and professional and business offices.

V. Closing Comments

Five centuries ago, the area known today as St. John's County experienced an influx of Europeans seeking to tap the riches of the land and the sea. Although most likely unintentional, the result of this migration was the extinction of a native people and their culture. Five hundred years later, the area is undergoing a second major incursion of people, who once again seek to reap the rewards of the land and the sea, and this time threatening to eliminate many of the natural communities that still thrive in the area.

Less than two hundred miles south of St. John's County exists a prime example of what can happen to the natural landscape as a result of human population growth combined with a lack of conservation planning. From West Palm Beach southward to Miami and beyond, sprawls what is often referred to as Florida's "Gold Coast". Here there is no chance for a Blueway project, as there are virtually no natural communities left to preserve. Instead this vast stretch of urban and suburban development has combined to permanently alter the unique character of North America's largest wetland, the Everglades. Drainage for the benefit of humans, along with the lowering of the water table, has resulted in a wetland that is often dry and is invaded by alien plants and animals. Massive efforts are now underway in an attempt to restore the Everglades to some semblance of their original glory. This effort will expend huge financial resources that could have been better spent in conservation efforts before the damage was done.

St. John's County is now at a crossroads, one that will determine the fate of the area's natural communities and ultimately the quality of life that draws people to the region. Linking the existing protected and managed areas with the acquisition of the lands recommended in the Northeast Florida Blueway II proposal will insure that threatened natural communities with their rich fauna and flora will continue to thrive and bring pride and pleasure to the people of Florida and our visitors. Steps must be taken, and quickly, to assure that the area often called Florida's "First Coast" does not suffer the fate of Florida's "Lost Coast" to its south.

References

Cox, James, Randy Kautz, Maureen MacLaughlin, and Terry Gilbert. 1994. Closing the Gaps in Florida's Wildlife Habitat Conservation System. Florida Fish and Wildlife Conservation Commission. 239 pp.

Florida Fish and Wildlife Conservation Commission. GIS data layers description.
<http://floridaconservation.org/pubs/gis/datalyrs.html>

Florida Natural Areas Inventory. April 1998. St. Johns County Summary - Rare Species and Natural Communities.

Florida Natural Areas Inventory. 2000. Florida Forever Conservation Needs Assessment: Summary Report to the Florida Forever Advisory Council. 53 pp.

Florida Natural Areas Inventory and Florida Department of Environmental Protection. 1994. Guide to the Natural Communities of Florida. 111 pp.

Florida Park Service. 1993. Reptiles & Amphibians of the Talbot Islands State Parks. July, 1993.

Meyer, John R., Ph.D. Consulting Biologist. 5525 Sauls Road, Callahan, FL 32011. 904-879-3252

Meyer, Robert. Florida Department of State, Division of Historical Resources. 850-487-2333. Pers. comm. June 20, 2001. Florida Master Site File inquiry response.

Miller, J. B. Florida Department of Environmental Protection, Division of Recreation and Parks. Faver-Dykes State Park. (904) 794-5959. pers. comm. May-June 2001. Information on Faver-Dykes and nearby areas.

Moultrie, Gina C. Florida Fish and Wildlife Conservation Commission, Tallahassee Office of Environmental Services. 850-488-6661. pers. comm. June 21, 2001. Wildlife information inquiry response and additional conversations.

Muller, James W. Muller and Associates, Inc., 3808 Sally Lane, Tallahassee, FL 32312. 850-668-4905.

Oetting, Jon. Florida Natural Areas Inventory. Tallahassee, FL. 850-224-8207. pers. comm. April - June 2001. Discussions and data base information for the project.

Renna, Vickie . Principal Planner . St. Johns County Planning Division . 4020 Lewis Speedway, St. Augustine, FL 32095. 904-823-2519

St. Johns County data bases. Accessed April 2001 through June 2001.

St. Johns County 2015 Comprehensive Plan Future Land Use Map. Adopted May 10, 2000.
Last amended Feb. 23, 2001.

Skelton, Jay. DDI Inc. 904-223-7503. Pers. comm. May 22, 2001.

U.S. Department of Agriculture, Natural Resources Conservation Service. 1983. Soil Survey of
St. Johns County, Florida. 196p. + maps.

Appendix I

Photographs of Northeast Florida Blueway Phase II: Tolomato and Matanzas Rivers

Unless noted otherwise, all photographs taken by John R. Meyer, Ph.D.



Hat Island from the east with the Tolomato River in the distance.



Estuarine Tidal Marsh community bordered by Xeric Hammock and Mesic Flatwoods communities along Pellicer Creek at Faver-Dykes StatePark.



