



St. Joseph Bay Aquatic Preserve

Management Plan



Florida Department of Environmental Protection
Office of Resilience and Coastal Protection
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A variety of habitats occur along the coast of St. Joseph Peninsula.

Mission Statement

The Office of Resilience and Coastal Protection's mission statement is: Conserving, protecting, restoring, and improving the resilience of Florida's coastal, aquatic, and ocean resources for the benefit of people and the environment.

The four long-term goals of the Office of Resilience and Coastal Protection's Aquatic Preserve Program are to:

1. Protect and enhance the ecological integrity of the aquatic preserves.
2. Restore areas to their natural condition.
3. Encourage sustainable use and foster active stewardship by engaging local communities in the protection of aquatic preserves.
4. Improve management effectiveness through a process based on sound science, consistent evaluation, and continual reassessment.

Acquisition and Restoration Council Management Plan Compliance Checklist

Land management Plan Compliance Checklist: Required for State-owned conservation lands over 160 acres

Section A: Acquisition Information Items

Item #	Requirement	Statute/Rule	Page Numbers and/or Appendix
1	The common name of the property.	18-2.018 & 18-2.021	Ex. Summ.
2	The land acquisition program, if any, under which the property was acquired.	18-2.018 & 18-2.021	p. 1
3	Degree of title interest held by the Board, including reservations and encumbrances such as leases.	18-2.021	p. 1, 6-11
4	The legal description and acreage of the property.	18-2.018 & 18-2.021	Ex. Summ., App. A.2
5	A map showing the approximate location and boundaries of the property, and the location of any structures or improvements to the property.	18-2.018 & 18-2.021	p. 17
6	An assessment as to whether the property, or any portion, should be declared surplus. <i>Provide Information regarding assessment and analysis in the plan, and provide corresponding map.</i>	18-2.021	n/a
7	Identification of other parcels of land within or immediately adjacent to the property that should be purchased because they are essential to management of the property. <i>Please clearly indicate parcels on a map.</i>	18-2.021	n/a
8	Identification of adjacent land uses that conflict with the planned use of the property, if any.	18-2.021	p. 43-45
9	A statement of the purpose for which the lands were acquired, the projected use or uses as defined in 253.034 and the statutory authority for such use or uses.	259.032(10)	p. 6
10	Proximity of property to other significant State, local or federal land or water resources.	18-2.021	p. 25-27, 39-43

Section B: Use Items

Item #	Requirement	Statute/Rule	Page Numbers and/or Appendix
11	The designated single use or multiple use management for the property, including use by other managing entities.	18-2.018 & 18-2.021	p. 16
12	A description of past and existing uses, including any unauthorized uses of the property.	18-2.018 & 18-2.021	p. 12-15, 36, 82-89
13	A description of alternative or multiple uses of the property considered by the lessee and a statement detailing why such uses were not adopted.	18-2.018	n/a
14	A description of the management responsibilities of each entity involved in the property's management and how such responsibilities will be coordinated.	18-2.018	p. 6-11, 64-89
15	Include a provision that requires that the managing agency consult with the Division of Historical Resources, Department of State before taking actions that may adversely affect archeological or historical resources.	18-2.021	p. 72, 73, App. E.2

Item #	Requirement	Statute/Rule	Page Numbers and/or Appendix
16	Analysis/description of other managing agencies and private land managers, if any, which could facilitate the restoration or management of the land.	18-2.021	p. 39-43
17	A determination of the public uses and public access that would be consistent with the purposes for which the lands were acquired.	259.032(10)	p. 82-89
18	A finding regarding whether each planned use complies with the 1981 State Lands Management Plan, particularly whether such uses represent "balanced public utilization," specific agency statutory authority and any other legislative or executive directives that constrain the use of such property.	18-2.021	p. 6-11
19	Letter of compliance from the local government stating that the LMP is in compliance with the Local Government Comprehensive Plan.	BOT requirement	App. E.3
20	An assessment of the impact of planned uses on the renewable and non-renewable resources of the property, including soil and water resources, and a detailed description of the specific actions that will be taken to protect, enhance and conserve these resources and to compensate/mitigate damage caused by such uses, including a description of how the manager plans to control and prevent soil erosion and soil or water contamination.	18-2.018 & 18-2.021	p. 18-27, 64-89
21	*For managed areas larger than 1,000 acres, an analysis of the multiple-use potential of the property which shall include the potential of the property to generate revenues to enhance the management of the property provided that no lease, easement, or license for such revenue-generating use shall be entered into if the granting of such lease, easement or license would adversely affect the tax exemption of the interest on any revenue bonds issued to fund the acquisition of the affected lands from gross income for federal income tax purposes, pursuant to Internal Revenue Service regulations.	18-2.021 & 253.036	n/a
22	If the lead managing agency determines that timber resource management is not in conflict with the primary management objectives of the managed area, a component or section, prepared by a qualified professional forester, that assesses the feasibility of managing timber resources pursuant to section 253.036, F.S.	18-021	n/a
23	A statement regarding incompatible use in reference to Ch. 253.034(10).	253.034(10)	p. 82-89

*The following taken from 253.034(10) is not a land management plan requirement; however, it should be considered when developing a land management plan: The following additional uses of conservation lands acquired pursuant to the Florida Forever program and other state-funded conservation land purchase programs shall be authorized, upon a finding by the Board of Trustees, if they meet the criteria specified in paragraphs (a)-(e): water resource development projects, water supply development projects, storm-water management projects, linear facilities and sustainable agriculture and forestry. Such additional uses are authorized where: (a) Not inconsistent with the management plan for such lands; (b) Compatible with the natural ecosystem and resource values of such lands; (c) The proposed use is appropriately located on such lands and where due consideration is given to the use of other available lands; (d) The using entity reasonably compensates the titleholder for such use based upon an appropriate measure of value; and (e) The use is consistent with the public interest.

Section C: Public Involvement Items

Item #	Requirement	Statute/Rule	Page Numbers and/or Appendix
24	A statement concerning the extent of public involvement and local government participation in the development of the plan, if any.	18-2.021	App. C
25	The management prospectus required pursuant to paragraph (9)(d) shall be available to the public for a period of 30 days prior to the public hearing.	259.032(10)	App. C.2
26	LMPs and LMP updates for parcels over 160 acres shall be developed with input from an advisory group who must conduct at least one public hearing within the county in which the parcel or project is located. <i>Include the advisory group members and their affiliations, as well as the date and location of the advisory group meeting.</i>	259.032(10)	App. C.1
27	Summary of comments and concerns expressed by the advisory group for parcels over 160 acres	18-2.021	App C.1.3
28	During plan development, at least one public hearing shall be held in each affected county. Notice of such public hearing shall be posted on the parcel or project designated for management, advertised in a paper of general circulation, and announced at a scheduled meeting of the local governing body before the actual public hearing. <i>Include a copy of each County's advertisements and announcements (meeting minutes will suffice to indicate an announcement) in the management plan.</i>	253.034(5) & 259.032(10)	App. C.2
29	The manager shall consider the findings and recommendations of the land management review team in finalizing the required 10-year update of its management plan. <i>Include manager's replies to the team's findings and recommendations.</i>	259.036	n/a
30	Summary of comments and concerns expressed by the management review team, if required by Section 259.036, F.S.	18-2.021	n/a
31	If manager is not in agreement with the management review team's findings and recommendations in finalizing the required 10-year update of its management plan, the managing agency should explain why they disagree with the findings or recommendations.	259.036	n/a

Section D: Natural Resources

Item #	Requirement	Statute/Rule	Page Numbers and/or Appendix
32	Location and description of known and reasonably identifiable renewable and non-renewable resources of the property regarding soil types. <i>Use brief descriptions and include USDA maps when available.</i>	18-2.021	p. 23-25
33	Insert FNAI based natural community maps when available.	ARC consensus	p. 30
34	Location and description of known and reasonably identifiable renewable and non-renewable resources of the property regarding outstanding native landscapes containing relatively unaltered flora, fauna and geological conditions.	18-2.021	Ex. Summ.
35	Location and description of known and reasonably identifiable renewable and non-renewable resources of the property regarding unique natural features and/or resources including but not limited to virgin timber stands, scenic vistas, natural rivers and streams, coral reefs, natural springs, caverns and large sinkholes.	18-2.018 & 18-2.021	p. 28-34, 37-39
36	Location and description of known and reasonably identifiable renewable and non-renewable resources of the property regarding beaches and dunes.	18-2.021	p. 18-23
37	Location and description of known and reasonably identifiable renewable and non-renewable resources of the property regarding mineral resources, such as oil, gas and phosphate, etc.	18-2.018 & 18-2.021	p. 23
38	Location and description of known and reasonably identifiable renewable and non-renewable resources of the property regarding fish and wildlife, both game and non-game, and their habitat.	18-2.018 & 18-2.021	p. 28-35, App. B.3.1
39	Location and description of known and reasonably identifiable renewable and non-renewable resources of the property regarding State and Federally listed endangered or threatened species and their habitat.	18-2.021	p. 28-35, App. B.3.2
40	The identification or resources on the property that are listed in the Natural Areas Inventory. <i>Include letter from FNAI or consultant where appropriate.</i>	18-2.021	p. 28-34
41	Specific description of how the managing agency plans to identify, locate, protect and preserve or otherwise use fragile, nonrenewable natural and cultural resources.	259.032(10)	p. 28-36, 71-78, App. E.2
42	Habitat Restoration and Improvement	259.032(10) & 253.034(5)	
42-A.	Describe management needs, problems and a desired outcome and the key management activities necessary to achieve the enhancement, protection and preservation of restored habitats and enhance the natural, historical and archeological resources and their values for which the lands were acquired.	259.032(10) & 253.034(5)	p. 28-36, 71-78
42-B.	Provide a detailed description of both short (2-year planning period) and long-term (10-year planning period) management goals, and a priority schedule based on the purposes for which the lands were acquired and include a timeline for completion.	259.032(10) & 253.034(5)	App. D.1
42-C.	The associated measurable objectives to achieve the goals.	259.032(10) & 253.034(5)	p. 76-78, App. D.1
42-D.	The related activities that are to be performed to meet the land management objectives and their associated measures. <i>Include fire management plans - they can be in plan body or an appendix.</i>	259.032(10) & 253.034(5)	p. 76-78, App. D.1

Item #	Requirement	Statute/Rule	Page Numbers and/or Appendix
42-E.	A detailed expense and manpower budget in order to provide a management tool that facilitates development of performance measures, including recommendations for cost-effective methods of accomplishing those activities.	259.032(10) & 253.034(5)	App. D.1
43	***Quantitative data description of the land regarding an inventory of forest and other natural resources and associated acreage. <i>See footnote.</i>	253.034(5)	Ex. Summ.
44	Sustainable Forest Management, including implementation of prescribed fire management	18-2.021, 253.034(5) & 259.032(10)	
44-A.	Management needs, problems and a desired outcome (see requirement for # 42-A).	18-2.021, 253.034(5) & 259.032(10)	n/a
44-B.	Detailed description of both short and long-term management goals (see requirement for # 42-B).	18-2.021, 253.034(5) & 259.032(10)	n/a
44-C.	Measurable objectives (see requirement for #42-C).	18-2.021, 253.034(5) & 259.032(10)	n/a
44-D.	Related activities (see requirement for #42-D).	18-2.021, 253.034(5) & 259.032(10)	n/a
44-E.	Budgets (see requirement for #42-E).	18-2.021, 253.034(5) & 259.032(10)	n/a
45	Imperiled species, habitat maintenance, enhancement, restoration or population restoration	259.032(10) & 253.034(5)	
45-A.	Management needs, problems and a desired outcome (see requirement for # 42-A).	259.032(10) & 253.034(5)	p. 34-35, 67-78, 81-89
45-B.	Detailed description of both short and long-term management goals (see requirement for # 42-B).	259.032(10) & 253.034(5)	p. 75-78, 81-89' App. D.1
45-C.	Measurable objectives (see requirement for #42-C).	259.032(10) & 253.034(5)	p. 75-78, 81-89, App. D.1
45-D.	Related activities (see requirement for #42-D).	259.032(10) & 253.034(5)	p. 75-78, 81-89, App. D.1, App. D.2
45-E.	Budgets (see requirement for #42-E).	259.032(10) & 253.034(5)	App. D.1
46	***Quantitative data description of the land regarding an inventory of exotic and invasive plants and associated acreage. <i>See footnote.</i>	253.034(5)	App. B.3.3
47	Place the Arthropod Control Plan in an appendix. If one does not exist, provide a statement as to what arrangement exists between the local mosquito control district and the management unit.	BOT requirement via lease language	App. B.4
48	Exotic and invasive species maintenance and control	259.032(10) & 253.034(5)	
48-A.	Management needs, problems and a desired outcome (see requirement for # 42-A).	259.032(10) & 253.034(5)	p. 35-36, 75, 82, App. D.1
48-B.	Detailed description of both short and long-term management goals (see requirement for # 42-B).	259.032(10) & 253.034(5)	p. 75, 82, App. D.1
48-C.	Measurable objectives (see requirement for #42-C).	259.032(10) & 253.034(5)	p. 75, 82, App. D.1
48-D.	Related activities (see requirement for #42-D).	259.032(10) & 253.034(5)	p. 75, 82, App. D.1
48-E.	Budgets (see requirement for #42-E).	259.032(10) & 253.034(5)	App. D.1

Section E: Water Resources

Item #	Requirement	Statute/Rule	Page Numbers and/or Appendix
49	A statement as to whether the property is within and/or adjacent to an aquatic preserve or a designated area of critical state concern or an area under study for such designation. <i>If yes, provide a list of the appropriate managing agencies that have been notified of the proposed plan.</i>	18-2.018 & 18-2.021	p. 1-4
50	Location and description of known and reasonably identifiable renewable and non-renewable resources of the property regarding water resources, including water classification for each water body and the identification of any such water body that is designated as an Outstanding Florida Water under Rule 62-302.700, F.A.C.	18-2.021	Ex. Summ., p. 1-4, 27
51	Location and description of known and reasonably identifiable renewable and non-renewable resources of the property regarding swamps, marshes and other wetlands.	18-2.021	p. 29-31
52	***Quantitative description of the land regarding an inventory of hydrological features and associated acreage. <i>See footnote.</i>	253.034(5)	Ex. Summ, p. 32
53	Hydrological Preservation and Restoration	259.032(10) & 253.034(5)	
53-A.	Management needs, problems and a desired outcome (see requirement for # 42-A).	259.032(10) & 253.034(5)	p. 64-89, App. D.1
53-B.	Detailed description of both short and long-term management goals (see requirement for # 42-B).	259.032(10) & 253.034(5)	p. 64-89, App. D.1
53-C.	Measurable objectives (see requirement for #42-C).	259.032(10) & 253.034(5)	p. 64-89, App. D.1
53-D.	Related activities (see requirement for #42-D).	259.032(10) & 253.034(5)	p. 64-89, App. D.1, App D.4
53-E.	Budgets (see requirement for #42-E).	259.032(10) & 253.034(5)	App. D.1

Section F: Historical Archaeological and Cultural Resources

Item #	Requirement	Statute/Rule	Page Numbers and/or Appendix
54	**Location and description of known and reasonably identifiable renewable and non-renewable resources of the property regarding archeological and historical resources. <i>Include maps of all cultural resources except Native American sites, unless such sites are major points of interest that are open to public visitation.</i>	18-2.018, 18-2.021 & per DHR's request	Ex. Summ., p. 36-37, App. B.5
55	***Quantitative data description of the land regarding an inventory of significant land, cultural or historical features and associated acreage.	253.034(5)	Ex. Summ., p. 36-37, App. B.5
56	A description of actions the agency plans to take to locate and identify unknown resources such as surveys of unknown archeological and historical resources.	18-2.021	p. 78, App. D.1, App. E.2
57	Cultural and Historical Resources	259.032(10) & 253.034(5)	
57-A.	Management needs, problems and a desired outcome (see requirement for # 42-A).	259.032(10) & 253.034(5)	p. 78, App. D.1, App. E.2
57-B.	Detailed description of both short and long-term management goals (see requirement for # 42-B).	259.032(10) & 253.034(5)	p. 78, App. D.1, App. E.2

Item #	Requirement	Statute/Rule	Page Numbers and/or Appendix
57-C.	Measurable objectives (see requirement for #42-C).	259.032(10) & 253.034(5)	p. 78, App. D.1, App. E.2
57-D.	Related activities (see requirement for #42-D).	259.032(10) & 253.034(5)	p. 78, App. D.1, App. E.2
57-E.	Budgets (see requirement for #42-E).	259.032(10) & 253.034(5)	App. D.1

****While maps of Native American sites should not be included in the body of the management plan, the DSL urges each managing agency to provide such information to the Division of Historical Resources for inclusion in their proprietary database. This information should be available for access to new managers to assist them in developing, implementing and coordinating their management activities.**

Section G: Facilities (Infrastructure, Access, Recreation)

Item #	Requirement	Statute/Rule	Page Numbers and/or Appendix
58	***Quantitative data description of the land regarding an inventory of infrastructure and associated acreage. <i>See footnote.</i>	253.034(5)	p. 92-93
59	Capital Facilities and Infrastructure	259.032(10) & 253.034(5)	
59-A.	Management needs, problems and a desired outcome (see requirement for # 42-A).	259.032(10) & 253.034(5)	p. 92-93, App. D.1
59-B.	Detailed description of both short and long-term management goals (see requirement for # 42-B).	259.032(10) & 253.034(5)	App. D.1
59-C.	Measurable objectives (see requirement for #42-C).	259.032(10) & 253.034(5)	App. D.1
59-D.	Related activities (see requirement for #42-D).	259.032(10) & 253.034(5)	App. D.1
59-E.	Budgets (see requirement for #42-E).	259.032(10) & 253.034(5)	App. D.1
60	*** Quantitative data description of the land regarding an inventory of recreational facilities and associated acreage.	253.034(5)	p. 39-43, 82-89
61	Public Access and Recreational Opportunities	259.032(10) & 253.034(5)	
61-A.	Management needs, problems and a desired outcome (see requirement for # 42-A).	259.032(10) & 253.034(5)	p. 86-89, App. D.1
61-B.	Detailed description of both short and long-term management goals (see requirement for # 42-B).	259.032(10) & 253.034(5)	p. 86-89, App. D.1
61-C.	Measurable objectives (see requirement for #42-C).	259.032(10) & 253.034(5)	p. 86-89, App. D.1
61-D.	Related activities (see requirement for #42-D).	259.032(10) & 253.034(5)	p. 86-89, App. D.1, App. D.4
61-E.	Budgets (see requirement for #42-E).	259.032(10) & 253.034(5)	App. D.1

Section H: Other/ Managing Agency Tools

Item #	Requirement	Statute/Rule	Page Numbers and/or Appendix
62	Place this LMP Compliance Checklist at the front of the plan.	ARC and managing agency consensus	Front and App. E.1
63	Place the Executive Summary at the front of the LMP. Include a physical description of the land.	ARC and 253.034(5)	Ex. Summ.

Item #	Requirement	Statute/Rule	Page Numbers and/or Appendix
64	If this LMP is a 10-year update, note the accomplishments since the drafting of the last LMP set forth in an organized (categories or bullets) format.	ARC consensus	App. D.3
65	Key management activities necessary to achieve the desired outcomes regarding other appropriate resource management.	259.032(10)	p. 64-89
66	Summary budget for the scheduled land management activities of the LMP including any potential fees anticipated from public or private entities for projects to offset adverse impacts to imperiled species or such habitat, which fees shall be used to restore, manage, enhance, repopulate, or acquire imperiled species habitat for lands that have or are anticipated to have imperiled species or such habitat onsite. The summary budget shall be prepared in such a manner that it facilitates computing an aggregate of land management costs for all state-managed lands using the categories described in s. 259.037(3) which are resource management, administration, support, capital improvements, recreation visitor services, law enforcement activities.	253.034(5)	App. D.1
67	Cost estimate for conducting other management activities which would enhance the natural resource value or public recreation value for which the lands were acquired, include recommendations for cost-effective methods in accomplishing those activities.	259.032(10)	App. D.1
68	A statement of gross income generated, net income and expenses.	18-2.018	n/a

*** = The referenced inventories shall be of such detail that objective measures and benchmarks can be established for each tract of land and monitored during the lifetime of the plan. All quantitative data collected shall be aggregated, standardized, collected, and presented in an electronic format to allow for uniform management reporting and analysis. The information collected by the DEP pursuant to s. 253.0325(2) shall be available to the land manager and his or her assignee.

Executive Summary

Lead Agency: Florida Department of Environmental Protection's (DEP) Office of Resilience and Coastal Protection (ORCP)

Common Name of Property: St. Joseph Bay Aquatic Preserve

Location: Gulf County, Florida

Acreage: 55,675

Management Agency: DEP's ORCP

Designation: Aquatic Preserve

Unique Features: St. Joseph Bay Aquatic Preserve (SJBAP) encompasses more than 55,000 acres of sovereign submerged lands. St. Joseph Bay is one of the only bodies of water in the eastern Gulf of Mexico not significantly influenced by the inflow of freshwater. Because of this, these coastal waters tend to be clearer with sandier sediments than in the north central Gulf of Mexico. These conditions make the bay ideal habitat for the growth of lush seagrass communities. Much of the productivity of the region is attributed to the nearshore salt marsh and seagrass habitats that serve as nursery and foraging grounds for a variety of commercial and recreational fish and invertebrate species, sea turtles, scallops and birds.

Archaeological/Historical Sites: The Division of Historical Resources has identified 27 archaeological sites and historical structures in the immediate vicinity of St. Joseph Bay Aquatic Preserve although there are likely to be additional sites (Appendix B.5). Known sites include the Confederate Salt Works (GU00013), the Black's Island Lighthouse (GU00011), a shipwreck believed to be the remains of a mid-nineteenth century steamer, the S.S. Florida (GU00109), old military sites, and old settlement/camp sites. Two of the more notable sites are the Old Cedar site (GU00085), a largely intact Weeden Island shell midden; and Richardson Hammock (GU00010), a large, well preserved shell midden site representative of the Deptford, Swift Creek, Weeden Island, and Fort Walton cultural periods (300 B.C. to A.D. 1500) (DEP, 2016).

Management Needs

Ecosystem Science

SJBAP has and continues to develop monitoring programs that focus on health of seagrass beds, changes in water quality, and the need to protect critical/sensitive habitats.

Resource Management

Resource management activities have focused on both the impacts of an individual action, as well as the cumulative impacts of all changes and actions on the natural system. SJBAP staff review and comment on proposed environmental regulatory permits, Minimum Flows and Levels, Total Maximum Daily Loads (TMDLs), land acquisition projects, and adjacent state lands management reviews.

Education and Outreach

Education and outreach programs conducted by SJBAP are designed to promote the goal of maintaining aquatic preserves at their current level of environmental quality for future generations. Coordinating and participating in education and outreach events proves difficult at times due to a lack of staff and budget. Common target audiences for education and outreach events include landowners and developers, commercial and recreational resource users, students at all grade levels, organized groups, the public, and government agencies (local, regional, state, and federal).

Public Use

SJBAP encourages sustainable use of natural resources while minimizing user impacts. The major use of SJBAP continues to revolve around recreational activities. The clear and shallow waters of the aquatic preserve offer excellent fishing opportunities due to the lush seagrass habitat that supports a variety of commercial and recreational fish species.

Public Involvement

Public support is vital to the success of conservation programs. The goal is to foster understanding of the problems facing these fragile ecosystems and the steps needed to adequately manage this important habitat. St. Joseph Bay Aquatic Preserve staff will hold an advisory committee meeting and a public meeting at a location near the aquatic preserve to receive input on the draft management plan. An additional public meeting will be held in Tallahassee when the Acquisition and Restoration Council (ARC) reviews the management plan.

Coastal Zone Management Issues

To ensure that water quality does not degrade, it is imperative to preserve the wetlands directly adjacent to the bay. Continued land acquisitions for the purposes of conservation in areas that directly protect the neighboring wetlands from nonpoint sources of pollution will ensure a high level of water quality. As human populations continue to concentrate along the coastline, impacts to seagrass habitats increase through nutrient loading, light reduction, increased boat traffic, and more direct vessel impacts such as propeller scarring. Deterioration in seagrass habitat has been attributed to both natural and human-induced disturbance, but human-induced disturbance is now the most serious cause of seagrass loss worldwide. A combination of storm events and beach erosion has resulted in narrowed beach widths and minimal or non-existent dunes adjacent to the aquatic preserve on St. Joseph Peninsula. These conditions provide inadequate protection to upland property from damage due to storm-induced erosion. Further, the narrowed beaches are often inadequate to support recreational use and constitute stressed habitat for sea turtles, beach mice, shorebirds, and other marine life. Continued erosion on the peninsula has significantly reduced the amount of beach available for public use and recreation, leading to increased user conflicts.

Goals

St. Joseph Bay Aquatic Preserve aims to protect and enhance the ecological integrity of the aquatic preserve, restore areas to their natural condition, encourage sustainable use and foster active stewardship by engaging local communities in the protection of aquatic preserves, and improve management effectiveness based on sound science, consistent evaluation, and continual reassessment. Through these strategies, a cohesive management program that leads to the long-term conservation of the natural system may be attained.

ORCP approval date:

ARC approval date:

Trustees approval date:

Acronym List

Abbreviation	Meaning
ANERR	Apalachicola National Estuarine Research Reserve
ARC	Acquisition and Restoration Council
B&B	Braun & Blanquet
cfs	cubic feet per second
CHCP	Coastal Habitat Conservation Plan
CPAP	Central Panhandle Aquatic Preserves
CZM	Coastal Zone Management
DEAR	DEP's Division of Environmental Assessment and Restoration
DEP	Florida Department of Environmental Protection
EPA	U.S. Environmental Protection Agency
F.A.C.	Florida Administrative Code
F.S.	Florida Statutes
FDACS	Florida Department of Agriculture and Consumer Services
FNAI	Florida Natural Areas Inventory
FPS	Florida Park Service
FTE	Full Time Equivalent
FWC	Florida Fish and Wildlife Conservation Commission
FWRI	Florida Wildlife Research Institute
G	global
GIWW	Gulf Intracoastal Waterway
HAB	harmful algal bloom
ICW	Intracoastal Waterway
NERR	National Estuarine Research Reserve

Abbreviation	Meaning
NOAA	National Oceanic and Atmospheric Administration
NRDA	Natural Resource Damage Assessment
NFWFMD	Northwest Florida Water Management District
OFW	Outstanding Florida Water
OPS	Other Personal Services
ORCP	Office of Resilience and Coastal Protection
S	state
SASJBEP	St. Andrews and St. Joseph Bays Estuary Program
SAV	submerged aquatic vegetation
SEACAR	Statewide Ecosystem Assessment of Coastal and Aquatic Resources
SJBAP	St. Joseph Bay Aquatic Preserve
SJPSP	T. H. Stone Memorial St. Joseph Peninsula State Park
STORET	STorage and RETrieval (database)
SWIM	Surface Water Improvement and Management
SWMP	System-Wide Monitoring Program
TMDLs	Total Maximum Daily Loads
the Trustees	Board of Trustees of the Internal Improvement Trust Fund
USCG	U.S. Coast Guard
USFWS	U.S. Fish and Wildlife Service
WIN	Water Information Network

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St. Joseph Bay shallows provides critical habitat to a variety of sea creatures.

