Nassau County 2030 Comprehensive Plan
Conservation Element

Background Data and Analysis

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I. Introduction

The purpose of the Conservation Element is to promote the conservation, use, and protection of natural, archaeological and historic resources. The Element identifies and analyzes natural resources in Nassau County. "Natural resources" includes rivers, lakes, wetlands, floodplains, areas of soil erosion, commercially valuable minerals, fish and wildlife including endangered and threatened species, vegetative communities, groundwater, and air quality. Analysis also includes existing commercial, recreational, or conservation uses of these resources and known pollution problems, including hazardous waste. Historical resources identified herein are primarily based upon information from the Florida Division of Historical Resources.

The Conservation Element is where the State of Florida requires each unit of local government to perform an assessment of current and future water needs and sources and the quality and quantity of these water resources. Goals, objectives, and policies in this element address the conservation, use, and protection of these resources including cooperation with adjacent local governments to protect unique vegetative communities, the designation of environmentally sensitive lands for protection, the protection of historic and archaeological resources, and the management of hazardous waste. This element will also address, in part, the statutory requirements of HB 697, adopted by the Florida legislature in 2008, by including policies for the maintenance of "green infrastructure" and promotion of energy efficiency in building and subdivision design.

The Element identifies all natural resources in Nassau County including surface water resources (lakes, rivers, etc.) and their quality, groundwater resources (aquifers, water use, recharge areas, cones of influence, etc), wetlands, floodplains, fisheries, wildlife, vegetative communities, environmentally sensitive lands, air quality, areas of soil erosion, minerals, as well as hazardous waste management. Each section is followed by an analysis of any issues related to the preservation, management, and use of these natural resources. The goals, objectives, and policies are the means by which any needs identified in the data and analysis are implemented, with the overall goal being to conserve and protect the natural resources of the County and to maintain an acceptable quality of life for its citizens as was voiced during the Vision 2032 process.

The County would like to recognize the contributions made to the background data and analysis for this element by The Nature Conservancy, who prepared *Conserving Land and Water in Nassau County,* a land acquisition feasibility study for the County in 2008 funded by a Rural Technical Assistance Grant from the Florida Department of Community Affairs. This study is included in its entirety as Appendix I.

II. Recommendations Incorporated from the 2008 EAR & Vision 2032 Final Report

Protection of Environmental Resources

- Encourage resource preservation by establishing standards in the land development regulations that allow transfers of residential densities for residential developments and increased floor area ratios for non-residential developments in areas that meet established resource protection standards. *(Vision 2032, QOL Issue 1: Conservation and Preservation of the Natural Environment)*

- Coordinate efforts with communities countywide to establish a strategy for protecting and conserving the water supply and resources for competing uses. *(Vision 2032, QOL Issue 1: Conservation and Preservation of the Natural Environment)*

- Coordinate public and private efforts to ensure continuance of the vital tourism industry and identify opportunities to create a sustainable eco-tourism segment of the economy that takes advantage of the County's abundance of natural resource areas, such as the St. Marys River. (*Vision 2032, Eco. Development and Tourism, Objective 2*)

- Cooperate with municipalities, adjacent jurisdictions and private landowners to retain the significant habitats for native wildlife and vegetation. If on-site habitat of threatened or endangered species should be disturbed by new development, similar habitat should be protectedwith an emphasis on viability by virtue of its size, configuration, and connecting habitat. *(EAR, Issue 6: Preserve environmental resources)*

- Coordinate with utility providers to explore and establish a plan to extend public sewer lines, where feasible, to control the number of septic tanks sited in environmentally sensitive areas *(EAR, Issue 6: Preserve environmental resources)*

- Coordinate with the SJRWMD and the municipalities to determine the need for alternative water supplies to help meet future demands. Study the feasibility of using various water supply alternatives such as desalinization, transfer of water, and wastewater reuse as potential alternative water supply sources. *(EAR, Issue 6: Preserve environmental resources)*

- Adopt a policy to create new zoning district(s) for mining areas which provide adequate buffers to protect surrounding land uses, environmental resources, and archaeological sites as determined by the state. *(EAR, Issue 6: Preserve environmental resources)*

Historic Resources

- Historic sites and buildings throughout the County, including the 50 block historic district in Fernandina Beach and historic American Beach on the south end of Amelia Island, attract thousands of visitors year-round. *(Vision 2032, Overview)*

- Emphasize Nassau County's cultural and historical amenities in tourism promotion and business recruitment efforts. *(Vision 2032, Eco. Development and Tourism, Strategy 5)*

Inventory of Conservation Lands

- Assemble and maintain an accurate inventory of public and private conservation lands. The inventory should include conservation easements, transfers of development rights, and permanently protected lands within Developments of Regional Impacts (DRIs). *(EAR, Issue 6: Preserve environmental resources)*

- Utilize the best available information to aid in the review of development submittals and public planning studies. Maintain a Geographic Information System (GIS) inventory of environmental resources. Develop a composite map of environmental resources that reflect the County's objectives and policies. *(EAR, Issue 6: Preserve environmental resources)*

Land Acquisition Program

- On an ongoing basis, coordinate with willing seller landowners, non-profit recreation, and conservation land groups to set aside land for conservation or public open space. *(Vision 2032, QOL Issue 4: Recreation and Open Space)*

- Develop a long-range, financially feasible plan for the identification and acquisition of environmental resources. The plan may include: an inventory of countywide Environmental resources; a priority ranking and criteria of areas for permanent preservation; a funding approach to accommodate land acquisition; coordination and partnering efforts; and, an implementation program. Future land acquisitions should be coordinated with the goals of the County's Parks and Recreation Master Plan. *(EAR, Issue 6: Preserve environmental resources)*

- Maintain partnerships with organizations such as Florida Communities Trust, the Trust for Public Land (TPL), and other organizations to provide the necessary funds to implement these efforts. *(EAR, Issue 6: Preserve environmental resources)*

Greenways

- Promote the maintenance and development of wildlife corridors through adjoining residential and non-residential areas including infrastructure expansion or rebuilding projects. *(Vision 2032, QOL Issue 1: Conservation and Preservation of the Natural Environment)*

- Consider greenways to link existing and proposed nature reserves, parks, cultural and historic sites with each other. *(EAR, Issue 2: Strengthen of long-range transportation planning efforts)*

- Consider identifying wildlife corridors as part of the FLUM series. Wildlife corridors create habitat linkages between existing preserves and environmentally sensitive areas. Preservation techniques within mapped corridors include full fee and less than fee acquisition, clustering of permitted development, density transfers and wildlife crossings at roadways. *(EAR, Issue 1: Update the future land use plan)*

Green Development Standards

- Incorporate natural areas and features into development plans, parks and recreation areas, non-residential development, and infrastructure projects. *(Vision 2032, QOL Issue 1: Conservation and Preservation of the Natural Environment)*

- Adopt Objectives/Policies that define criteria of and incentivize the use of "green development" standards, including the LEED Green Building Rating System. *(EAR, Issue 6: Preserve environmental resources)*

Agriculture/Silviculture

- Define the role of the County in protecting the integrity of agricultural land, and define what actions, if any, will be taken to protect agriculture. *(EAR, Issue 1: Update the future land use plan)*

- Conserve and manage unique agricultural or silvicultural soils. Identify and list soils in Plan. Provide a map of these soils in Plan. *(EAR, Issue 6: Preserve environmental resources)*

- Coordinate with the Florida Dept. of Agricuture and County Extension Agent to explore experimental agricultural programs to strengthen the County's agricultural base. *(EAR, Issue 6: Preserve environmental resources)*

- Provide incentives to acquire management agreements for flatwoods and forests of the St. Mary's River Basin that would favor the continued management of the timber resources on a sustainable, long term basis. *(EAR, Issue 5: Preserve rural lifestyle choices)*

III. Inventory of Natural Resources

Physical and Geologic Setting

Nassau County lies within the Atlantic Coastal Plain province. Most of Nassau County is equally divided between two physiographic provinces: the western portion is situated within in the region known as the Duval Upland of northeastern Florida, and the St. Marys Meander Plain to the east of the Duval Upland. A small portion of the high, sandy Trail Ridge physiographic province is found in the extreme southwestern portion of the County (see Map CS-1).

At the mouth of the St. Marys River is the Sea Islands region, assignable to the Atlantic Beach Ridges physiographic province that is the prevailing formation along the extreme eastern portion of Nassau County.

The Duval Upland region is an extensive area extending from northern Putnam County, Florida, into southern Georgia. This upland system is generally characterized by rolling topography that ranges in elevation from 25 to 100 feet above mean sea level. Much of the Duval Upland province was once dominated by longleaf pine flatwoods interspersed with swamp forests of hardwoods and cypress. Most of these uplands have now been converted to commercial silviculture operation (i.e., pine plantations). Along the western slope of this upland where the St. Marys River runs northward for some 40 miles, small tributary streams are numerous and drain much of this area.

The St. Marys Meander Plain is generally low and flat with sandy soils and elevations ranging from 5 to 25 feet above MSL. The poorly drained upland areas were once vegetated with longleaf and slash pine flatwoods, which today also have been replaced mostly with commercial pine plantations. Scattered live oak hammocks also commonly occur within this region.

The Trail Ridge is a barrier ridge that ranges from 100 to 150 feet above MSL and was historically dominated by longleaf pine flatwoods and xeric sandhills.

Soils

Soils in Nassau County are depicted on Map CS-2. This map depicts soil categories throughout the County. The Soils Map denotes land units that have a distinct pattern of soils, relief and drainage. Each land unit is a unique natural landscape and may consist of one or more major soils. Soils making up one unit can occur in other units, but in a different pattern or proportion to each other. The map provides a basis for comparing the land use soil capacity potential of large areas. Areas that are, for the most part, suited to certain kinds of farming or to other land uses can be identified.

Knowledge of soil conditions is necessary in planning for the use and management of soils for crops and pasture, woodland, woodland grazing, and as wildlife habitat. Also, knowledge of soil conditions and the ability of soil to absorb moisture is extremely important when planning for the use of septic tanks for sanitary wastewater disposal. Soil suitability is therfore a significant potential development indicator.

The Nassau County Soil and Water Conservation District (SWCD) is dedicated to encouraging productive use of land, water and air resources in the county. Organized under the provisions of Ch. 582, Florida Statutes, the five (5) supervisors of the district have the authority to conduct research and develop comprehensive plans for the conservation of soil and water resources and to construct, improve, operate and maintain such structures as may be necessary for the control and prevention of soil erosion and for flood prevention. The SWCD may also formulate

regulations within the district in the interest of conserving soil and soil resources, and preventing and controlling soil erosion.

The supervisors may also conduct demonstrational projects and make agricultural and engineering machinery and equipment, fertilizer, seeds and seedlings, and such other material or equipment available to landowners within the district to carry on operations for the conservation of soil and water resources.