TOP:
Depression
Marsh community
ringed by button-
bush and
blackgum sur-
rounded by Shell
Mound commu-
nity at Hemming
Point in Faver-
Dykes State
Park.



LEFT:
Maritime Ham-
mock community
at Hemming
Point. Dominant
trees are live oak
and red cedar.



Estuarine Tidal Marsh community bordered by Coastal Strand community at Anastasia State Recreation Area.



Maritime Hammock community on Fishers Island south of the Highway 312 bridge over the Matanzas River.



Maritime Hammock community at Vaill Point at the entrance to Moultrie Creek.



Development to water's edge in Maritime Hammock community along west side of the Matanzas River between Moultrie Creek and Moses Creek.



Estuarine Tidal Marsh community grading into Coastal Strand community along the east side of the Matanzas River adjacent to Ft. Matanzas National Monument.



Two manatees of a group of three breaching in the Intracoastal Waterway about ½ mile south of the Palm Valley Road bridge.



Left:
Active osprey
nest on west
side of the
Intracoastal
Waterway just
south of the
junction with
Pablo Creek.

Below:
Residences
along east
side of the
Intracoastal
Waterway in
the Marsh
Landing
development.





Hydric Hammock community along west side of the Intracoastal Waterway across from the region of development shown in Figure 33.



Maritime Hammock community on Hat Island from the Tolomato River with an American egret in the foreground.



Top:
Mesic Flatwoods
community in
foreground with
Hydric Hammock
community in the
background at
Faver-Dykes
State Park.



Left:
Bottomland Forest
community along
small tributary of
Pellicer Creek in
Faver-Dykes
State Park.



Estuarine Tidal Marsh community along San Sebastian River in St. Augustine north of the Highway 16 bridge. Looking from the west across the marsh with Maritime Hammock community in the distance.



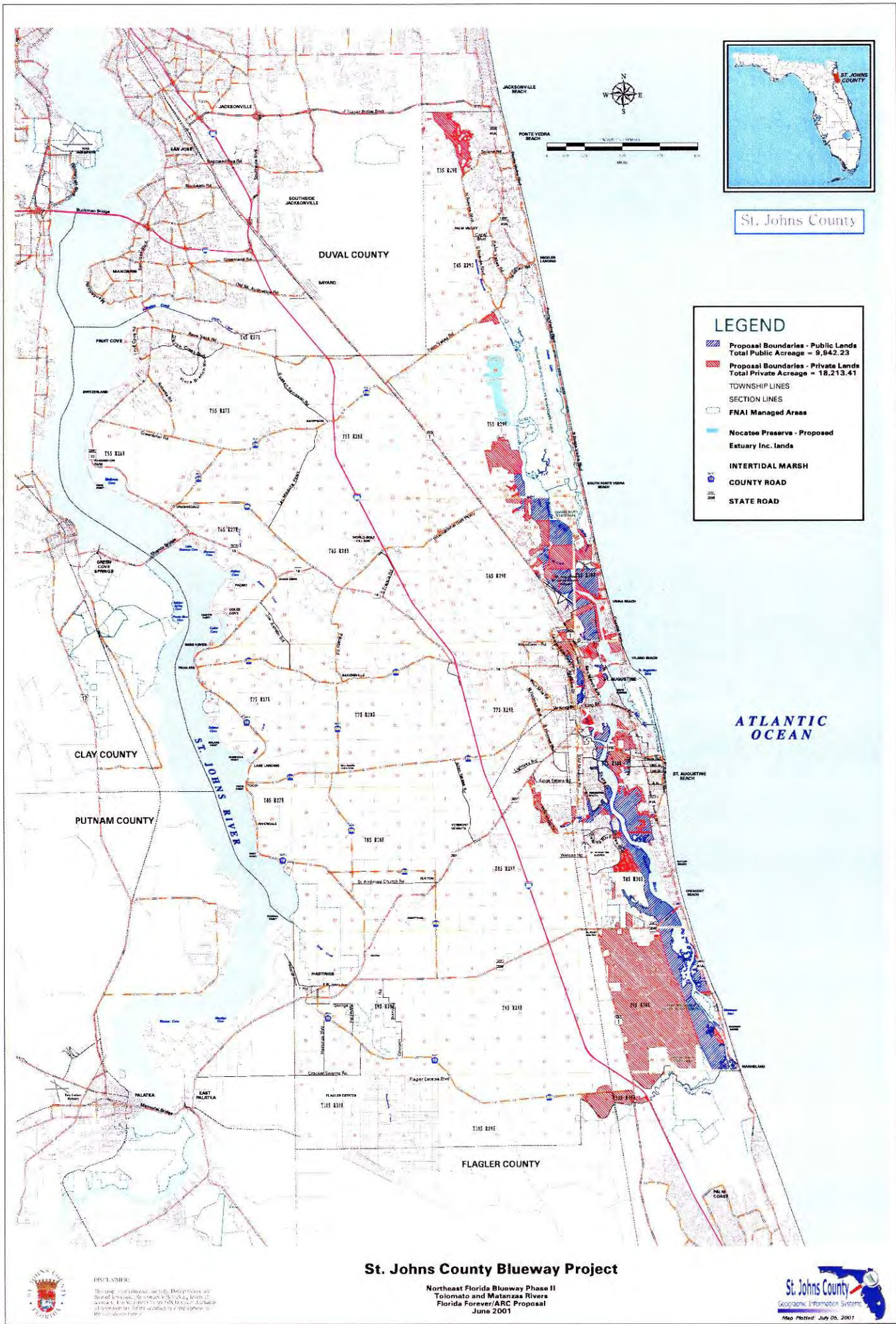
Looking eastward at Cayos Island across the Estuarine Tidal Marsh community north of St. Augustine.