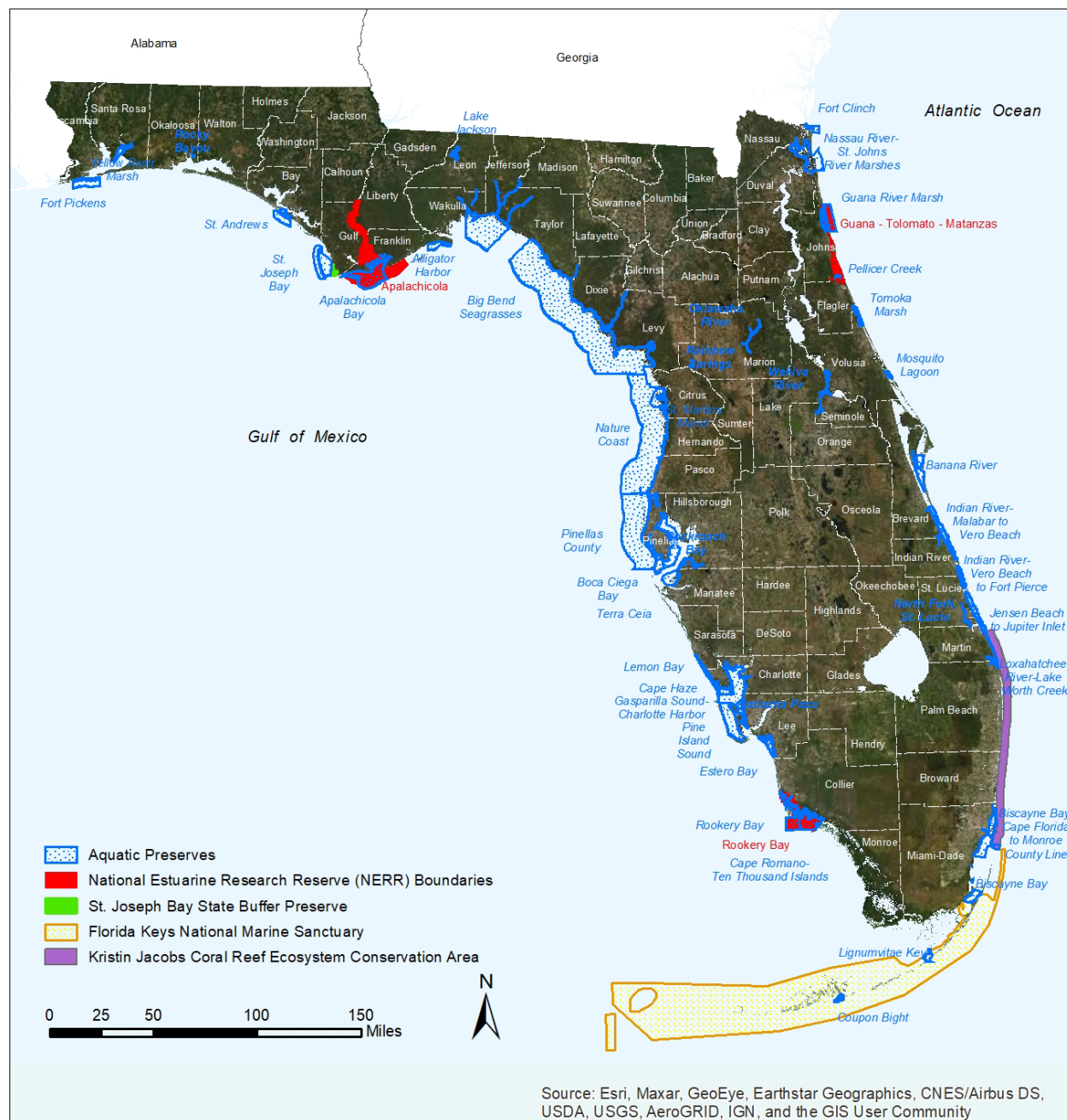
Chapter 1 / Introduction

The Florida aquatic preserves are administered on behalf of the state by the Florida Department of Environmental Protection's (DEP) Office of Resilience and Coastal Protection (ORCP) as part of a network that includes 42 aquatic preserves, three National Estuarine Research Reserves (NERRs), a State Buffer Preserve, a National Marine Sanctuary, and the Kristin Jacobs Coral Reef Ecosystem Conservation Area (Map 1). This network of managed areas provides for a system of significant protections to ensure that our most popular and ecologically important underwater ecosystems are cared for in perpetuity. Each of these special places is managed with strategies based on local resources, issues and conditions.

Our extensive coastline and wealth of aquatic resources have defined Florida as a subtropical oasis, attracting millions of residents and visitors, and the businesses that serve them. Florida's submerged lands play important roles in maintaining good water quality, hosting a diversity of wildlife and habitats (including economically and ecologically valuable nursery areas), and supporting a treasured quality of life for all. In the 1960s, it became apparent that the ecosystems that had attracted so many people to Florida could not support rapid growth without science-based resource protection and management. To this end, state legislators provided extra protection for certain exceptional aquatic areas by designating them as aquatic preserves.

Title to submerged lands not conveyed to private landowners is held by the Board of Trustees of the Internal Improvement Trust Fund (the Trustees). The Governor and Cabinet, sitting as the Trustees, act as guardians for the people of the state of Florida (§253.03, Florida Statutes [F.S.]) and regulate the use of these public lands. Through statute, the Trustees have the authority to adopt rules related to the management of sovereignty submerged lands (Florida Aquatic Preserve Act of 1975, §258.36, F.S.). A higher layer of protection is afforded to aquatic preserves including areas of sovereignty lands that have been "set aside forever as aquatic preserves or sanctuaries for the benefit of future generations" due to "exceptional biological, aesthetic, and scientific value" (Florida Aquatic Preserve Act of 1975, §258.36, F.S.).

The tradition of concern and protection of these exceptional areas continues, and now includes Rookery Bay NERR in southwest Florida, designated in 1978; Apalachicola NERR in northwest Florida, designated in 1979; and Guana Tolomato Matanzas NERR in northeast Florida, designated in 1999. In addition, the Florida Oceans and Coastal Council was created in 2005 to develop Florida's ocean and coastal research priorities, and establish a statewide ocean research plan. The group also coordinates public and private ocean research for more effective coastal management. This dedication to the conservation of coastal and ocean resources is an investment in Florida's future.



Map 1 / Office of Resilience and Coastal Protection system.

1.1 / Management Plan Purpose and Scope

Florida's aquatic resources are at risk for both direct and indirect impacts of increasing development and recreational use, as well as resulting economic pressures, such as energy generation and increased fish and shellfish harvesting. These potential impacts to resources can reduce the health and viability of the ecosystems that contain them, requiring active management to ensure the long-term health of the entire network. Effective management plans for the aquatic preserves are essential to address this goal and each site's own set of unique challenges. The purpose of these plans is to incorporate, evaluate, and prioritize all relevant information about the site into a cohesive management strategy, allowing for appropriate access to the managed areas while protecting the long-term health of the ecosystems and their resources.

The mandate for developing aquatic preserve management plans is outlined in Section 18-20.013 and Subsection 18-18.013(2) of the Florida Administrative Code (F.A.C.). Management plan development and review begins with the collection of resource information from historical data, research and monitoring, and includes input from individual ORCP managers and staff, area stakeholders, and members of the general public. The statistical data, public comment, and cooperating agency information is then used to identify management issues and threats affecting the present and future integrity of the site, its boundaries, and adjacent areas. The information is used in the development and review of the management plan, which is examined for consistency with the statutory authority and intent of the Aquatic Preserve Program. Each management plan is evaluated periodically and revised as necessary to allow for strategic improvements. Intended to be used by site managers and other agencies or private groups involved with maintaining the natural integrity of these resources, the plan includes scientific information about the existing conditions of the site and the management strategies developed to respond to those conditions.

To aid in the analysis and development of the management strategies for the site plans, the ORCP identified four comprehensive management programs applicable to all aquatic preserves. To address the goals, objectives, integrated strategies and performance measures of the four programs, relevant information about the specific site has been collected, analyzed, and compiled to provide a foundation for development of the management plan. While it is expected that unique issues may arise with regard to resource or management needs of a particular site, the following management programs will remain constant across the resource protection network:

- Ecosystem Science
- Resource Management
- Education and Outreach
- Public Use

Each aquatic preserve management plan will identify unique local and regional issues and contain the goals, objectives, integrated strategies, and performance measures to address those issues. The plan will also identify the program and facility needs required to meet the goals, objectives, and strategies of the management plan. These components are key elements for achieving the resource protection mission of each aquatic preserve.

This is an update of the previous management plan for St. Joseph Bay Aquatic Preserve that was approved by the Governor and Cabinet on September 16, 2008.

1.2 / Public Involvement

ORCP recognizes the importance of stakeholder participation and encourages their involvement in the management plan development process. ORCP is also committed to meeting the requirements of Florida's Government-in-the-Sunshine Law (§286.011, F.S.), including:

- meetings of public boards or commissions must be open to the public;
- reasonable notice of such meetings must be given; and
- minutes of the meetings must be recorded.

Several key steps are taken during management plan development. First, staff compose a draft plan after gathering information of current and historic uses; resource, cultural and historic sites; and other valuable information

regarding the property and surrounding area. Staff then organize an advisory committee comprised of key stakeholders and conduct public meetings to engage the stakeholders for feedback on the draft plan and the development of the final draft of the management plan. Additional public meetings are held when the plan is reviewed by the Acquisition and Restoration Council and the Trustees for approval. For additional information about the advisory committee and the public meetings refer to Appendix C - Public Involvement.



Chapter 2 / The Florida Department of Environmental Protection's Office of Resilience and Coastal Protection

2.1 / Introduction

The Florida Department of Environmental Protection (DEP) protects, conserves and manages Florida's natural resources and enforces the state's environmental laws. DEP is the lead agency in state government for environmental management and stewardship and commands one of the broadest charges of all the state agencies, protecting Florida's air, water and land. DEP is divided into three primary areas: Regulatory Programs, Land and Recreation, and Ecosystem Restoration. Florida's environmental priorities include restoring America's Everglades; improving air quality; restoring and protecting the water quality in our springs, lakes, rivers and coastal waters; conserving environmentally-sensitive lands; and providing citizens and visitors with recreational opportunities, now and in the future.

The Office of Resilience and Coastal Protection (ORCP) is the unit within the DEP that manages more than five million acres of submerged lands and select coastal uplands. This includes 42 aquatic preserves, three National Estuarine Research Reserves (NERRs), the St. Joseph Bay State Buffer Preserve, and the Florida Keys National Marine Sanctuary as well as providing management support through the Florida Coastal Management Program, the Outer Continental Shelf Program, the Coral Reef Conservation Program, the Clean Boating Program, the Florida Resilient Coastlines Program, and the Beaches Programs. The three NERRs, the Florida Keys National Marine Sanctuary, and the Coral Reef Conservation Program are managed in cooperation with the National Oceanic and Atmospheric Administration (NOAA).

ORCP manages sites in Florida for the conservation and protection of natural and historical resources and resource-based public use that is compatible with the conservation and protection of these lands. ORCP is a strong supporter of the NERR system and its approach to coastal ecosystem management. Florida has three designated NERR sites, each encompassing at least one aquatic preserve within its boundaries. Rookery Bay NERR includes

Rookery Bay Aquatic Preserve and Cape Romano-Ten Thousand Islands Aquatic Preserve; Apalachicola NERR includes Apalachicola Bay Aquatic Preserve; and Guana Tolomato Matanzas NERR includes Guana River Marsh Aquatic Preserve and Pellicer Creek Aquatic Preserve. These aquatic preserves provide discrete areas designated for additional protection beyond that of the surrounding NERR and may afford a foundation for additional protective zoning in the future. Each of the Florida NERR managers serves as a regional manager overseeing multiple other aquatic preserves in their region. This management structure advances ORCP's ability to manage its sites as part of the larger statewide system.

The Florida Keys National Marine Sanctuary, established in 1990 by Congress, and confirmed by the Board of Trustees of the Internal Improvement Trust Fund, covers 2.3 million acres of state and federal submerged lands. The Florida Keys National Marine Sanctuary contains unique and nationally significant marine resources, including the southern portion of the Florida Reef Tract (the world's third largest barrier coral reef), extensive sea grass beds, mangrove-fringed islands and more than 6,000 species of marine life. ORCP leads state co-management efforts in the Sanctuary in partnership with the Florida Fish and Wildlife Conservation Commission and NOAA.

The Coral Reef Conservation Program coordinates research and monitoring, develops management strategies and promotes partnerships to protect the northern portion of the Florida Reef Tract along the southeast Florida coast, pursuant to the U.S. Coral Reef Task Force's National Action Plan. The Coral Reef Conservation Program also implements Florida's Local Action Strategy, the Southeast Florida Coral Reef Initiative. The program leads response, assessment and restoration efforts and jointly oversees enforcement efforts for non-permitted reef resource injuries (vessel groundings, anchor and cable drags, etc.) in southeast Florida pursuant to the Florida Coral Reef Protection Act (Section 403.93345, Florida Statutes [F.S.]).

The Coral Protection and Restoration Program was created to focus the state's protection of Florida's Coral Reef and the administration of funds appropriated from the Legislature for these critical efforts. The Coral Protection and Restoration Program provides leadership on coral reef-related national and state legislative issues, represents Florida on the U.S. Coral Reef Task Force and U.S. All Islands Coral Reef Committee, and represents DEP on the Stony Coral Tissue Loss Disease leadership team.

The Florida Coastal Management Program is based on a network of agencies implementing 24 statutes that protect and enhance the state's natural, cultural and economic coastal resources. The goal of the program is to coordinate local, state and federal government activities using existing laws to ensure that Florida's coast is as valuable to future generations as it is today. ORCP is responsible for directing the implementation of the statewide coastal management program. The Florida Coastal Management Program provides funding to promote the protection and effective management of Florida's coastal resources at the local level through the Coastal Partnership Initiative grant program.

The Outer Continental Shelf Program is responsible for coordinating the state's review, oversight, monitoring and response efforts related to activities that occur in federal waters on the Outer Continental Shelf to ensure consistency with state laws and policies and that these activities do not adversely affect state resources. Reviews are conducted under federal laws, including the Outer Continental Shelf Lands Act, Coastal Zone Management Act, National Environmental Policy Act, Deepwater Ports Act, Marine Protection, Research and Sanctuaries Act, Rivers and Harbors Act, Clean Air and Water Acts and the regulations that implement them.

The Clean Boating Program includes Clean Marina designations to bring awareness to marine facilities and boaters regarding environmentally friendly practices intended to protect and preserve Florida's natural environment. Marinas, boatyards and marine retailers receive clean designations by demonstrating a commitment to implementing and maintaining a host of best management practices. Via the Clean Boating Program, the Clean Vessel Act provides grants, with funding provided by the U.S. Fish and Wildlife Service, for construction and installation of sewage pumpout facilities and purchase of pumpout boats and educational programs for boaters.

The Florida Resilient Coastlines Program's mission is synergizing community resilience planning and natural resource protection tools and funding to prepare Florida's coastline for the effects of climate change, especially

rising sea levels. This program is working to ensure Florida's coastal communities are resilient and prepared for the effects of rising sea levels, including coastal flooding, erosion, and ecosystem changes. The program is synergizing community resilience planning and natural resource protection tools; providing funding and technical assistance to prepare Florida's coastal communities for sea level rise; and continuing to promote and ensure a coordinated approach to sea level rise planning among state, regional, and local agencies.

A healthy beach and dune system provide protection for upland development and critical infrastructure, preservation of critical wildlife habitat for threatened and endangered species, and a recreational space that drives the state's tourism industry and economy. In order to protect, preserve and manage Florida's valuable sandy beaches and coastal systems, the Legislature adopted the Florida Beach and Shore Preservation Act, Chapter 161, F.S., in 1964. The Act provides for the creation of a statewide, comprehensive beach management program that integrates coastal data acquisition, coastal engineering and geology, biological resource protection and analyses, funding initiatives and regulatory programs designed to protect Florida's coastal system both above and below the mean high-water line. This comprehensive approach allows DEP's Beaches Programs to collaborate with coastal communities to address critical erosion caused by altered and managed inlets, imprudent construction, rising seas and storm impacts. DEP's Beaches Programs consist of the following: Beach Field Services, Coastal Engineering and Geology Group, the Coastal Construction Control Line Program, the Beaches and Inlets Ports Program and the Beaches Funding Group.

2.2 / Management Authority

Established by law, aquatic preserves are exceptional areas of submerged lands and associated waters that are to be maintained in their natural or existing conditions. The intent was to forever set aside submerged lands with exceptional biological, aesthetic, and scientific values as sanctuaries, called aquatic preserves, for the benefit of future generations.

The laws supporting aquatic preserve management are the direct result of the public's awareness of and interest in protecting Florida's aquatic environment. The extensive dredge and fill activities that occurred in the late 1960s spawned this widespread public concern. In 1966, the Board of Trustees of the Internal Improvement Trust Fund (the Trustees) created the first offshore reserve, Estero Bay, in Lee County.

In 1967, the Florida Legislature passed the Randall Act (Chapter 67-393, Laws of Florida), which established procedures regulating previously unrestricted dredge and fill activities on state-owned submerged lands. That same year, the Legislature provided the statutory authority (§253.03, F.S.) for the Trustees to exercise proprietary control over state-owned lands. Also, in 1967, government focus on protecting Florida's productive water bodies from degradation due to development led the Trustees to establish a moratorium on the sale of submerged lands to private interests. An Interagency Advisory Committee was created to develop strategies for the protection and management of state-owned submerged lands.

In 1968, the Florida Constitution was revised to declare in Article II, Section 7, the state's policy of conserving and protecting natural resources and areas of scenic beauty. That constitutional provision also established the authority for the Legislature to enact measures for the abatement of air and water pollution. Later that same year, the Interagency Advisory Committee issued a report recommending the establishment of 26 aquatic preserves.

The Trustees acted on this recommendation in 1969 by establishing 16 aquatic preserves and adopting a resolution for a statewide system of such preserves. In 1975, the state Legislature passed the Florida Aquatic Preserve Act of 1975 (Act) that was enacted as Chapter 75-172, Laws of Florida, and later became Chapter 258, Part II, F.S. This Act codified the already existing aquatic preserves and established standards and criteria for activities within those aquatic preserves. Additional aquatic preserves were individually adopted at subsequent times up through 1989.

In 1980, the Trustees adopted the first aquatic preserve rule, Chapter 18-18, Florida Administrative Code (F.A.C.), for the administration of the Biscayne Bay Aquatic Preserve. All other aquatic preserves are administered under Chapter 18-20, F.A.C., which was originally adopted in 1981. These rules apply standards and criteria for activities

in the aquatic preserves, such as dredging, filling, building docks and other structures that are stricter than those of Chapter 18-21, F.A.C., which apply to all sovereignty lands in the state.

This plan is in compliance with the Conceptual State Lands Management Plan, adopted March 17, 1981 by the Board of Trustees of the Internal Improvement Trust Fund and represents balanced public utilization, specific agency statutory authority, and other legislative or executive constraints. The Conceptual State Lands Management Plan also provides essential guidance concerning the management of sovereignty lands and aquatic preserves and their important resources, including unique natural features, seagrasses, endangered species, and archaeological and historical resources.

Through delegation of authority from the Trustees, the DEP and ORCP have proprietary authority to manage the sovereignty lands, the water column, spoil islands (which are merely deposits of sovereignty lands), and some of the natural islands and select coastal uplands to which the Trustees hold title.

Enforcement of state statutes and rules relating to criminal violations and non-criminal infractions rests with the Florida Fish and Wildlife Conservation Commission law enforcement and local law enforcement agencies. Enforcement of administrative remedies rests with ORCP, the DEP Districts, and Water Management Districts.

2.3 / Statutory Authority

The fundamental laws providing management authority for the aquatic preserves are contained in Chapters 258 and 253, F.S. These statutes establish the proprietary role of the Governor and Cabinet, sitting as the Board of Trustees of the Internal Improvement Trust Fund, as Trustees over all sovereignty lands. In addition, these statutes empower the Trustees to adopt and enforce rules and regulations for managing all sovereignty lands, including aquatic preserves. The Florida Aquatic Preserve Act was enacted by the Florida Legislature in 1975 and is codified in Chapter 258, F.S.

The legislative intent for establishing aquatic preserves is stated in Section 258.36, F.S.: "It is the intent of the Legislature that the state-owned submerged lands in areas which have exceptional biological, aesthetic, and scientific value, as hereinafter described, be set aside forever as aquatic preserves or sanctuaries for the benefit of future generations." This statement, along with the other applicable laws, provides a foundation for the management of aquatic preserves. Management will emphasize the preservation of natural conditions and will include lands that are statutorily authorized for inclusion as part of an aquatic preserve.

Management responsibilities for aquatic preserves may be fulfilled directly by the Trustees or by staff of the DEP through delegation of authority. Other governmental bodies may also participate in the management of aquatic preserves under appropriate instruments of authority issued by the Trustees. ORCP staff serves as the primary managers who implement provisions of the management plans and rules applicable to the aquatic preserves. ORCP does not "regulate" the lands per se; rather, that is done primarily by the DEP Districts (in addition to the Water Management Districts) which grant regulatory permits. The Florida Department of Agriculture and Consumer Services through delegated authority from the Trustees, may issue proprietary authorizations for marine aquaculture within the aquatic preserves and regulates all aquaculture activities as authorized by Chapter 597, Florida Aquaculture Policy Act, F.S. Staff evaluates proposed uses or activities in the aquatic preserve and assesses the possible impacts on the natural resources. Project reviews are primarily evaluated in accordance with the criteria in the Act, Chapter 18-20, F.A.C., and this management plan.

Comments of ORCP staff, along with comments of other agencies and the public are submitted to the appropriate permitting staff for consideration in their issuance of any delegated authorizations in aquatic preserves or in developing recommendations to be presented to the Trustees. This mechanism provides a basis for the Trustees to evaluate public interest and the merits of any project while also considering potential environmental impacts to the aquatic preserves. Any activity located on sovereignty lands requires a letter of consent, a lease, an easement, or other approval from the Trustees.

Florida Statutes that authorize and empower non-ORCP programs within DEP or other agencies may also be important to the management of ORCP sites. For example, Chapter 403, F.S., authorizes DEP to adopt rules concerning the designation of “Outstanding Florida Waters” (OFWs), a program that provides aquatic preserves with additional regulatory protection. Chapter 379, F.S., regulates saltwater fisheries, and provides enforcement authority and powers for law enforcement officers. Additionally, it provides similar powers relating to wildlife conservation and management. The sheer number of statutes that affect aquatic preserve management prevents an exhaustive list of all such laws from being provided here.

2.4 / Administrative Rules

Chapters 18-18, 18-20 and 18-21, F.A.C., are the three administrative rules directly applicable to the uses allowed in aquatic preserves specifically and sovereignty lands generally. These rules are intended to be cumulative, meaning that Chapter 18-21 should be read together with Chapter 18-18 or Chapter 18-20 to determine what activities are permissible within an aquatic preserve. If Chapter 18-18 or Chapter 18-20 are silent on an issue, Chapter 18-21 will control; if a conflict is perceived between the rules, the stricter standards of Chapter 18-18 or Chapter 18-20 supersede those of Chapter 18-21. Because Chapter 18-21 concerns all sovereignty lands, it is logical to discuss its provisions first.

Originally codified in 1982, Chapter 18-21, F.A.C., is meant “to aid in fulfilling the trust and fiduciary responsibilities of the Board of Trustees of the Internal Improvement Trust Fund for the administration, management and disposition of sovereignty lands; to insure maximum benefit and use of sovereignty lands for all the citizens of Florida; to manage, protect and enhance sovereignty lands so that the public may continue to enjoy traditional uses including, but not limited to, navigation, fishing and swimming; to manage and provide maximum protection for all sovereignty lands, especially those important to public drinking water supply, shellfish harvesting, public recreation, and fish and wildlife propagation and management; to insure that all public and private activities on sovereignty lands which generate revenues or exclude traditional public uses provide just compensation for such privileges; and to aid in the implementation of the State Lands Management Plan.”

To that end, Chapter 18-21, F.A.C., contains provisions on general management policies, forms of authorization for activities on sovereignty lands, and fees applicable for those activities. In the context of the rule, the term “activity” includes “construction of docks, piers, boat ramps, boardwalks, mooring pilings, dredging of channels, filling, removal of logs, sand, silt, clay, gravel or shell, and the removal or planting of vegetation” (Rule 18-21.003, F.A.C.). In addition, activities on sovereignty submerged lands must be not contrary to the public interest (Rule 18-21.004, F.A.C.). Chapter 18-21 also sets policies on aquaculture, geophysical testing (using gravity, shock wave and other geological techniques to obtain data on oil, gas or other mineral resources), and special events related to boat shows and boat displays. The rule also addresses spoil islands, preventing their development in most cases.

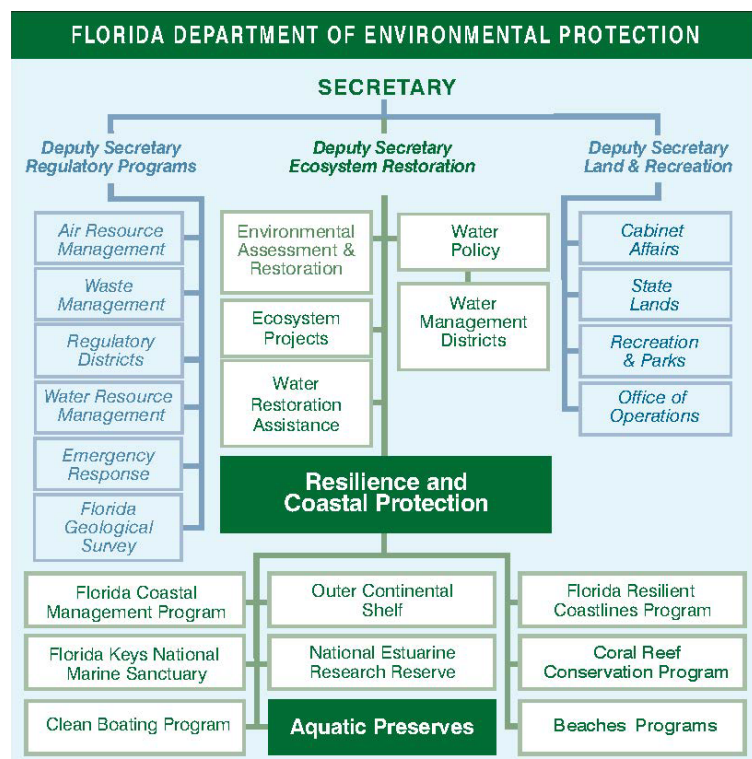
Chapters 18-18 and 18-20, F.A.C., apply standards and criteria for activities in the aquatic preserves that are stricter than those of Chapter 18-21. Chapter 18-18 is specific to the Biscayne Bay Aquatic Preserve and is more extensively described in that site’s management plan. Chapter 18-20 is applicable to all other aquatic preserves. It further restricts the type of activities for which authorizations may be granted for use of sovereignty lands and requires that structures that are authorized be limited to those necessary to conduct water dependent activities. Moreover, for certain activities to be authorized, “it must be demonstrated that no other reasonable alternative exists which would allow the proposed activity to be constructed or undertaken outside the preserve” (Paragraph 18-20.004(1)(g), F.A.C.).

Chapter 18-20, F.A.C., expands on the definition of “public interest” by outlining a balancing test that is to be used to determine whether benefits exceed costs in the evaluation of requests for sale, lease, or transfer of interest of sovereignty lands within an aquatic preserve. The rule also provides for the analysis of the cumulative impacts of a request in the context of prior, existing, and pending uses within the aquatic preserve, including both direct and indirect effects. The rule directs management plans and resource inventories to be developed for every aquatic

preserve. Further, the rule provides provisions specific to certain aquatic preserves and indicates the means by which the Trustees can establish new or expand existing aquatic preserves.

Aquatic preserve management relies on the application of many other DEP and outside agency rules. Perhaps most notably, Chapter 62-302, F.A.C., concerns the classification of surface waters, including criteria for OFW and the designation of the aquatic preserve as an OFW. An OFW designation provides for the state's highest level of protection for water quality. All aquatic preserves contain OFW designations. No activity may be permitted within an OFW that degrades ambient water quality unless the activity is determined to be in the public interest. Once again, the list of other administrative rules that do not directly address ORCP's responsibilities but do affect ORCP-managed areas is so long as to be impractical to create within the context of this management plan.

Figure 1 / State management structure.





The breach caused by Hurricane Michael at Eagle Harbor had naturally filled in by May 2019.

Chapter 3 / St. Joseph Bay Aquatic Preserve

3.1 / Historical Background

Native Americans once inhabited the St. Joseph Peninsula and gathered shellfish for meals from the bay's shallow, clear waters. Prehistoric occupation included the Woodland period, the third major stage of cultural development in eastern North America. This first stage of habitation is marked by population increases along the coast, probably because sea levels stabilized around 400 B.C. (Florida Department of Environmental Protection [DEP], 2014).

The Weeden Island people (A.D. 200 to 1000) utilized shellfish, fish, deer and nuts as primary food resources. The Mississippian culture (A.D. 1000 to 1500) developed along the Apalachicola River around A.D. 1000. Contacts between the Weeden Island culture and the emerging Mississippian groups brought new ideas; however, coastal groups seem to have continued a subsistence strategy. There are no definitive archaeological or historic evidence about Indian groups on the peninsula when Europeans arrived (DEP, 2014). St. Joseph Bay appears to have been reported first by Spaniards from Pensacola in 1699 who reported seeing the prow of a shipwreck. Named San Joseph de Vallardes in honor of Comte de Moctezuma, the bay was occupied by 1701 in order to prevent the French from interrupting the Spanish supply route to Pensacola (DEP, 2014).