Natural Communities

Nassau County encompasses a wide variety of highly important and ecologically valuable natural communities. This section will describe specific areas of the County that are vital to supporting the economy through direct financial benefits, as well as providing the underlying suite of ecosystem services that allow the County to function and thrive on a sustainable basis. The Florida Natural Areas Inventory (FNAI) indicates that there are 17 different natural communities documented within the County. The 2008 land acquisition feasibility study (see Appendix I) contains a full description of these natural communities shows the distribution of these communities as well as developed (i.e., "Urban") areas throughout the County based upon Landsat data from the Florida Fish and Wildlife Conservation Commission (FWC).

Amelia Island/Amelia River

Amelia Island is widely recognized as one of the most important and beautiful barrier islands in northeast Florida. The island affords enormous recreational, tourism and residential/commercial opportunities, many of which have already been realized. Amelia Island is critical to the economy of Nassau County and having sandy beaches has undoubtedly contributed enormously to the success of Amelia Island as a destination and community.

Barrier islands are vital to lessening the impact of storm surge from hurricanes to adjacent inland areas and can potentially reduce property damage in such inland areas by millions of dollars. The beach dune systems found there are also important to the proper functioning of barrier islands in protecting the inland and coastal residents from such storm surges. As sea turtle nesting grounds, shore bird habitat and foraging areas, and as habitat for a large variety of migratory birds along a renowned migration route, this is one of the finest natural resources in Nassau County.

Natural communities found on or in association with Amelia Island include Maritime Hammock, Beach Dune, Coastal Interdunal Swale, Mesic Flatwoods and Estuarine Tidal Marsh.

The Maritime Hammock community represents a relatively small, but exceedingly important, prominent and characteristic feature of this region of Nassau County. Typically, Maritime Hammocks are found behind the Beach Dune community but between a zone of flatwoods and/or fringing Upland Mixed Forest community and the extensive Estuarine Tidal Marshes of the County.

Maritime Hammocks within Nassau County are dominated by a canopy of mixed hardwoods, including live oak *(Quercus virginiana)* - the branches often supporting a luxuriant growth of resurrection fern *(Polypodium polypodioides)* and Spanish moss (*Tillandsia usneoides)* - laurel oak *(Q. hemispherica)*, southern magnolia *(Magnolia grandiflora)*, hackberry *(Celtis laevigata)*, black cherry *(Prunus serotina)*, and loblolly pine (*P. taeda)* The subcanopy supports red bay, American holly *(Ilex opaca)*, cabbage palm *(Sabal palmetto)* and sweetgum with an open, but shrubby, understory.

The Estuarine Tidal Marsh natural community dominates a very large proportion of the area lying behind Amelia Island, and formed by the confluence of the combined St. Marys, Nassau and

Amelia rivers. This community is not only extensive, but is very well-developed and exhibits characteristics indicative of very high quality examples of this community type. This vast estuarine system is one of the most ecologically and economically significant along Florida's northeastern coast.

Dominant species in the Estuarine Tidal Marsh community include smooth cordgrass *(Spartina alterniflora)* in what are often termed "low marsh" areas and black needle rush *(Juncus roemerianus)* and sawgrass *(Cladium jamaicense)* in what are often termed "high marsh" areas. Interspersed among these brackish water marsh systems are various small islands of what might be termed "Coastal Flatwoods" – a variant of Wet Flatwoods with some maritime influence and a conspicuous understory of cabbage palms and southern red cedar *(Juniperus silicicola)*.

This community is highly significant as a nursery for many game and commercial fish species, important and economically valuable for hundreds of invertebrate species and as prime feeding grounds for a variety of birds, some of them rare and endangered. Although somewhat protected through regulatory means, the long-term conservation of this community type is not strictly assured.

The St. Marys River

The beautiful and historic St. Marys River has its origin in the Okefenokee and Pinhook Swamp regions of southeastern Georgia and northeastern Florida. It runs 150 miles along Nassau County's western and northern boundary before forming a large and highly significant estuarine community near its mouth with the Atlantic Ocean.

The St. Marys is one of the few riverine systems in the southeastern United States that has escaped major disturbance and alteration. While many riverine systems have been dammed, the St. Marys is still mostly free-flowing and supports high water quality along most of its length, having avoided negative impacts of agricultural, silvicultural, industrial and residential effluents that have degraded other rivers in the region. The St. Marys River is fortunate in this respect largely because that while there has been considerable commercial forestry practiced along its banks, including areas that were clear-cut, most of these lands were immediately replanted to pine plantations, thus limiting detrimental runoff and soil erosion.

Because large portions of both banks of the river are covered with natural vegetation, much of the river provides a true wilderness experience for canoeist, kayakers, small boats and freshwater anglers. The ecotourism benefits that can be better developed along the St. Marys River should allow for substantial revenues through enhanced economic activity with the river at its center.

The St. Marys flows through a region that has historically been relatively rural with a sparse population and less industrial or urban development than that found along many other regional rivers. This situation is rapidly changing, however, as more people move into Florida and Nassau County, particularly those seeking riverfront homes which are often serviced by septic tanks that have the capacity to degrade water quality if not properly installed and maintained.

The St. Marys River itself comprises a Blackwater Stream natural community The headwaters of this river lie principally in the Okefenokee Swamp It originates deep in sandy lowlands where extensive wetlands with organic soils function as reservoirs, collecting rainfall and discharging it slowly to the stream. The tea-colored waters of Blackwater Streams are laden with tannins, particulates and dissolved organic matter and iron derived from drainage through swamps and marshes. The dark-colored water reduces light penetration and, thus, inhibits photosynthesis and the growth of submerged aquatic plants. This, along with the typically steep banks and seasonal fluctuations in water level, limit most aquatic and emergent vegetation to shallower and slower moving sections of the river.

The other natural communities found directly along the St. Marys River include numerous Floodplain Swamp, Floodplain Lakes, Floodplain Forest and Bottomland Forest/Slope Forest. Near its mouth, these communities give way to Estuarine Tidal Marsh and Maritime Hammocks that have many recreational and economic benefits, both direct and indirect in terms of the ecosystem services they provide. Together, the natural communities found along the St. Marys River provide tremendous economic benefits in terms of natural flood control, a vast commercial and sport fisheries nursery ground (including shell fish), are part of a nationally-recognized migratory bird route (bird watching), production of wood-based building products and fiber/pulp supplies from commercial forestry activities, barriers against hurricane and other storm surges, protection of land from erosion, carbon dioxide sink in salt marsh grasses and accumulating sediments, building land, wildlife habitat and production, hunting opportunities, canoe and kayak livery services and row crop based food production. With the prices of basic commodities escalating rapidly, such food, fiber and fuel (biofuel) production on valuable farmlands with rich soils adjacent to the river is more important than ever to sustainability at the local, regional and national levels.

In 2003, the County adopted the St. Marys River Overlay District as part of the Land Development Code (Ord. 2003-34). The intent of the St. Marys River Overlay District is to protect and preserve the water quality, natural habitats, diverse wildlife, and recreational value of the St. Marys River.

The Overlay District is applicable to all zoning districts; it establishes minimum lot area and width (one acre and 100 feet, respectively) for properties along the river, and prohibits on-site sewage and disposal systems within one hundred (100) feet of the riverbank, measured from the mean high-water line of the tidally influenced portions or from the normal annual flood line of the river (whichever is more restrictive). All other State, Federal, and local regulations are applicable to properties within the Overlay District.

The Nassau River

The Nassau River in south-central Nassau County is formed by the confluence of four prominent creek systems: Thomas Creek (with its headwaters near Cary State Forest), Alligator Creek (with headwaters near Callahan), Mills Creek and Snell Swamp (with headwaters forming east of Hilliard) and Plummer Swamp Creek (with headwaters south of County Road 108 and west of I-95). All of these creeks have their origins in north-central Nassau County. These creeks are the namesake of the relatively new Four Creeks State Forest.

The natural communities along the Nassau River include Creek Swamp, Freshwater Tidal Swamp Estuarine Tidal Marsh, and some Maritime Hammock.

The ecological and economic importance of these varied creek and stream systems to Nassau County's natural resource base is enormous. Not only do they provide significant wildlife habitat, they flow into the larger riverine systems that feed and support the renowned estuaries of the Nassau, as well as St. Marys and Amelia rivers. Without the protection of the lands that encompass the watersheds, usually various types of pine flatwoods that provide slow release of groundwater into these creeks and streams, the sustainability of Nassau County's timberlands and estuarine-based economic activities will be diminished.

Because the eastern portion of Nassau County has the Nassau River as its boundary line between Duval and Nassau counties, areas along this river have experienced more growth, development and population pressure than has the St. Marys River. For example, the Jacksonville International Airport in Duval County is in close proximity to both the Nassau River and one of its major tributaries, Thomas Creek. Recent conservation efforts along the Nassau County side (as described below) have sought to buffer this important natural and hydrological resource in part because of this growth pressure.

Brandy Branch

A significant and high quality example of the Floodplain Swamp natural community in southwestern Nassau County is represented by the Brandy Branch system. This Floodplain Swamp drains a large area just south of Cary State Forest and runs westward to the St. Marys River where it forms a vast Floodplain and "Riverine" Swamp at its confluence with the river. This single forested wetland system alone encompasses almost 4,000 acres of an intact, high quality Floodplain Swamp natural community. Because of its high quality, the area was included in The Nature Conservancy's Baldwin Bay/St. Marys River Florida Forever conservation land acquisition project.

The Floodplain Swamp at this location is characterized by an overstory of a relatively dense growth of bald cypress *(Taxodium distichum)* – some of which are huge, old-growth individuals – mixed with swamp blackgum *(Nyssa biflora)* and red maple *(Acer rubrum)*. Many of the trees can be described as secondary old-growth, forming a canopy 40-60 feet high with many individuals of all three species well buttressed and having good diameters. Depending on the density of the canopy, the subcanopy may be either dense or consist of more scattered individuals of several hardwoods, including pop ash *(Fraxinus caroliniana)*, ogeechee lime *(Nyssa ogeeche)*, plane tree *(Planera aquatica)*, water hickory *(Carya aquatica)*, and diamondleaf oak *(Quercus laurifolia)*. At several places within the floodplain, individuals of loblolly pine *(Pinus taeda)* are not uncommon.

Although only a few old-growth bald cypress occur within this community, the fact that the majority of this area has not been logged or otherwise disturbed in many years (estimated at 50+ years), establishes this area as a high quality example of this community type that should be conserved.

High quality Floodplain Swamp communities provide excellent habitat for many species dependant on this forested wetland system, particularly American alligator, bald eagle, osprey, wild turkey and the occasional Florida black bear.