View from the east looking westward across the Intracoastal Waterway from Marsh Landing development.



Coastal development along Highway A1A viewed from above Guana Lake.



St. Johns County

LEGEND

- Proposal Boundaries - Public Lands
Total Public Acreage = 9,942.23
- Proposal Boundaries - Private Lands
Total Private Acreage = 18,213.41
- TOWNSHIP LINES
- SECTION LINES
- FNAI Managed Areas
- Nocatee Preserve - Proposed Estuary Inc. lands
- INTERTIDAL MARSH
- COUNTY ROAD
- STATE ROAD

St. Johns County Blueway Project

Northeast Florida Blueway Phase II
 Tolomato and Matanzas Rivers
 Florida Forever/ARC Proposal
 June 2001



DISCLAIMER:
 This map is not a contract. It is for informational purposes only. It is not intended to be used as a legal document. It is not intended to be used as a legal document. It is not intended to be used as a legal document.



Appendix III

Descriptions of Natural Communities Occurring and Potentially Occurring in the Northeast Florida Blueway Phase II: Tolomato and Matanzas Rivers

Northeast Florida Blueway Phase II: Tolomato and Matanzas Rivers Natural Communities

(Excerpted from Guide to the Natural Communities of Florida with comments)

Xeric Hammock – typical plants include live oak, sand live oak, laurel oak, turkey oak, blackjack oak, red oak, sand post oak, staggerbush, saw palmetto, sparkleberry, pignut hickory, southern magnolia, redbay, American holly, wild olive, black cherry, fox grape, beautyberry, bluejack oak, Chapman's oak, persimmon, and yaupon. An advanced successional stage of Scrub or Sandhill. The soils consist primarily of deep, excessively-drained sands that were derived from old dune systems. Species composition is often similar to Maritime Hammock. Xeric Hammock is often considered the climax community on sandy uplands. Occurs generally as isolated patches that rarely cover extensive areas. Because of its general location on high ground with big trees, Xeric Hammock is prime residential property, especially when near the coast. Xeric Hammock is to be expected along either side of the ICW wherever Maritime Hammock encounters higher and drier sandy soils.

Beach Dune – characterized as a wind-deposited foredune and wave-deposited upper beach that are sparsely to densely vegetated with pioneer species, especially sea oats. Beach dune, especially along its ecotone with the unvegetated beach, is also the primary nesting habitat for numerous shorebirds and marine turtles. Found along shorelines subject to high energy waves which deposit sand-sized grains to form the open beach. Onshore winds move the grains inland until slowed by an obstacle, usually plant stems, causing the grains to drop. As a barrier island grows seaward, new beaches are deposited seaward of the old ones and a characteristic ridge and swale topography develops. Beach Dunes are very dynamic communities and mobile environments. The wind continually moves the sand inland from the beach until trapped by vegetation. Beach Dunes are subject to drastic topographic alterations during winter storms or hurricanes. Taking the brunt of storm surge, intact Beach Dunes are essential for protection of inland biological communities. Because of their vulnerability, Beach Dunes require protection from trampling and off-road vehicles. Coastal developments that affect the sand necessary for Beach Dune replenishment should be strongly discouraged. Unfortunately, this is good advice arriving too late in most places in St. Johns County. This community, although critical in protecting other coastal natural communities, lies outside of the proposed Blueway II project area.