Historically called St. Joseph, this small coastal community, which is presently known as Port St. Joe, is rich in both history and resources. St. Joseph was founded in 1835 on the shores of St. Joseph Bay. As no rivers flowed into St. Joseph Bay, two railroads were built connecting St. Joseph with the Apalachicola River to facilitate the delivery of

the cotton and lumber being shipped down the river to the Port of Apalachicola. By 1837, St. Joseph had become the largest town in the Territory of Florida, with approximately 6,000 residents. In 1838, the town hosted the first Constitutional Convention for Florida, which shaped the constitution used when Florida became a state in 1845. In 1839 a lighthouse began operating at the tip of the spit and guided local shipping. St. Joseph became known as the “Constitutional City” and even transferred the name to the new name of Port St. Joe. The town served as a seaport until 1841 when a ship docked with passengers carrying yellow fever. More than 75 percent of the town died of the disease, and the rest of the population fled, abandoning the city only seven years after it was founded. In 1843, a hurricane destroyed the abandoned city. This same storm forced the grounding of the S.S. Florida on the east side of the St. Joseph Peninsula. Only the metal firebox remains in the bay waters (DEP, 2014).

The lighthouse ceased operation in 1847 and was leveled by another hurricane in 1851. In 1857, a brick lighthouse was erected, just prior to the Civil War. The lighthouse returned to operation on July 23, 1865. In 1869, the Lighthouse Board reported that the beach in front of the lighthouse was eroding swiftly and needed protection from the sea's encroachment. By 1875, the waters of the Gulf had moved to within 150 feet of the tower's base. By 1882, it stood in eight feet of water. Over many years, multiple towers have been constructed to replace the storm-damaged lighthouse, and attempts were made to relocate the lighthouse to avoid impacts from shoreline erosion and coastal flooding. On July 15, 2014, the Cape San Blas Lighthouse was relocated to Port St. Joe to preserve the structure. The Cape San Blas Lighthouse at Port St. Joe was opened to visitors on September 12, 2014 (St. Joseph Historical Society, Inc., 2018).

The historical town of St. Joseph remained uninhabited for the rest of the 19th century. In the early 20th century, Port St. Joe was founded about two miles north of the site of old St. Joseph. The only remains of Old St. Joseph are tombstones in the Old St. Joseph Cemetery in present-day Port St. Joe. The cemetery is a historical site and serves as a grim reminder of the yellow fever epidemic and the hurricane that destroyed the town known as St. Joseph.

In the Panhandle, as elsewhere, real estate development was inextricably linked with transportation improvements. The revival of the town along the shores of St. Joseph Bay, where the old town of St. Joseph had briefly flourished, was directly tied to the arrival in 1909 of a new railroad, the Apalachicola Northern Railroad. The railroad went 99 miles from River Junction, just south of present-day Chattahoochee (where it connected with the east-west line to Pensacola) to St. Joseph Bay, by way of Apalachicola. Its cars carried lumber from the Panhandle's longleaf pine forests to markets on the East Coast and abroad. The railroad was essential to both developing and serving deep-water docks that revived the shipping trade at St. Joseph Bay. With the addition of docks, St. Joseph Bay presented a nearly perfect shipping harbor because it was protected by the St. Joseph Peninsula from severe weather in all directions except due north and lacked inflowing rivers that would deposit silt that interfered with navigation. By July 1, 1913, when the settlement was incorporated with the new name of Port St. Joe, local trade products included sawn lumber, tobacco, sugar cane, fish oil, rosin, pitch, and turpentine.

The town had a large sawmill, an ice plant, and an oyster packing house. Sunday was the prime day, when the train would bring hundreds of day-trippers to picnic, swim, fish, crab, scallop and enjoy the shore. Large slides and a merry-go-round set up in the water provided early water-park amusement for children and adults. Like other parts of the rural South, however, the region struggled with the poverty, disease, and limited educational opportunities that went hand-in-hand with geographical isolation and a slow economy (Ziewitz & Wiaz, 2004).

In 1925, Gulf County was created and named for the Gulf of Mexico. Port St. Joe, the largest city in Gulf County, serves as the county seat. In the early 20th century a bathhouse was constructed at Eagle Harbor by T.H. Stone so that tourists from the mainland could change clothes for swimming and sailing. Fish camps arose on the east side of the peninsula and a house for local bar pilots, or maritime pilots, was built near the tip. The peninsula was used by the U.S. Army as a training facility for gunnery and bombing practice during World War II. In 1962 and 1963, the U.S. Army Reserve took over the remaining military lands for training exercises (DEP, 2014). To date, a large camp area and bulldozed roads are still evident within the Wilderness Preserve at the state park. In 1967, as a result of local interest, the site was dedicated as the T. H. Stone Memorial St. Joseph Peninsula State Park (SJPSP). On

October 21, 1969, the Governor and Cabinet adopted a resolution designating 18 water bodies to become aquatic preserves, including St. Joseph Bay.

Over the years, Gulf County has experienced relatively slow growth accompanied by a minimal tourism base, which can be attributed to large land ownership patterns and minimal employment opportunities. In the past, the county's economy was dominated by the paper mill in Port St. Joe until the early 1990s when several mills experienced shutdowns and the Port St. Joe mill was closed in 1998. Soon after, Governor Jeb Bush designated Gulf County as a "rural area of economic concern."

The shift in the county's economy from a paper production related industry to a tourism industry has resulted in a steady increase in the number of tourists. The increase in tourism has brought about a demand for homes. Coastal development within Gulf County is primarily related to the construction of beach vacation homes that are typically used as rental property throughout much of the year. In the mid-1990s, SJPS saw a 50 percent increase in number of annual visitors, and in 2002, the park was named Top American Beach. From 2008-2017, park visitors contributed an estimated \$38.9 million to the state economy. In the 2016-17 fiscal year, approximately 273,000 people visited the state park, generating \$1.75 million in sales tax revenue alone and 420 jobs (DEP, 2017).

Promotional marketing has brought about slogans such as, Florida's Forgotten Coast, Florida's Great Northwest, and Pearl of the Panhandle. Increasing national familiarity has continued to bring visitors to the area, and the population continues to steadily increase. For six decades, the St. Joe Paper Company grew and harvested pines in the Panhandle and turned them into pulp at its mill in Port St. Joe. The company's shift to real estate dates back to the 1980s and began in Walton and Okaloosa counties. Since 1997, the St. Joe Company has placed more than 170,000 acres into permanent conservation (St. Joe Company, n.d.). Many of Northwest Florida's state parks, state forests and wildlife refuges were created in part with St. Joe land. As of 2003, the St. Joe Company owned approximately one million acres of Florida land, with roughly 900,000 acres concentrated in the Panhandle (Ziewitz & Wiaz, 2004). Most of these acres are concentrated in Bay and Gulf counties. In 2013, St. Joe Company sold approximately 400,000 acres of land to AgReserves, Inc, a tax paying affiliate of the Church of Jesus Christ of Latter-day Saints, and now only owns about 187,000 acres, the majority of which is located in northwest Florida and is used for the company's forestry operations and conservation projects (Liston, 2013).

On April 20, 2010, the oil drilling rig Deepwater Horizon, operating in the Gulf of Mexico, exploded and sank resulting in the death of 11 workers and the largest spill of oil in the history of marine oil drilling operations. Over a period of 87 days, approximately four million barrels of oil flowed from the damaged well before it was finally capped on July 15, 2010 (U.S. Environmental Protection Agency [EPA], 2020). To address injuries and/or losses to natural resources and ecosystem services that resulted from the Deepwater Horizon oil spill, the United States filed a complaint in District Court against BP Exploration & Production and several other defendants alleged to be responsible for the spill. BP Exploration & Production settled for a record \$5.5 billion Clean Water Act penalty and up to \$8.8 billion in natural resource damages (EPA, 2020).

Many coastal habitats were severely damaged and countless marine organisms were injured and killed as a result of the spill. States with impacted areas along Gulf of Mexico have and continue to use funding from this settlement for natural resource damage assessment and planning, restoration and rehabilitation projects, or acquisition of the equivalent of injured or lost natural resources; additionally, the funding is used for monitoring, information management, project oversight and coordination, public education, and administrative activities related to the restoration plans and programs. Submerged aquatic vegetation (SAV) habitat in Florida's Panhandle was adversely impacted by the Deepwater Horizon oil spill and related response activities. In 2015, the aquatic preserve received funding through the Natural Resource Damage Assessment and initiated The Florida Seagrass Recovery project to will address boat damage to shallow seagrass beds in the Florida Panhandle by restoring scars located primarily in turtle grass habitats in St. Joseph Bay Aquatic Preserve (SJBAP).

On July 15, 2014, the Cape San Blas Lighthouse, its two keepers' quarters and oil house were moved from its original location on Cape San Blas to George Core Park in Port St. Joe. The choreographed moving process took an

entire day and required multiple power lines and a traffic light to be moved to accommodate the convoy on their safe journey. Locals and visitors alike applauded with relief and pride as it came to its final stop in George Core Park. Hundreds gathered once again on July 24 to observe the Lighthouse as it was erected onto its new platform (Gulf County Tourist Development Council, n.d.).

On October 10, 2018, Hurricane Michael impacted the Gulf Coast of Florida, particularly in Gulf and Bay counties. Michael reached Category 5 status with peak winds of 160 mph before making landfall near Mexico Beach, Florida. The storm caused catastrophic damage from wind and storm surge, particularly in the Panama City Beach to Mexico Beach to Cape San Blas areas. Much of the city and communities of Port St. Joe were damaged by devastating winds and flooding. The extreme storm conditions greatly impacted the SJPS; the park suffered significant damage from Hurricane Michael, including a breach that connected the Gulf to the Bay, severing the park just north of the boat ramp in the Eagle Harbor area. This new breach/opening was approximately 1000 ft (280 meters) wide and seven ft deep (DEP, 2019c). Roads, utilities, and facilities in the park camping, cabin, and staff residence areas were severely damaged and impassable. Recovery planning has been in progress since late 2018/early 2019. Public access north of the former breach site for day use and overnight accommodation faces a multi-year closure. Early recovery efforts reopened the southern portion of the park on January 19, 2019 for day use beach access and boat launching (D. Alsentzer, personal communication, September 29, 2020).

3.2 / General Description

International/National/State/Regional Significance

The Florida Panhandle is one of the nation's six "biological hot spots," along with Hawaii, the southern Appalachians, the San Francisco Bay area, the Death Valley region, and southern California, that has many rare species that are only found in small areas. The highest biodiversity of species in the United States is found specifically within the central Florida Panhandle, along the Apalachicola River. The Apalachicola River drainage basin supports more than 40 amphibian and 80 reptilian species (DEP, 2013).

Gulf fisheries are some of the most productive in the world. In 2002, the commercial fish landings of the northern Gulf region totaled more than 1.7 billion pounds accounting for nearly \$705 million in revenues (National Oceanic and Atmospheric Administration [NOAA], n.d.). In 2008, western Florida experienced the greatest economic boost from recreational fishing in the Gulf region; recreational anglers contributed \$5.65 billion in total sales to the regional economy and added approximately 54,600 jobs (National Resources Defense Council, 2010). Since 1950, annual commercial landing data shows that the commercial fish landings of the entire Gulf totaled approximately 44.24 billion pounds accounting for nearly \$32.6 billion in revenues (NOAA, n.d.). In 2019, the commercial fish landings in Gulf County totaled 1,347,994 pounds, which is estimated to be worth \$1,519,357 in revenues (Florida Fish and Wildlife Conservation Commission [FWC], n.d.-c).

SJBAP was designated in 1969 and encompasses more than 55,000 acres of sovereign submerged lands below the mean high-water line. St. Joseph Bay is a small embayment that lies just west of Apalachicola, Florida. Partially isolated from the Gulf of Mexico, St. Joseph Bay extends from Cape San Blas in the south to the tip of the St. Joseph Peninsula in the north. St. Joseph Bay is one of the only bodies of water in the eastern Gulf of Mexico not significantly influenced by the inflow of freshwater, thus resulting in coastal waters that tend to be clearer with sandier sediments when compared to other coastal regions in the north central Gulf of Mexico. These conditions make the bay ideal habitat for the growth of lush seagrass communities. Much of the productivity of the region is attributed to the nearshore salt marsh and seagrass habitats that serve as nursery and foraging grounds for a variety of commercial and recreational fish and invertebrate species, sea turtles, scallops and birds.

In 2019, Bay County and Florida State University partnered to establish the St. Andrew and St. Joseph Bays Estuary Program (SASJBEP). As part of a greater initiative to bring estuary programs across the Florida Panhandle, this program will help provide for the health, enhancement and protection of the estuary through the development and implementation a plan of action for these valuable resources. SASJBEP is designed to be a community and

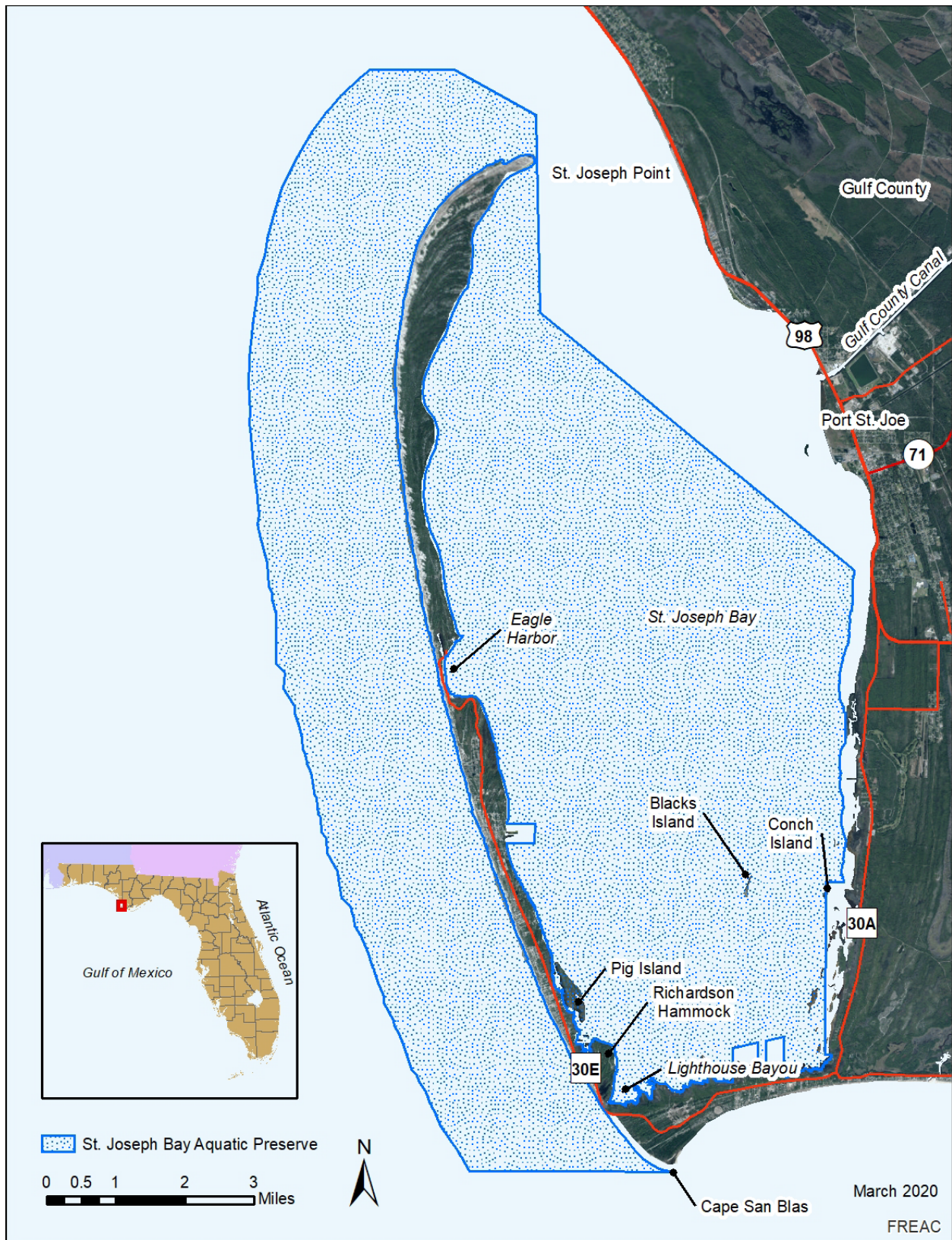
citizen-driven effort to work with state and federal agencies, local stakeholders and the public to identify and solve the problems facing the St. Andrews and St. Joseph bays utilizing objective and scientific information. (FSU Panama City, 2021).

The protection and restoration of these interdependent habitats is crucial to the health of the ecosystem (Northwest Florida Water Management District [NFWFMD], 2017). To effectively manage a natural resource, one must be knowledgeable about the resource function and composition. Additionally, one must be able to transmit this knowledge to people who use and/or can potentially affect the resource and who are willing to take necessary actions to manage and protect the resource. Therefore, the management strategies for an aquatic preserve must consist of a variety of programs, including direct, hands-on management of the resources, resource protection, environmental education and research.

Location/Boundaries

St. Joseph Bay is located in Gulf County near the community of Port St. Joe which is approximately 35 miles southeast of Panama City and approximately 100 miles southwest of Tallahassee. Gulf County consists of two municipalities, Port St. Joe, located on the coastline, and Wewahitchka, located northeast of Port St. Joe. There are several established unincorporated communities in Gulf County including Beacon Hill, St. Joe Beach, Highland View, Overstreet, Dalkeith, Howard Creek, White City, Simmons Bayou, Cape San Blas, and Indian Pass.

St. Joseph Bay is bound on the eastern shoreline by the city of Port St. Joe and St. Joseph Bay State Buffer Preserve lands and on the west by the St. Joseph Peninsula and SJBSP. The bay is approximately 15 miles long north to south, with a maximum width of six miles, and opens north to the Gulf of Mexico, thru a relatively narrow opening. The aquatic preserve boundaries encompass more than 55,000 acres, including much of St. Joseph Bay itself and waters in the gulf (Map 2). Uplands and manmade canals are excluded from the aquatic preserve. Other areas that are not included within the aquatic preserve's boundaries include a linear band of privately-owned and publicly-owned submerged lands and marsh running along the eastern shore of St. Joseph Bay, six private in-holdings that occur along the southern and western shore, the area of the bay located north of the Port St. Joe navigation channel, and the immediate area of the channel. Some of this land is included in the St. Joseph Bay Buffer Florida Forever Project, and the state is pursuing acquisition of these areas.



Map 2 / St. Joseph Bay Aquatic Preserve.

3.3 / Resource Description

Surrounding Population Data and Future Projected Changes

More than three-quarters of Florida's population live in coastal communities. As the population continues to rise and the demand for development, infrastructure, and services increases, there could be environmental and subsequent economic impacts that must be appropriately managed. Port St. Joe is a small, predominately rural community. In 2019, the estimated Gulf County population was 13,659. Gulf County has a population density of approximately 28 persons per square mile the (U.S. Census Bureau, 2020). Tourism is a vital element in the economy of Gulf County and will continue to grow for years to come. Plans for future development include large-scale, residential, commercial and resort development.

In 2013, The Port St. Joe Master Plan was updated and described future development plans for short term (1-5 years) and long term (6-10 years). In the short-term, the Port Authority hopes to complete dredging of the Port's Ship Channel. Long-term development plans focus on extending a bulkhead, establishing a new wastewater facility, and increasing tenants and manufacturing along the waterfront (Port St. Joe Port Authority, n.d.). The state of Florida issued a grant to complete environmental and engineering studies of the Gulf County shipping channel, a requirement before any dredging can take place. The US Army Corps of Engineers (Corps) and DEP have both issued permits to dredge the shipping channel up to 37 feet in December 2014 and February 2015 respectively. The Florida Department of Transportation awarded a \$1 million grant to the Port St Joe Port Authority to fund final design of the dredge material disposal areas and to prepare specifications and bid documents for their construction in November 2015 (Port St. Joe Port Authority, n.d.). The channel has not been dredged as of June 2021.

Topography and Geomorphology

St. Joseph Bay lies on an offshore extension of the Gulf Coast Lowlands geomorphic province, which is characterized by low elevations and poor drainage. Numerous relict bars and dunes are associated with this province, indicating historic fluctuations in sea level. Along the coast, fluvial deposition and shore zone processes are active in developing and maintaining beaches, swamps, and mudflats (McNab & Avers, 1994). The onshore terrain consists of a flat, frequently swampy plain sloping gently towards the coast. Near-surface sediments are Pleistocene and Holocene deltaic and marine sands which are generally more than 100 feet thick. These overlay Upper Miocene limestone, clays, and shell beds (Schmidt, 1978). Relict marine bars, dunes, and spits, formed during high Pleistocene sea level stands, are superimposed on the otherwise flat landscape. Land slope near the coast averages two to three feet per mile. Offshore, the submarine plain slopes seaward at a rate of four to five feet per mile for at least 10 miles. The shallow nearshore gulf in the region is a drowned alluvial plain grading into a limestone plateau to the east and south (McNulty, Lindall & Sykes, 1972). The north gulf coast sedimentary province contains relict sand west of the Apalachicola delta.

St. Joseph Bay is formed by a narrow spit of land extending out from Cape San Blas, the southernmost part of the St. Joseph Peninsula. Cape San Blas is the elbow of an L-shaped coastal barrier of beach and coastal upland habitats extending from the Florida Panhandle into the Gulf. The peninsula is 17 miles long and has an average width of 1,000 feet. Eagle Harbor, midway up the spit, forms a natural cove on the bay side. This feature may represent an ancient pass which once divided the spit into two islands (Stapor, 1973). This pass was briefly re-opened by Hurricane Michael.

The bay owes its existence to the Cape San Blas shoals and the historical migration of the Apalachicola River (Stewart, 1962). Before sea level rise, these shoals are believed to have been a barrier island system (Schnable & Goodell, 1968). The shoals extend about 10 miles into the Gulf of Mexico and are marked by a series of broad ridges and troughs. They have caused wave action to deflect littoral drift, which in turn has resulted in the emergence of the St. Joseph spit or peninsula. Cape San Blas formed as a result of westward shifting mainland sediments during a time when sea level was on the rise, and the spit formation is attributed to sediments being

eroded from the westward beaches of the cape and deposited even further westward. This lengthening of the spit enclosed a large area of water, thus creating St. Joseph Bay (Gulf County, 2018). The cape and the spit sediments are primarily composed of quartz sands, originally supplied by the Apalachicola River, which is approximately 20 miles to the east (Florida Department of Natural Resources, 1987).

An analysis of the coastal sand budgets for northwest Florida suggests that the region has shifted from historically having an excess of sand to a current shortage (Stapor, 1973). The beach habitat on St. Joseph Peninsula has experienced a continuous balance of erosion and deposition over the last 100 years. Some sections have experienced long-term recession and have contributed sand to other areas that have a history of accretion (Beaches and Shores Resource Center, 1985).

After Hurricane Michael in October 2018, DEP provided an assessment of storm impact, beach and dune erosion, and structural damages to the coast of northwest Florida. It has been determined that the barrier spit on Cape San Blas is subject to storm surge over wash. The net direction of longshore transport is northerly along St. Joseph Peninsula and the erosion rates reach a maximum to the south at Stump Hole, which is a drift divide for longshore transport. The west shore of Cape San Blas has the highest erosion rate on the Florida Gulf Coast (approximately 40 feet per year), while longshore transport is generally southward with sediments being carried onto shoals off the cape (DEP, 2019b).

Today, Florida has six major geographic regions that historians use to describe these areas. The Coastal Lowlands encircle the state and extend along the shores inland from 10 to 100 miles. St. Joseph Peninsula is located within the Gulf Coast Lowlands, a geographic province characterized by marine terraces (remnant shorelines from times of higher sea level) and flat, sandy terrain, bars, spits, and dune fields. Cape San Blas occupies the portion of the Gulf Coast Lowlands known as the Silver Bluff Terrace, an area extending from the modern Gulf Coast to approximately eight feet above mean sea level. Dune systems, relict beach ridges, and swales typify the Silver Bluff Terrace.

Tide gauges around the Port St. Joe region indicate diurnal tides with similar mean tidal ranges of approximated 1.15 ft (NOAA, 2020). Most of the shoreline of St. Joseph Peninsula is affected primarily by waves out of the south-southwest, the longest fetch direction. The Corps Wave Information Studies Station 37 located at 62 ft deep offshore of St. Joseph Peninsula, experienced a mean significant wave height of 2.0 ft and a mean period of four seconds from 1976 to 1995 (Foster & Cheng, 2001). In 2014, Corps Wave Information Studies Station 73189 (52 ft offshore) recorded an average maximum wave height of approximately 1.6 ft and a mean period of approximately four seconds (U.S. Army Corps of Engineers, 2020).

The shoreline topography of this coastal barrier system has been in a state of change with varying rates of accretion and erosion. Between 1875 and 1942, 36 feet of shoreline per year was lost along the spit adjacent to Cape San Blas. At the northern tip of the St. Joseph Peninsula, a gain of 29 feet per year was experienced between 1875 and 1970 (Gulf County, 2018). Cape San Blas is considered one of the most critically eroding shorelines in Florida (DEP, 2020).

Gulf County includes three distinct open coast segments. The first is a 5.9-mile (9.5 km) shoreline segment extending from the Bay County line southeastward. This area is exposed to Gulf waves entering the gap between St. Joseph Point and the Crooked Islands of Bay County. The second segment is the St. Joseph Peninsula, approximately 17 miles long, extending from Cape San Blas to St. Joseph Point. This area is the most exposed to higher wave energy of the three segments. The third segment is approximately 8.5 miles in length and extends from Cape San Blas eastward to Indian Pass and the Franklin County line. This area is within an embayment bounded by two large offshore shoal systems: those off Cape San Blas on the west, and those off Cape St. George on the east (Foster & Cheng, 2001).

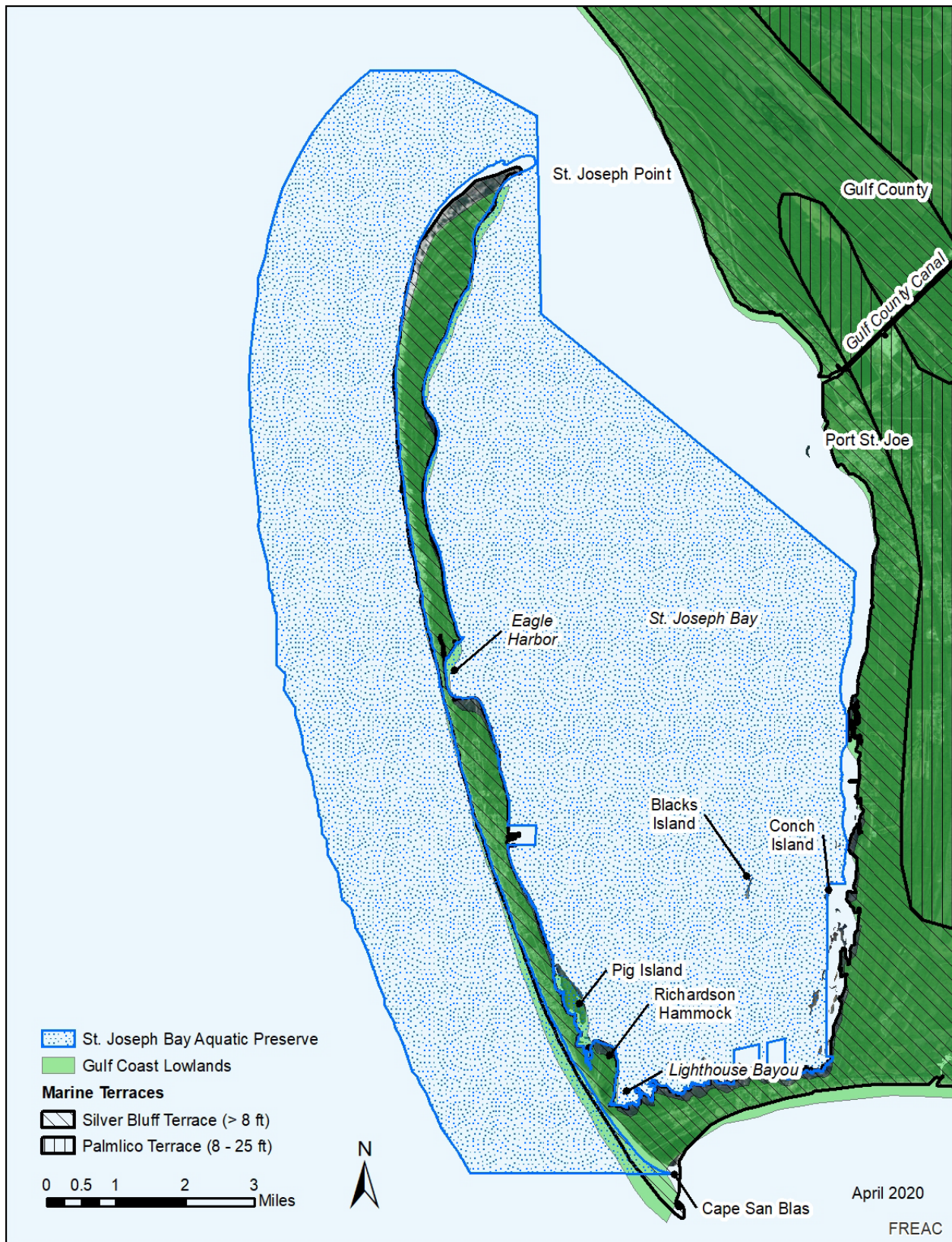
There are 162 sequentially numbered DEP survey reference points, generally referred to as “R” monuments, spaced approximately 1,000 ft (300 m) apart in Gulf County (see Map 4). There is no coastal armoring of

significance within Gulf County, with the exception of a rock revetment fronting the road between approximately R- 105 and R-106.5 on St. Joseph Peninsula, an area commonly referred to as the Stump Hole.