Interior Timberlands

The interior portion of the County contains small rivers, black water creeks and wetland systems but is more uniform in its overall natural community mosaic and the interrelationships of its communities. Much of the western interior of Nassau County is dominated by vast timberlands, or commercial forestry/silvicultural (i.e., pine plantation) operations. Such timberlands have been a mainstay of the Nassau County economy and the northeast Florida region for decades, and one that should become even more appreciated because they represent a truly sustainable natural resource. Having a high potential for becoming an even more "green" industry with continued long-term economic impacts, silviculture can become an even more clean, environmentally friendly industry, and one that also helps to offset damaging carbon dioxide releases from fossil fuel consumption into the Earth's atmosphere.

Timberlands provide a vast array of ecosystem services and other economically valuable activities to their owners (besides just the wood/fiber production). These include: the fact that flatwoods are the major community type that form the terrestrial base of watersheds, wherein these pine/palmetto based communities catch, store and slowly release rainfall thereby contributing to the formation of the County's productive and ecologically important creeks (and downstream, to its rivers and estuaries). Not only does much of this captured and stored rainfall seep into the ground to recharge local aquifers, thereby maintaining groundwater supplies that are critical to the County's water supply for its population, but such a system of collection, storage and slow release is a major contributor to flood control efforts on a regional basis. Prevention of soil erosion, maintenance of soil productivity, wildlife habitat and production, oxygen production, hunting and other outdoor recreational opportunities and pine straw harvesting are quite lucrative enterprises. As well, these vast timberland tracts require very little in the way of traditional (and

costly) governmental services such as schools, health care, utilities, road maintenance, police and fire protection, yet pay taxes and provide many jobs.

Overall, the interior areas of Nassau County can be characterized as having a flatwoods matrix through which other forested upland and wetland systems are interspersed. There are four distinct kinds of flatwoods that may be found within Nassau County, including North Florida slash pine *(Pinus elliottii)*-dominated Wet Flatwoods, pond pine *(P. serotina)*- dominated Wet Flatwoods, longleaf pine (P. palustris)-dominated Mesic Flatwoods, and longleaf dominated Scrubby Flatwoods. Because flatwoods of all types in Florida are fire-adapted communities, their native species composition and structure thrive on periodic fire.

Most areas of these once dominant flatwoods, however, have been either logged and/or fire suppressed to varying degrees over the years, and now exist mostly as remnant patches. The majority of the inland areas in the County in vegetative cover are typically vast plantations of North Florida slash pine *(Pinus elliottii)* or loblolly pine *(P. taeda)* that have been planted in areas that were formerly Mesic-Wet Flatwoods or Wet Prairie communities.

Although these pine plantations now cover much of the interior portion of the County, the community structure and species composition of the former natural communities over which they were established are still reasonably intact and readily recognizable. Fortunately, because many of these systems have been only lightly bedded it would be relatively easy, if desired, to restore selected portions back to their original community species composition and structure.

Interspersed throughout the flatwoods systems are forested and herbaceous wetland systems that form much of the habitat important to wildlife populations in Nassau County and the region. Many of streams that traverse the County are considered to be Blackwater Streams These flowing aquatic systems originate in deep, sandy lowland swamp areas where the organic soils function as reservoirs, collecting rainfall and discharging it slowly into the stream. The waters of these streams are characteristically tea-colored due to the presence of tannins, particulates and dissolved organic matter and iron derived from drainage through swamps and marshes. A few streams located in the western reaches of the County, in areas where the Sandhill natural community is common, can be termed Seepage Streams since they receive their water from rain percolating through the sandy upland soils before seeping laterally out into stream channels. Many Seepage Streams and their associated hardwood communities have become increasing degraded due to intensive silvicultural operations on adjacent uplands.

Species

Data provided by the Florida Natural Areas Inventory (FNAI) indicate that there are 19 animals and nine plant species that are considered rare by the FNAI that are documented to occur in Nassau County.

Reptiles and Amphibians

- The Gopher tortoise *(Gopherus polyphemus)* is a State Threatened Species. This species is typically present within the Sandhill communities of the County as well as in other habitats. It is well documented that the deep burrows that this fossorial reptile excavates provide habitat and refuge for numerous other rare and/or declining species.

- The Eastern indigo snake *(Drymarchon corais couperi)* is found in Sandhills, Mesic Flatwoods, Maritime Hammocks and several other habitats.

- Loggerhead turtles *(Caretta caretta)* is listed as endangered by both state and federal authorities. They are frequently found nesting on the beaches of Amelia Island.

- American alligator *(Alligator mississippiensis)* is found in forested and herbaceous wetlands, creeks and other such habitats throughout the County.

- The Many-lined Salamander *(Stereochilus marginatus)* is found in specialized creek and swamp habitats in the County.

- Timber rattlesnake *(Crotalus horridus*) is an unusual species for Florida, but a population has been documented in Nassau County.

It is also known that three species of sea turtle listed as endangered or threatened by state and federal authorities are occasionally found nesting on the beaches of Amelia Island. These include the Leatherback (endangered), Kemp's Ridley (endangered) and Green sea turtles (threatened).

Birds

- Woodstork (*Mycteria Americana*) is listed as endangered by both state and federal authorities It is found in a wide variety of coastal and inland freshwater sites throughout the County.

- Bachman's sparrow *(Aimophila aestivalis)* is found in several habitats in the County, but particularly various kinds of intact flatwoods.

- Black-crowned night-heron (Nycticorax nycticorax) prefers dense wetland forest types along rivers and creeks and coastal tidal marshes.

- Lest Tern *(Sterna antillarum)* is a species predominately found on the sandy beaches of Amelia Island and within estuarine tidal marsh habitats.

- Wilson's Plover *(Charadrius wilsonia)* also a coastal species found primarily on and around Amelia Island.

- American Oystercatcher *(Haematopus palliatus)* prefers both open sandy beaches and estuarine tidal marsh habitats.

- Red-Cockaded Woodpecker *(Picoides borealis)* is listed as federally endangered and occurs only in open, old-growth pine forests where suitably aged trees allow it to excavate nest cavities. It is the only North American woodpecker that builds is nest cavities in living pine trees.

- Little Blue Heron *(Egretta caerulea)* is a resident of both coastal and freshwater habitats throughout the County.

- Snowy Egret *(Egretta thula)* is a resident of both coastal and freshwater habitats throughout the County.

- Great Egret *(Ardea alba)* is a resident of both coastal and freshwater habitats throughout the County.

Although not documented by FNAI, FWC and other state agencies have documented observations of the following species in Nassau County:

- Southern bald eagle *(Haliaeetus leucocephalus)* is no longer protected under the Endangered Species Act, although the level of protection has not changed. The bald eagle will continue to be federally protected under the Bald and Golden Eagle Protection Act and the Migratory Bird Treaty Act. In Florida, the bald eagle is no longer a listed species, though it continues to be protected under the state's newly enacted bald eagle rule, 68A-16.002, F.A.C.

- Osprey *(Pandion haliaetus)* is found in many habitats, particularly those including open fresh and/or salt water resources. Although not listed in Nassau County, permits are required throughout the state to remove a nest.

- Southeastern American kestrel *(Falco sparverius paulus)* found in numerous, open agricultural and woodland habitats. It is currently listed as threatened in the state of Florida.

In addition to these rare species, there are at least 119 bird species documented as occurring during the breeding season (i.e., March-September) in the greater St. Marys River basin. The variety of habitat provided by the St. Marys makes a strong contribution to the continued existence of the majority of these species. Also important game bird species such as northern bobwhite *(Colinus virginianus)*, wild turkey *(Meleagris gallopavo)* and wood duck *(Aix sponsa)* are well represented in Nassau County.

Mammals

- The North Atlantic Right Whale *(Eubalaena glacialis)* is listed as endangered by federal authorities and may be the most unusual, and rarest, species found in Nassau County's coastal waters. Calving occurs in the coastal waters off Georgia and northern Florida from December through March.

- Sherman's fox squirrel (*Sciurus niger shermani)* is a federal Category 2 candidate species for listing. Although it may still be found in the Sandhills, Flatwoods and hammocks of the County in good numbers, this subspecies has suffered from much habitat loss, habitat fragmentation, and its numbers have declined greatly in recent years throughout Florida.

- Southeastern Weasel *(Mustela frenata olivacea)* occurs sparingly in various terrestrial and palustrine habitats including pine flatwoods, floodplain forests and swamps and bottomland forests.

It is also known that at least two rare species occasionally inhabit the riverine and associated floodplain corridor of the St. Marys River: the West Indian manatee *(Trichechus manatus)* and Florida black bear *(Ursus americanus floridanus)*.

Nassau County also supports numerous common species such as white-tailed deer *(Odocoileus virginianus)*, beaver *(Castor canadensis)* and gray fox *(Urocyon cinereoargenteus)*, among many others.

Plants

- Florida toothache grass *(Ctenium floridanum)* is found very rarely in Florida, but with several localities in Nassau County. This species inhabits various kinds of flatwoods communities including Mesic, Scrubby and Wet Flatwoods.

- Purple honeycomb-head *(Balduina atropurpurea)* is also an extremely rare plant species in Florida and Nassau County is, in fact, the only county in Florida where it is found. This species occurs only within intact, little disturbed Seepage Slope and Wet Prairie natural communities in the ecotone between Sandhills, Flatwoods and Baygalls.

- Hartwrightia *(Hartwrightia floridana)* is found in several counties in Central Florida but has several well-documented populations in Seepage Slope and adjacent habitats in Nassau County.

- Yellow sunnybell *(Schoenolirion croceum)* is found in Wet Flatwoods and Seepage Slope habitats and is considered rare in Florida. It is typically found only in the northern portions of the panhandle, but a small population is known in Nassau County.

- Silver buckthorn *(Sideroxylon alachuense)* typically inhabits calcareous hammocks (i.e., where limestone closely underlies the soil) – including areas of Bottomland Forest and Upland Hardwood/Slope Forest – and is known to occur in only a few counties in northeastern Florida.

- Ciliate-leaf tickseed *(Coreopsis integrifolia)* is considered rare in Florida and is known in only a few counties in the state where it may be found in Floodplain Forests along rivers.

- Heartleaf *(Hexastylis arifolia)* is a species found in deep Slope Forest habitats in northern Nassau County. It is also considered rare in Florida.

- Florida merrybells *(Uvularia floridana)* is found in Slope Forest, Bottomland Forest and Floodplain Forest communities in northern Nassau County. It is known in only five counties in Florida, with the remaining four in the panhandle.

- Southern milkweed *(Asclepias viridula)* is known in only 11 Florida counties where it may be found in Mesic/Wet Flatwoods, Wet Prairie and Seepage Slope habitats.