Coastal Strand – characterized as stabilized, wind-deposited coastal dunes that are vegetated with a dense thicket of salt-tolerant shrubs, especially saw palmetto. Other typical plants include sand live oak, cabbage palm, myrtle oak, yaupon, greenbriar, Spanish bayonet, woody goldenrod, and Florida rosemary. Occurs on deep, wind-deposited sands which have been wind-sorted and wave-washed. Frequently dwarfed and pruned as a result of the salt spray-laden winds that kill twigs on the seaward side, producing a smooth, dense, upward-slanting canopy resembling a sheared hedge. An ecotonal community that lies between Beach Dune and Maritime Hammock. Fire may

reduce succession towards Maritime Hammock, but marine influences alone will often suffice to inhibit succession to forest. Originally occurred as a nearly continuous band along the Atlantic coast, but now found in only broken and isolated small stretches due to development pressures. Where present, it protects inland communities from the severe effects of storms. This community occurs on the ocean side of the ICW, and for the most part has been subjected to development except where encompassed within managed areas. Very little of this community is considered to fall within the proposed project boundaries.

Scrub – often characterized as a closed to open canopy forest of sand pines with dense clumps or vast thickets of scrub oaks and other shrubs dominating the understory. The ground cover is generally very sparse, being dominated by ground lichens or, rarely, herbs. Often patches of barren sand are common. Scrub occurs on sand ridges along former shorelines. Some of the sand ridges originated as wind-deposited dunes, others as wave-washed sand bars. The loose sands drain rapidly, creating very xeric conditions for which the plants appear to have evolved several water conservation strategies. Scrub is associated with and often grades into Coastal Strand and Xeric Hammock, making intermediate stages difficult to classify. Scrub is readily damaged by off-road vehicle or even foot traffic, which destroys the delicate ground cover and allows the loose sand to erode. This community reportedly occurs on Rayonier Corp. lands north of Faver-Dykes State Park (J.B. Miller, pers. comm.) and was observed north of Pine Island Road on Davis family property.

Maritime Hammock - characterized as a narrow band of hardwood forest lying just inland of the Coastal Strand community. Live oak, cabbage palm, and redbay generally combine to form a dense, wind-pruned canopy whose streamlined profile deflects winds and generally prevents hurricanes from uprooting the trees. Other typical plants include American holly, southern magnolia, red cedar, saw palmetto, beautyberry, poison ivy, and ferns. Migrating birds rely on these forests for food and shelter following trans-oceanic or trans-gulf migrations. Occurs on old coastal dunes that have been stabilized long enough for the growth of a forest. Humus buildup contributes to moisture retention, while the dense canopy minimizes temperature fluctuations by reducing soil warming during the day and heat loss at night. Often grades into Coastal Strand and Hydric Hammock, and may be confused with Shell Mound. It is the terminal stage of succession in coastal areas. Prime resort and residential property because of its relatively protected location along the coast. Although it originally occurred in virtually continuous bands it is now dissected into short strips by development and is rapidly disappearing. This is a common natural community along both sides of the ICW, although much of it has been developed on the ocean side. Fairly extensive stretches of it occur along the west side of the ICW, especially north and south of St. Augustine where development has not encroached.

Shell Mound – unusual among the biological communities in that it is largely a result of the activities of Indians, instead of natural physical factors. Generally characterized as an elevated mound of mollusk shells and aboriginal garbage on which a hardwood, closed-canopy forest develops. Typical plants include cabbage palm, red cedar, live oak, and

hackberry. Shell Mound soils are composed of shells and shell fragments with an organic component derived from forest litter. The soil is generally circumneutral to slightly alkaline, and the loose collection of shells allows water to drain extremely rapidly. Shell Mound is often associated with and grades into Maritime Hammock. This community was observed at Hemming Point on land managed by Faver-Dykes State Park, and undoubtedly also exists at isolated localities along the streams which enter the Matanzas and Tolomato rivers where conditions were favorable for occupation by ancient Indians.

Mesic Flatwoods – characterized as an open canopy forest of widely spaced pine trees with little or no understory but a dense ground cover of herbs and shrubs. Several variations of Mesic Flatwoods are recognized, the most common associations being longleaf pine – wiregrass – runner oak and slash pine – gallberry – saw palmetto. Occur on relatively flat, moderately to poorly drained terrain. The soils typically consist of 1-3 feet of acidic sands generally overlaying an organic hardpan or clayey subsoil. During the rainy seasons, water frequently stands on the hardpan's surface and briefly inundates much of the flatwoods, while during the drier seasons ground water is unobtainable for many plants whose roots fail to penetrate the hardpan. Nearly all plants and animal inhabiting this community are adapted to periodic fires, and several species depend upon fire for their continued existence. Mesic Flatwoods are closely associated with and often grade into Wet Flatwoods, Dry Prairie, or Scrubby Flatwoods. Wet Flatwoods occupy the lower, wetter areas, while Scrubby Flatwoods occupy the higher, drier areas. Very few undisturbed areas of Mesic Flatwoods exist because of habitat mismanagement and silvicultural, agricultural, or residential development. This community was observed along the east side of the ICW in the Guana Lake State Park and Wildlife Management Area. On the west side, it was evident at various points along the Matanzas and Tolomato rivers; the aerial survey and aerial photographs indicate that much of the Mesic Flatwoods has been altered by tree farm operations, although Faver-Dykes State Park has initiated a long-range program to restore lands that it manages or hopes to acquire to their natural state.