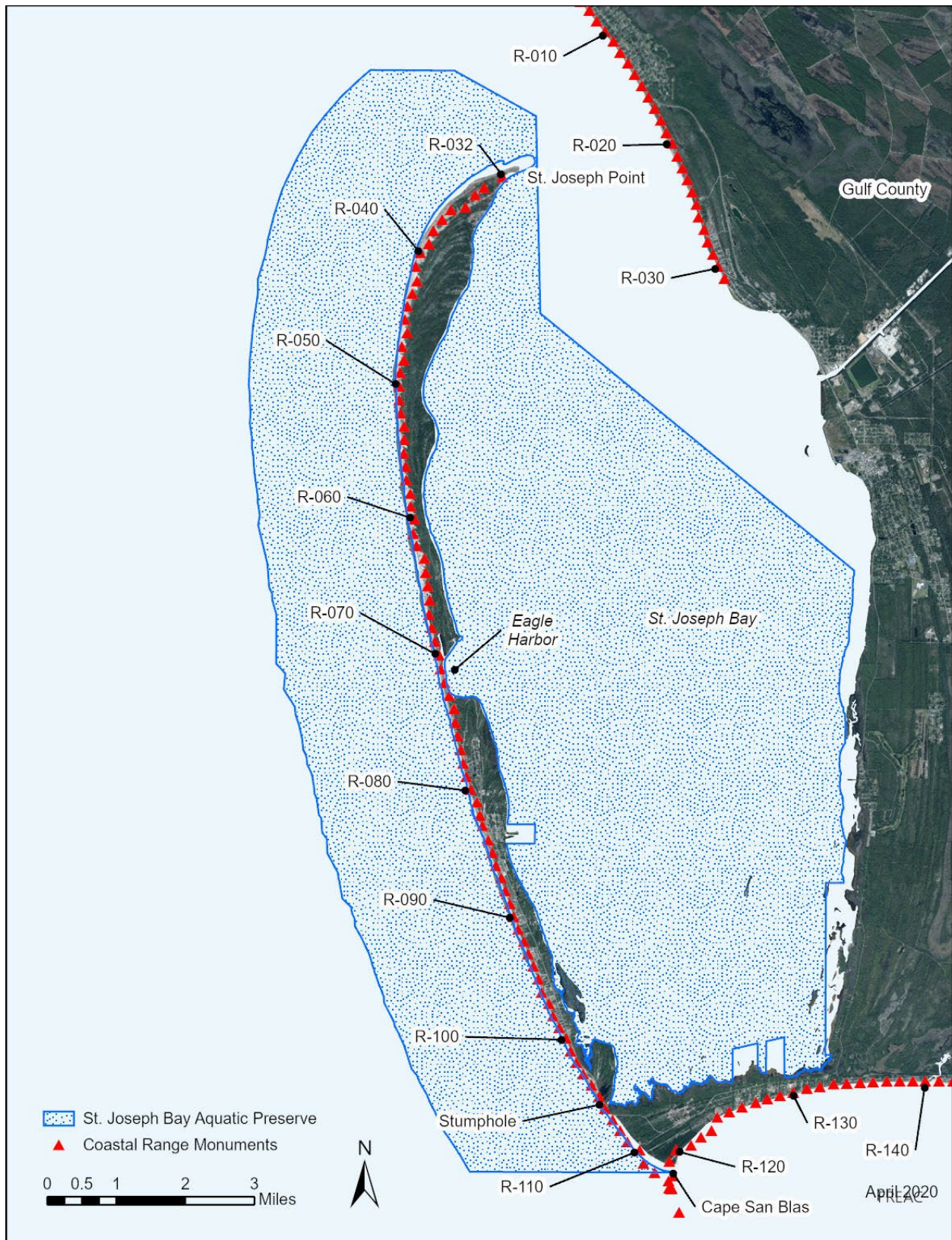
Coastal Gulf County has a complex geomorphology. The barrier islands of Gulf County and western Franklin County, including St. Joseph Peninsula, and the extensive shoals of Cape San Blas and Cape St. George, and the islands within the embayment between them, all appear to be related to a complex deltaic history of the Apalachicola River. It is important to note the presence of the extensive offshore shoals because they refract and diffract the wave energy reaching this area, controlling the wave climate between and to either side of Cape San Blas and Cape St. George. These major shoals can be viewed in any navigational chart of the area. Sediment from R-110 eastward to Cape San Blas, and all the way to Indian Pass, appears finer and darker in color than on St. Joseph Peninsula in general. The peat is significant because it is not sand and therefore erodes differently. It has probably been a significant factor in preventing an island break-through with a new inlet in the Stump Hole area (R-105), thus far. The sand difference is significant because it strongly suggests different sources of material and possibly different directions of net transport (Foster & Cheng, 2001). The shoreline segment extending from R-1 to R-31, because of its location at the entrance to St. Joseph Bay, is affected primarily by waves out of the west and northwest, as refracted and diffracted through the gap between the Crooked Islands (in Bay County) and St. Joseph Point (Foster & Cheng, 2001).

Net longshore transport along the majority of St. Joseph Peninsula is from south to north, consistent with the direction of longest wave fetch and the observed growth of St. Joseph Point as well as its shoals (Foster & Cheng, 2001). Generally, the net longshore transport along the entire peninsula is northerly, whereas south of Stump Hole along the cape it is generally southerly. That is the major reason the cape has such a high rate of shoreline change of approximately -40 feet per year in the vicinity of the old Air Force facilities and former lighthouse site (R. Clark, personal communication, April 7, 2021) . Sand in the cape area and eastward appears finer and darker in color than elsewhere on the peninsula. It is probable that a point where net transport direction changes on the peninsula exists in the vicinity of R-100 to R-110, due to shoal sheltering and refraction around the shoals off Cape San Blas. The above interpretation of net northerly transport over most of St. Joseph Peninsula is consistent with the totality of available information. It is also the only physical explanation that matches the observed shoreline erosion pattern between approximately R-107 and R-75, as determined by a numerical modeling study by Foster (1991). In that study it was shown that the tapered pattern of higher erosion to lesser erosion from south to north is a sand supply deficit-induced erosion pattern equivalent to those found elsewhere in the state down drift of inlet jetties (Foster & Cheng, 2001). Further analysis of trends observed indicate that the net sediment transport between R-94 and R-110 is from north to south, which is highly dependent on the seasonal wave climate. Historically, sediment transport has been documented to be largely to the north with a fluctuating nodal point located somewhere near the southern end of the peninsula at R-105 (MRD Associates, DEP 2018).

Between 1997 and 2008, R-90-R-100 lost approximately 123,550 yds³/yr for an average rate of -13.9 cubic yards per linear foot per year (yds³/lf/yr) over the 11-year period. The total volume change rates ranged between -18.4 (R-100) and -7.4 (R-90) yds³/lf/yr. Above the MHWL, the beach segment lost an average rate of -3.2 yds³/lf/yr, while below the MHWL the volume change rate was measured at -10.7 yds³/lf/yr. During the same time period, the shoreline changes at the Stumphole Limits (R-100 to V-105.5), ranged between -22.0 (R-104) and -14.2 (R-100) ft/yr with an average of -16.8 ft/yr. The beach segment lost approximately 110,750 yds³/yr of sand for an average rate of -19.6 yds³/lf/yr. The volume change rates ranged between -21.0 (R-105) and -17.9 (R-103) yds³/lf/yr. Above the MHWL the beach



Map 3 / Geomorphology of St. Joseph Bay Aquatic Preserve.



Map 4 / Survey reference points in Gulf County, Florida.

segment averaged -3.4 yds³/lf/yr while below the MHWL the volumes changed at a rate of -16.2 yds³/lf/yr (MRD Associates/DEP, 2018).

From 2009-2014, the shoreline position change rate between R-90-R-100 ranged between -34.9 (R-99) and -4.0 ft/yr at R-93, with an average of -14.8 ft/yr. The 10,110-foot beach segment lost approximately 125,400 yds³/yr for a total average rate of -12.4 yds³/lf/yr. The total volume change rates ranged between -33.5 (V-98.5) and +2.0 (V93.5) yds³/lf/yr. Above the MHWL the beach segment changed an average rate of -1.5 yds³/lf/yr, while below the MHWL the volume change rate of -10.9 yds³/lf/yr. The shoreline and volume changes at the Stumphole Limits (R-100 to V 105.5) over the same period ranged between -38.8 (V-104.5) and -10.7 (V-105.5) ft/yr, with an average change of -24.3 ft/yr. The beach segment lost approximately 157,600 yds³/yr (average rate of -27.9 yds³/lf/yr), and the total volume change rates ranged between -47.1 (V-104.5) and -14.8 (R-101) yds³/lf/yr. Above the MHWL, the beach segment had an average rate of -4.7 yds³/lf/yr while below the MHWL the volumes changed at a rate of -19.2 yds³/lf/yr (MRD Associates/DEP 2018).

Between October 2013 and August 2014, the shoreline position change rate ranged between -12.6 ft/yr (R-91) and +45.2 ft/yr (R-92) with an average of +18.9 ft/yr. This beach segment lost approximately 390,800 yds³/yr over the one-year period, having a volume change of -36.6 yds³/lf/yr. The total volume change rates ranged between -52.8 (V-94.5) and -18.5 (R-96) yds³/lf/yr. Above the MHWL the beach segment gained at an average rate of +4.2 yds³/lf/yr, while below the MHWL, this segment averaged -40.7 yds³/lf/yr. The measured shoreline position at the Stumphole Limits ranged between -14.2 (R-104) and +42.2 (V-102.5) ft/yr with an average of +19.5 ft/yr. This beach segment lost approximately -322,000 yds³/yr (average rate of -54.7 yds³/lf/yr), and the total volume change rates ranged between -119.8 (R-104) and -11.5 (R-101) yds³/lf/yr. Above the MHWL the beach segment gained at an average of +0.3 yds³/lf/yr while below the MHWL, the volume changes were measured at an average rate of -55.0 yds³/lf/yr. (MRD Associates/DEP, 2018).

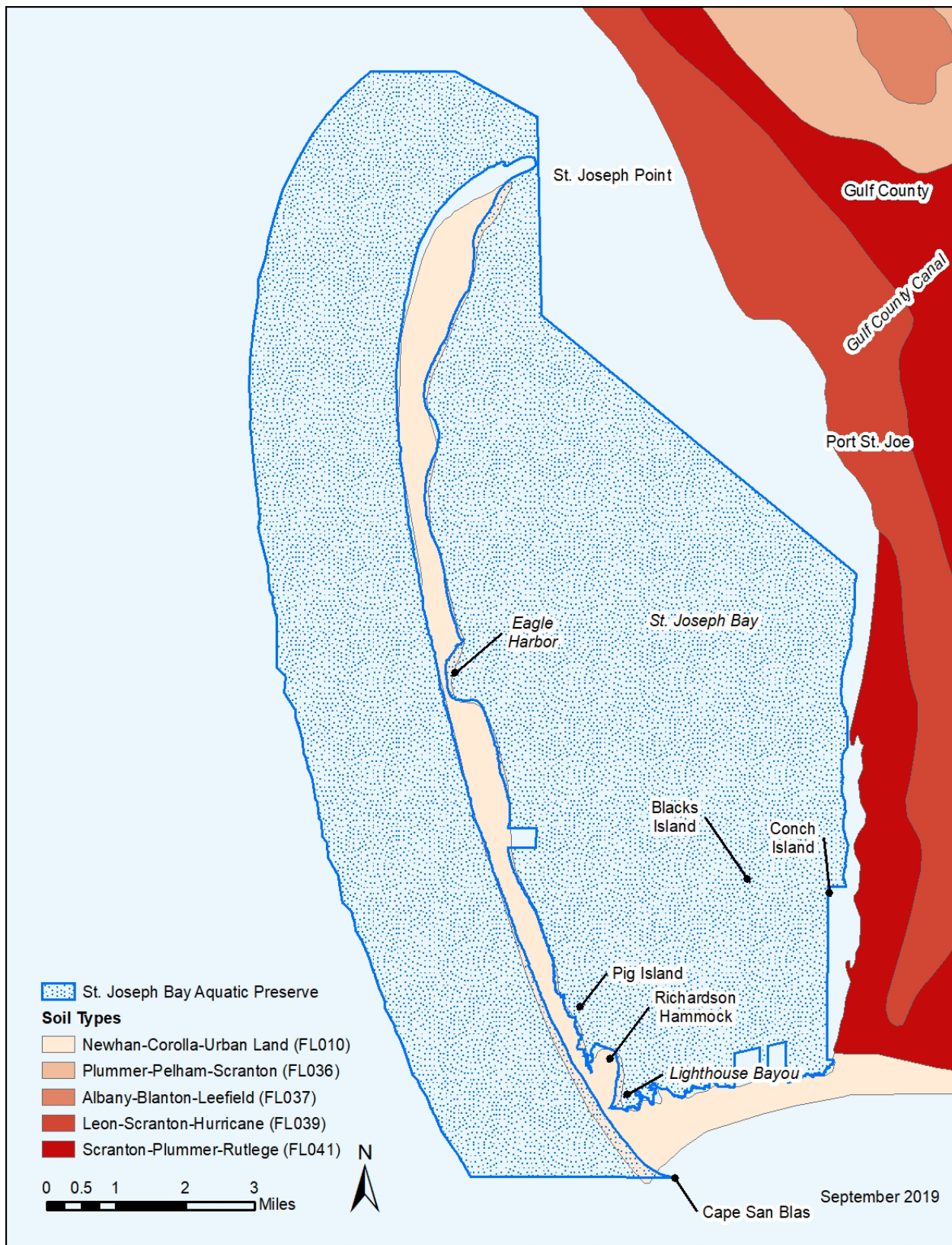
Since 2010, the shoreline in the vicinity of the Sunrise Sunset Condominiums (R-101.5 to R-102.5), Stumphole (R-102.5 to R-105.5) and Cape Shoals (R-90 to R-91) has continued to experience a high rate of erosion. The reasons for the higher recession rates may be due to: beach cusps; wave focusing; edge or reflected waves; alongshore currents; or the mean sand grain size – or a combination of these theories or others yet to be identified (MRD Associates/DEP, 2018).

The Entrance Channel to St. Joseph Bay is a federal navigation project that is regularly dredged, and has a controlling effect on the northernmost tip of St. Joseph Peninsula. Before 1970, all of the dredged sand was disposed of in deep water (Dean & O'Brien, 1987). Since that time, there have been several placements of sand offshore, nearshore, and onto St. Joseph Point.

Hurricanes occur frequently in this area and both the storms and their effects can remain for long periods of time. However, storms are just peaks in the total normal wind and wave climate record (Foster & Cheng, 2001). Observations indicate that severe storms can temporarily disrupt or obscure the long-term erosion pattern, perhaps for up to a decade (Foster & Cheng, 2001). In some situations, if a major factor such as the sand supply is altered, or if an inlet is significantly changed, coastal processes can be permanently affected by a storm. Major storms continue to cause significant dune erosion and add to ongoing beach erosion. In October 2018, the devastating winds and substantial storm surge from Hurricane Michael resulted in significant dune and beach erosion along the St. Joseph Peninsula; consequently, the storm surge carved through the dune system, creating a new temporary inlet at Eagle Harbor, located within SJSPS.

Geology

The bottom sediments of St. Joseph Bay are predominantly sand, sand-silt-clay, sandy clay and silty clay (Isphording, 1993). Five major soil types exist within SJBP: Newhan-Corolla-Scranton, Plummer-



Map 5 / Soils of St. Joseph Bay Aquatic Preserve.

Pelham-Scranton, Albany-Blanton-Leefield, Leon-Scranton-Hurricane, and Scranton-Plummer-Rutlege (Map 5). The Newhan-Corolla complex (typically gray fine sand) are very deep, excessively drained and somewhat poorly drained soils are on remnant coastal dunes and in swales; typical Newhan fine sand in an area of Newhan-Corolla complex can be expected near Cape San Blas. Some soils, especially areas of the Newhan and Corolla soils near coastal beaches, receive addition sediments of windblown sands, which accumulate on the surface. Scranton soils are poorly drained and are referred to as Scranton fine sand in many cases. The surface layer is very dark brown fine sand while the underlying material is brownish and grayish fine sand. Plummer-Pelham-Scranton are very deep, poorly drained soil is in low areas of flatwoods and in broad, slightly depressional areas on flats. Pelham soils are in landscape positions similar to those of the Plummer soil but have thinner surface and subsurface layers. Plummer soils are examples of soils that formed in unconsolidated marine sediments on sea bottoms, coastal bars, and spits (Turner, et al., 2001).

Albany sands have a loamy subsoil and are very deep, somewhat poorly drained soil and are found on broad flats and knolls on the southern Coastal Plain; Blanton soils are moderately well drained and are found on the higher ridges, pine plantations, and knolls on the southern Coastal Plain. Leefield soils are very deep, somewhat poorly drained soil is on low uplands and on narrow ridges in areas of flatwoods on the southern Coastal Plain. The somewhat poorly drained Albany and Leefield soils are located on lower side slopes and in slight depressions (Turner, et al., 2001).

Leon series consists of poorly drained, nearly level soils that formed in sandy marine sediments and are common in areas of flatwoods on the southern Coastal Plain; Leon soils are examples of soils that formed in unconsolidated marine sediments on sea bottoms, coastal bars, and spits. Rutlege soils form in sandy coastal plain sediments and are black fine sand that do not have an organic surface layer. These very deep, very poorly drained soils are in broad, shallow depressions and occur in the slightly higher landscape positions outside the tidal marshes (Turner, et al., 2001).

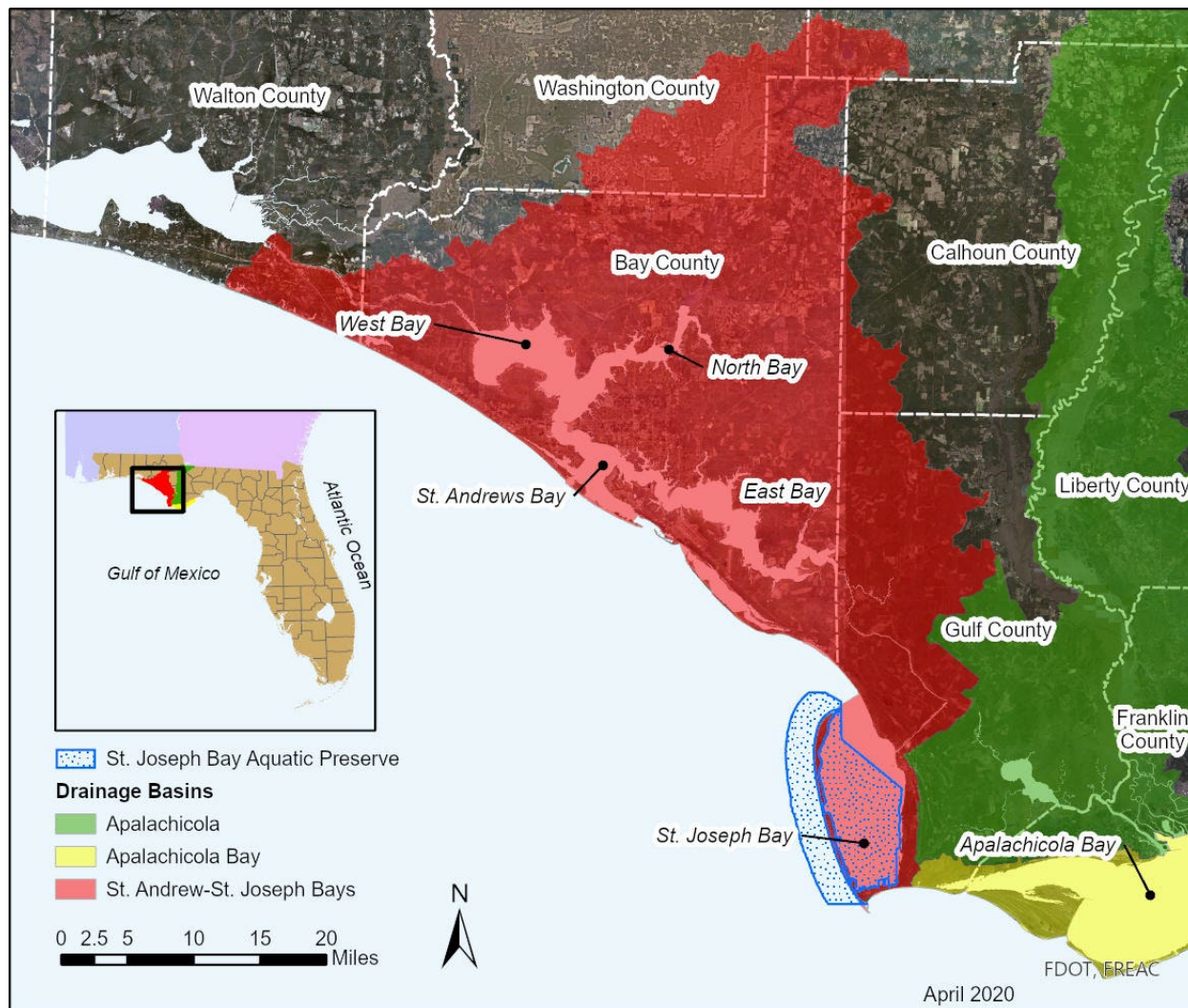
Present day sedimentation in St. Joseph Bay may be attributed to the coastal transport of sand from the east and biological activity within the bay itself. Since the spit enclosed the bay, the rate of sedimentation has been slow. Therefore, the central portion of the bay has a depth and gradient which is in close agreement with that of the offshore slope. The large accumulation of clay in the central portion of the bay has led to the conclusion that these fine sediments represent a relic surface produced by the discharge of old distributaries of the Apalachicola River (Stewart & Gorsline, 1962). More recent sediment studies reveal that St. Joseph Bay has a large area, in excess of approximately 20,000 acres, below the 20-foot contour, consisting of sediments with high percentages of silt, clay, and total organic carbon that were apparently deposited thousands of years ago (Hemming, Brim, & Jarvis, 2002). Such sediments can quite easily accumulate chemical contaminants, and contaminants associated with these sediments can be accumulated by biological organisms inhabiting the bay (Hemming et al., 2002).

There are no known commercially viable mineral resources in this area of the Florida Panhandle.

Hydrology and Watershed

St. Joseph Bay is included within the St. Andrew Bay watershed, which includes St. Andrew West, North, and East bays; St. Joseph Bay; Deer Point Lake Reservoir, as well as the respective surface water basins of each of these waterbodies. Primarily in Bay and Gulf counties, the watershed also includes portions of Washington, Walton, Jackson, and Calhoun counties. St. Joseph Bay is unique in being one of the few sizeable embayment bodies of water in the eastern portion of the Gulf of Mexico that is not markedly influenced by the inflow of freshwater (NFWFMD, 2017). Numerous small bayous, creeks, and ditches drain into the bay, but the principal sources of freshwater include rainfall, the underlying confined Upper Floridan Aquifer, overland drainage and the Gulf County Canal, a constructed waterway that connects the bay with the Gulf Intracoastal Waterway (GIWW) and adjacent shallow ground water (Berndt & Franklin, 1999). The Gulf County Canal is approximately 5.5 miles long and links the GIWW to St. Joseph Bay. The GIWW is a 1,300-mile system of inland channels and tributaries traversing the Gulf Coast that was constructed to provide a route for ships up the eastern coast of the U.S. The 5-foot deep and

65-foot wide channel connecting Apalachicola and St. Andrew Bay was constructed between 1911 and 1915 and upgraded to 9 feet by 100 feet in 1937 by the USACE. The channel runs from Wetappo Creek via Searcy Creek and Lake Wimico to the Apalachicola River, about five miles above its mouth (Alperin 1983).



Map 6 / Drainage basins associated with St. Joseph Bay Aquatic Preserve.

Estimates for Upper Floridan Aquifer discharge rates for the St. Joseph Bay area range from 0.5 to 2 inches per year (Bush & Johnson, 1988). Net precipitation, defined as the difference between precipitation and lake evaporation, for the St. Joseph Bay area is estimated between eight and nine inches per year (Visser & Hughes, 1975). Historically, the Port St. Joe wastewater treatment plant discharged directly into the Gulf County Canal. While there is currently not any direct sewage discharge into the canal, potential impacts from wastewater spray fields may pose a concern. Higher turbidity flowing from the Gulf County Canal probably reflects the proximity of the site to the land-derived sources of sediment.

A previous study by Berndt and Franklin (1999) reported that the range in water levels over a tidal cycle in St. Joseph Bay in October 1997 was about one foot. During a 24-hour tidal cycle, estimated hourly discharge varied from about -116,000 cubic feet per second (cfs) (into the bay) to about 110,000 cfs (out of the bay). During a 24-hour tidal cycle in March 1998, the water level change was about 1.3 feet and estimated hourly discharge varied from about 132,000 cfs into the bay to about 121,000 cfs out of the bay. As of 2021, the Gulf County Canal may provide more significant freshwater input into the bay while development and land-use around the bay has

changed. The extent of the freshwater flow volume is currently being studied to measure turbidity and the influence of freshwater flows.

Because of minimal freshwater influence, St. Joseph Bay essentially remains a high salinity coastal lagoon, with some estuarine qualities (Hand, Col, & Lord, 1996). Sediment loading, a phenomenon related to inflow, topography, and terrestrial geologic conditions, has no significant impact on the bay and thus it has remained quite deep since a rise in sea level flooded the coastal plain approximately 5,000 years ago (Stewart & Gorsline, 1962). The total surface area of the bay at mean high water is approximately 43,872 acres (Hemming et al., 2002). The bay has a mean depth of 21 feet, with the deepest parts being approximately 35 feet near the northern tip of the spit. The southern portion of the bay is shallow and has an average depth of three feet, which is consistent with most of the bay's shallow shoreline. The bay is considered a coastal lagoon primarily because it functions as a closed system, and currents do not have any impacts at depths greater than 5.5 feet (1.7 meters) (Stewart & Gorsline, 1962).

All surface waters of the state have been classified by the DEP according to their designated use, as required by the Clean Water Act. Florida has five classes with associated designated uses, which are arranged in order of degree of protection required. St. Joseph Bay is classified as a Class II Waterbody. Class II waters are those coastal waters with a designated beneficial use of shellfish propagation or harvesting. Class II water standards are more stringent concerning bacteriological quality than any other class due to the fact that consumed, uncooked shellfish can concentrate pathogens in quantities significantly higher than the surrounding waters. The Florida Department of Agriculture and Consumer Services (FDACS) maintains a lab in Apalachicola and conducts surveys to determine water quality in shellfish waters. Based on these surveys, all Class II shellfish harvesting areas are then classified by FDACS as approved, conditionally approved, or prohibited. As conditions change, areas are closed or opened based on bacterial surveys and major rainfall events, which increase bacterial levels due to storm water runoff.

SJBAP is also designated as an Outstanding Florida Waterbody (OFW) by the DEP. This designation is applied to certain waters that are worthy of special protection due to their natural attributes. These waters are afforded special protection by the state due to their high quality, recreational or ecological significance, or their location within state or federally owned lands. This designation is intended to preserve the ambient water quality at the time of the designation and permitted activities cannot cause any degradation. Stringent standards are applied regarding proposed alterations or potentially damaging activities planned for these waters.