Hydrological Resources

Surface Water Resources

Nassau County's surface water resources are, generally, in good condition. The enforcement of State, Federal, and local regulations, coupled with the public's generally increased awareness of the need to conserve and protect water resources have combined to protect these waters from the types of point and non-point sources of pollution which have degraded surface waters in other parts of the state. The primary threats to Nassau County's surface waters continue to include non-point source pollution generated by urban and agricultural runoff, leachate from septic tanks and package wastewater treatment plants, and erosion from improper land clearing activities.

Florida's water quality standards, the foundation of the state's program of water quality management, designate the "present and future most beneficial uses" of the waters of the state (Sec. 403.061(10), Florida Statutes). Water quality criteria for surface water and ground water, is expressed as numeric or narrative limits for specific parameters, describe the water quality necessary to maintain these uses. Florida's surface water is classified using the following five designated use categories:

- Class I- Potable water supplies
- Class II- Shellfish propagation or harvesting
- Class III- Recreation, propagation, and maintenance of a healthy, well-balanced population of fish and wildlife
- Class IV- Agricultural water supplies
- Class V- Navigation, utility, and industrial use (there are no state waters currently in this class)

All waters in the Nassau- St. Marys Basin are Class III, except for the Class II waters listed below in Table CS-1 and shown on Map CS-4. Shellfishing is currently prohibited in all of the Class II waters in the basin.

Table CS- 1 Class II Waters in Nassau County

Name	Description
Alligator Creek	Alligator Creek (in its entirety)
Nassau River /Creek	From the mouth of Nassau Sound (a line connecting the northeasternmost point of Little Talbot Island to the southeasternmost point of Amelia Island) westerly to Seymore Point.
South Amelia River	From Nassau River north to a line from the northern shore of the mouth of Alligator Creek to the northernmost shore of Harrison Creek; and waters between South Amelia River and Alligator Creek.

Source: Rule 62-302, FAC

Outstanding Florida Waters (OFWs) are designated for "special protection due to their natural attributes" (Sec. 403.061, F.S.). These waters are listed in Section 62-302.700, Florida Administrative Code (F.A.C.). The intent of an OFW designation is to maintain ambient water quality, even if these designations are more protective than those required under the water body's surface water classification. Most OFWs are associated with managed areas in the state or federal park system, such as aquatic preserves, national seashores, or wildlife refuges. Other OFWs may also be designated as "Special Waters" based on a finding that the waters are of exceptional recreational or ecological significance, and are identified as such in Rule 62-302, F.A.C. In Nassau County, waters located within the Ft. Clinch State Park Aquatic Preserve and the Nassau-St. Johns River Marshes Aquatic Preserve are designated OFWs. These waters are shown on Map CS-5.

Groundwater Resources

The three principal Florida aquifer systems–surficial, intermediate, and Floridan–are all present beneath the entire Nassau-St. Marys Basin. These aquifer systems are defined and separated based primarily on variations in lithostratigraphy. The primary source of potable water in the basin is the Floridan aquifer, which is deep, confined, and under artesian pressure throughout the area. The intermediate system is mainly a confining unit that occurs in the Hawthorn Group, which in this area includes extensive clay layers. The surficial aquifer system is the "water table" aquifer in the basin. It is used as a potable water supply to a limited extent, but the surficial aquifer is significant to this evaluation because it is the ground water source that directly interacts with surface water bodies, providing base flow to streams, estuaries, and lakes in the basin.

The basin is not known for significant amounts of spring discharge because the limestone formations are so deeply buried by confining sediments. However, seepage from the surficial aquifer may constitute a significant percentage of water to the overall stream flow in the basin. In an analysis of base flow conducted in 2005 by the DEP Ground Water Protection Section for a study site on the St. Marys River, the ground water component of flow at U.S. Geological Survey flow measurement stations on the St. Marys River was approximately 50 percent of the total flow. Similar amounts of ground water seepage are expected for other streams in the basin. The only identified spring in the County, in fact, the only one in the entire basin, is Su-No-Wa Spring located near the head of Thomas Creek in the upper end of the coastal drainage area between the St. Marys and St. Johns Rivers in Nassau County.

The western one third of Nassau County, and also a portion of northeastern Nassau County are identified as providing 0-4 inches of water recharge per year to the Floridan aquifer, the source of

the public fresh water supply for most of Florida (see Map CS-6). Protection of at least portions of these areas is therefore important to the future groundwater supplies and water quality of the County.

Conservation, Recreation, and Managed Areas

Nassau County currently has a significant array of state, local and private conservation, recreation and other managed lands that demonstrate the importance of the natural, hydrological and archaeological resources of Nassau County (see Map CS-7). This system of protected and managed areas has contributed to the economy and quality of life of the County, particularly through tourism, as well as continuing forestry operations on public lands that are managed by the Florida Division of Forestry.

State Parks

The 1,362-acre *Ft. Clinch State Park* at the northern tip of Amelia Island is a premier destination for tourists visiting this spectacular and ecological important barrier island. Established in 1935, Ft. Clinch State Park supports large areas of Maritime Hammock, Coastal Strand and large Beach Dunes. It also provides habitat for numerous migratory bird species and is the site of the United States champion myrtle oak.

Along with Ft. Clinch, the 230-acre *Amelia Island State Park* at the extreme southern end of Amelia Island also affords numerous recreational opportunities for the citizens and visitors to Nassau County. Amelia Island State Park encompasses some of the remaining barrier island natural communities that once covered the entire Atlantic Ocean coastal portion of the County, including Beach Dune, Coastal Swale and Maritime Hammock.

Aquatic Preserves

These two parks are both contiguous with established state Aquatic Preserves – the Ft. Clinch State Park Aquatic Preserve and the Nassau River-St. Johns River Marshes Aquatic Preserve (located in both Nassau and Duval counties) that extend into the Atlantic Ocean as well as into surrounding estuarine systems. At 9,000 acres and 85,000 acres, respectively, these two State of Florida Managed Areas provide an enhanced degree of protection to the aquatic and fishery resources along the coastline of Nassau County.

State Forests

Cary State Forest was one of the first State Forests established sometime around 1930. At 11,911 acres, Cary State Forest in southwestern Nassau County (and extending into adjacent Duval County) supports several intact natural communities including Mesic and Wet Flatwoods, Dome Swamps, Baygalls, and Sandhills. It supports numerous game and non-game wildlife species including white-tailed deer, Sherman's fox squirrel and gopher tortoise, as well as at least one rare plant species, the purple balduina. An environmental education pavilion was built there in 1972.

Ralph E. Simmons State Forest in northern Nassau County protects 6.7 miles of direct frontage along the St. Marys River. At 3,638 acres this State Forest protects significant areas of longleaf pine-dominated Sandhill and Mesic Flatwoods, as well as several high quality Seepage Slopes and Slope Forest natural communities. The property also supports two Oxbow Lakes along the river, as well as numerous cypress-dominated Dome Swamps. White-tailed deer and wild turkey are two of the prized game species on the property, while at least two rare plant species are also found (Florida toothache grass and purple balduina). The property was purchased in 1992 with

the assistance of The Nature Conservancy and eventually renamed the Ralph E. Simmons State Forest in 1996.

Four Creeks State Forest is one of Florida's newest State Forests. The 10,221-acre forest is situated in south central Nassau County along the northern bank of the Nassau River at the confluence of several significant creeks systems that feed into the Nassau River.

Wildlife Management Areas

The *Nassau Wildlife Management Area (WMA)* is a cooperative management area, jointly managed by the Florida Fish and Wildlife Conservation Commission (FWC) and the landowner, Rayonier. It consists of approximately 14,000 acres in central Nassau County between CR 108 and SR 200/A1A. The WMA consists primarily of pine plantations. Access to the area is allowed only during hunting seasons and requires a recreational use permit. The area is considered to have good deer and turkey populations. Fishing is permitted during periods when the area is open for hunting or scouting, but camping is prohibited.

National Parks/Preserves

The Timucuan Ecological and Historic Preserve lies adjacent to Nassau County in northeast Duval County (Jacksonville). This 46,019-acre managed area is jointly held by the federal government (National Park Service) in cooperation with the State of Florida who both own lands within its boundaries. The Preserve consists of an array of marsh and forest lands located between the Nassau River and the St. Johns River and includes several historic sites of national significance, including the Ft. Caroline National Memorial and Kingsley Plantation.

Trails & Greenways

There are several established trails and/or greenways that exist in Nassau County including the Cary State Forest Hiking Trails, the Ft. Clinch State Park Trail, the Ralph E. Simmons State Forest Trails and the St. Marys River State Canoe Trail.

The 316-acre *Egans Creek Greenway* is located on Amelia Island and is owned by the City of Fernandina Beach. The greenway consists of a series of tidal impoundments that provide habitat for a variety of migratory and wading birds (e.g., wood stork, roseate spoonbill, and snowy egret), while the uplands, consisting of Upland Hardwood Forest and Maritime Hammock, provide habitat for the gopher tortoise.

Other Resources

The St. Johns River Water Management District owns and manages the 395-acre Geiger Tract near Four Creeks State Forest.

The Nature Conservancy (TNC) holds three perpetual conservation easements over portions of the privately-owned St. Marys River Ranch. Located just west of the Ralph E. Simmons State Forest in northwestern Nassau County, the St. Marys River Ranch represents a highly significant conservation land. Together, the conservation easements protect nearly 1,200 acres of varied and high quality habitats, as well as over five miles of direct frontage along the St. Marys River.

Florida Forever Projects

Florida Forever is Florida's premier conservation and recreation lands acquisition program, a blueprint for conserving natural resources and renewing Florida's commitment to conserve the state's natural and cultural heritage. Florida Forever replaces Preservation 2000 (P2000), which was the largest public land acquisition program of its kind in the United States.

Between its inception in July 2001 to the present, the Florida Forever program has acquired more than 638,600 acres of land with $2.62 billion. Florida Forever funding is allocated by the legislature at $300 million per year. It is distributed by the Florida Department of Environmental Protection to a number of state agencies and programs to purchase public lands in the form of parks, trails, forests, wildlife management areas and more. All of these lands are held in trust for the citizens of Florida.

There are two Florida Forever projects in Nassau County. Acquisition is dependent upon willing seller agreements and financing. They are:

Baldwin Bay/St. Marys River

The 9,500-acre Baldwin Bay/St. Marys River project that is a proposed FDEP acquisition located in extreme southwestern Nassau County (see Map CS-8). It forms part of the Northeast Florida Timberlands Watershed Reserve (NFTWR) a corridor that, if fully acquired, would consist of 146,164 acres spanning Nassau, Duval and Clay Counties and generally running southwest from the Nassau River Aquatic Preserve to Etoniah State Forest in Clay County. The Baldwin Bay project encompasses some very significant natural resources, including Brandy Branch, an old-growth Bottomland Forest and some intact Mesic Flatwoods managed for long-rotation (i.e., saw log) timber.