Hydric Hammock – characterized as a well-developed hardwood and cabbage palm forest with a variable understory often dominated by palms and ferns. Typical associated plants include, red cedar, red maple, sweetbay, water oak, southern magnolia, wax myrtle, saw palmetto, loblolly pine, American hornbeam, yellow jessamine, hackberry, and Virginia creeper. Occurs on low, flat sites where limestone may be near the surface. Soils are sands with considerable organic material that, although generally saturated, are inundated only for short periods following heavy rains. Occurs as patches in a variety of lowland situations, and in extensive forests just inland of coastal communities. Generally grades into Wet flatwoods, Coastal Berm, or Maritime Forest. North of St. Augustine, the most extensive areas supporting this community appear to be on the west side of the ICW north of the Palm Valley Bridge, and to some extent south of here on the Davis family properties. South of St. Augustine, Hydric Hammock was observed on managed lands at Hemming Point north of Pellicer Creek, and appears to be sporadically distributed on the west side of the ICW between this point and the Highway 312 bridge.

Wet Flatwoods – characterized as relatively open-canopy forests of scattered pine trees or cabbage palms with either thick shrubby understory and very sparse ground cover, or a sparse understory and a dense ground cover of hydrophytic herbs and shrubs. Typical plants include pond pine, slash pine, sweetbay, sedges, dwarf wax myrtle, gallberry, titi, saw palmetto, and greenbrier. Occurs on relatively flat, poorly drained terrain. The soils typically consist of 1 to 3 feet of acidic sands generally overlying an organic hardpan or clay layer. During the rainy season, water frequently stands on the surface, inundating the flatwoods for 1 or more months per year. Nearly all plants and animals inhabiting this community are adapted to periodic fires, and several species depend upon fires for their continued existence. Closely associated with and often grade into Hydric Hammock or Mesic Flatwoods. Although not specifically encountered during the surveys, this community likely occurs in moister situations on the Rayonier Corp. and Davis family lands along the western side of the ICW.

Bottomland Forest – characterized as a low-lying, closed-canopy forest of tall, straight trees with either a dense, shrubby understory and little ground cover, or an open understory and ground cover of ferns, herbs, and grasses. Typical plants include water oak, live oak, red maple, sweetgum, loblolly pine, cabbage palm, southern magnolia, loblolly bay, swamp tupelo, and wax myrtle. Occurs on low-lying flatlands that usually border streams with distinct banks, such that water rarely overflows the stream channel to inundate the forest. They also occur in scattered low spots in basins and depressions that are rarely inundated. Soils are generally a mixture of clay and organic materials. The water table is high, but Bottomland Forests are inundated only during extreme floods or exceptionally heavy rains. Tree density and species diversity is relatively high. May be extremely difficult from Hydric Hammock, but Bottomland Forest would not be inundated during periods of typical high water, whereas Hydric Hammock would be. Often associated with and grades into Hydric Hammock, Mesic Flatwoods, Wet Flatwoods, and Maritime Hammock. Their location on substrates that occasionally are inundated or saturated make Bottomland Forests generally unsuitable for development. A prime example of this community was encountered along a tributary of Pellicer Creek at Faver-Dykes State Park, and based upon aerial photos the potential for this community exists on the Rayonier Corp. and Davis family properties on the west side of the ICW.

Baygall – characterized as densely forested, peat-filled seepage depressions often at the base of sandy slopes. The canopy is composed of tall, densely packed, generally straight-boled evergreen hardwoods dominated by sweetbay, swamp red bay, and loblolly bay. Typically develop at the base of a slope where seepage usually maintains a saturated peat substrate. They may also be located at the edges of floodplains or in other flat areas where high lowland water tables help maintain soil moisture. Dependent upon seepage flow and a high water table. Alterations in the local or regional hydrology could impact Baygall communities. At least one stretch of this community exists along a seepage stream on Rayonier Corp. lands west of the ICW, and it potentially occurs on Davis family lands to the north.