The Gulf Coast falls within a moderate energy coastal area (Tanner, 1960), with average breaker heights of 4 to 20 inches. Waves traveling northward through the Gulf of Mexico are refracted clockwise around the Cape San Blas shoals in such a manner as to arrive nearly parallel to the beach. This results in a bi-directional littoral drift system that runs northward along the northern half of the spit and southward along the southern portion (Tanner, 1966). In general, the currents in St. Joseph Bay sweep around the St. Joseph Peninsula and a counter-clockwise circulation pattern occurs in the central portion of the bay. This movement is disrupted only during the maximum flood tide when currents flow from the bay and outer basin via the channel at the peninsula tip and across the shoal in the vicinity of the boat channel. Current movement occurs on the surface throughout a major portion of the bay, diminishing rapidly below the five-foot depth contour. In most of the extensive shallow reaches of the southern end of the bay, there is no appreciable current except for the daily tide. Therefore, this most productive area of the bay functions largely as a closed system (Stewart, 1962).

Climate

The climate of Gulf County is largely determined by its proximity to the Gulf of Mexico, the northern continental land mass, and its temperate latitude. Generally, the warm waters help create warm, humid summers and mild winters. Wind conditions are generally north through the winter and southerly during the summer months. Hurricanes and tropical storms occasionally influence the late summer and fall weather of the region, bringing extremes in wind, rainfall, and tide. Average annual rainfall is about 60 inches with peak rainfall periods occurring primarily during the summer and fall months. September is typically the wettest month and the dry season occurs

from October through December. Convection-type storms are the predominant source of rainfall in the summer and frontal storms are the typical source in the winter.

The average low temperature is approximately 45°F, while the average high temperature is 89°F (TimeandDate.com, 2019). Seasonal and annual temperatures vary greatly however, ranging from the upper 90s in the summer to the lower 20s in the winter. Prevailing winds are from a southerly direction during the spring and summer and from a northerly direction during the fall and winter months. Local winds, however, may change abruptly due to thunderstorms and the movement of fronts through the area.

Natural Communities

The natural community classification system used in this plan was developed by the Florida Natural Areas Inventory (FNAI) and the Florida Department of Natural Resources, now the DEP. The community types are defined by a variety of factors, such as vegetation structure and composition, hydrology, fire regime, topography and soil type. The community types are named for the most characteristic biological or physical feature (FNAI, 2010). FNAI also assigns Global (G) and State (S) ranks to each natural community and species that FNAI tracks. These ranks reflect the status of the natural community or species worldwide (G) and in Florida (S). Lower numbers reflect a higher degree of imperilment (e.g., G1 represents the most imperiled natural communities worldwide, S1 represents the most imperiled natural communities in Florida). Appendix B.6 provides an explanation of the FNAI Community Types and the ranking system.

The marine communities in SJBAP are ecologically valuable habitat to a variety of species. Approximately one-sixth of the bay bottom is seagrass habitat. Another important community, salt marsh provides a transition zone between the terrestrial and aquatic habitats. The following are community types found within the aquatic preserve.

Seagrass Bed - (synonyms: seagrass meadows, grass beds, grass flats). Seagrass beds are floral based natural communities typically characterized as expansive stands of vascular plants. Seagrasses are also described as submerged aquatic vegetation (SAV) although this description can include freshwater vegetation as well. This community occurs in subtidal (rarely intertidal) zones, in clear, coastal waters where wave energy is moderate. Seagrasses are not true grasses. The three most common species of seagrasses in Florida are turtle grass (*Thalassia testudinum*), manatee grass (*Syringodium filiforme*), and shoal grass (*Halodule wrightii*). Nearly pure stands of any one of these species can occur, but mixed stands are also common. Star grass (*Halophila engelmannii*) and related species may be intermingled with the other seagrasses, but species of this genus are considerably less common than turtle grass, manatee grass and shoal grass. Widgeon grass (*Ruppia maritima*) can also be found occurring with the previously listed seagrasses but is more common in lower salinity areas. Neither star grass nor widgeon grass has not been documented in any recent seagrass monitoring efforts.

Attached to the seagrass leaf blades are numerous species of epiphytic algae and invertebrates. Together, seagrasses and their epiphytes serve as important food sources for manatees, marine turtles, and many fish, including spotted sea trout, spot, sheepshead, and redfish. The dense seagrasses also serve as shelter or nursery grounds for many invertebrates and fish. Seagrass beds occur most frequently on unconsolidated substrates of marl, muck or sand, although they may also occur on other unconsolidated substrates. The dense blanket of leaf blades reduces the wave-energy on the bottom and promotes settling of suspended particulates. The settled particles become stabilized by the dense roots and rhizomes of the seagrasses. Factors affecting the establishment and growth of seagrass beds include water temperature, salinity, wave-energy, tidal activity, and available light. Seagrasses occur most frequently in areas with moderate current velocities, as opposed to either low or high velocities. Although seagrass beds are most commonly submerged in shallow subtidal zones, they may be exposed for brief periods of time during extreme low tides. Seagrass beds are often associated with and grade into unconsolidated substrate, coral reefs, tidal swamps, and tidal marshes, but may also be associated with any other marine and estuarine natural community. Seagrass beds are extremely vulnerable to human impacts such as

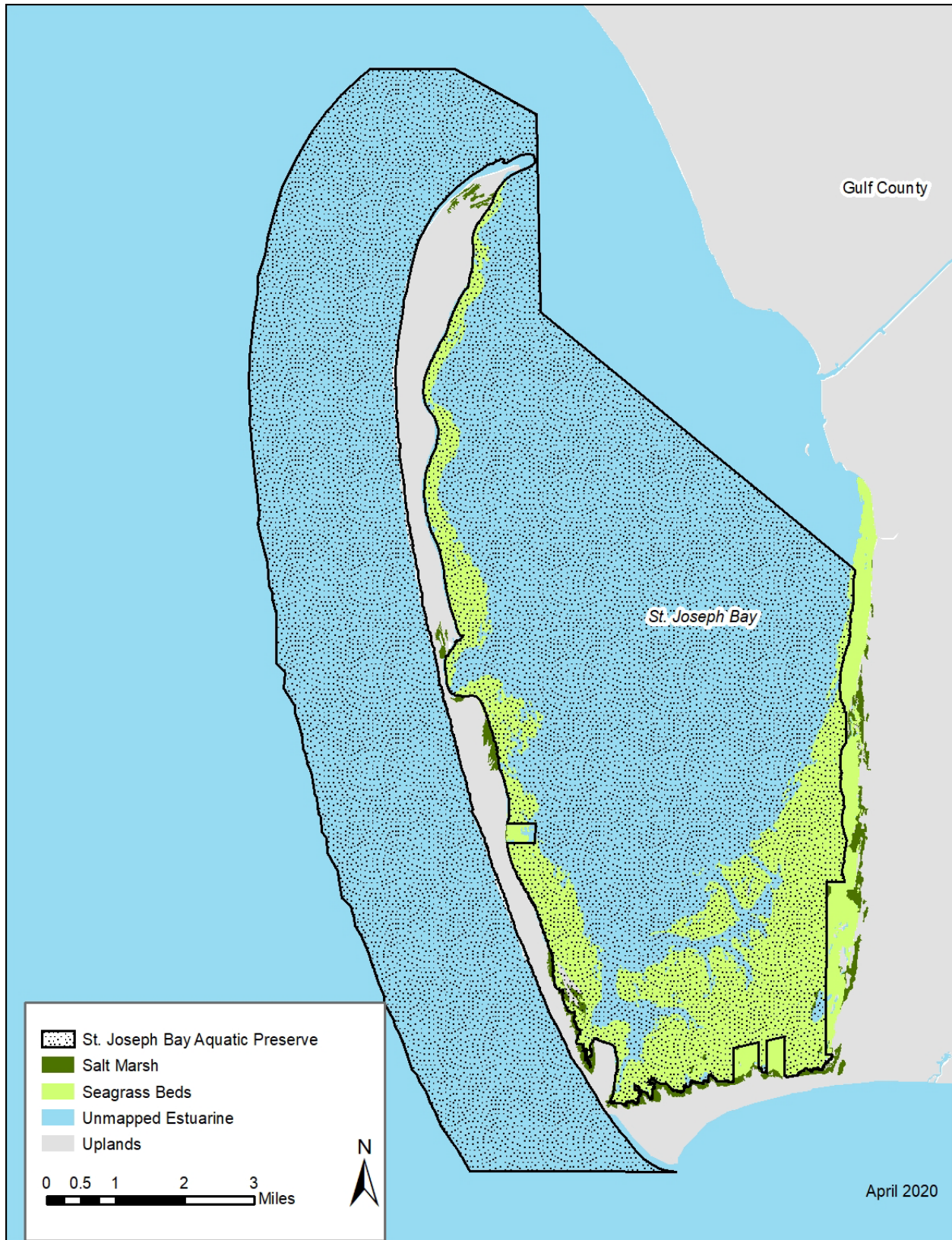
dredging and filling activities, water quality impacts from excess nutrient discharges (i.e. sewage outfalls) , and long-term scarring cuts from boat propellers, anchors and trawls.

Historically, seagrasses covered one-sixth of the bay bottom- approximately 9,669 acres (Sargent, Leary, Crewz & Krue, 1995). In 2010, seagrasses were measured with multi-spectral imagery as covering 7,166 acres in St. Joseph Bay (Wren & Yarbrow, 2016). Turtle grass dominates beds in St. Joseph Bay, but manatee grass, shoal grass, and drift red macroalgae occur in a few locations. Turtle grass occurs in depths up to ten feet (three meters); manatee grass often occurs with turtle grass and is located predominantly in areas along the western shoreline of the bay. Epiphyte loads on seagrass blades are increasing, presumably due to increasing nutrients in the water column. Propeller scarring continues to affect seagrass beds, especially in southern portions of the bay (Wren & Yarbrow, 2016).

Tidal Marsh - (synonyms: salt marsh, brackish marsh, coastal wetlands, coastal marshes, tidal wetlands). Marine and estuarine tidal marshes are floral based natural communities generally characterized as expanses of grasses, rushes and sedges along coastlines of low wave energy and river mouths. Black needlerush and smooth cordgrass are indicator species which usually form dense, uniform stands. The stands may be arranged in well-defined zones according to tide levels or may grade subtly over a broad area with elevation as the primary determining factor. In the upper reaches of river mouths, where estuarine tidal marsh begins to blend with freshwater tidal swamp and marsh, sawgrass may occur in dense stands. Tidal marsh soils are generally very poorly drained muck or sandy clay loams with substantial organic components and often a high sulfur content. The elevation of tidal marshes ranges from just below sea level to slightly above sea level with vegetation occupying the intertidal and supratidal zones. The frequently high density of plant stems and roots effectively traps sediments derived from upland runoff or from littoral and storm currents. The decaying, dead marsh plants and the transported detritus, which the living plants trap and accumulate, form peat deposits.

Tidal marsh plants live under conditions which would stress most plants. High salt content in the soil, poor soil aeration, frequent submersion and exposure, intense sunlight, and occasional fires make the tidal marsh community inhospitable to most plants and require a wide tolerance limit for its inhabitants. Typical zonation in this community includes smooth cordgrass in the deeper edges, grading to salt tolerant plants such as black needlerush that withstand less inundation. Tidal fluctuation is the most important ecological factor in tidal marsh communities, cycling nutrients and allowing marine and estuarine fauna access to the marsh. This exchange helps to make tidal marsh one of the most biologically productive natural communities in the world. In fact, primary productivity in tidal marshes surpasses that of most intensive agricultural practices.

A myriad of invertebrates and fish, including most of the commercially and recreationally important species such as shrimp, blue crab, oysters, sharks, grouper, snapper and mullet, use tidal marshes throughout part or all of their life cycles. Tidal marshes are also extremely important because of their storm buffering capacity and their pollutant filtering actions. The dense roots and stems hold the



Map 7 / Florida Natural Areas Inventory natural communities in St. Joseph Bay Aquatic Preserve.

unstabilized soils together, reducing the impact of storm wave surge. The plants, animals, and soils filter, absorb, and neutralize many pollutants before they can reach adjacent marine and estuarine communities.

Adverse impacts of urban development of tidal marshes include degradation of water quality, filling of marshes, increased erosion, and other alterations such as bulkheading and beach nourishment. The most attractive coastal areas for development activities frequently are the most ecologically fragile and are extremely vulnerable to development of any kind. Currently, salt marsh habitat spans approximately 720 acres in SJBAP.

Algal Bed - (synonyms: algal mats, periphyton mats). Marine and estuarine algal beds are floral based natural communities characterized as large populations of non-drift macro or micro algae. The dominant plant species include star alga (*Anadyomene stellata*), *Argardhiella*, *Avrainvella*, *Batophora*, *Bryopsis*, *Calothrix*, *Caulerpa*, *Chondria*, *Cladophora*, *Dictyota*, *Digenia*, *Gracilaria*, *Halimeda*, *Laurencia*, *Oscillatoria*, shaving brush (*Penicillus capitatus*), *Rhipocephalus*, and *Sargassum*. This community may occur in subtidal, intertidal, and supratidal zones on soft and hard bottom substrates. Vascular plants (e.g., seagrasses) may occur in algal beds associated with soft bottoms. Sessile animals associated with algal beds will vary based on bottom type. Marine and estuarine algal beds may grade into seagrass beds, tidal marsh, tidal swamp, or many of the other natural communities. The primary threat to algal beds is dredging and filling activities which physically remove or bury the beds. Other damage occurs from increased turbidity in the water column, which reduces available light, pollution, particularly from oil spills, and damage from boats. Macroalgal species are found throughout the seagrass beds in St. Joseph Bay; however, occurrence, abundance and distribution of algal species tends to vary annually. While not a current management plan strategy, future research and monitoring strategies may include the need to accurately assess the status of algal communities in St. Joseph Bay.

Composite Substrate - Marine and estuarine composite substrates consist of a combination of natural communities such as “beds” of algae and seagrasses or areas with small patches of consolidated and unconsolidated bottom with or without sessile floral and faunal populations. Composite substrates may be dominated by any combination of marine and estuarine sessile flora or fauna, or mineral substrate type. Typical combinations of plants, animals and substrates representing composite substrates include soft and stony corals with sponges on a hard bottom such as a limerock outcrop; psammophytic algae and seagrasses scattered over a sand bottom; and patch reefs throughout a coralgal bottom. Combinations of consolidated and unconsolidated substrate components offer the greatest opportunity for diversity and should be high priority areas for protection. Management requirements are negligible providing the composite community is adequately protected. Protection efforts will vary slightly based on components of the community; generally, habitat degradation can occur as a result of impacts water quality, as well as mechanical disturbance from anchoring, dredging, trawling and similar activities. These communities seem to be healthy as seagrasses and other floral and faunal communities continue to thrive; however, anchoring and propeller scarring are increasing threats to the health of these communities.

Octocoral Bed - (synonyms: gorgonians, sea fans, sea feathers, sea fingers, sea pansies, sea plumes, sea rods, sea whips, soft corals). Marine and estuarine octocoral beds are soft faunal based natural communities characterized as large populations of sessile invertebrates. This community is confined to the subtidal zone since the sessile organisms are highly susceptible to desiccation. Other sessile animals typically occurring in association with these soft corals are sea anemones (*Actiniaria*). An assortment of non-sessile benthic and pelagic invertebrates and vertebrates [e.g., sponges, mollusks, tube worms, sand dollars (*Clypeasteroida*), and fishes] are associated with octocoral beds. Sessile and drift algae can also be found scattered throughout octocoral beds. Octocoral beds require hard bottom (consolidated substrate (i.e., coquina, limerock, relic reefs) on which to anchor. Octocoral beds may grade into other marine and estuarine hard bottom subtidal, intertidal, and supratidal communities, as

FNAI Natural Community Type	# Acres	% of Area	Federal Rank	State Rank	Comments
Algal Bed	Unknown	Unknown	G3	S2	Characterized as large populations of nondrift macro or micro algae.
Composite Substrate	Unknown	Unknown	G3	S3	Consist of a combination of natural communities such as “beds” of algae and seagrasses.
Octocoral Bed	Unknown	Unknown	G2	S1	An assortment of non-sessile benthic and pelagic invertebrates and vertebrates (e.g., sponges, mollusks, tube worms, crabs, and fishes) are associated with octocoral beds.
Seagrass Bed	9669	17.0%	G3	S2	Typically characterized as expansive stands of vascular plants that occur in subtidal zones, in clear, coastal waters with moderate wave energy.
Sponge Bed	Unknown	Unknown	G2	S2	Characterized as dense populations of sessile invertebrates of the phylum Porifera, Class Demospongiae.
Tidal Marsh	763	1.3%	G5	S4	Characterized as estuarine wetland on muck/sand/limestone substrate that are inundated with saltwater by daily tides; saltmarsh cordgrass, needle rush, saltgrass, saltwort are common species.
Unconsolidated Substrate	Unknown	Unknown	G5	S5	Generally characterized as expansive, relatively open areas of subtidal, intertidal, and supratidal zones which lack dense populations of organisms.
Tidal Flats	53	0.1%	G5	S5	Tidal flats are categorized as an unconsolidated substrate and are created by sediment that is deposited by the changing tides.

Table 1 / Summary of Florida Natural Areas Inventory natural communities in St. Joseph Bay Aquatic Preserve.

well as soft bottom communities. Primary threats to octocoral beds include siltation from beach nourishment or restoration projects, anchor damage by nautical craft, trawling by commercial fishermen, collecting for tourist-oriented trade, and water pollution, particularly oil spills. Many species common in octocoral beds have been observed throughout the seagrass beds in St. Joseph Bay. However, occurrence, abundance and distribution of these species tends to vary. While not a current management plan strategy, future research and monitoring strategies may include the need to confirm the presence and status of octocoral beds in St. Joseph Bay.

Sponge Bed - (synonyms: branching candle sponge, Florida loggerhead sponge, sheepswool sponge). Sponge beds are soft faunal based natural communities characterized as dense populations of sessile invertebrates of the phylum *Porifera*, Class *Demospongiae*. Sessile and drift algae can also be found scattered throughout sponge beds in estuarine intertidal zones; however, sponge beds are primarily confined to subtidal zones. Sponge beds require hard bottom (consolidated) substrate (i.e., coquina, limerock, relic reefs) on which to anchor. Hard bottom substrate occurs sparsely throughout Florida in marine and estuarine environments. Sponge beds may grade into other marine and estuarine hard bottom subtidal, intertidal and supratidal communities (i.e., consolidated substrate, mollusk reef, or algal bed) as well as soft bottom communities (i.e., unconsolidated substrate, algal bed, seagrass bed, tidal marsh, tidal swamp).

Management considerations should include locating all true sponge beds within the state, thought to be more prevalent off the southwest coast, and providing protection for them from external degradation. Primary threats to sponge beds include siltation from beach “nourishment” or “restoration” projects, anchor damage by nautical craft, trawling by commercial fishermen, collecting for tourist-oriented trade, and water pollution, particularly oil spills. Sponges are observed throughout St. Joseph Bay in the seagrass beds; however, they may not be numerous enough to warrant description as a natural community of their own.

Unconsolidated Substrate - (synonyms: beach, shore, sand bottom, shell bottom, sandbar, mudflat, tidal flat, soft bottom, coralgall substrate, marl, gravel, pebble, calcareous clay). Unconsolidated substrates are mineral based natural communities generally characterized as expansive, relatively open areas of subtidal, intertidal, and supratidal zones which lack dense populations of sessile plant and animal species. Unconsolidated substrates are unconsolidated material and include coralgall, marl, mud, mud/sand, sand or shell. This community may support a large population of infaunal organisms as well as a variety of transient planktonic and pelagic organisms (e.g., tube worms, sand dollars, mollusks, isopods, amphipods, burrowing shrimp, and an assortment of crabs). While these areas may seem relatively barren, the densities of infaunal organisms in subtidal zones can reach the tens of thousands per meter square, making these areas important feeding grounds for many bottom-feeding fish, such as redfish, flounder, spot, and sheepshead. The intertidal and supratidal zones are extremely important feeding grounds for many shorebirds and invertebrates.

Unconsolidated substrate communities are associated with and often grade into beach dunes, tidal marshes, tidal swamps, grass beds, octocoral beds, sponge beds, and algal beds. Unconsolidated substrate communities, which are composed chiefly of sand (e.g., sand beaches), are the most important recreational areas in Florida, attracting millions of residents and tourists annually. This community is resilient and may recover from recreational disturbances. However, this community is vulnerable to compaction associated with vehicular traffic on beaches and disturbances from dredging activities and low dissolved oxygen levels, all of which can cause infaunal organisms to be destroyed or to migrate out of the area.

St. Joseph Bay’s tidal flats support a wide range of marine life and a large population of migratory birds. Tidal flats are categorized as an unconsolidated substrate and are created by sediment that is deposited by the changing tides and Gulf of Mexico. Tidal flats have been mapped as comprising approximately 53 acres in SJBP. Tidal flats serve as important habitat in preventing coastal erosion and act as natural filters for polluted waters. Tidal flats worldwide are under threat from predicted sea level rises, land claims for development, dredging due to shipping purposes, and chemical pollution.

Other Habitats

Open water - St. Joseph Bay consists of open water areas offshore and in the middle of the bay with depths reaching approximately 35 feet near the northern tip of the peninsula. In these areas, the bottom is covered with sediments of a fine grain nature with dominant amounts of silts and clays. These sediment types are found primarily below the 5.5-meter (18-28 foot) contour and represent approximately 20,000 acres of deep-water habitat (Hemming et al., 2002). Many of the commercially important benthic invertebrates are harvested from this habitat. Blue crabs (*Callinectes sapidus*) and several varieties of shrimp (*Farfantepenaeus aztecus*, *F. duorarum*,

Litopenaeus setiferus) are not restricted to this environment but feed and burrow extensively here when they leave the protection of the marshes. Spot (*Leiostomus xanthurus*), spotted seatrout (*Cynoscion nebulosus*), and many other dominant fish in the system feed extensively in this habitat.

Native Species

The diverse set of natural communities found in SJBAP provide habitat for a variety of plant and animal species (Appendix B.3). To date, more than 600 native species have been located and identified within SJBAP and the coastal lands immediately adjacent that are managed by SJPS and the St. Joseph Bay State Buffer Preserve.

Among the species of submerged aquatic vegetation found in the harbor, turtle grass, shoal grass, and manatee grass are the most common. These grass beds provide food, shelter and nursery grounds for a variety of marine species including blue crabs (*Callinectes sapidus*), cownose rays (*Rhinoptera bonasus*), and the West Indian manatee (*Trichechus manatus*).

Many recreationally and commercially important fish species utilize the aquatic preserve during part or all of their life cycle. Among these are sheepshead (*Archosargus probatocephalus*), spotted seatrout (*Cynoscion nebulosus*), ladyfish (*Elops saurus*), and spot (*Leiostomus xanthurus*).

Local bird species include American oystercatchers (*Haematopus palliatus*), black skimmers (*Rynchops niger*), snowy plovers (*Charadrius alexandrinus*), royal terns (*Sterna maxima*), and brown pelicans (*Pelecanus occidentalis*).

A complete survey of habitats and species within the aquatic preserve has not been completed. However, this plan addresses the need to conduct one within the next ten years.

Listed Species

SJBAP provides valuable habitat and protection for a variety of rare and protected species including fish, reptiles, mammals, and birds. Listed species are those which are listed by the U.S. Fish and Wildlife Service, National Marine Fisheries Service, the Florida Fish and Wildlife Conservation Commission (FWC), and FNAI as endangered, threatened or of special concern. Specific management strategies to promote the protection and recovery of these plants and animals are addressed later in this plan and all management actions will be in compliance with the conservation of these species.

Florida has more threatened and endangered native species than any state excluding California and Hawaii. Twenty species listed as endangered (four) or threatened (sixteen) have been documented to inhabit or utilize resources in SJBAP.

The St. Andrew beach mouse (*Peromyscus polionotus peninsularis*) is a subspecies of the small old-field mouse that inhabits sand dunes from the St. Joseph. The beach mouse is threatened by development along beaches that results in the destruction or degradation to sand dunes. This limits areas of habitat for the beach mouse, increasing fragmentation and possibly leading to isolation of populations. Increased vehicular traffic on sand dunes is also a threat for the beach mouse, as the increased traffic damages vegetation on dunes that the beach mice depend on for food and shelter. Additionally, hurricanes pose a risk to the beach mouse as they can cause damage sand dune habitat with intense winds and storm surge. Other threats include increased predation from feral and free-ranging cats, foxes, raccoons (*Procyon lotor*), and coyotes (*Canis latrans*) (FWC, n.d.-n).

Loggerhead sea turtles (*Caretta caretta*) are known to frequent the aquatic preserve area. Listed as a federally threatened species, loggerheads face many threats including entanglement and beach development. Additionally, SJBAP provides significant foraging habitat for the endangered juvenile green sea turtle (*Chelonia mydas*) and the Kemp's ridley sea turtle (*Lepidochelys kempii*), the most endangered turtle in the world. Juvenile green turtles use specific foraging habitats and are capable of navigating to specific habitats if artificially displaced due to cold stunning events. Continued increase in coastal development will cause degradation of vital nesting habitats for these animals, in addition to creating more artificial lighting which can cause confusion for new hatchlings (FWC, n.d.-l).

Gulf sturgeon (*Acipenser oxyrinchus desotoi*) are also among the list of federally threatened species present in the aquatic preserve. Due to overfishing, gulf sturgeon populations have declined dramatically, and the fish has been listed in Florida since the 1980s. Additional threats to these fish include development, dredging, and other man-made habitat alterations (FWC, n.d.-g).

The West Indian manatee, a species protected under the Endangered Species Act and Marine Mammal Protection Act, has also been documented in the aquatic preserve. These marine mammals are impacted by several anthropogenic alterations to their environment including decreasing water clarity and increasing boat traffic (FWC, n.d.-f).

The aquatic preserve is also a major foraging ground for migratory birds including piping plovers (*Charadrius melodus*), and least terns (*Sternula antillarum*). These threatened species utilize the area as a resting area and food resource during their trans-gulf migration (DEP, 2014).

Invasive Non-native and/or Problem Species

Invasive non-native species are species that have been introduced to an area where they pose a threat to the native species. Not all introduced species become invasive, but those that compete with native residents for resources such as food and space are harmful to the ecosystem and therefore considered to be invasive or problem species.

Florida is second only to Hawaii in the number of established invasive species (Simberloff, Schmitz, & Brown, 1997). Due to competition with native species or habitat alteration, invasive non-native species are the one of the most significant threats to native species, second only to direct habitat destruction (Ecological Society of America, 2004). Introductions of non-native marine invertebrates and seaweeds to coastal habitats in the United States have increased one hundred-fold in the last 200 years (Jacoby, Walters, Baker, & Blyler, 2003).

Non-native species can be introduced to a natural area in a variety of ways. They can be transported in the ballast water in ships, on the hulls or propellers of recreational boats, by flooding of aquaculture ponds during an extreme rain event, or through international food transport. The greatest pathway by which non-natives are introduced into Florida habitats is through escape or release by pet owners (FWC, n.d.-e).

Whether intentionally released or accidentally introduced, understanding how the local and global spread of non-indigenous species affects marine and terrestrial ecosystems is critical. Invasive plant species have been documented in the past; however, their presence is primarily terrestrial and adjacent to the aquatic preserve. Therefore, much of the assessment and treatment of invasive plant species is managed by other state agencies. Coyotes have been a terrestrial problem because they prey on threatened or endangered species, specifically sea turtle eggs and hatchlings. The St. Joseph Peninsula Turtle Patrol has reported that coyotes are the main predation issue on the Cape and tend to be worse in the areas of Rish Park and closest to SJPS (J. Swindall, personal communication, Dec 11, 2019).

Throughout the last decade, an increasing amount of research has focused on the impacts of the invasive lionfish (*Pterois volitans*) on native species and habitats and the efficiency of removal and control efforts. In recent years, lionfish have become successfully established in nonnative ranges and are classified as the worst marine invasion to date (FWC, 2019). Highly focused research, monitoring, and control efforts to implement effective lionfish control strategies and minimize adverse impacts has been a top priority. Due to limited resources, such as funding and the ability of lionfish to inhabit depths beyond the range of the current most-effective removal strategies (i.e. divers using spearfishing equipment), there is an increasing need to identify critical habitats for priority removal efforts and to develop more-efficient removal methods. Despite funding from private organizations and state and federal governments increasing the quality and quantity of research projects on invasive lionfish, gaps remain in the research that can be applied to improve management strategies (FWC, 2018).