An important remnant of the once dominant natural community within interior Nassau County lies within the Baldwin Bay/St. Marys River proposal. Approximately 4,500 acres of intact Mesic-Wet Flatwoods comprise the northwesterly portion of this active Florida Forever project. This tract has been identified by the FNAI as one of the largest remaining contiguous parcels of intact pine flatwoods communities still under private ownership. This tract consists almost entirely of uneven-aged, naturally-regenerated stands of mixed slash and longleaf pine with ages appearing to exceed 50 years. The understory contains good to excellent quality native groundcover components.

Tiger Island/Little Tiger Island

The Tiger Island/Little Tiger Island project represents a significant resource that should also become a Nassau County conservation priority. At 1,260 acres, this project will close a protection gap in a network of National and State Parks/Preserves stretching from St. Andrews Sound in Georgia to the St. Johns River in Florida (see Map CS-9). Approximately 75 percent of the project is Estuarine Tidal Marsh along the St. Marys River, Amelia River, and a series of smaller connecting rivers and creeks. The remainder is comprised of Maritime Hammock on the elevated islands in the Tidal Marsh ecosystem. The U.S. Fish and Wildlife Service have proposed the Cumberland Sound side of Tiger and Little Tiger Islands as critical habitat for the wintering populations of the piping plover. Other rare, threatened or endangered species found there include Roseate spoonbill, Great egret, Piping plover, White ibis, Southern lip fern, Atlantic Coast Florida lantana and terrestrial peperomia.

White Oak Plantation

White Oak Plantation is a 7,400-acre private tract of land that straddles the St. Marys River in central Nassau and Camden (Georgia) Counties. It combines an international wildlife conservation breeding and rehabilitation center with a conference center that employs almost 200 Nassau County residents for its operations. White Oak has been a committed supporter of preservation efforts on the St. Marys River, which runs directly through the property.

White Oak Conservation Center is one of the world's premiere wildlife breeding, research, and training facilities. Established in 1982 by philanthropist Howard Gilman, the center spans 600 acres within White Oak Plantation provides conservation options for the future by maintaining genetically diverse populations of threatened species in spacious, natural facilities. With a complex of research, husbandry, education and conference facilities, the Center leads professional efforts to improve veterinary care, develop holistic animal management techniques, and better understand the biology of critically endangered species.

In Nassau County, development within White Oak Plantation is controlled in the County's Comprehensive Plan through the White Oak Plantation Limited Development Overlay as detailed in the Future Land Use Element.

Mitigation Banking

Mitigation is process by which developers offset the impacts to natural systems that occurs during the building process. A mitigation bank is an attempt to consolidate the offsets into one ecosystem size project that will be more likely to replicate - at scale- the ecological services of the impacted property. If done well, these mitigation banks can become part of a larger system and provide environmental benefits to the area.

A mitigation bank is a site where wetlands or other aquatic resources are restored, enhanced, created, or preserved to compensate for impacts to wetlands permitted under Section 404 or similar state or local wetland regulations.

One of the largest banks in Nassau exists in the western part of the County. The Longleaf Mitigation Bank is comprised of three ecologically and hydrologically related tracts totaling 3,021 acres (see Map CS-10). The Northwest tract contains waters and wetlands of Crosby Bay and Mill Creek. The East Site contains headwater wetland systems of Thomas Creek and Mill Creek. The South Site contains waters and wetlands associated with Deep Creek, Brandy Branch and Crosby Bay. Crosby Bay is a large, headwater wetlands system that connects the three bank tracts. The site is dominated by a densely planted slash pine plantation. Wetlands on the site include pine plantation, along with cypress sloughs, hardwood sloughs and creek bottomlands.

Specific objectives of the bank include re-establishing surface water flows and wetland hydroperiods; elimination of pine plantations; regeneration of converted and previously harvested wetlands and uplands to a natural condition; planting and other steps to improve habitat quality; eliminating hunting pressure caused by the issuance of hunting leases; control of nuisance plants and animals; headwater and stream restoration of channelized systems; drainage-structure abandonment; and introduction of prescribed burns within a preserved landscape.

IV. Historical Resources

Historic resources represent the non-renewable remains of previous generations that link past to the present. Historic resources provide a community with a sense of place, character and uniqueness. Preservation of historic resources must be considered in land use, transportation and infrastructure decisions.

Nassau County claims a long and interesting history, with three official historical district listings in the National Register of Historic Places, and over 600 structural and architectural sites listed on the Florida Master Site File (FMSF) of the State Division of Historical Resources.

The Florida Master Site File is the State's clearinghouse for information on archaeological sites, historical structures and field surveys for such sites. It is administered by the Bureau of Archaeological Research, Division of Historical Resources, under the Florida Department of State. The Master Site file depends on the reporting of outside individuals and organizations for its information. Recording is mandated if State funds are used to conduct the historic surveys; otherwise it is voluntary. Listing on the Master Site file, does not require any minimal site age, (although most sites entered are more than 50 years old), nor a preset level of site significance. Historically significant structures listed on the FMSF in the unincorporated area of the County are identified in Table CS-2.

In the City of Fernandina Beach, the National Register has recognized the locally-designated North Historic District and the South Historic District.

The unincorporated community of American Beach on Amelia Island also has National Register recognition. American Beach was developed by A. L. Lewis, founder of the Jacksonville-based Afro-American Life Insurance Company, as an ocean front resort for African Americans on the south end of Amelia Island. American Beach was known as the resort location of choice for African Americans throughout the region during the 1930s, 40s, and 50s. The beach included hotels, restaurants and nightclubs as well as homes and other businesses. A historic buildings survey was completed by the American Beach Homeowner's Association in 1998, with many structures in American Beach being added to the FMSF database at that time.

There are presently no locally-designated historic districts in unincorporated Nassau County.

In addition to historical structures, Nassau County has a large number of recorded archaeological sites. The locations of these sites are available by contacting the Nassau County Growth Management Department or the FMSF, but listings of archaeological are omitted from this Plan to preclude unauthorized scavenging for artifacts.

Table CS-2 Historic Structures in Unincorporated Nassau County (FSMF)

FMSF Site ID	Name	Gen. Location	Year Built
NA00079	Dingler House	Hilliard GV	c1920
NA00141	Norton House	Callahan GV	N/A
NA00142	Deep Creek School	Callahan GV	N/A
NA00143	Wade Hicks House	Callahan GV	N/A
NA00145	Log House # 1	Callahan GV	N/A
NA00146	W M Canupp Log Cabin	Callahan GV	N/A
NA00147	Allen, Wilke House	Callahan GV	N/A
NA00148	Green House	Callahan GV	N/A
NA00149	St. George Crib	Callahan GV	N/A
NA00150	St. George Barn	Callahan GV	N/A
NA00151	St. George House	Callahan GV	N/A
NA00152	Corner Road Barn	Callahan GV	N/A
NA00153	Corner Road Crib	Callahan GV	N/A
NA00154	Shed	Callahan GV	N/A
NA00155	Log Crib	Callahan GV	N/A
NA00156	William Rowe Farm Furnace House	Callahan GV	N/A
NA00157	William Rowe Farm Barn	Callahan GV	N/A
NA00158	William Rowe Farm Crib	Callahan GV	N/A
NA00159	William Rowe Farm Chicken Houses	Callahan GV	N/A
NA00160	James M Henderson House	Hilliard GV	N/A
NA00161	Roy Sikes House	Hilliard GV	N/A
NA00162	Tompkins Road House	Hilliard GV	N/A
NA00163	Reed Barn	Hilliard GV	N/A
NA00164	Conner Cutoff House	Hilliard GV	N/A
NA00165	Hilliard House	Hilliard GV	N/A
NA00166	Hilliard Syrup Shed	Hilliard GV	N/A
NA00167	Noah Carroll Crib	Hilliard GV	N/A
NA00168	Noah Carroll Syrup Shed	Hilliard GV	N/A
NA00169	Noah Carroll House	Hilliard GV	N/A
NA00170	Rogers Crews Chicken House	Hilliard GV	N/A
NA00171	Roger Crews House	Hilliard GV	N/A
NA00172	Carroll-Smith Cabin	Hilliard GV	N/A
NA00173	Daniel Benjamin Sykes House	Hilliard GV	N/A
NA00174	Daniel Benjamin Sykes Kitchen	Hilliard GV	N/A
NA00175	Ralph Hurst Log Barn	Hilliard GV	N/A
NA00176	Ralph Hurst House	Hilliard GV	N/A
NA00177	Hurst House # 2	Hilliard GV	N/A
NA00178	Old Jones House	Callahan GV	N/A
NA00178	Old Jones House	Callahan GV	N/A
NA00179	James Wesley Keen House	Crawford	N/A
NA00179	James Wesley Keen House	Crawford	N/A
NA00180	James Wesley Keen Barn	Crawford	N/A
NA00181	D W Keen House	Crawford	N/A
NA00181	D W Keen House	Crawford	N/A
NA00182	House #4	Callahan GV	N/A
NA00183	Roy Braddock Garage	Callahan GV	N/A
NA00184	Roy Braddock Crib	Callahan GV	N/A
NA00185	Roy Braddock Pole Barn	Callahan GV	N/A
NA00186	Braddock Road House	Callahan GV	N/A
NA00187	Braddock Road House	Callahan GV	N/A
NA00188	Claude Sikes House	Hilliard GV	N/A
NA00189	Musselwhite Turpentine Co. House	Callahan GV	N/A
NA00190	Musslewhite Turpentine Co. Commissary	Callahan GV	N/A
NA00191	Middle Road "I" House	Callahan GV	N/A
NA00192	Haddock Crib	Hilliard GV	N/A
NA00193	Haddock Shed	Hilliard GV	N/A
NA00194	Haddock House	Hilliard GV	N/A
NA00195	Haddock Syrup Shed	Hilliard GV	N/A
NA00196	King's Ferry Shed	Hilliard GV	N/A
NA00197	King's Ferry Garage	Hilliard GV	N/A
NA00198	King's Ferry Barn	Hilliard GV	N/A
NA00199	Kings Ferry House	Kings Ferry	N/A
NA00200	Conners-Haddock House	Kings Ferry	N/A
NA00201	King's Ferry Southern Methodist Church	King's Ferry	N/A
NA00202	Clarence Rerrine House	Kings Ferry	N/A
NA00203	Linton L Owens Slaughter House	Evergreen	N/A
NA00204	John Owens Crib	Evergreen	N/A
NA00205	Linton L Owens Crib	Evergreen	N/A
NA00206	Linton L. Owens Barn 1	Evergreen	N/A
NA00207	Linton L. Owens Barn 2	Evergreen	N/A
NA00208	Linton L. Owens Crib	Evergreen	N/A
NA00209	Thomas Jefferson Wingate House	Evergreen	N/A
NA00210	Yulee Road Crib	Italia GV	N/A
NA00211	Yulee Road Barn	Italia GV	N/A
NA00212	Callahan House 1	Callahan GV	N/A
NA00213	Alonzo Joyce House	Callahan GV	N/A
NA00214	Alonzo Joyce Syrup House	Callahan GV	N/A