Depression Marsh – characterized as a shallow, usually rounded depression in sand substrate with herbaceous vegetation often in concentric bands. Depression Marshes are

considered extremely important in providing breeding or foraging habitat for a variety of amphibians and birds. Those occurring as isolated wetlands within larger upland ecosystems are of critical importance to many additional wetland and upland species. Hydrological conditions vary, with most Depression Marshes drying in most years, eliminating fish populations and making them ideal breeding places for amphibian species. Threatened by drainage, agriculture, pollution, fire suppression, and the invasion of exotic species. A regional lowering of the water table as a result of overuse may eliminate many Depression Marshes, a serious potential threat in St. Johns County with its burgeoning human population. Two of these marshes were encountered at Hemming Point within the Maritime Hammock/Hydric Hammock/Shell Mound communities, and it is almost certain that several more are to be found in similar situations along the western side of the ICW. Because of the lack of fishes in these communities, they are extremely important for amphibian breeding.

Dome Swamp – characterized as shallow, forested, usually circular depressions that generally present a domed profile because smaller trees grow in the shallower waters at the outer edge, while bigger trees grow in the deeper water in the interior. Pond cypress, swamp tupelo, and slash pine are common trees. Often derive much of their water through runoff from surrounding uplands, and they function as reservoirs that recharge the aquifer when adjacent water tables drop during drought periods. Dome Swamps may have a Depression marsh or pond in their center, creating a doughnut appearance when viewed from above. This community does not appear to be as common as it is further inland, but one example was examined on former Rayonier Corp. lands recently acquired by Faver-Dykes State Park, and it seems likely that additional examples are to be found in isolated occurrences along the west side of the ICW.

Freshwater Tidal Swamp – occur on floodplains near the mouths of rivers just inland from saltmarshes. They are swamp forests with well-developed trees inland and increasingly dwarfed trees towards the coast, often with an extensive mat of convoluted surface roots. The dominant trees are usually cabbage palm, black gum, bald cypress, southern magnolia, and red cedar. Other typical plants include water tupelo, swamp bay, titi, wax myrtle, myrtle-leaved holly, saltbush, and leather fern. Often occur between anastomosing channels, on soils that are highly organic. These swamps are flooded by freshwater at least twice daily in response to tidal cycles. One example of this community was observed just north of the St. Augustine airport, and it is likely that this community occurs at the mouths of small streams scattered along the west side of the ICW.

Unconsolidated Substrate – generally characterized as expansive, relatively open areas of subtidal, intertidal, and supratidal zones which lack dense populations of sessile plant and animal species. This community may support a large population of infaunal organisms as well as a variety of transient planktonic and pelagic organisms, such as tube worms, sand dollars, mollusks, and crabs. Unconsolidated Substrates are important in that they form the foundation for the development of other marine and estuarine communities when conditions become appropriate. They are associated with, and often grade into Beach Dunes, Tidal Marshes, Tidal Swamps, and Mollusk Reefs. They are

susceptible to the accumulation of toxic levels of heavy metals, oils, and pesticides, and significant amounts of these compounds in the sediments will kill the infaunal organisms, thereby eliminating a food source for certain fishes, birds, and other organisms. This community is extensive along and around the Tolomato and Matanzas rivers and their tributaries.

Consolidated Substrate – Marine and Estuarine Consolidated Substrates are Mineral Based Natural Communities generally characterized as expansive, relatively open areas of subtidal, intertidal, and supratidal zones which lack dense populations of sessile plant and animal species. Consolidated Substrates are solidified rock or shell conglomerates and include coquina, limerock, or relic reef materials. Coquina, which is a limestone composed of broken shells, corals and other organic debris, occurs primarily in marine areas in the vicinity of St. Johns and Flagler counties. Limerock substrates occur as outcrops of bedded sedimentary deposits consisting primarily of calcium carbonate and are more widespread than Coquina substrates, occurring under both marine and estuarine conditions in north Florida. Consolidated Substrates are important in that they form the foundation for the development of other Marine and Estuarine Natural Communities when conditions become appropriate. They are easily destroyed through siltation or placement of fill. Although not positively identified during surveys, this community undoubtedly is to be found in the project area due to the presence of coquina rock deposits in the region