In 2011, three lionfish were documented within SJBP (U.S. Geological Survey, 2019). Lionfish are a predatory reef fish. They eat native fish, which can reduce native populations and have negative effects on the overall reef habitat

and health. They can eliminate species that serve important ecological roles, such as fish that keep algae in check on the reefs. Lionfish also compete for food with native predatory fish such as grouper and snapper (FWC, n.d.-i).

Archaeological and Historical Resources

Aquatic preserves offer a window into Florida's cultural and historical past. They are often rich in food supplies and other natural resources, making them attractive to human inhabitants of all eras. The Division of Historical Resources, a division of the Department of State, has identified 27 archaeological sites and historical structures in the immediate vicinity of SJBAP although there are likely to be additional sites (Appendix B.5). Due to the moderate energy nature of the coastline, most relict Indian sites were probably either buried by sand or destroyed by wave action. Known sites include the Confederate Salt Works (GU00013), the Black's Island Lighthouse (GU00011), a shipwreck believed to be the remains of a mid-nineteenth steamer, the S.S. Florida (GU00109), old military sites, and old settlement/camp sites. The Old Cedar site (GU00085) is a largely intact Weeden Island shell midden. It is unusual for a northwest Florida Weeden Island type site because the midden has abundant conch and whelk remains, as well as other well preserved faunal and floral remains. During a limited 2000 investigation, four pit features were found below the deep midden and others are likely to be present.

In 1999, Florida purchased a major archaeological site and adjacent wetlands for preservation as part of the St. Joseph Bay State Buffer Preserve. Richardson Hammock (GU00010) is a large, well preserved shell midden site representative of the Deptford, Swift Creek, Weeden Island, and Fort Walton cultural periods (300 B.C. to A.D. 1500) (DEP, 2016). This site is known to contain human burials and is believed to be one of the largest and best-preserved archaeological sites of its kind in the northwest Florida Gulf Coast region; deposits include large gastropod midden with some bivalves and other shellfish, fish, other fauna, ceramics, lithic remains.

Other Associated Resources

The St. Joseph Bay ecosystem is viewed by many as one of the most diverse, productive, and important natural areas in Florida. The crystal-clear waters of the bay support an abundant and biologically diverse ecosystem that includes lush seagrass habitat, extensive salt marsh, scattered corals and mangroves, other benthic communities, commercial and recreational fish species, sea turtles, rays, sharks, and dolphins. Seagrasses cover approximately one-sixth of the bay bottom and salt marsh habitat virtually



Map 8 / Archaeological and cultural sites associated with St. Joseph Bay Aquatic Preserve.

borders the entire rim of the bay. Seagrasses and salt marsh habitat play an important role in the food web of St. Joseph Bay. A variety of commercial and recreational fish and invertebrate species utilize the bay's extensive habitat for nursery and foraging grounds. This area also serves as an important feeding, breeding, nesting and stopover area for a variety of bird species.

3.4 / Values

One of the most pristine coastal bays in all of Florida, the coastal waters of St. Joseph Bay supports a diverse ecosystem. It is rare to have conditions of high salinity and clear water immediately nearshore in a shallow, low-energy environment in the northern Gulf of Mexico (Beck et al., 2000). These conditions permit a high diversity of plants and animals to thrive. St. Joseph Bay offers great value as a natural laboratory for scientific research relating to biodiversity, high productivity and ecological relations within seagrass and salt marsh habitat. There are a number of animals that appear to occur at greater densities in St. Joseph Bay than in most other places in the northern Gulf of Mexico including stone crabs (*Menippe mercinaria*) bay scallops (*Argopecten irradians*) horse conchs (*Pleuroploca gigantea*), the largest gastropod in North America, lightning whelks (*Busycon perversum pulleyi*), and pen shells (*Atrina rigida*). Pen shells are abundant in the waters of the bay and develop and maintain rich communities of sessile and motile species (Munguia, 2004). Pen shell communities reflect how dynamic and complex marine systems can be and they represent the most abundant source of hard substrate for many fouling organisms in St. Joseph Bay. Historically, bay scallops occurred in healthy populations across the Panhandle; however, in recent years their range has decreased considerably. Today, Florida's bay scallops occur in isolated populations scattered along its west coast, and the majority are found in nearshore seagrass beds from Tarpon Springs in Pinellas County to Port St. Joe in Gulf County (FWC, n.d.-b). Harvesting bay scallops has been a treasured recreational activity on St. Joseph Bay for many years that has instilled decades-long family traditions and vacations. The recreational harvest of bay scallops is also very important to the local economy; the opportunity to harvest scallops attracts many users to the area, which in turn boosts commerce for local businesses, restaurants, eco-charters, and rental property companies.

Gulf County residents and tourists enjoy the aesthetic values and natural coastal resources surrounding the beaches of the Gulf of Mexico and St. Joseph Bay. These beaches encompass nearly 58 coastal miles of marine and estuarine waterfront (Gulf County, 2018). Although Gulf County is predominately rural, there is a diversity of lifestyles and activities. St. Joseph Bay is located in one of the least populated areas in the state, and the clear waters and adjacent conservation lands provide a variety of year-round recreational activities to nature enthusiasts including: fishing, boating, snorkeling, scalloping, birding, kayaking, canoeing, hiking, or just exploring.

Florida ranks first in the nation in boating activity. Total visitor spending in Gulf County was an estimated \$136.2 million in 2017 (prior to Hurricane Michael), an 11 percent increase from 2016 (Visit Florida, n.d.). The Gulf of Mexico, freshwater lakes and rivers, St. Joseph Bay and the Intracoastal Waterway provide excellent fishing opportunities, and recreational fishing is an important source of revenue for Gulf County with both in- and out-of-state anglers contributing to the local economy. Sport and shellfishing are the most active forms of tourism throughout the year. Although live shelling is prohibited within the aquatic preserve, discarded shells of more than 30 species of bivalves are actively collected by tourists and commercial retailers in the region. St. Joseph Bay offers some of the world's best fishing grounds for a variety of species including spotted seatrout (*Cynoscion nebulosus*), king mackerel (*Scomberomorus cavalla*) and Spanish mackerel (*Scomberomorus maculatus*), red drum (*Sciaenops ocellatus*), southern flounder (*Paralichthys lethostigma*), red fish (*Sciaenops ocellatus*), tarpon (*Megalops atlanticus*), mullet (*Mugil cephalus*, *Mugil curema*) and bay scallops. Recreational fishing is supported by seagrass habitat which increases tourism and benefits the local economy. Tourists spend hundreds of millions of dollars annually at hotels, restaurants, and outdoor outfitting shops along the coast.

A range of values have been calculated for seagrass meadows throughout the world based on many different factors such as exploitable fisheries, ecosystem services (including coastal protection, water filtration, carbon cycling, and nutrient cycling), tourism, and restoration/rehabilitation costs. A widely used value for the nutrient

cycling services that seagrasses provide is \$7,691 per acres/year, which was determined in 1997 (Unsworth & Cullen-Unsworth, 2010). The additional values of seagrass beds can be particularly variable to region because of the local value of tourism and the per pound of the supported fisheries. Determining the total economic value of seagrasses may increase the attention paid toward seagrass protection, rehabilitation, and restoration. Gray snapper (*Lutjanus griseus*), black sea bass (*Centropristis striata*), shrimp (*Penaeus aztecus*, *P. duorarum*, *Litopenaeus setiferus*), and blue crab (*Callinectes sapidus*) are among the many species that contribute to the overall value of commercial fishing in the region. Since most of Florida's fishery species (approximately 70 percent) spend at least part of their life cycle within seagrass communities, seagrasses are vital to the survival of these fishing industries (FWC, n.d.-m).

3.5 / Citizen Support Organization

In 1969 the St. Joseph Bay Aquatic Preserve was established to protect the important natural resources of St. Joseph Bay. Recognizing the importance of the protection of surrounding uplands to the preservation of the outstanding water quality and natural resources of the bay, the St. Joseph Bay State Buffer Preserve was created in 1995 with an initial 702 acres. Buffer preserve acreage has since expanded to more than 5,000 acres (DEP, 2016). Together, these preserves help protect a regionally significant natural area with outstanding ecological, economic and historical, and cultural values.

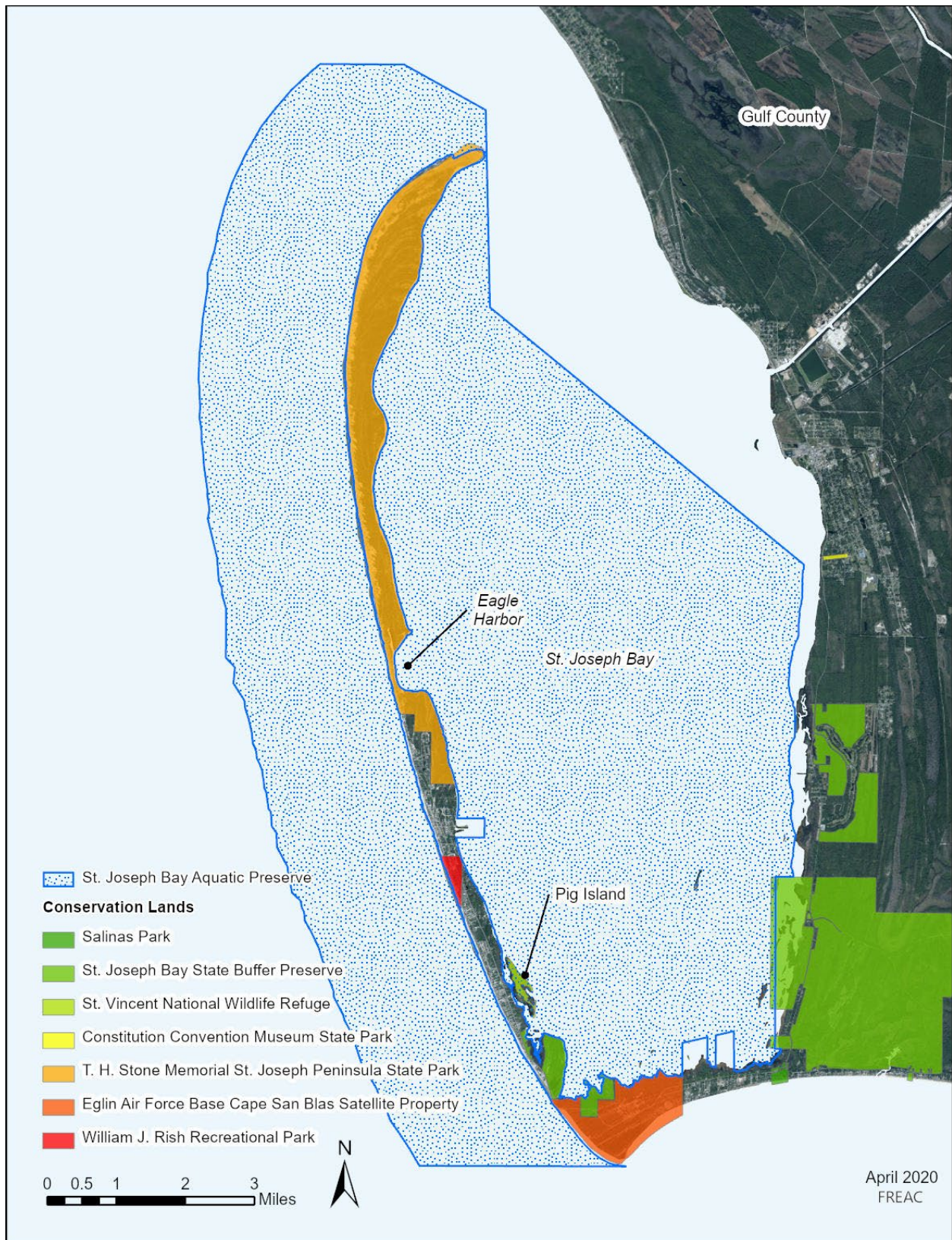
The Friends of the St. Joseph Bay Preserves, Inc. is a nonprofit 501(c)(3) Citizen Support Organization that was established in 2003 to protect, preserve, and support the St. Joseph Bay State Buffer Preserve and SJBAP. The Friends group raises funds, provides volunteer services, and promotes environmental awareness of the aquatic and buffer preserves. Citizens can help by volunteering to work at the preserves. Opportunities are available for a wide variety of interests and expertise. Becoming a member, making a donation or a memorial gift are some of the ways that the public's generosity will benefit the St. Joseph Bay preserves.

The Friends of St. Joseph State Parks is another nonprofit 501(c)(3) Citizen Support Organization that helps support SJBAP. Sponsored by the Florida Park Service, the organization is a non-profit 501(c)(3) corporation staffed by volunteers. Their mission is to preserve and protect the parks' cultural and natural resources; support individual park operations; and provide recreational and historical opportunities to area visitors and local citizens. For more information, please visit the Friends of St. Joseph State Parks website at www.friendsofstjosephpeninsulastatepark.org.

3.6 / Adjacent Public Lands and Designated Resources

SJBAP is located in Gulf County, on the northwest coast of Florida, in one of the least populated coastal areas in the state. St. Joseph Bay and Apalachicola Bay sit shoulder to shoulder but provide a great contrast in condition because most of the freshwater of the region goes to Apalachicola Bay (Beck et al., 2000).

The Apalachicola Bay Aquatic Preserve and the Apalachicola National Estuarine Research Reserve (ANERR) are located approximately 28 miles east of Port St. Joe. ANERR is one of 29 sites around the United States designated by the National Oceanic and Atmospheric Administration as a Research Reserve. ANERR consists of more than 238,000 acres which includes barrier island, estuarine, riverine, floodplain, and upland environments that are closely interrelated and influenced by each other. Apalachicola Bay is an exceptionally important nursery area for the Gulf of Mexico. More than 95 percent



Map 9 / Conservation lands near St. Joseph Bay Aquatic Preserve.

of all species harvested commercially, and 85 percent of all species harvested recreationally in the open Gulf spend a portion of their life in estuarine waters (DEP, 2013).

Billy Joe Rish State Park

Billy Joe Rish State Park is a state-owned 100-acre park located on Cape San Blas Road, approximately three miles south of the T.H. Stone Memorial St. Joseph Peninsula State Park entrance. Rish Park is run by the state under the Department of Children and Family Services, Agency for Persons with Disabilities. The park caters to young children with disabilities and hosts several camps and events throughout the year. The park is closed to the public. Since Hurricane Michael impacted the area in October 2018, the Rish facility has remained closed until repairs can be made.

St. Joseph Bay State Buffer Preserve

Approximately 5,000 acres of coastal natural forests and native plants buffer the St. Joseph Bay Aquatic Preserve and offer additional protection to the water quality in the bay and nearby drainages of Money Bayou and Depot Creek. The St. Joseph Bay Buffer Florida Forever Project has identified and seeks to acquire additional priority lands adjacent to St. Joseph Bay; land acquired by Florida Forever includes the St. Joseph Bay State Buffer Preserve. The primary purpose of the St. Joseph Bay State Buffer Preserve is to protect and preserve the wetlands and water resources of the adjacent aquatic preserve. By limiting development along the aquatic preserve's shores, the buffer prevents additional degradation of the water quality within the aquatic preserve. The management strategies outlined in the St. Joseph Bay State Buffer Preserve Management Plan work cooperatively with the management needs of the aquatic preserve to fulfill this goal (DEP, 2016).

St. Vincent National Wildlife Refuge

The St. Vincent National Wildlife Refuge is in Franklin and Gulf counties and is primarily comprised of an undeveloped barrier island just offshore from the mouth of the Apalachicola River with representative native animals. The refuge was established in 1968 and consists of approximately 12,490 acres. The refuge is managed by the U.S. Fish and Wildlife Service to preserve its highly varied plant and animal communities and public use opportunities including fishing, hunting, wildlife observation, hiking trails, and photography. Pig Island, a 46-acre island in St. Joseph Bay, is also a part of St. Vincent National Wildlife Refuge. Pig Island is only accessible by boat or paddlecraft (U.S. Fish and Wildlife Service, n.d.).

T.H. Stone Memorial St. Joseph Peninsula State Park

The T.H. Stone Memorial St. Joseph Peninsula State Park offers 9 nine miles of white sand beach, remarkable dune formations that are some of the oldest and tallest in the state, heavily forested interiors and favorable climates for year-round recreation (DEP, 2014). The park encompasses 2,717 acres and was ranked as America's Top Beach in 2002 by Dr. Stephen Leatherman (Dr. Beach) because it consists of the finest, whitest sand in the world and is not overdeveloped. The park is bounded on two sides by the waters of St. Joseph Bay and the Gulf of Mexico. Recreational activities include fishing, boating, sunbathing, snorkeling, swimming, surfing, kayaking, canoeing, camping, hiking, bicycling, wildlife viewing, and birding. The park offers an array of interpretive, recreational or educational programming for the enjoyment of park visitors. Programs include in-person presentations, guided walks, self-guided tours, interpretive facilities, and publications. Ranger-led programs are offered seasonally and by special appointment. In-person presentations have covered a wide range of topics and formats, including park ecology and wildlife, "how to" presentations, and organized recreational activities. The number of visitors to the park has continued to increase since the mid-1990s when the park had a 50 percent increase in the annual number of visitors. In the 2016-17 fiscal year, approximately 273,000 people visited the state park, generating \$1.75 million in sales tax revenue alone and 420 jobs (DEP, 2017). In FY 2019-2020, park attendance only reached 88,000, with a significant portion of that visitation being attributed to boat trailers launching out of the park to access the aquatic preserve. Current visitation is significantly lower than in the past, mostly due to limited park access (D. Alsentzer,

personal communication, September 29, 2020). Visitor expenditures in FY 2019-2020 contributed approximately \$7.6 million, generating an additional \$533,000 in sales tax revenue and 120 new jobs (DEP, 2020a).

On October 10, 2018, Hurricane Michael (Category 5) struck the Florida Panhandle with the initial impact in Gulf and Bay counties. The extreme storm conditions greatly impacted the St. Joseph Peninsula at Eagle Harbor, located within SJPSP; in addition to catastrophic damage to the infrastructure of the park, storm surge carved through the dune system, creating a new inlet. This new breach/opening was approximately 1300 ft wide and seven ft deep (DEP, 2019b). Roads, utilities, and facilities in the park camping, cabin, and staff residence areas were severely damaged and impassable.

Through the use of the U.S. Army Corps of Engineers post-storm LiDAR survey, DEP determined the peninsula north of the breach sustained a net loss of approximately one million cubic yards of sand above mean low water. DEP's Florida Park Service (FPS) held a public meeting on January 15, 2019 to hear public comments and recommendations regarding post-hurricane recovery efforts for SJPSP. Recognizing the great environmental and economic significance of this park, both regionally and statewide, FPS sought public input before planning long-term solutions. Many of the submitted public comments wanted to see the park restored such that the park's unique recreational opportunities (RV camping, kayaking, swimming, etc.) would again be available to the public while others wanted to keep the breach open. In addition to creating new eco-tour and recreational opportunities, it was hypothesized that this new breach was introducing large amounts of seawater into St. Joseph Bay, especially with incoming tides and westerly winds, increasing the flushing in St. Joseph Bay. It was inferred that this influx of seawater may help stabilize salinity in the bay, which would benefit seagrasses and other organisms (i.e. bay scallops); but currently there is no scientific data to support this theory. Research about currents, flows, sedimentation, water quality (salinity), etc. would have been necessary on both the Gulf and bay side of the breach to determine if the quantity and flow rate of the incoming seawater had any impacts to the bay.

After the public meeting, FPS organized multiple agency-wide planning and coordination meetings to discuss plans to restore SJPSP and how to address the new inlet or breach. Public access north of the former breach site for day use and overnight accommodation faced a multi-year closure. Many potential options were discussed including, but not limited to, building a bridge or causeway over the inlet and performing maintenance dredging to keep the breach open; constructing jetties to prevent the natural sediment transport (See Topography and Geomorphology and Hydrology Sections) from filling in the breach, coupled with routine maintenance dredging of the breach to maintain flow/access; filling in the breach and restoring dune system to pre-storm conditions, ultimately leading to the restoration of the park's infrastructure; or perform no maintenance and allow nature to run its course. Early recovery efforts reopened the southern portion of the park on January 19, 2019 for day use beach access and boat launches.

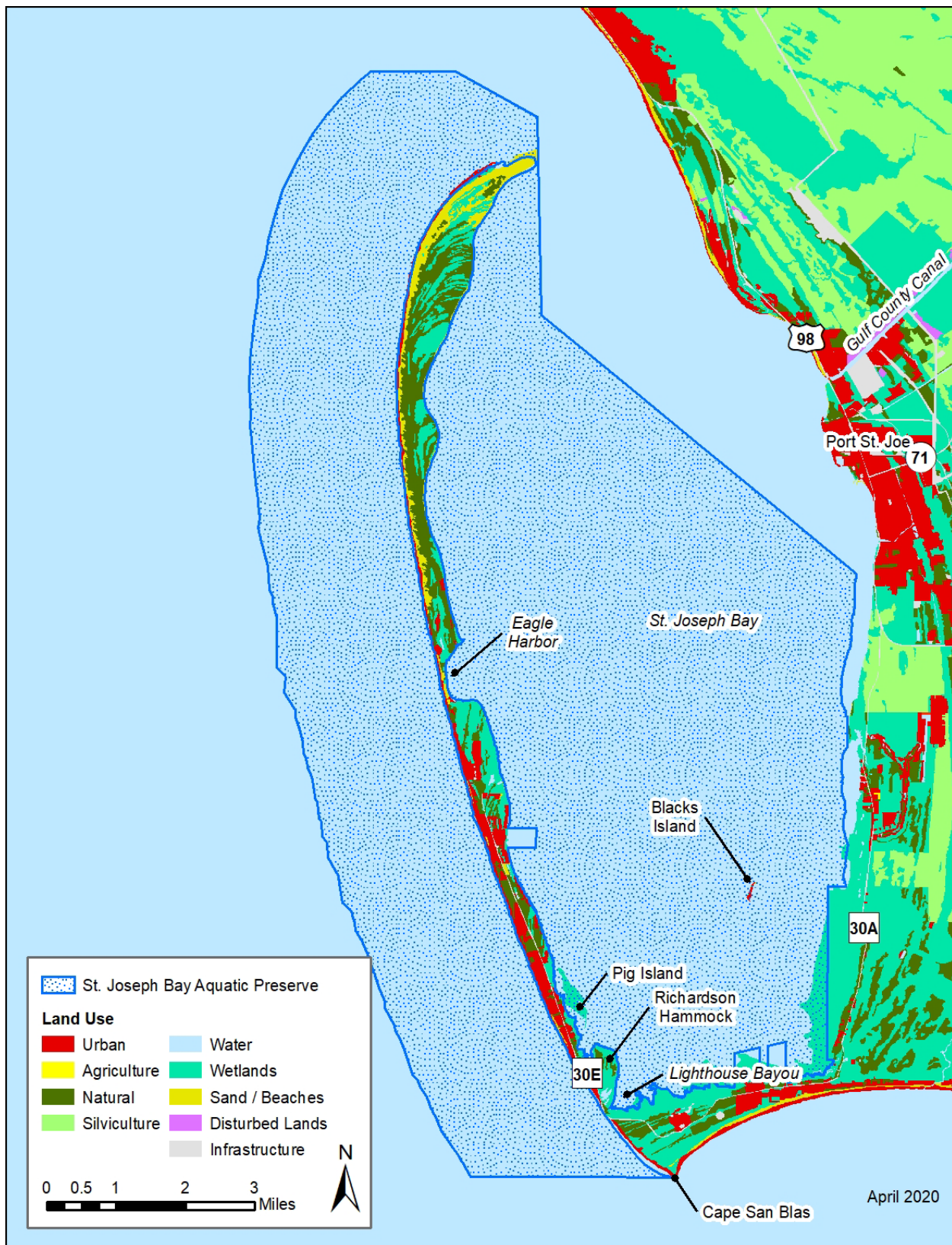
In addition to expressing concerns over natural resources, critical habitats, and listed species, the Central Panhandle Aquatic Preserves office (CPAP) provided existing water quality and seagrass monitoring data to show changes to the bay and natural communities post-storm. Water quality data revealed the average salinity in the bay was significantly lower than historical recorded salinity ranges in the bay; in fact, salinities did not return to historical ranges until March 2019. It was hypothesized that freshwater coming out of the Gulf County Canal was being pulled across the bay towards the breach while the breach was open, especially during outgoing tides and weather events with strong Easterly winds. This may have caused increased amounts of freshwater to be circulated around the bay (lower salinities observed at all sampling locations). Over time, the breach began to naturally fill in at an exponential rate due to the incredible sediment transport rate along Cape San Blas (See Topography and Geomorphology and Hydrology Sections). As the breach continued to fill in, salinities in the bay began to return to historical ranges; it was hypothesized that as the breach closed, the movement (pulling) of freshwater across the bay may have been reduced, allowing the bay to resume natural flow and circulation patterns, and return to typical salinity ranges.

FPS held a second public informational meeting on April 30, 2019 to provide updates on post-hurricane recovery planning for SJPS. CPAP presented water quality and seagrass data to while FPS presented construction and dune restoration plans. Many environmental aspects were evaluated in the development of the restoration plan which include impacts/benefits to listed species, impacts to water quality and submerged resources within SJBAP, and developing future resource management plans focused on coastal resiliency. As of May 2019, the breach had completely filled in and continues to naturally accrete sand. FPS plans to augment the breach area with compatible sand to be able to construct a road, which would re-connect the park to the RV campsite and allow for continued repair to the park infrastructure. Also, FPS designed a multi-layered dune restoration project that has proven successful in similar areas; additionally, this type of dune restoration has been successful in re-establishing habitat for listed species, such as the beach mouse. FPS organized two additional public meetings in September 2021 to inform the public of the renovation and restoration progress at SJPS. CPAP continues to observe the Eagle Harbor area and is committed to working with FPS in all post-hurricane recovery efforts.

3.7 / Surrounding Land Use

Population growth and development have many implications for Florida's coastal areas. As populations continue to rise, the need and demand for development, infrastructure, and services increases, which could lead to environmental and economic impacts. Population increase exerts additional pressure on natural resource consumption. Land use planning for the protection of natural resources and the associated ecosystems is based on the principle that a location's environmental characteristics render the area inherently more suitable for some land uses than others (NFWFMD, 2017). Impacts on marine resources from adjacent land uses may result from either the direct use of the marine resources through such structures as docks, piers, and marinas or through effects from upland activities through means such as storm water runoff and septic tank drainage (point and nonpoint sources of pollution). The ability to anticipate land use change and predict the consequences of the changes will depend on the ability to understand the past, current, and future drivers of land use change. These factors as well as other emerging social and political factors may have significant effects on future land use. Patterns of land use, land cover change, and land management are shaped by the interaction of economic, environmental, social, political, and technological forces on local to global scales.

Local government comprehensive plans are intended to guide future development to "preserve and enhance present advantages; encourage the most appropriate use of land, water and resources, consistent with the public interest; overcome present handicaps; and deal effectively with future problems that may result from the use and development of land within their jurisdictions" (Section 163.3161(3), Florida Statutes [F.S.]). The St. Joe Company historically owned adjacent lands that had traditionally been used to grow trees as a source of pulpwood for the production of paper products (NFWFMD, 2017). Recent reorganization of the company changed the company's focus, however, to large-scale, residential, commercial, resort and related development. In 2013, St. Joe Company sold approximately nearly 383,000 acres of land to AgReserves, Inc, a tax paying affiliate of the Church of Jesus Christ of Latter-day Saints who also manages The Deseret Ranches in Central Florida. AgReserves, Inc purchased the St. Joe land for timber and agriculture and assumed all existing agreements and contracts involving timber production (Harrington, 2013).