FMSF Site ID	Name	Gen. Location	Year Built
NA00816	1735 Julia Street	American Beach	c1964
NA00817	1748 Julia Street	American Beach	c1956
NA00818	5461 Ervin Street	American Beach	c1948
NA00819	1752 Julia Street	American Beach	c1948
NA00820	1757 Julia Street	American Beach	c1959
NA00821	1808 Julia Street	American Beach	c1944
NA00822	5406 Mary Street	American Beach	c1962
NA00823	5466 Leonard Street	American Beach	c1958
NA00824	5479 Leonard Street	American Beach	c1955
NA00825	5491 Leonard Street	American Beach	c1945
NA00826	5495 Leonard Street	American Beach	c1962
NA00827	5454 Lee Street	American Beach	c1960
NA00828	5472 Lee Street	American Beach	c1945
NA00829	5478 Lee Street I	American Beach	c1940
NA00830	5478 Lee Street II	American Beach	c1940
NA00831	5484 Lee Street	American Beach	c1964
NA00832	Simmons Restaurant	American Beach	c1958
NA00833	Hippard House	American Beach	c1938
NA00834	5413 Ervin Street	American Beach	c1961
NA00835	Carolinda	American Beach	c1957
NA00836	5442 Ervin Street	American Beach	c1958
NA00837	Bay Holly Oaks	American Beach	c1954
NA00838	5466 Ervin Street	American Beach	c1950
NA00839	5473 Ervin Street	American Beach	c1955
NA00840	5479 Ervin Street	American Beach	c1942
NA00841	5484 Ervin Street	American Beach	c1944
NA00842	5491 Ervin Street	American Beach	c1959
NA00843	5494 Ervin Street	American Beach	c1961
NA00844	5461 James Street	American Beach	c1930
NA00845	5478 James Street	American Beach	c1961
NA00846	5484 James Street	American Beach	c1959
NA00847	5494 James Street	American Beach	c1959
NA00848	1815 James Street	American Beach	c1960
NA00849	5424 Waldron Street	American Beach	c1955
NA00850	Sans Souci	American Beach	c1950
NA00851	5443 Waldron Street	American Beach	c1956
NA00852	5449 Waldron Street	American Beach	c1941
NA00853	5455 Waldron Street	American Beach	c1963
NA00854	5473 Waldron Street	American Beach	c1946
NA00855	5479 Waldron Street	American Beach	c1948
NA00856	5485 Waldron Street	American Beach	c1936
NA00857	5406 Waldron Street	American Beach	c1965
NA00858	5431 Ocean Boulevard	American Beach	c1935
NA00859	5437 Ocean Boulevard	American Beach	c1953
NA00860	5443 Ocean Boulevard	American Beach	c1952
NA00861	5455 Ocean Boulevard	American Beach	c1940
NA00862	5475 Ocean Boulevard	American Beach	c1945
NA00863	Jeanette's Place I & II	American Beach	c1956
NA00864	5424 Gregg Street	American Beach	c1949
NA00865	5431 Gregg Street	American Beach	c1939
NA00866	5436 Gregg Street	American Beach	c1955
NA00867	5443 Gregg Street	American Beach	c1948
NA00868	Las Angeles	American Beach	c1930
NA00869	5460 Gregg Street	American Beach	c1930
NA00870	A.L. Lewis Residence	American Beach	c1938
NA00871	5472 Gregg Street	American Beach	c1938
NA00872	5475 Gregg Street	American Beach	c1949
NA00873	Reynold's Sandwich Shop	American Beach	c1953
NA00874	5500 Gregg Street	American Beach	c1958
NA00875	Evan's Rendezvous	American Beach	c1951
NA00876	Tino's	American Beach	c1962
NA00877	5528 Gregg Street	American Beach	c1965
NA00878	5572 Gregg Street	American Beach	c1965
NA00879	5576 Gregg Street	American Beach	c1961
NA00880	5584 Gregg Street	American Beach	c1950
NA00881	A.L. Lewis Motel	American Beach	c1950
NA00882	5577 Gregg Street	American Beach	c1959
NA00883	5581 Gregg Street	American Beach	c1959
NA00884	5603 Gregg Street	American Beach	c1965
NA00885	Franklintown United Methodist Church	American Beach	c1949
NA00886	5436 Price Street	American Beach	c1963
NA00922	3679 Ratliff Road	Ratliff	c1946
NA00923	3685+ Ratliff Road	Ratliff	c1958
NA00924	4393 Ratliff Road	Ratliff	c1958
NA00926	1048 E SR 200	Yulee	c1940
NA00927	1056 E SR 200	Yulee	c1940
NA00928	1087 E SR 200	Yulee	c1955

FMSF Site ID	Name	Gen. Location	Year Built
NA00079	Dingler House	Hilliard GV	c1920
NA00215	Alonzo Joyce Barn	Callahan GV	N/A
NA00216	Horseshoe Circle House	Bryceville	N/A
NA00217	Sanderson Bennett Farmstead Kitchen	Bryceville	N/A
NA00218	S Bennett Farmstead Smokehouse	Bryceville	N/A
NA00219	S Bennett Farmstead House	Bryceville	N/A
NA00220	William Pringle Syrup Shed	Bryceville	N/A
NA00221	William Pringle House	Bryceville	N/A
NA00222	William Pringle House	Bryceville	N/A
NA00223	Henry Jasper Stokes Crib	Bryceville	N/A
NA00224	Henry J Stokes Hog Killing Shed	Bryceville	N/A
NA00225	Henry J Stokes Barn	Bryceville	N/A
NA00226	Henry J Stokes House	Bryceville	N/A
NA00724	Russell House	Kings Ferry	c1875
NA00740	Rt 1, Box 124	Boulogne	c1940
NA00741	US1, Box 2058		
NA00760	Pringle, Vanis & Patricia House	Bryceville	c1940
NA00761	Max-Lee Lawn Care House	Verdie	c1949
NA00762	Griffen, Jasper & Shirley House	Dahoma	1903
NA00763	Jasper & Shirley Griffin Store	Dahoma	c1940
NA00764	Brooks, I E & Olivia House	Dahoma	c1936
NA00765	Delores M Newom House	Dahoma	c1935
NA00766	Schilling, John J & Joanne House	Crawford	c1925
NA00767	John D. & Nellie R Holton House	Callahan GV	c1947
NA00768	Joyce Griffis House	Callahan GV	c1848
NA00769	Vacant	Callahan GV	c1940
NA00770	Juanita Johnson House	Callahan GV	c1946
NA00771	Martha Braddock House	Callahan GV	c1914
NA00772	Ricky & M.C. Armstrong	Callahan GV	c1950
NA00773	Corner of US301 & Evelyn Street	Callahan GV	c1930
NA00774	Rolland H. & Delores P. Vanzant House	Callahan GV	c1930
NA00775	Sweat House	Callahan GV	c1940
NA00776	Joseph C. & Marilyn J. Andolina	Callahan GV	c1950
NA00778	Christelle B. Shackelford House	Callahan GV	c1930
NA00779	Rt. 2, Box 1030	Callahan GV	c1940
NA00780	Shave House	Italia	c1920
NA00781	Fingar, Robert House	Yulee	c1942
NA00795	Ervin' Rest	American Beach	c1938
NA00801	Mount Olive Missionary Baptist Church	Nassauville	c1920
NA00802	1508 Lewis Street	American Beach	c1939
NA00803	1519 Lewis Street	American Beach	c1964
NA00804	1731 Lewis Street	American Beach	c1955
NA00805	1720 Lewis Street	American Beach	c1961
NA00806	1723 Lewis Street	American Beach	c1960
NA00807	1735 Lewis Street	American Beach	c1953
NA00808	1736 Lewis Street	American Beach	c1955
NA00809	1752 Lewis Street	American Beach	c1959
NA00810	Duck's Ocean Vu-Inn	American Beach	c1945
NA00811	1823 Lewis Street	American Beach	c1955
NA00812	1830 Lewis Street	American Beach	c1940
NA00813	El Patio	American Beach	c1960
NA00814	1945 Burney Road	American Beach	c1963
NA00815	1714 Julia Street	American Beach	c1955
NA00816	1735 Julia Street	American Beach	c1964
NA00929	1185 E SR 200	Yulee	c1953
NA00930	1224 E SR 200	Yulee	c1900
NA00931	17 Harts Road	Yulee	c1940
NA00932	1278 E SR 200	Yulee	c1900
NA00933	1277 E SR200	Yulee	c1901
NA00934	Yulee Pump Company	Yulee	c1931
NA00935	Yulee Railroad Depot	Yulee	c1901
NA00936	Yulee Florist and Gifts	Yulee	c1950
NA00937	A1A Antiques	Yulee	c1953
NA00938	476 US 17	Yulee	c1948
NA00940	1525 E SR 200	Yulee	c1955
NA00941	1550 E SR 200	Yulee	c1945
NA00942	1762 E SR 200	Yulee	c1941
NA00943	1768 E SR 200	Yulee	c1958
NA00944	1818 E SR 200	Yulee	c1930
NA00945	1850 E SR 200	Yulee	c1956
NA00946	1960 E SR 200	Yulee	c1958
NA00947	2117 E SR 200	Yulee	c1958
NA00948	2129 E SR 200	Yulee	c1956
NA00949	383 Peeples Road	Yulee	c1939
NA00950	2145 E SR 200	Yulee	c1956
NA00951	Hurst Bail Bonds	Yulee	c1955
NA00954	3074 E SR 200	Yulee	c1950
NA00955	70 Blackrock Road	Mt. Zion	c1953
NA00956	2207 3rd Mt. Zion Circle	Mt. Zion	c1950
NA00957	3675 SR 200	Mt. Zion	c1953
NA00958	3670+ SR 200	Mt. Zion	c1938
NA00959	3698 SR 200	Mt. Zion	c1953
NA00960	3730B E SR 200	Mt. Zion	c1958
NA00961	3730A SR 200	Mt. Zion	c1956
NA00962	3721 E SR 200	Mt. Zion	c1955
NA00963	3733 E SR 200	Mt. Zion	c1938
NA00964	O'neal Memorial	O'Neil	c1948
NA00965	3936 E SR 200	O'Neil	c1953
NA00966	4000 E SR 200	O'Neil	c1953
NA00967	4035 E SR 200	O'Neil	c1953
NA00968	4145 E SR 200	O'Neil	c1940
NA00969	4193 E SR 200	O'Neil	c1947
NA00970	Bob's Irrigation and Landscape, Inc.	O'Neil	c1956
NA00971	Bridgeview Nursery & Garden Center	O'Neil	c1955
NA00972	4263 E SR 200	O'Neil	c1957
NA00974	4291-3 E SR 200	O'Neil	c1948
NA00975	4291-2 E SR 200	O'Neil	c1948
NA00976	4291-1 E SR 200	O'Neil	c1946
NA00977	4315 E SR 200	O'Neil	c1956
NA00978	4327 E SR 200	O'Neil	c1956
NA00985	Fernandina & Jacksonville Railroad	Yulee	c1929
NA00990	1352 Petree Road	Callahan GV	c1929
NA00993	1350 Old Bluff Road	Amelia City	1940
NA00993	1350 Old Bluff Road	Amelia City	1940
NA01084	45142 Gressman Dairy Road	Callahan GV	c1948
NA1240	5512 Gregg Street	American Beach	c1961