Mollusk Reef - characterized as expansive concentrations of sessile mollusks occurring in intertidal and subtidal zones to a depth of 40 feet. Generally restricted to estuarine areas and are dominated by the American oyster. Numerous other sessile and benthic invertebrates live among, attached to, or within the collage of mollusk shells. Several fish also frequently occur near or feed among Mollusk Reefs. Those reefs that are exposed during low tides are frequented by a multitude of shorebirds, wading birds, and other vertebrates. Once established, Mollusk Reefs can generally persist and often expand by building upon themselves. Significant increases or decreases in salinity levels through natural or man-made alterations of freshwater inflow can be detrimental to oyster Mollusk Reef communities. The major threats to Mollusk Reefs continue to be pollution and substrate degradation due, in large part, to upland development. Declining oyster and other Mollusk Reef populations can be expected in coastal waters that are being dredged or are receiving chemicals mixed with rainwater flowing off the land, or from drainage of untreated residential or industrial sewage systems. Mollusk Reefs and mollusk bars were widespread along the Tolomato and Matanzas rivers and their tributaries.

Estuarine Tidal Marsh - generally characterized as expanses of grasses, rushes, and sedges along coastlines of low wave-energy and river mouths. Black needlerush and Smooth cordgrass are indicator species which usually form dense, uniform stands. The stands may be arranged in well-defined zones according to tide levels or may grade subtly over a broad area, with elevation as the primary determining factor. In the upper reaches of river mouths, where Estuarine Tidal Marsh begins to blend with Freshwater Tidal Marsh, sawgrass may occur in dense stands. Tidal Marsh soils are generally poorly drained muck or sandy clay loams with substantial organic components and often a high

sulfur content. The decaying, dead marsh plants and the transported detritus which the living plants trap, accumulate to form peat deposits. Together, these accretion processes may build land. A myriad of invertebrates and fish, including most of the commercially and recreationally important species, use Tidal Marshes throughout all or part of their life cycles. Tidal Marshes are also extremely important because of their storm buffering capacity and their pollutant filtering actions. Adverse impacts of urban development of Tidal Marshes include degradation of water quality, filling of marshes, increased erosion, and other alterations such as bulkheading and beach renourishment. This community is extremely widespread along the Tolomato and Matanzas rivers and the associated estuaries. Although most parts are directly protected from development, they are highly vulnerable to the downstream effects of land disturbance and pollution.

Appendix IV

Explanation of Florida Natural Areas Inventory (FNAI) Element Ranks and Federal and State Statuses

FEDERAL AND STATE LEGAL STATUSES

Provided by FNAI for information only.

For official definitions and lists of protected species, consult the relevant state or federal agency.

FEDERAL LEGAL STATUS

Definitions derived from U.S. Endangered Species Act of 1973, Sec. 3. Note that the federal status given by FNAI refers only to Florida populations and that federal status may differ elsewhere.

- LE Endangered: species in danger of extinction throughout all or a significant portion of its range.
- LT Threatened: species likely to become Endangered within the foreseeable future throughout all or a significant portion of its range.
- E(S/A) Endangered due to similarity of appearance to a species which is federally listed such that enforcement personnel have difficulty in attempting to differentiate between the listed and unlisted species.
- T(S/A) Threatened due to similarity of appearance (see above).
- PE Proposed for listing as Endangered species.
- PT Proposed for listing as Threatened species.
- C Candidate species for which federal listing agencies have sufficient information on biological vulnerability and threats to support proposing to list the species as Endangered or Threatened.
- XN Non-essential experimental population.
- MC Not currently listed, but of management concern to USFWS.
- N Not currently listed, nor currently being considered for listing as Endangered or Threatened.

FLORIDA LEGAL STATUSES

Animals: Definitions derived from "Florida's Endangered Species and Species of Special Concern, Official Lists" published by Florida Fish and Wildlife Conservation Commission, 1 August 1997, and subsequent updates.

- LE Endangered: species, subspecies, or isolated population so few or depleted in number or so restricted in range that it is in imminent danger of extinction.
- LT Threatened: species, subspecies, or isolated population facing a very high risk of extinction in the future.
- LS Species of Special Concern is a species, subspecies, or isolated population which is facing a moderate risk of extinction in the future.
- PE Proposed for listing as Endangered.
- PT Proposed for listing as Threatened.
- PS Proposed for listing as Species of Special Concern.
- N Not currently listed, nor currently being considered for listing.

Plants: Definitions derived from Sections 581.011 and 581.185(2), Florida Statutes, and the Preservation of Native Flora of Florida Act, 5B-40.001. FNAI does not track all state-regulated plant species; for a complete list of state-regulated plant species, call Florida Division of Plant Industry, 352-372-3505.