Map 10 / Land use surrounding St. Joseph Bay Aquatic Preserve

The margins of St. Joseph Bay are surrounded by the city of Port St. Joe along the eastern shoreline near the mouth of the canal, St. Joseph Bay State Buffer Preserve further south along the eastern shoreline, and by SJPSP located on the western shoreline. Residential development is steadily increasing around the bay and along St. Joseph Peninsula. Major industries located adjacent to the bay, or along the nearby Gulf County Canal, include a former paper mill site, two chemical companies and a coal-handling facility (Hemming et al., 2002). Eastern Shipbuilding currently operates a shipyard at the former paper mill location. The Gulf County Canal is maintained to the same standards as the Gulf Intracoastal Waterway and connects the shipping canal to the Intracoastal Waterway. Commercial fishing vessels and associated fish-processing facilities are also located on the canal. Historically, the city of Port St. Joe operated an Industrial Wastewater Treatment Plant with a permitted discharge into the Gulf County Canal. The point of discharge was located on the south side of the canal approximately 0.42 miles above the point where the canal empties into the bay (Hemming et al., 2002). Discharge volume was approximately 39.5 million gallons per day (U.S. Environmental Protection Agency [EPA], 1996). Currently, there is no direct wastewater discharge into the Gulf County Canal; wastewater is discharged into spray fields with a permitted flow of 3.1 million gallons per day (NFWFMD, 2017). Point sources are permitted to discharge certain pollutants in specific amounts to the land or surface waters. The National Pollutant Discharge Elimination System is administered by the EPA, but the permitting of discharges within Florida has been delegated to the DEP. These permits are reviewed and renewed at designated intervals. The overall assimilative capacity of the system is unknown, although specific permits are issued based on the results of water quality-based effluent limit studies (NFWFMD, 2017).

To ensure that water quality does not further diminish, it is imperative to preserve the surrounding wetlands directly adjacent to the bay. Continued land acquisitions for the purposes of conservation in areas that directly protect the neighboring wetlands from nonpoint sources of pollution will ensure high water quality standards. Thus, obtaining additional remaining undeveloped shoreline surrounding the bay is a high priority. Priority land acquisition parcels have been developed, with an emphasis on the most productive ecosystems that border St. Joseph Bay Aquatic buffer zones serve as natural boundaries that aid in water quality protection by filtering pollutants, sediments, and nutrients from storm water runoff as well as providing erosion control and habitat for native species of plants and animals.



Aquatic preserve staff conduct annual surveys to monitor the health of the seagrass beds in the bay.

Chapter 4 / The St. Joseph Bay Management Programs and Issues

The work performed by the Florida Department of Environmental Protection's (DEP) Office of Resilience and Coastal Protection (ORCP) is divided into components called management programs. In this management plan, all site operational activities are explained within the following four management programs: Ecosystem Science, Resource Management, Education and Outreach, and Public Use.

The hallmark of Florida's Aquatic Preserve Program is that each site's natural resource management efforts are in direct response to, and designed for, unique local and regional issues. When issues are addressed by an aquatic preserve it allows for an integrated approach by the staff using principles of the Ecosystem Science, Resource Management, Education and Outreach, and Public Use Programs. This complete treatment of issues provides a mechanism through which the goals, objectives and strategies associated with an issue have a greater chance of being met. For instance, an aquatic preserve may address declines in water clarity by monitoring levels of turbidity and chlorophyll (Ecosystem Science - research), planting eroded shorelines with marsh vegetation (Resource Management - habitat restoration), creating a display or program on preventing water quality degradation (Education and Outreach), and offering training to municipal officials on retrofitting storm water facilities to increase levels of treatment (Education and Outreach).

Issue-based management is a means through which any number of partners may become involved with an aquatic preserve in addressing an issue. Partnering is a necessity, and by bringing issues into broad public consciousness,

partners are able to ensure that an issue receives input from perspectives that the aquatic preserve may not normally include.

This section will explore issues that impact the management of St. Joseph Bay Aquatic Preserve (SJBAP) directly or are of significant local or regional importance such that the aquatic preserve's participation in them may prove beneficial. While an issue may be the same from preserve to preserve, the goals, objectives and strategies employed to address the issue will likely vary depending on the ecological and socioeconomic conditions present within and around a particular aquatic preserve's boundary. In this management plan, SJBAP will characterize each of its issues and delineate the unique goals, objectives and strategies that will set the framework for meeting the challenges presented by the issues. Beneficial project proposals that were initially developed as Gulf Restoration Priority Projects, are identified in Appendix D.4, if opportunities become available to support those projects in the ten-year span of this management plan.

Each issue will have associated goals, objectives, and strategies. Goals are broad statements of what the organization plans to do or enable in the future. They should address identified needs and advance the mission of the organization. Objectives are a specific statement of expected results that contribute to the associated goal, and strategies are the general means by which the associated objectives will be met. Appendix D contains a summary table of all the goals, objectives and strategies associated with each issue.

4.1 / The Ecosystem Science Management Program

The Ecosystem Science Management Program supports science-based management by providing resource mapping, modeling, monitoring, research and scientific oversight. The primary focus of this program is to support an integrated approach (research, education and stewardship) for adaptive management of each site's unique natural and cultural resources. ORCP ensures that, when applicable, consistent techniques are used across sites to strengthen the state of Florida's ability to assess the relative condition of coastal resources. This enables decision-makers to more effectively prioritize restoration and resource protection goals. In addition, by using science-based approaches to establish baseline conditions of aquatic habitats, the Ecosystem Science Management Program allows for objective analyses of the changes occurring to the state's natural and cultural resources.

4.1.1 / Background of Ecosystem Science at St. Joseph Bay Aquatic Preserve

In 2011, budget cuts forced the Florida Department of Environmental Protection (DEP) to reduce staff and close several aquatic preserve offices, resulting in reduced oversight of SJBAP. As a result of a grant from the National Fish and Wildlife Foundation in 2014, the management of SJBAP was re-established as part of the Central Panhandle Aquatic Preserves (CPAP); the grant provided funding to re-establish management of the St. Andrews and St. Joseph Bay Aquatic Preserves through implementation of a comprehensive management program, seagrass monitoring, and education and outreach to boaters and local communities. The ecosystem science management programs resumed in the spring of 2015. Monitoring programs continue to evolve as partnerships and other opportunities become available.

Resource Mapping

In order to effectively manage resources within SJBAP, it is imperative to conduct routine mapping of these resources. This allows for the identification of areas within the aquatic preserve where increased research, monitoring, and management emphasis is necessary. Habitat mapping within St. Joseph Bay has focused on identifying and classifying various resources within the aquatic preserve that require protection by the management program.

- In 1980, a St. Joseph Bay Seagrass Mapping Project was performed by the U.S. Environmental Protection Agency (EPA), the U.S. Fish and Wildlife Service (USFWS) and the Florida Marine Research Institute, now the Fish and Wildlife Research Institute (FWRI). This mapping effort was conducted in part for the Minerals Management Service as part of the Environmental Impact Statement for offshore oil and gases. In 2001, these data were updated.

- In 1995, a FWRI Technical Report, “Scarring of Florida’s Seagrasses: Assessment and Management Options,” indicated that Gulf County had 8,170 acres of seagrass habitat. The studies in this report found that 4,840 acres of this habitat were lightly-to-severely scarred by vessels.
- In 2006, a Coastal Zone Management (CZM) grant was secured for hyperspectral mapping of SJBAP. Because of the good water clarity in the bay, St. Joseph Bay was chosen as the pilot project for these mapping efforts in coordination with the Florida Environmental Research Institute.
- In 2008, ORCP secured a CZM grant for additional post processing of the 2006 data to determine seagrass coverage/extent and to produce an accurate high resolution bathymetric map of St. Joseph Bay. Areal extent, abundance and productivity of seagrass meadows, as well as shallow water bathymetry (<2m), were quantified and mapped across the bay using a combination of algorithms and models.
- In 2009, the Florida Fish and Wildlife Conservation Commission’s (FWC) FWRI began the Seagrass Integrated Mapping and Monitoring (SIMM) Program to report on the status and trends of Florida seagrasses through mapping and monitoring data produced and contributed by a large group of partners and collaborators. Mapping of seagrasses occurs at least every six years, with St. Joseph Bay being mapped in 2010, and most recently in 2016.
- Beginning in late 2017, as part of the Natural Resource Damage Assessment Seagrass Recovery project, high resolution aerial imagery of seagrass areas was obtained within St. Joseph Bay in Gulf County, FL through the use of Unmanned Aerial Vehicles. The collection of this imagery would be used to assess seagrass coverage in SJBAP and to identify severely propeller scarred areas for restoration.

Modeling

Modeling can be a powerful tool to support sustainable management and can be used as an environmental assessment tool. There are no current modeling efforts established for SJBAP, however, with development rapidly increasing, there may be a future need to establish appropriate models to examine carrying capacities. Ideas may include creating a conceptual model of St. Joseph Bay and the effects that natural phenomena, water management, growth, and land use intensification can have on the bay by altering hydrology and freshwater inflow, changing the water quality and increasing contaminants, altering habitat, and the effect that these activities may have on fisheries, wading bird communities, coral habitat, algal blooms, and seagrass and salt marsh habitat.

- In 2008, Waycott et. al investigated the effects of accelerating seagrass loss on a global scale; much of the available data came from the Big Bend and Panhandle region. Their research revealed that continued seagrass loss will result in significant ecological consequences. It was determined that if the current rate of seagrass loss is sustained or continues to accelerate, the ecological losses will also increase, causing even greater ill-afforded economic losses (Waycott et. al, 2009).

Monitoring and Research

The research and monitoring efforts within the aquatic preserve have included limited, internal research projects, research projects led by other agencies, and contracts with outside entities to accomplish necessary research.

- In 1957, R.R. Hathaway studied the biology of the crown conch, (*Melongena corona*), and its predation on oysters.
- In 1961, The Florida State Board of Health found a degradation of water quality of St. Joseph Bay compared to the previous survey in 1949.
- In 1962, R.A. Steward and D.S. Gorsline produced a sedimentary history of St. Joseph Bay.
- In 1966, B.J. Copeland conducted an assessment of the effects of industrial discharges on the water quality and biota of St. Joseph Bay.
- In 1968, R.J. Stokes, E.A. Joyce and R.M. Ingle completed a fishing survey of the sunray venus clam, (*Macrocallista nimbosa*).
- In 1970, E.W. Cake identified predator-prey relationships involving the sunray venus clam along the

Gulf Coast of Florida.

- In 1970, E.A. Joyce presented a history and current status of the sunray venus clam in St. Joseph Bay.
- In 1972, J.A. Eidemiller completed a thorough inventory of fauna of the seagrass beds, and the predator-prey relationships.
- In 1972, J.W. Jolley conducted a study on the sunray venus clam.
- In 1972, J.K. McNulty, W.N. Lindall, and J.E. Sykes summarized biota, hydrology and pollution sources for St. Joseph Bay.
- In 1973, Port St. Joe's Water Pollution Control Department established water quality monitoring stations in the vicinity of the Gulf County Canal in Port St. Joe.
- In 1974, D.K. Stauble and D.A. Warnke determined the bathymetry and sedimentation of Cape San Blas shoal and shelf.
- In 1976, M.L. Haines examined the reproductive cycle of the sunray venus clam.
- In 1978, the EPA evaluated the city wastewater treatment plant in Port St. Joe.
- In 1978, R.C. Phillips, M.K. Vincent, and R.T. Huffman completed a transplant study of shoal grass.
- In 1979, N.M. Osbourne studied the polychaete worm community and the influence of seagrass and sediment habitat on worm populations.
- In 1980, J.M. Foster discussed the biology and collection of the bay scallop.
- In 1981, K.J. Savastano, K.H. Faller, and R.L. Iverson used remote sensing to construct a map of bottom features in St. Joseph Bay, including seagrass coverage.
- In 1983, G.W. Thayer, J.J. Govoni, and D.W. Connally studied the carbon content in the marine food web off Louisiana and Cape San Blas.
- From 1985-present, the Florida Department of Agriculture and Consumer Services (FDACS) has conducted water sampling on St. Joseph Bay to assess microbiological conditions (fecal coliform and toxic marine plankton) of coastal waters to reduce the risk of shellfish-borne illness. Sanitary surveys have been conducted to identify waters where contaminants may be present in amounts that present a human health hazard; hence, should not be open to harvest.
- In 1985, A. Rudloe studied the variation in the expression of lunar and tidal behavior rhythms in the horseshoe crab (*Limulus polyphemus*).
- In 1985, R.D. Vetter analyzed the sulfur content of three species of clams in St. Joseph Bay.
- In 1986, E.L. Barnett and J.S. Gunter conducted a comprehensive shellfish harvesting survey for St. Joseph Bay.
- In 1986, W.R. Brooks and R.N. Mariscal studied two species of hermit crabs (*Pagurus pollicaris* and *P. impressus*) with regard to their anemone-carrying behavior. Two populations were studied, one in St. Joseph Bay and one in Turkey Point, Florida.
- In 1986, C.N. D'Asaro describes the egg capsules, developmental pattern, and reproductive behavior of eleven gastropod mollusks from northwest Florida.
- In 1987, K.L. Heck and K.A. Wilson showed that seagrasses provide a significant, though variable, refuge from predation for decapod crustaceans.
- In 1990, J.F. Valentine and K.L. Heck studied the effects of the variegated sea urchin, (*Lytechinus variegatus*) in turtle grass seagrass beds in St. Joseph Bay.
- In 1991, a small bay scallop project was initiated through FWRI to determine the status of the bay scallop population in Florida.
- In 1991, J.W. Crenshaw, P.B. Heffernan, and R.L. Walker compared genetics and growth rates between populations of the southern bay scallop, from Georgia and St. Joseph Bay.
- In 1991, J.F. Valentine and K.L. Heck determined the role of sea urchin grazing in regulating subtropical seagrass meadows,
- In 1993, A.S. Hasan, G.A. Hines, and S.A. Watts examined the biosynthesis of sex steroids in sea urchins in St. Joseph Bay.

- In 1993, P.B. Heffernan, F.L. Walker, and M. Ryan studied genetics and growth rates of the southern bay scallop from St. Joseph Bay.
- In 1993, R.A. Roller and W.B. Stickle studied the effects of temperature and salinity on larval survival, physiology, and early development in variegated sea urchins.
- In 1993 and 1994, R.L. Walker and P.B. Heffernan measured the age, growth rate, and size of the southern surf clam (*Spisula solidissima similis*).
- In 1994, J.F. Valentine and K.L. Heck examined the role of mussels in seagrass meadows.
- In 1994, S.D. Beddingfield and J.B. McClintock determined that a combination of low air temperatures and extreme tides caused a sea urchin die-off in 1993.
- In 1994 and 1995, M.L. Kuhlmann examined the interaction between the pen shell and its predator, the horse conch in St. Joseph Bay, and its indirect effect on other species.
- In 1994, J.F. Valentine, K.L. Heck, P. Harper, and M. Beck determined the effects of bioturbation in controlling turtle grass abundance.
- From 1994-present, FWC/FWRI conducted annual adult scallop population monitoring in St. Joseph Bay.
- In 1995, M.W. Beck studied the effects of available sheltering habitat on the reproduction and survival of stone crabs in St. Joseph Bay.
- In 1995, S.D. Beddingfield and J.B. McClintock studied the differences in growth, reproduction and recruitment of this sea urchin in the various seagrass habitats of St. Joseph Bay.
- In 1995, P. Bologna studied the scallop growth, population production, and predation rate in various seagrass beds in St. Joseph Bay.
- In 1995, K.L. Heck and J.F. Valentine studied the effects of sea urchins grazing upon seagrass beds in St. Joseph Bay.
- In 1995, F.J. Sargent, T.J. Leary, and D.W. Crews studied the status of the seagrass beds in St. Joseph Bay.
- From 1995-2017, FWC/FWRI conducted monthly scallop recruitment monitoring in St. Joseph Bay.
- The Florida Department of Natural Resources, now the DEP, conducted a long-term beach and offshore profile monitoring project that included 85 monitoring stations along the gulf shoreline of the aquatic preserve as well as obtaining aerial videos of the coastline.
- Since 1998, the Florida State University Coastal and Marine Lab has been assessing coastal shark abundance and community structure across many geographic areas in the northeastern Gulf of Mexico. Researchers have conducted geographic and ontogenetic variation analyses, as well as paired surveys, designed to assess the relative abundance of sharks and large bony fishes over space and time.
- From 2002-2007, G.I. Lopez used optical dating to describe the late quaternary evolution of the Apalachicola Barrier Island Complex.
- In 2005, R. Crandall studied the effects of multiple disturbances on congeneric re-seeders and re-sprouters (*Hypericum* spp.) along Gulf Coast ecoclines.
- In 2006, J. Huffman examined the historical fire regimes in southeastern pine savannas in the Little St. George Island fire history.
- From 2006-present, J. Fodrie, K. Heck, and M. Johnson have investigated the role and trajectory of seagrass meadows as essential nursery habitat in the northern Gulf of Mexico,
- In 2006, P. Munguia studied the diversity patterns in pen shell communities.
- From 2007-2009, P. Prado studied the influence of seagrass canopy structure in juvenile and adult sea urchin predation: a mega-scale comparison across temperate (Mediterranean-North Florida-Western Australia) ecosystems.
- In 2008, B. Balmer et al determined seasonal abundance and distribution patterns of common bottlenose dolphins (*Tursiops truncatus*) near St. Joseph Bay, Florida.

- In 2008, J. Indorf studied the phylogeography of the marsh rice rat (*Oryzomys palustris*) in wetlands of the southeastern United States.
- From 2010 – present, P. Carlson and L. Yarbro have assimilated seagrass monitoring and mapping research to produce FWC’s Seagrass Integrated Mapping and Monitoring (SIMM) report.
- In 2010, B. Balmer et al studied linking dive behavior to satellite-linked tag condition for a bottlenose dolphin along Florida’s northern Gulf of Mexico coast.
- In 2012, R. Hughes studied the effects of seagrass wrack on marsh plants.
- In 2013, K. Bjorndal et al investigated movements and habitat-use of loggerhead sea turtles in the northern Gulf of Mexico during the reproductive period.
- In 2014, M. Lamont and C. Houser studied spatial distribution of loggerhead turtle emergences along a highly dynamic beach in the northern Gulf of Mexico.
- In 2014, K. Hart et al researched migration, foraging, and residency patterns for Northern Gulf loggerheads: implications of local threats and international movements.
- In 2014, M. Lamont et al estimated vital rates for a declining loggerhead turtle subpopulation: implications for management.
- In 2015, N. Williams et al analyzed winter diets of immature green turtles on a northern feeding ground: integrating stomach contents and stable isotope analyses.
- In 2015, M. Lamont et al studied spatial requirements of different life-stages of the loggerhead turtle from a distinct population segment in the northern Gulf of Mexico.
- In 2015, M. Lamont determined home range and habitat use of juvenile green turtles in the northern Gulf of Mexico.
- In 2015, I. Fujisaki and M. Lamont studied the effects of large beach debris on nesting sea turtles.
- In response to a major red tide event in 2015, FWC/FWRI has conducted scallop restoration efforts on St. Joseph Bay from 2016-present.
- From 2016-2018, J. Cebrian and L. West studied carbon and nitrogen cycling in the northeastern Gulf of Mexico: Functional equivalency between primary producers.
- In 2018, E. Jones conducted mangrove propagule manipulation research at the St. Joseph Bay State Buffer Preserve.
- From 2018-present FWC/FWRI conducted monthly scallop recruitment monitoring in St. Joseph Bay.
- In 2018, B. Balmer et al determined long-term trends in a northern Gulf of Mexico common bottlenose dolphin population in the wake of the Deepwater Horizon oil spill.
- In 2018, I. Fujisaki, M. Lamont, and R. Carthy examined temporal shift of sea turtle nest sites in an eroding barrier island beach.
- In 2018, K. Hart et al studied how marine threats overlap key foraging habitat for two imperiled sea turtle species in the Gulf of Mexico.
- In 2018, M. Lamont et al analyzed overwintering behavior of juvenile sea turtles at a temperate foraging ground,
- In 2018, M. Lamont and A. Iverson researched shared habitat use by juveniles of three sea turtle species.
- In 2018, K. Hart et al investigated drivers of distribution and co-occurrence for two imperiled sea turtle species in Gulf of Mexico neritic waters.
- In 2019, A. Iverson et al examined loggerhead sea turtle diving changes with productivity, behavioral mode, and sea surface temperature.
- In 2020, A. Iverson et al studied migration corridors and threats in the Gulf of Mexico and Florida Straits for loggerhead sea turtles.
- In 2020, M. Lamont et al researched the incubation environment of nests deposited by a genetically distinct group of loggerhead sea turtles in northwest Florida.
- In 2020, P. Carlson et al initiated a project to prevent further losses of seagrasses by mobilizing teams

of scientists to relocate populations of herbivorous sea urchins. This project also includes Urchin Round Ups (public outreach events) that involve citizens volunteering to relocate sea urchins from active grazing fronts.

4.1.2 / Current Status of Ecosystem Science at St. Joseph Bay Aquatic Preserve

Research and monitoring are crucial components of resource and ecosystem management. Data obtained from monitoring programs provides staff with information to make effective resource management decisions. Monitoring efforts allow for the creation of baseline data as well as recognizing short and long-term variation of environmental conditions. Major management issues that SJBAP confronts include health of seagrass beds, changes in water quality, and the need to protect critical/sensitive habitats. Florida is rapidly growing and development pressures on habitats are growing just as quickly. Therefore, sound resource management practices, public education and outreach, system-wide monitoring and research, and interagency and volunteer cooperation are integral in maintaining and protecting the natural resources within the aquatic preserve. Current Ecosystem Science programs within SJBAP and the future needs of the program are discussed in the following sections.

Water Quality Monitoring Projects

Chemical water quality analyses alone do not adequately reflect or predict the condition of living aquatic resources. This has led to the development of measures of biological integrity that can be expressed in biological criteria (Gibson, Bowman, Gerritsen, & Snyder, 2000). The aquatic preserve is in the process of establishing an approach to water quality monitoring that includes using multiple tools to support management decisions at multiple scales. This approach to monitoring includes a strategy to define a core set of baseline indicators to help explain causes and/or sources of any impairments and to assess whether physical, chemical, and biological integrity are supported. Biological surveys, criteria, and assessments complement physical and chemical assessments of water quality by reflecting the cumulative effects of human activities and natural disturbances on the biological community in a water body and can be used to help identify the causes of these effects (Gibson, Bowman, Gerritsen, & Snyder, 2000). Furthermore, monitoring efforts should be expanded to assess point and nonpoint sources of pollution in the bay and increased nutrients. This information will be critical in determining future management needs and in devising means to eliminate pollution issues.

Continuous Water Quality Monitoring

As an ORCP-wide initiative in 2005, SJBAP began monitoring water quality with the use of YSI 6600 dataloggers. The aquatic preserve has modeled its datalogger water quality monitoring project after the National Estuarine Research Reserve's (NERR) System-Wide Monitoring Program (SWMP) that uses nationally standardized methods of data collection to ensure continuity and accuracy. Two stations were established in St. Joseph Bay and abiotic factors including dissolved oxygen, salinity, temperature, conductivity, pH, turbidity, and depth were continuously monitored every 30 minutes. Dataloggers were swapped out in two-week intervals for data retrieval, instrument service and calibration, and monitoring station maintenance. After major storm events, staff prioritize swapping out dataloggers to capture and analyze any changes in salinity, turbidity, other parameters, and make data available as soon as possible. The data are downloaded and reviewed as part of quality assurance and quality control, then analyzed and plotted in order to determine trends. The NERR Centralized Data Management Office began providing data storage and analysis for all aquatic preserve datalogger data in 2020. Additionally, data are stored in DEP's Statewide Ecosystem Assessment of Coastal and Aquatic Resources (SEACAR) Data Discovery Interface. SEACAR is a collaborative process which involves local, state and federal natural resource managers, data providers, researchers and partners to identify and assess ecological indicators and to develop a decision support tool to better understand the status of aquatic resources throughout the managed areas of ORCP. SEACAR will inform and develop planning and restoration tools through a collaborative process involving assessment teams comprised of local, state and federal natural resource managers, data providers, researchers and partners. Data are also stored on a local server. These data are used to identify trends in water quality for specific areas and allows the aquatic preserve to track environmental changes in the ecosystem. Due to budget and staffing

limitations, data were collected intermittently between 2005 and 2011. Summaries of water quality data collected during this time period is presented in Table 2. The 2011 office closure resulted in the suspension of the datalogger program and transfer of datalogger units. In 2018, staff reacquired YSI 6600 EDS dataloggers, and CPAP installed a new datalogger station on St. Joseph Bay in close proximity to the historical Windmark location in March 2021.

Year	Temp (C°)	SpCond (mS/cm)	Sal (ppt)	DO (%)	DO (mg/L)	Depth (m)	pH	Turb (NTU)
2005	22.97	45.99	29.035	91.94	N/A	1.758	8.075	53.84
2006	16.27	47.70	31.685	92.75	7.47	2.031	8.085	-0.6
2007	21.49	52.01	34.255	88.95	6.525	1.903	8.055	-0.25
2008	16.52	50.18	32.93	97.5	7.79	1.597	7.8	-1.2
2009	13.78	44.00	28.405	97.6	8.535	1.809	7.87	0.7
2010	12.69	44.78	28.955	109.95	9.755	1.8465	8.03	0.05
2011	19.76	49.91	32.64	82.6	6.52	1.6915	8.1	-0.1

Table 2 / Historical water quality data at Richardson’s Hammock.

LAKEWATCH Water Quality Monitoring

In 2001, the aquatic preserve partnered with the University of Florida’s LAKEWATCH/COASTWATCH program which had expanded to include bay systems and began a water quality monitoring project focused on nutrients. These data have been used to document nutrient levels, including total nitrogen and phosphorous, algae content, and water clarity. Water samples are collected at nine sites within the bay on a monthly basis and are analyzed by the University of Florida’s water chemistry lab at the Department of Fisheries and Aquatic Sciences. Metered data collected at each station includes temperature, pH, dissolved oxygen, salinity, secchi depth, and weather conditions. The data acquired were historically stored in a computerized DEP database called STORET (a STOrage and RETrieval database, which in 2018 was replaced by a new database called Water Information Network (WIN). Data are also stored in DEP’s SEACAR database. These data have established a baseline record of nutrient concentrations in the bay for comparison with future data.

LAKEWATCH sampling was suspended in April of 2011. After the management of the aquatic preserve was re-established, the partnership and water sampling efforts resumed in the spring of 2016. The aquatic preserve’s water quality monitoring program utilizes several methods to examine the bay’s water column characteristics.

DEP Division of Environmental Assessment and Restoration (DEAR) Water Quality Monitoring

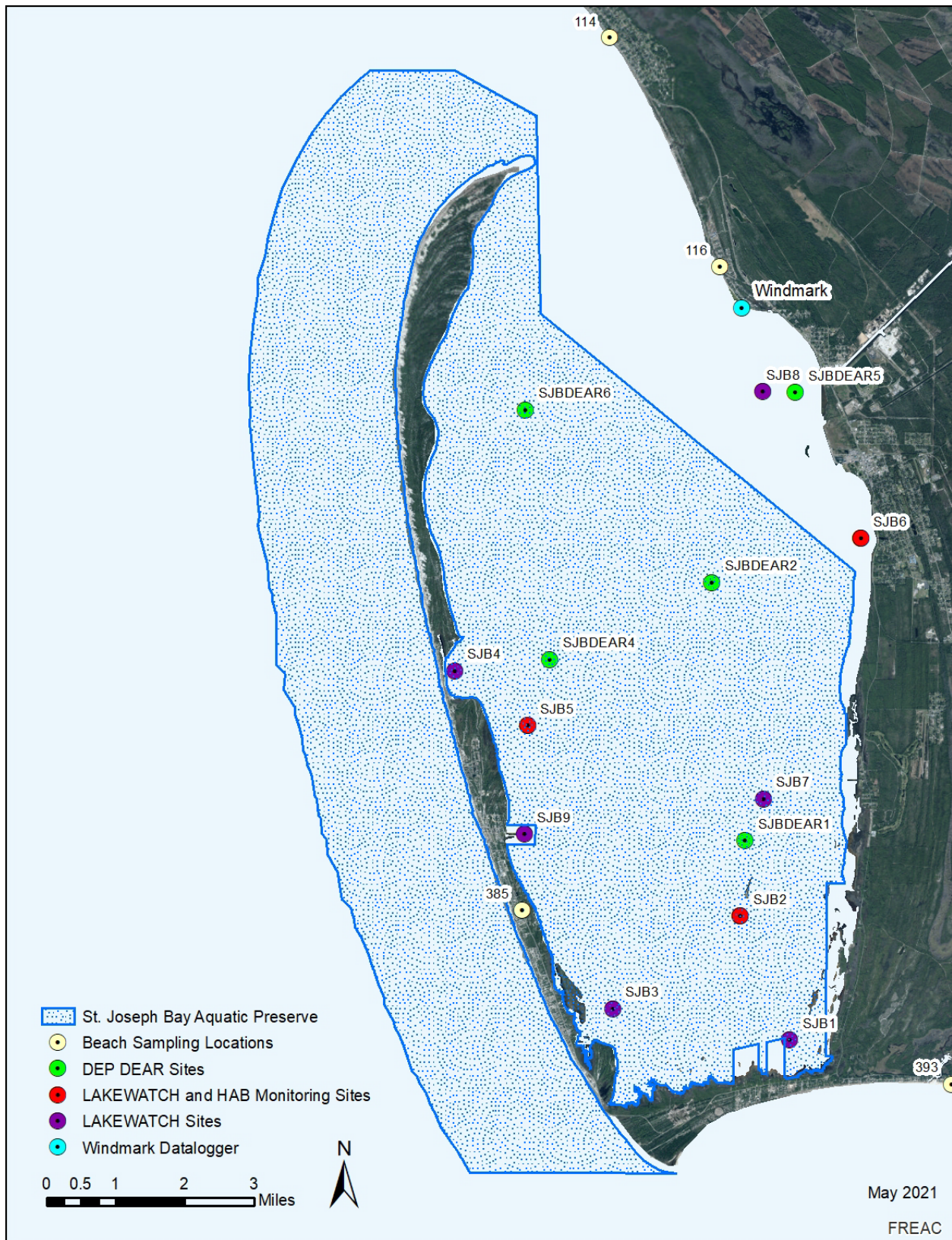
DEP’s DEAR is charged with monitoring and assessing Florida's surface water and groundwater quality; identifying, verifying and prioritizing pollution problems; developing strategies to resolve the problems; and implementing those strategies through comprehensive restoration actions in partnership with local stakeholders. The monitoring data from the LAKEWATCH and DEAR stations are stored in DEAR’s WIN database, and are used by DEAR to identify water segments (WBIDs) that are not meeting applicable water quality standards and designated uses based on the Impaired Waters Rule, Chapter 62-303, Florida Administrative Code (F.A.C.). Waterbodies that do not meet water quality standards are identified as impaired for the pollutants of concern - nutrients, bacteria, mercury, etc. - and Total Maximum Daily Loads (TMDLs) must be developed, adopted and implemented to reduce those pollutants and clean up the water body. A TMDL is a scientific determination of the maximum amount of a given pollutant that a surface water can absorb and still meet the water quality standards that protect human health and aquatic life. Numeric nutrient criteria were developed by DEAR and became effective for St. Joseph Bay in 2012. St. Joseph Bay is currently listed as impaired for nitrogen and fecal coliform. St. Joseph Bay is listed as

impaired for fecal coliform because the shellfish harvesting classification is not fully approved by the Shellfish Environmental Assessment Section (SEAS) of the Department of Agriculture and Consumer Services. St. Joseph Bay will be re-assessed in 2021, and it is believed that the bay will be removed from the impaired list for nitrogen (N. Wellendorf, personal communication, March 24, 2021).