V. Potential Environmental Hazards

Nonpoint Source (NPS) Pollution

Nonpoint source (NPS) pollution, unlike pollution from industrial and sewage treatment plants, comes from many diffuse sources. NPS pollution occurs when rainfall, snowmelt, or irrigation runs over land or through the ground, picks up pollutants throughout the watershed, and deposits them into rivers, lakes, and coastal waters or introduces them into ground water. Imagine the path taken by a drop of rain from the time it hits the ground to when it reaches a river, ground water, or the ocean. Any pollutant it picks up on its journey can become part of the NPS problem. NPS pollution also includes adverse changes to the vegetation, shape, and flow of streams and other aquatic systems.

NPS pollution is widespread because it can occur any time activities disturb the land or water. Septic systems, urban runoff, construction, recreational boating, agriculture, forestry, grazing, physical changes to stream channels, and habitat degradation are all potential sources of NPS pollution. Careless or uninformed household management also contributes to NPS pollution problems.

As the designation “non-point” implies, it is difficult to isolate the source of these pollutants, other than to identify their proximate causes as stated above. It is even more difficult to develop and successfully implement programs to reduce the amount of such pollutants which enter the surface water system because such programs (for example, the Florida Yards program administered by the County Extension Service) usually rely on public education and voluntary compliance. The challenge facing Nassau County and all of Florida is to continue to provide water for all the various human needs (residential, agricultural, and industrial) without damaging the natural systems which supply the water and make Florida a desirable place in which to live.

Air Quality

Air quality is generally good in Nassau County and well within the standards set by State and Federal regulatory agencies. Florida’s statewide air quality monitoring network is operated by both state and local environmental programs. The air is monitored by the Florida Department of Environmental Protection (DEP) for carbon monoxide, lead, nitrogen dioxide, ozone, particulate matter and sulfur dioxide. The federal EPA and DEP established the ambient air quality standards for these six pollutants. These pollutants are referred to as “criteria air pollutants.” As a result of legislation and various control measures carbon monoxide, lead, nitrogen and sulfur dioxide have come into acceptable levels or better. Although still monitored, these pollutants are not considered a major threat of air pollution.

Not all pollutants are monitored in all areas. The only air quality monitoring station in the County, which is located in Fernandina Beach, has monitored only particle matter (PM10) and sulfur dioxide. Table CS-3 shows the Air Quality Index (AQI) for Nassau County as measured by DEP for 2005-2007. The AQI indicates that air quality in the County generally good year-round.

Table CS-3 Air Quality Index (AQI), Nassau County 2005-2007

AQI Descriptor	No./ Percent of Days					
	2005	%	2006	%	2007	%
Good	355	97.3	362	99.2	365	100.0
Moderate	8	2.2	3	0.8	0	0.0
Unhealthy for Sensitive Groups	1	0.3	0	0.0	0	0.0
Unhealthy	1	0.3	0	0.0	0	0.0
Very Unhealthy	0	0.0	0	0.0	0	0.0

Monitored Pollutants: PM10 and Sulfur Dioxide
Source: DEP, Div. of Air Resource Mgmt.

There are a variety of permitted point sources which are monitored through DEP. These projects include the recently closed West Nassau Landfill near Callahan and two paper mills in Fernandina Beach. DEP does not routinely monitor or inspect those facilities for which it has issued permits, though it does require monitoring reports and will respond to complaints from neighboring property owners, if needed. Nassau County has development siting and design standards within its land development code to control the placement and operation of such facilities which will help avoid land use conflicts between potential point sources of air pollution and neighboring properties, as well as safeguard the health, safety, and welfare of the general public.

Hazardous Waste

Hazardous waste is solid waste, or a combination of solid wastes, which, because of its quantity, concentration, or physical, chemical, or infectious characteristics, may cause, or significantly contribute to, an increase in mortality or an increase in serious irreversible or incapacitating reversible illness or may pose a substantial present or potential hazard to human health or the environment when improperly transported, disposed of, stored, treated or otherwise managed.

Hazardous waste (HW) exhibits one or more characteristics of ignitability, corrosivity, reactivity or toxicity which make it dangerous. Paint products, pool chemicals, household cleaners and pesticides are typical examples. When disposed of in the municipal solid waste stream or otherwise improperly managed, these materials have the potential of contaminating the groundwater, the sole source of the County's potable water supply.

Data and analysis, as well as associated goals, objectives and policies regarding hazardous waste disposal in the County is included in the Solid Waste Disposal sub-element of the Public Facilities Element.

VI. Analysis and Recommendations

The Benefits of "Green" Infrastructure

Growth pressures continue to increase annually. Along with population increases, come increased infrastructure needs, i.e. more roads, schools, sewer and utility lines, and emergency management needs like police and fire stations. Just as growing communities need to upgrade and expand their transportation and utilities infrastructure (or "gray" infrastructure), they also need to upgrade and expand their "green" infrastructure, the network of open space, woodlands, wildlife habitat, parks and other natural areas, which sustain clean air, water, and natural resources and enrich their citizens' quality of life.

The County's natural lands comprise its "green infrastructure," and provide the bulk of its natural support system. Ecosystem services, such as cleaning the air, filtering and cooling water, storing and cycling nutrients, conserving and generating soils, pollinating crops and other plants, regulating climate, sequestering carbon, protecting areas against storm and flood damage, and maintaining aquifers and streams, are all provided by the existing expanses of forests, wetlands, and other natural lands. These ecologically valuable lands also provide marketable goods and services, like forest products, fish and wildlife, and recreation. They serve as vital habitat for native species, provide scenery, and contribute in many ways to the health and quality of life for residents.

Green infrastructure benefits all citizens. For farmers, fishermen, foresters, and those who cater to outdoor recreation, it provides their livelihood. For urban & suburban dwellers, it provides clean drinking water. For those living or farming near shorelines, streams, or steep hillsides, it protects their land from erosion. The green infrastructure provides places for hobbies, recreational activities, and educational opportunities.

Many Florida coastal counties rely heavily on the nature- based tourism that comes with being a 'destination' site, and Nassau County's economy is intrinsically linked to its natural resources. The service industry that caters to nature- based tourism (including fishing, hunting, golf, and bird watching) is the major employer of local residents.

In addition to their ecological and economic contributions, these lands provide a sense of place and a unique identity. Natural landscapes make communities more comfortable and appealing; they link current generations to their heritage and cultural past. For everyone who lives in or visits Nassau County, protecting green infrastructure helps to preserve our quality of life and safeguard it for future generations.

Preserving Nassau County's green infrastructure means preserving waterways, wetlands, woodlands, wildlife habitats, and other natural areas including greenways for recreational purposes, parks, working tree farms, forests, wilderness and other open spaces that support native species. By doing so, the County will be making a direct investment in its resident's current and future quality of life and strengthening its local economy that relies so heavily on tourism and the forest products industry.

In *Green Infrastructure: Linking Landscapes and Communities* (2006) authors Mark Benedict and Edward T. McMahon define green infrastructure as the combining of land use planning and conservation biology, and offer ten main principles that should shape green infrastructure:

1. *Connectivity is crucial to green infrastructure*- Linkage is essential for natural systems to function and for wildlife to thrive. The strategic connection of ecosystem components- parks, preserves, riparian areas, wetlands, and other green spaces- is critical to maintaining the values and services of natural systems such as carrying and filtering storm-water runoff-, and to maintaining the health of wildlife populations. Green

Infrastructure can help establish land acquisition priorities that ensure adequate connectivity among already preserved lands.

2. *Green infrastructure requires regional context and linkage*- Counties can not make land use decisions without giving consideration to their surrounding areas. Green infrastructure dictates that you must consider how the county's natural resources contribute to, interact with, and are influenced by the ecosystems of neighboring areas. Strategically conserving priority conservation areas requires taking an integrated landscape approach that takes regional context into account.

3. *Green infrastructure should be based on sound science and land use planning*- Any green infrastructure project should aim to use scientifically sound information as the basis of its findings or conservation recommendations. The methodology for any green infrastructure project should include accurate land use data, water resource information, and comprehensive recreational, historic and cultural information.

4. *Green infrastructure should be used as a framework for conservation and development* - Green infrastructure planning can help communities prioritize their conservation needs and determine appropriate areas for development and new growth. Implementing this framework will ensure green space systems that can maintain essential ecological functions and provide an entire host of ecosystem services: clean air, clean water, and healthy forests.

5. *Green infrastructure should be planned and preserved prior to development*- It is less expensive to take a proactive approach when preserving natural resources versus restoration of natural resources. In addition, man made or engineered solutions, while better than no solution often falls short of its natural functioning counterparts. Protecting key green infrastructure areas ensures that existing connected forests, water systems, and working lands are preserved up front before they are left for development. Many studies have shown that smart growth (i.e., when planned out proactively to preserve functioning ecosystems) is more economically beneficial to local governments and will enhance a communities quality of life.

6. *Green infrastructure is a critical public investment and should be funded up front like other capital improvements*- Just as gray infrastructure (school, roads, utilities and sewer) are primary budgetary line items, green infrastructure needs should be invested into up front. Governments should plan, design, and invest in our green infrastructure following the same approaches that are used for built infrastructure.

7. *Green infrastructure should provide benefits to nature and people*- Two very important benefits communities gain from implementing green infrastructure preservation efforts are ecosystem services health benefits, and the avoidance of natural hazards such as flooding, erosion, and wild fires. Green infrastructure preservation efforts determine the natural resource areas that should be preserved and directs growth towards appropriate areas which typically do not include floodplains and their associated wetland systems, coastal areas prone to erosion, sea level rise, and hurricanes, or natural fire prone areas. Ecosystem services that come from sustained ecological systems and functions include clean air, clean water, healthy soil and land. People also get the added health benefits through the recreational opportunities provided by preserved green space and trails. Parks and preserves provide people with contact with nature and thus provides certain health benefits associated with physical activity opportunities (i.e., increase fitness and reduce obesity) as well as and enhance well-being.