- LE Endangered: species of plants native to Florida that are in imminent danger of extinction within the state, the survival of which is unlikely if the causes of a decline in the number of plants continue; includes all species determined to be endangered or threatened pursuant to the U.S. Endangered Species Act.
- LT Threatened: species native to the state that are in rapid decline in the number of plants within the state, but which have not so decreased in number as to cause them to be Endangered.
- PE Proposed for listing as Endangered.
- PT Proposed for listing as Threatened.
- N Not currently listed, nor currently being considered for listing.

GLOBAL AND STATE RANKS

Florida Natural Areas Inventory (FNAI) defines an **element** as any rare or exemplary component of the natural environment, such as a species, natural community, bird rookery, spring, sinkhole, cave, or other ecological feature. FNAI assigns two ranks to each element found in Florida: the **global rank**, which is based on an element's worldwide status, and the **state rank**, which is based on the status of the element within Florida. Element ranks are based on many factors, including estimated number of occurrences, estimated abundance (for species and populations) or area (for natural communities), estimated number of adequately protected occurrences, range, threats, and ecological fragility.

GLOBAL RANK DEFINITIONS

- G1 Critically imperiled globally because of extreme rarity (5 or fewer occurrences or less than 1000 individuals) or because of extreme vulnerability to extinction due to some natural or human factor.
- G2 Imperiled globally because of rarity (6 to 20 occurrences or less than 3000 individuals) or because of vulnerability to extinction due to some natural or human factor.
- G3 Either very rare and local throughout its range (21-100 occurrences or less than 10,000 individuals), or found locally in a restricted range, or vulnerable to extinction from other factors.
- G4 Apparently secure globally (may be rare in parts of range).
- G5 Demonstrably secure globally.
- GH Occurred historically throughout its range, but has not been observed for many years.
- GX Believed to be extinct throughout range.
- GXC Extirpated from the wild but still known from captivity or cultivation.
- G#? Rank uncertain (e.g., G2?).
- G#G# Range of rank; insufficient data to assign specific global rank (e.g., G2G3)
- G#T# Rank of a taxonomic subgroup such as a subspecies or variety; the G portion of the rank refers to the entire species, and the T portion refers to the subgroup; T# has same definition as G#.
- G#Q Ranked as species but there is some question as to whether it is a valid species.
- G#T#Q Same as above, but validity as subspecies or variety is questioned.
- GU Global rank unknown; due to lack of information, no rank or range can be assigned.
- G? Temporarily not ranked.

STATE RANK DEFINITIONS

State ranks (S#) follow the same system and have the same definitions as global ranks, except they apply only to Florida, with the following additions:

- SA Accidental in Florida and not part of the established biota.
- SE Exotic species established in Florida (may be native elsewhere in North America).
- SX Believed to be extirpated from state.

Appendix V

Survey Information Relevant to the
Northeast Florida Blueway Phase II:
Tolomato and Matanzas Rivers

Birds Observed at Hemming Point May 20, 2001
(Water Management District Tract Managed by Faver-Dykes State Park)

Great Blue Heron¹
Little Blue Heron¹
Great Egret¹
Least Tern¹
Osprey^{1,2}
Red-shouldered Hawk
Turkey Vulture
Pileated Woodpecker
Red-bellied Woodpecker
Fish Crow
Carolina Wren
Cardinal
Ovenbird
American redstart
Parula Warbler³
Pine Warbler
White-eyed Vireo
Red-eyed Vireo
Blue-gray Gnatcatcher

¹ Observed over the Pellicer Creek marsh

² Observed on nest

³ Observed with young of year

Observations of John R. Meyer, Ph.D.

Amphibians and Reptiles Captured or Observed During Intensive Surveys at Ft. George Island in 1991 and Big N Island in 1992.

Common Name	Number of Individuals
Amphibians	709
Mole salamander	6
Dwarf salamander	85
Slimy salamander	10
Eastern newt	122
Greenhouse frog*	14
Eastern spadefoot toad	168
Eastern narrowmouth frog	221
Southern cricket frog	1
Green treefrog	24
Squirrel treefrog	6
Southern chorus frog	1
Southern leopard frog	51
Reptiles	349
Common snapping turtle	2
Striped mud turtle	3
Eastern mud turtle	1
Gopher tortoise	6
Red-eared slider*	5
Florida box turtle	2
Green anole	40
Six-lined racerunner	18
Ground skink	12
Southeastern five-lined skink	32
Broadhead skink	133
Five-lined skink	12
Slender glass lizard	2
Eastern glass lizard	25
Peninsula ribbon snake	1
Eastern garter snake	4
Ringneck snake	1
Red rat snake	3
Yellow rat snake	6
Scarlet snake	5
Black racer	28
Coachwhip	1
Rough green snake	5
Eastern diamondback	2

* Introduced species