8. *Green infrastructure should respect the diverse needs and input of its local stakeholders*- Preserving green infrastructure requires establishing good relationships with private

landowners from the very beginning. Public, private and nonprofit concerns must all be addressed to ensure a desirable outcome representative of the different stakeholders. Stakeholders should have green infrastructure explained as initiatives that work to preserve not just important habitat types and species that depend on them, but the community's character as well through the preservation of its working waterfronts and lands such as tree farms and ranches. Willing- seller philosophy should also be explained from the very beginning and throughout the process to avoid any unfounded concerns landowners would have about local preservation efforts.

9. *Green infrastructure should capitalize on various community initiatives*– A preservation plan should compliment growth management objectives, flood mitigation efforts as found in the county's 'Local Mitigation Strategy' reports, and recreational development initiatives.

10. *Green infrastructure efforts require long- term commitment*– Implementing a successful protection plan to preserve the county's green infrastructure will require a long term commitment from the county. The county can ensure this commitment to conservation by making sure the process is bipartisan. In order to outlast administration and political changes the process should include private stakeholders such as, local landowners, business leaders, nonprofit conservation organizations, regional planning members and other knowledgeable parties.

Maintaining the Green Infrastructure

Over the past 20 years, state local and non-profit agencies have invested billions of dollars in the acquisition and protection of some of the state's most sensitive springs, riparian corridors, coastal areas, forests, and other natural habitats. Despite these extensive preservation efforts, fragmentation of habitat and functional ecosystems is, unfortunately, still common across the state. In 2006, the University of Florida's GeoPlan completed a special growth management report with predictive modeling that concluded the state's urban areas will double by the year 2060 unless new changes in growth management policies are enacted. The study recommended balancing maintenance and redevelopment of existing urban areas with new land development and countering urbanized places with protected lands to protect natural functions and create healthy environments for people.

By understanding the "green infrastructure" of Nassau County and the surrounding region, the Comprehensive Plan can provide conservation priorities that provide linkages and greenways that best support the natural environment and improve the quality of life for the community as a whole. With proper foresight and planning by the County, a vision for both conservation and growth in Nassau County can emerge and become a reality, one that could make the County an even more desirable place to work, live and enjoy a more rural lifestyle, but one that has numerous urban amenities and economic opportunities as well.

What could be achieved with these concepts is a network of parks, watershed reserves, wildlife management areas, state forests, greenways and trails that can contribute in myriad ways to environmental resource protection and provide for a sustainable economy. Such a natural resource protection plan can, and should, be constructed so as not to impact negatively upon any individual's private property rights and allow for much future economic growth and development. It should encourage clustered and compact communities that will maintain the open, rural feel, and provide for continued hunting, fishing and outdoor recreation opportunities for the County's citizens.

Conserving Nassau County's vast, inland timberlands in productive, sustainable and economically viable silviculture for generations to come is a key step in maintaining the rural character of the community and the local forest products industry. Where possible, such timberland conservation

may be accomplished through the less-than-fee approach through the establishment (i.e., purchase and donation) of perpetual conservation easements over these forested working landscapes in the central and western portions of the County. These conservation easements would be vital pieces of the regional network of natural areas and could help sustain the forestry industry.

This potential network of parks, wildlife management areas, state forests, watershed reserves and working forestlands should be connected, where at all practical, by a series of greenways and trails. It is recommended that County planning staff, in conjunction with its non-profit partners and major public and private landowners, use extensive public participation efforts around the County to receive local input on where and how a system of greenways and trails can be achieved.

Options for Land Acquisition and Management

Nationwide, a range of public financing options has been utilized to fund parks and open space preservation. These include general obligation bonds, the local sales tax, the property tax, and less frequently used mechanisms such as special assessment districts, real estate transfer tax, impact fees, and income taxes. In Florida, local government funding options for land conservation have primarily taken the form of budget appropriations, general obligation bonds backed by property taxes or the infrastructure sales tax. Many communities also impose impact fees on new development to help fund additional parks infrastructure needs. Currently, in Nassau County, funding for parks, recreation, and protection of environmentally sensitive lands largely comes from general county ad valorem taxes, the one-cent sales tax fund, and impact fees.

As part of the 2008 Land Acquisition Feasibility Study funded by the County, The Nature Conservancy contracted with the Trust for Public Land (TPL) to provide an analysis of Nassau County's financial capacity and to research the most viable local public options for funding parks creation and land conservation in Nassau County and provide analysis of which local options and funding levels are economically prudent and likely to be publicly acceptable. The Trust for Public Land finds that the county has two primary funding alternatives available to provide significant additional public monies for land conservation purposes:

1. Bond issuance, backed by the Ad Valorem Tax;
2. Appropriation of the Ad Valorem Tax (County tax or Municipal Services Tax Unit).

The Board of County Commissioners has the authority to issue general obligation bonds for parks and open space purposes. It may also determine the amount of bonds required for a particular purpose, the rate of interest, and the time when the principal and interest are due. The state statutes do not place specific limits on the amount of debt that can be incurred, but do limit the duration of the bonds to a period not exceeding 40 years. County bonds require a referendum and must be approved by a majority of votes of voters residing in the county.

The County's financial staff and advisors would need to determine the requirements for approval of any proposed increase/override in the general millage based on the recent property tax reforms. Such a change could require either a supermajority vote of the Board of County Commissions and/or a public referendum. Alternatively, Nassau County could impose a voted millage not to exceed a period of two years. A voted levy must be approved by majority vote of the qualified electors in the county or district voting in an election called for such purpose. Such an election may be called by the governing body of any such county or district on its own motion or by a citizen petition. The petition must specify the amount of millage sought to be levied and the purpose for which the proceeds will be expended and contain the signatures of at least 10 percent of the persons qualified to vote in such election, signed within 60 days prior to the date the petition is filed.

County governments also have the authority to establish municipal service taxing units (MSTU) for any or all of the unincorporated area of the county in order to provide essential facilities and municipal services. Within the limits fixed for the taxing unit, the county may levy additional ad valorem taxes of up to 10 mills. MSTUs are subject to recent Florida property tax reforms. If an MSTU is considered a potential option for funding land conservation, the county attorney should be consulted for guidance as to whether the creation of a new MSTU would require a public vote.

The County should seriously consider these options in order to fund a targeted land acquisition program for conservation and recreation land to implement the "green infrastructure" concepts described above. However, while some areas may be protected for future generations through fee simple purchase and ownership, the County will have limited funds and resources available to buy, develop, and manage vast areas of land for conservation and/or recreational uses. A more practical approach is for the County to explore conserving land through various less-than fee techniques, such as the establishment of conservation easements, through the land development process; and to seek close partnerships with private or non-profit conservation groups, funding agencies, and land owners. It should be a guiding principle of Nassau County that any land conservation endeavors are based strictly upon a willing seller approach.

Green Development Standards

In order for new development to be environmentally sustainable, developers and planners are increasingly looking to implement "green development" standards which address environmental and resource conservation concerns in innovative ways. There are many benefits of building green including lower operating costs for residents, increased comfort, higher perceived value, reduced sprawl, and protection of the natural environment.

The elements of green development fall into three basic categories: environmental responsiveness, resource efficiency, and community and cultural sensitivity. Green development projects consider siting and land-use issues; conserve energy, water, and other precious resources; provide a healthy and comfortable indoor space through the use of reused and recycled products, as well as energy- and resource-efficient products; blend in with the natural environment and protect open space; increase a sense of community; and address cultural issues.

In the past developers have often equated green development with reduced profits and delayed schedules. The reality, however, is that well-executed green development projects often perform extremely well financially and often command a premium price in the marketplace. Some of the general benefits of green development are reduced capital costs, reduced operating costs, health and productivity benefits, higher perceived value and quality.

The United States Green Building Council (USGBC) Leadership in Energy and Environmental Design (LEED) Green Building Rating System is a third party certification program and the nationally accepted benchmark for the design, construction and operation of high performance green buildings. LEED gives building owners and operators the tools they need to have an immediate and measurable impact on their buildings' performance. LEED promotes a whole-building approach to sustainability by recognizing performance in five key areas of human and environmental health: sustainable site development, water savings, energy efficiency, materials selection and indoor environmental quality. In 2008, Ch. 252, Florida Statutes was amended to require that buildings constructed and financed by the state be designed to meet the LEED rating system or another nationally recognized green building rating system. It is strongly recommended that the County follow this example a require green building standards for all future public buildings.

Watershed Management

Coordinated local, state, and regional efforts in the Nassau-St. Marys Basin are responsible for much of the progress that has been made in implementing watershed and water quality improvements in the area. Many plans share common goals, and their implementation is based on a combination of groups playing critical roles in planning, funding, managing, and executing projects. Local organizations and initiatives provide leadership in water body restoration and preservation efforts. The County continues to coordinate its efforts with local, regional, and other state agencies to obtain data, strengthen monitoring activities, and exchange information through periodic meetings.

The St. Marys River Management Committee (SMRMC) was formed in 1991 as an intergovernmental entity of elected and appointed members from four counties along the St. Marys River (Charlton, Camden, Nassau, and Baker). Initially formed while the NPS was studying the river for inclusion in the federal Wild and Scenic Rivers Program(it was not included), the SMRMC has evolved into a group whose primary focus is to maintain local management and control of the St. Marys River and develop and maintain a management plan to guide the river's future. The management plan was completed in 2002. The committee's goal is to promote and protect the long-term viability of both the environmental and economic resources of the St. Marys River in a way that retains local control, protects property rights, and fosters cooperation among individuals, governments, and agencies at all levels. The SMRMC has been actively working on a septic tank setback ordinance that would be a standard requirement for all counties located along the St. Marys River. The County should continue to cooperate and coordinate with the other local governments of the SMRMC to protect the St. Marys River and the important lands surrounding it.

Agricultural Best Management Practices

The Florida Legislature authorizes the Florida Department of Agriculture and Consumer Services (DACS) to develop agricultural best management practices (BMPs). While BMPs are often adopted by rule, they are voluntary if not covered by regulatory programs.

Over the last several years, DACS has worked with agriculturists, soil and water conservation entities, the University of Florida's Institute of Food and Agricultural Sciences, and other major interests to improve product marketability and operational efficiency by implementing agricultural BMPs, while at the same time promoting water quality and water conservation objectives. In addition, programs have been established and are being developed to create a network of state, local, federal, and private sources of funds for developing and implementing BMPs. The County should continue to promote the use of agricultural BMP throughout the County in order to better protect and manage its natural hydrological resources.