In June 2019, CPAP staff assumed responsibility for collecting monthly water samples at four locations in St. Joseph Bay for DEAR. Data collected included temperature, pH, dissolved oxygen, salinity, conductivity, turbidity, secchi depth, weather conditions, and sea state. Nutrients and bacteria were monitored quarterly. Samples are returned to the DEP laboratory in Tallahassee for evaluation of turbidity, color, total suspended solids, and chlorophyll *a*. In addition to the data being stored in STORET/WIN, CPAP utilizes the SEACAR database for data storage and dissemination. These data will contribute to the establishment of a baseline record of nutrient concentrations in the bay for comparison with future data, as well as provide valuable data for the future development of DEP's nutrient criteria programs. In April 2019, a fifth sampling site was added to the monitoring effort. Data collected by CPAP staff is presented in Appendix B.6.

St. Joseph Bay Water Watch

St. Joseph Bay Water Watch was a citizen-science water monitoring program run by University of Florida's Institute of Food and Agricultural Services (UF/IFAS) Gulf County Extension office. UF/IFAS partnered with local organizations and residents to monitor water quality throughout the waters of St. Joseph Bay. SJBAP staff have coordinated sampling locations and techniques with the St. Joseph Bay Water Watch Team. In June 2018, UF/IFAS trained a team of volunteers to monitor six stations in the bay; volunteers measured surface waters for temperature, dissolved oxygen, salinity, pH, water clarity, and microplastics. Hurricane Michael impacted the region in October 2018, and many volunteers were displaced. As a result, only four stations were monitored (R. Bodrey, personal communication, August 19, 2019) and monitoring was fully discontinued in June 2020.



Map 11 / Water quality monitoring stations in St. Joseph Bay Aquatic Preserve.

Florida Department of Agriculture and Consumer Services Water Quality Monitoring

FDACS assesses microbiological conditions (fecal coliform and Harmful Algal Blooms) of coastal waters to reduce the risk of shellfish-borne illness. Sanitary surveys are conducted to identify waters where contaminants may be present in amounts that present a human health hazard; hence, should not be open for shellfish harvesting. FDACS routinely monitors fecal coliform and water quality parameters at established stations in each of Florida's shellfish harvesting areas. Sub-surface water samples are typically collected, placed in ice-filled coolers and shipped overnight to a certified laboratory. The FDACS Apalachicola Shellfish Center is responsible for the collection and processing of all water samples collected on St. Joseph Bay. The analysis for fecal coliform takes 24 hours, and numbers of bacteria are expressed in Colony Forming Units per 100 milliliters (ml) (FDACS, n.d.). All the water in St. Joseph Bay south of Peninsula Point (~34,000 acres) is classified as a shellfish harvesting area, and it is important to monitor the water quality in these shellfish harvesting areas for harvest area classifications and closures and to protect public health. FDACS currently has 22 sampling locations in St. Joseph Bay.

Harmful Algal Bloom Monitoring

FWC's FWRI Harmful Algal Bloom (HAB) group monitors more than 100 locations around the state weekly, twice-monthly, or monthly to detect nuisance, harmful and toxic algal blooms, including red tide. A red tide is a higher-than-normal concentration of a microscopic alga (plant-like organism). In Florida, the species that causes most red tides is *Karenia brevis*. *Pyrodinium bahamense* produces saxitoxins that can cause Paralytic Shellfish Poisoning or Saxitoxin Puffer Fish Poisoning in humans if contaminated shellfish or puffer fish are consumed. Some, but not all, species of *Pseudo-nitzschia* produce domoic acid, which can cause Amnesic Shellfish Poisoning in humans if contaminated shellfish are consumed. Blooms of *Pseudo-nitzschia* spp. ($\geq 1,000,000$ cells/L) frequently occur in Florida's marine and estuarine waters (FWC, n.d.-h). FWRI staff coordinates sample collection with state agencies, local governments and private citizens participating in a volunteer offshore monitoring program.

Description	<i>Karenia brevis</i> (cells/liter)	Possible Effects (<i>K. brevis</i> only)
–Not present - background	background levels of 1,000 cells or less	None anticipated
Very low	>1,000 to 10,000	Possible respiratory irritation; shellfish harvesting closures >5,000 cells/liter
Low	>10,000 to 100,000	Respiratory irritation, possible fish kills and bloom chlorophyll probably detected by satellites at upper limits
Medium	>100,000 to 1,000,000	Respiratory irritation and probable fish kills
High	>1,000,000	As above plus discoloration

Table 3 / Effects of red tide (*Karena brevis*) abundance.

Florida red tide occurs in the Gulf of Mexico almost every year, generally in the late summer or early fall season. The Florida red tide organism was identified in 1947, but anecdotal reports of the effects of red tide in the Gulf of Mexico date back to the 1530s. Most blooms last three to five months and may affect hundreds of square miles. Red tide can kill fish, turtles, birds, and marine mammals, cause health problems for humans, and adversely affect local economies (FWC, n.d.-h). Bottom-dwellers such as groupers and grunts are usually the first fish to die in a Florida red tide, although most fish are probably susceptible. Mortality, in terms of numbers killed and species affected, can be severe and is dependent upon factors such as bloom density and the length of time animals are exposed to the toxins (FWC, n.d.-h). Table 2 shows the possible effects from red tide according to the level of concentration.

HAB sampling began in St. Joseph Bay at two locations by Florida Marine Patrol in 1971. Until 1995, samples were mostly collected in response to blooms (L. Markley, personal communication, August 1, 2018). Over time, many different agencies have since contributed to the sampling process: FDACS, FWRI, DEP, USFWS, University of South Florida, Florida State University, commercial fishermen, non-profit organizations, volunteers, and others. Samples are brought back to FWRI in St. Petersburg for analyses (K. Atwood, personal communication, October 24, 2016). They are filtered by FWRI's HAB toxins group for toxins and DNA for reporting and on-going research projects. All data are entered into the HAB historical database and are placed on the FWC Red Tide Status Report for Northwest Florida. Researchers report monitoring results to managers who can then take appropriate actions, such as closing shellfish harvesting areas, as necessary, to protect human health. In addition to routine monitoring, HAB staff respond to possible blooms throughout Florida. Following reports of discolored water, respiratory irritation, fish kills, or dead or stranded marine mammals, HAB staff lead sampling trips or coordinate sampling with the same collaborators they rely on for routine monitoring. This event-response effort varies from year to year, depending on the frequency and duration of blooms (FWC, n.d.-h).

In 2005, due to the increased occurrence of red tide (*Karenia brevis*) in St. Joseph Bay, the aquatic preserve partnered with FWRI to begin collecting monthly water samples at five sites within the bay. During the office closure, FWC, FWRI, FDACS, non-profit organizations, and volunteers continued the HAB sampling in St. Joseph Bay. After the management of the aquatic preserve was re-established, the partnership and water sampling efforts resumed in the spring of 2016. CPAP staff currently collect samples at three locations in St. Joseph Bay monthly; these sampling locations are also LAKEWATCH sampling stations.

Coastal Beach Water Quality Monitoring

Under Florida's Healthy Beaches Program, administered by the Florida Department of Health, coastal beach water samples are collected by the Gulf County Health Department and are analyzed for enterococci and fecal coliform bacteria. Fecal coliform and enterococci are both enteric bacteria that normally inhabit the intestinal tract of humans and animals. The presence of high levels of enteric bacteria is an indication of fecal pollution, which may come from storm water runoff, pets and wildlife, or human sewage. Gulf County previously collected surface water samples from six locations around St. Joseph Bay; however, the locations of some of the sampling sites have changed over the years. As of 2019, samples are collected at three locations (see Map 11). The Gulf County Health Department issues health advisories or warnings when high levels of bacteria are confirmed. In addition, the aquatic preserve will continue to track the results of the Healthy Beaches Program to correlate this data with other water quality monitoring efforts regarding nutrient loading in the bay.

Northwest Florida Water Management District Water Quality Projects

The Northwest Florida Water Management District (NFWFMD) has completed several projects to improve water quality across the Florida Panhandle, including many stormwater retrofit projects, stabilization projects, mapping, and monitoring projects. Enacted in 1987 by the Florida Legislature to improve and manage the water quality and natural systems associated of Florida's surface waters, which include lakes, rivers, streams, estuaries, and other waterbodies, the NFWFMD began publishing comprehensive plans for watershed management across major Panhandle watersheds. These reports, called the Surface Water Improvement and Management Plans, (SWIM), outlines several projects including seagrass and water quality monitoring. Covering about 1,156 square miles in the central Florida Panhandle, the St. Andrew Bay watershed covered by the SWIM Plan includes the interconnected estuarine system of St. Andrew, West, North, and East bays; St. Joseph Bay; and Econfinia Creek and the ground water contribution area for springs discharging into the creek. The watershed also includes Deer Point Lake Reservoir, Lake Powell and several other coastal dune lakes, and contributing basins and tributaries of these waterbodies. It is the only major watershed in northwest Florida located entirely within the state of Florida.

In 2016, the NFWFMD began updating SWIM plans for each of northwest Florida's major watersheds with grant funding from the National Fish and Wildlife Foundation. Updates to the St. Andrews SWIM plan were completed and approved in September 2017. NFWFMD has also partnered with the Federal Emergency Management Agency

(FEMA) since 2011 to implement the Risk Mapping, Assessment and Planning program, to deliver quality data that support risk management decisions and flood mitigation actions. SJBAP will continue to coordinate with NFWFMD as monitoring programs expand and to protect the St. Andrews watershed.

In recent years, multiple sources have reported adverse changes concerning the water quality and ecology of St. Joseph Bay, and many individuals are attributing these changes to freshwater inputs from the Gulf County Canal. In 2019, NFWFMD created The St. Joseph Bay Assessment Project; a project designed to determine the effects of freshwater inflows from the Gulf County Canal on the water quality of St. Joseph Bay, Florida. The project is anticipated to contain multiple, subsequent stages and include collaboration with other government entities (DEP, FWC, FDACS, etc.). This project aims to collect data concerning the volume, range, discharge, and periodicity of freshwater inflows into St. Joseph Bay from the Gulf County Canal, collect data concerning the volume, range, and periodicity of freshwater inflows into St. Joseph Bay from areas other than the Gulf County Canal, and model the effects of freshwater inflows from Gulf County Canal and other sources on water quality and salinity in St. Joseph Bay. Abiotic water quality parameters (temperature, salinity, dissolved oxygen, pH, and turbidity) will be collected at all sampling stations along the canal and Intracoastal Waterway. In September 2020, three monitoring stations were erected on the Intracoastal Waterway (ICW) and have begun collecting data.

Numerous hydrodynamic models exist for Apalachicola Bay, and may potentially exist for St. Andrew Bay, both of which are connected to St. Joseph Bay via the Gulf County Canal and Intracoastal Waterway. These models may be useful in creating a large multisystem hydrodynamic model to help predict effects in all systems with changes in freshwater flows through the Gulf County Canal (NFWFMD, 2019). Understanding the volumes and seasonality of freshwater inflows into St. Joseph Bay will allow for extensive collaboration with multiple groups to more thoroughly understand how St. Joseph Bay functions as an estuary, as well as the facilitate the development of future resource management decisions. The need to rehabilitate the sewer collection system and storm water treatment facility is a high priority, both for the well-being of the citizens and to ensure high water quality in the bay. NFWFMD is currently developing a stormwater retrofit project for Port St. Joe to address major runoff issues. This project is a Natural Resource Damage Assessment funded project and, as of November 2020, is currently in the early planning stages. Multiple public meetings have been proposed to receive stakeholder and public input during the planning process.

St. Joseph Bay Seagrass Monitoring

Seagrass communities are considered to be the most productive ecosystems in the world, but are also one of the most sensitive. Monitoring this habitat has quickly become one of the best methods to determine the overall health and condition of the aquatic environment. Changes to seagrass communities have been used to predict how certain factors (i.e. changes to salinity) may also influence both short and long-term changes to other nearshore aquatic ecosystems. Seagrasses serve as indicator species since they are very sensitive to changes in water quality. For example, a decline in seagrass coverage could be a sign of decreased water quality. In St. Joseph Bay, these communities are critically important to the health and vitality of the waters of the bay. Seagrass meadows provide a protected nursery and foraging area for numerous marine species, and their extensive root system aids in stabilizing sediments on the bay bottom, helping to keep the water clear. The aquatic preserve's objectives focus on management issues regarding the seagrass communities in St. Joseph Bay and the environmental and human surroundings that impact them. As human populations concentrate along our coastlines, anthropogenic impacts to seagrass habitats increase through nutrient loading from runoff, light reduction from increased turbidity and phytoplankton blooms, increased boat traffic, and more direct vessel impacts such as propeller scarring (Fonseca, Kenworthy & Thayer, 1998). Propeller scarring occurs in shallow water when a boat's propeller tears and cuts up seagrass roots, stems and leaves, leaving a long, narrow furrow devoid of seagrasses. This damage can take eight to ten years to repair and areas with severe scarring may never completely recover.

In 2002, the aquatic preserve began a seagrass monitoring project at specific sites to determine the current health of the ecosystem and provide insight for seagrass decline in the bay. The goals of the project are to determine

seagrass distribution and abundance, trends in seagrass conditions throughout the bay, determine the health of these beds through baseline water quality monitoring efforts, and use ground-truth information to update seagrass coverage maps to compare to historical maps. CPAP staff currently utilize the Braun-Blanquet (B&B) study method for measuring the submerged aquatic vegetation. All seagrass monitoring data are analyzed and summarized in an annual report; this report is made available to partnering agencies, external researchers, and the public. This information is used to analyze and understand species composition, abundance, and distribution of seagrasses within a particular area. Seagrass data provides helpful information that can be used to address management issues within the aquatic preserve; furthermore, seagrass monitoring data, coupled with water quality data, can be used to determine the overall health of these highly diverse ecosystems. It is important to collect baseline conditions of the seagrass beds to identify short and long-term changes to the habitat and develop sound watershed management activities.

Survey methods have changed over the years to develop a more precise monitoring program, and a variety of site-specific techniques are currently being utilized to determine the health and status of these communities. Originally, staff established 16 monitoring sites around the bay and sampled them twice a year, at the beginning and end of the growing season; as of 2019, the aquatic preserve is currently monitoring 30 seagrass sites annually. Monitoring methods have included fixed-transect monitoring, abbreviated quad transects, fixed-point location (haphazard quadrat) sampling, aerial photography, and hyperspectral imagery.

Preliminary seagrass monitoring in St. Joseph Bay was established in 2002 using protocols from the Southwest Florida Water Management District and the Charlotte Harbor Aquatic Preserves. To complement the efforts being executed by FWC, CPAP staff began monitoring seagrasses in SJBAP. Initially, fixed transects were conducted at monitoring locations in SJBAP. Fixed transects offer a precise reference of what species are present in each location, and thus provide the capability to detect long-term and short-term changes. At each site, a leaded line was laid along the imaginary line of the transect, and a 1m² quadrat, commonly referred to as a quad, was laid down along the transect line in 10-meter increments. Within the quad, observations are made about the seagrasses, including species occurrence, the abundance of each species (B&B), blade lengths and widths of each species, epiphyte density, sediment type, and the depth are determined and recorded; abiotic water quality parameters were also recorded at each monitoring site. At specific sites, cores were taken to determine above and below ground biomass and a sediment and epiphyte sample is also collected for lab analysis.

In 2005, staff availability and funding had decreased, so instead of conducting transects at each monitoring location, the monitoring strategy was changed to fixed-point sampling locations where the quadrat was haphazardly thrown four times, and Braun-Blanquet (B&B) visual cover assessment values were recorded for each seagrass and macro-algae species observed within the quad. Additional observations that were documented include: blade length and width, epiphyte density, sediment type, sediment depth, presence of variegated urchins or bay scallops, and presence of prop scars or blowouts. Abiotic water quality parameters (temperature, salinity, and dissolved oxygen) were recorded at each sample site as well. At specific sites, cores were taken to determine above and below ground biomass, and a sediment and epiphyte sample was also collected for lab analysis.

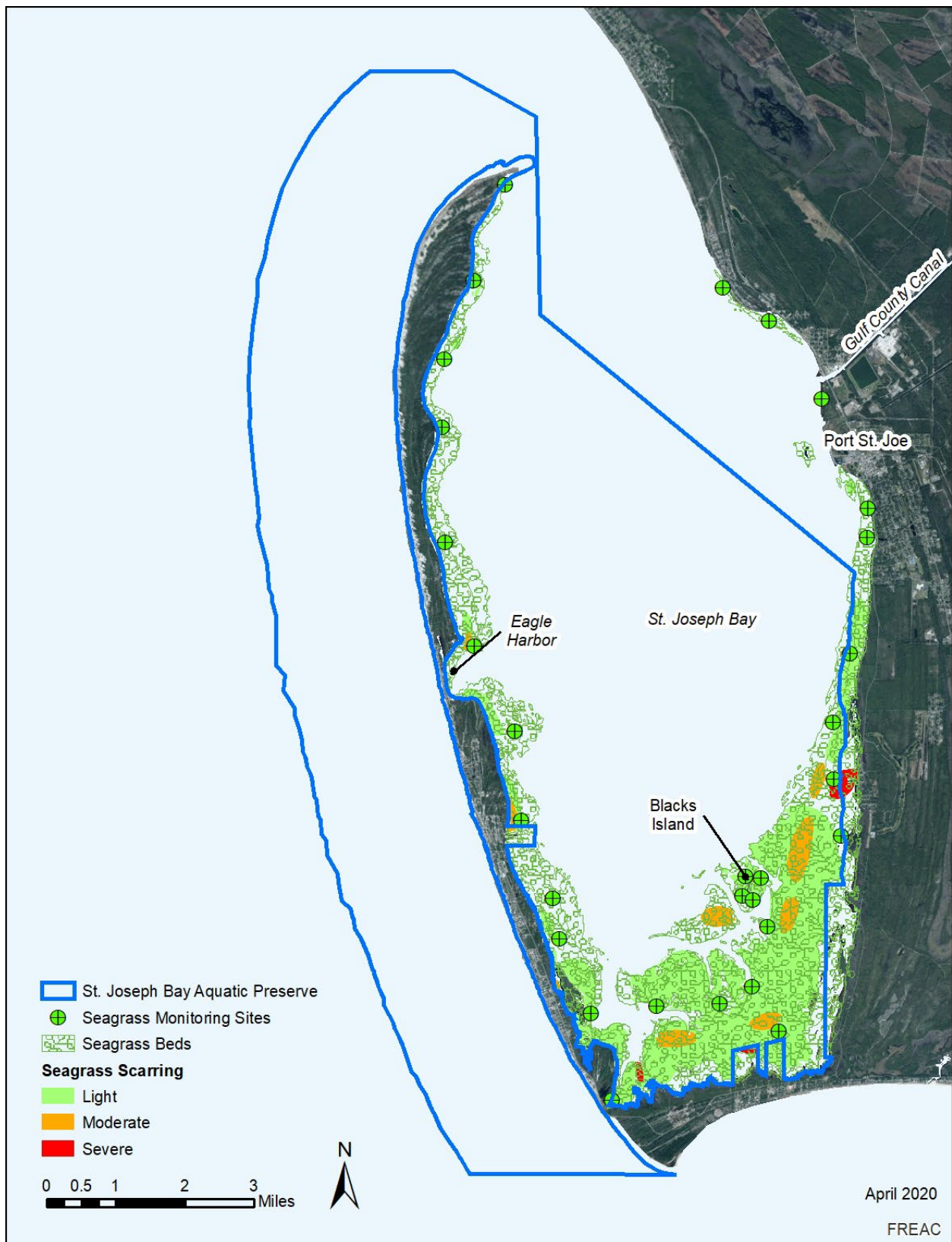
In 2006, through a Coastal Zone Management (CZM) grant to use St. Joseph Bay as a “pilot project” for hyperspectral mapping efforts in coordination with the Florida Environmental Research Institute (FERI; DEP contract #: RM055). There is currently a need to replicate this effort; ideally, mapping efforts should continue to be performed approximately every three to five years to determine changes in the amount and condition of the submerged habitats. In December 2008, an additional CZM grant (12/15/08-12/15/09) was secured for additional post processing of the 2006 data to determine seagrass coverage/extent and to produce an accurate high-resolution bathymetric map of St. Joseph Bay. Areal extent, abundance and productivity of seagrass meadows, as well as shallow water bathymetry (<2m) were quantified and mapped across the bay using a combination of algorithms and models. In 2010, aquatic preserve staff secured a CZM grant for \$150,000 to acquire high resolution, satellite imagery of St. Joseph Bay’s submerged features. Collection of this high-resolution imagery allowed aquatic preserve staff to monitor changes in physical and biological conditions over the four years since

the previous survey. This allowed for the identification of areas within the aquatic preserve where increased management emphasis may be necessary and areas where habitat may be increasing and/or declining.

After the 2009 sampling season, seagrass monitoring was suspended due to a lack of staff, but the aquatic preserve was able to map seagrass beds with multispectral imagery in November 2010 prior to the office closure in 2011. Seagrasses continued to be monitored by FWC's Division of Habitat and Species Conservation and FWRI in 2008, 2009, 2011, and 2014; monitoring data indicated that the occurrence of seagrass species was stable but that the density of seagrass beds was variable and thinning (Wren & Yarbro, 2016). FWC has continued to conduct seagrass surveys in SJBAP in 2016 and 2018 and will collaborate with aquatic preserve staff for future monitoring efforts.

In 2014, ORCP was awarded a grant through the National Fish and Wildlife Foundation to re-establish management of St. Joseph Bay and St. Andrews aquatic preserves. Seagrass sampling resumed in the summer of 2015 at 15 sites in SJBAP. In summer 2016, the seagrass monitoring program was expanded to 25 fixed-point locations. In spring 2019, the number of sampling locations was further increased to 30, and the sites will continue to be monitored to determine species composition, abundance and distribution of seagrasses in SJBAP (Map 12). Staff continue to utilize fixed-point sampling where the quadrat is haphazardly thrown four times at each monitoring location, and Braun-Blanquet (B&B) visual cover assessment values are recorded for each seagrass and macro-algae species observed within the quadrat. Additional observations that are documented include blade length, epiphyte density, sediment type, presence of variegated urchins or bay scallops, and presence of prop scars or blowouts. Abiotic water quality parameters (temperature, salinity, and dissolved oxygen) are also recorded at each sample site.

Turtle grass dominates beds in St. Joseph Bay, but manatee grass, shoal grass, and drift red macroalgae occur at low levels. Monitoring data indicates that the occurrence of turtle grass is stable, but the occurrence of manatee grass and shoal grass varied (Wren & Yarbro, 2016). CPAP monitoring data suggests that seagrass communities are relatively stable; however, some losses have been observed. As further data analysis occurs, CPAP plans to expand monitoring efforts to focus on areas previously not included. Future needs for the seagrass monitoring project include the necessity to address specific issues in regard to the seagrass communities of the bay. Prominent and increasing prop scar damage is evident in St. Joseph Bay, especially in the southern portion of the bay and with increased visitor use this trend is expected to continue (Wren & Yarbro, 2016). The extent of this damage must be mapped, documented and monitored and efforts to mark these shallow, sensitive areas should be a high priority effort.



Map 12 / Seagrass monitoring in St. Joseph Bay Aquatic Preserve.

In 2020, CPAP partnered with FWC/FWRI to address the impacts of sea urchin grazing on seagrass beds in the southern end of the bay. This project aims to prevent further losses of seagrasses by mobilizing teams of scientists to remove populations of herbivorous sea urchins that have greatly increased in the past five years. Following stabilization of urchin grazing fronts in seagrass beds, natural recovery will be enhanced by creating temporary herbivore exclosures and by planting turtle grass (*Thalassia testudinum*) seedlings collected from other areas in the bay.

Monitoring of seagrass cover expansion and loss over fine and coarse spatial scales is a key component of the project, and outputs will include GIS maps in shapefile and GoogleEarth format of seagrass cover in the project area at the beginning, middle and end of the project. Improvements in water clarity are anticipated in response to increased seagrass cover, and turbidity, color, and phytoplankton chlorophyll concentrations will be measured quarterly during the project.

Algae Monitoring

The many species of algae within the bay need to be identified. The functional roles of algae within seagrass meadows are numerous. They include increased habitat complexity, primary production and trophic cycling, as well as sediment stabilization. Seagrass communities include many species of algae that can be coarsely grouped into drift algae, rhizophytic algae (e.g. benthic macroalgae, *Caulerpa* spp.), psammophytic algae (e.g. *Acetabularia* spp.), and epiphytes. Macroalgae may be present in seagrass beds as large clumps of detached drift algae, and the factors that control the drift algal distribution and abundance are not fully known. Drift algae have been found to be important contributors to primary production and have also been recognized as important habitat for numerous benthic fish and invertebrate species. The aquatic preserve's SAV monitoring efforts have indicated an increase in algae in St. Joseph Bay; this may be a result of an increase in nutrients in the bay from stormwater runoff (DEP, 2019a). While conducting seagrass surveys, staff record the presence and identify any attached macro-algae and record a B&B cover assessment value; drift algae is not identified but is assigned a B&B value. As SAV communities change, it will be important to identify any algae species within the bay and to determine the seasonal dynamics, biomass and productivity of the specific algal groups; additionally, understanding how algae species impact surrounding seagrass species could provide valuable insight to the dynamics of seagrass habitats within SJBAP.

St. Joseph Bay Scallop Monitoring

Bay scallops are generally distributed within the shallow waters along the southeastern, southern, and southwestern shores of the bay. Annual scallop surveys have been conducted by FWRI in SJBAP since 1994. Each year, 20 stations located in and adjacent to SJBAP in depths up to 10 feet are surveyed (Steve Geiger, personal communication July 20, 2018). In 1995, through a partnership established with the FWRI, the aquatic preserve began assisting with the monitoring of bay scallop recruitment rates using spat collectors in St. Joseph Bay. Scallop numbers fluctuate from year to year. The spat collectors are constructed of a mesh polypropylene onion or citrus bag attached at one end to a crab trap float and at the other end with a cinder block anchor. The scallop spat will settle on these bags during a recruitment event. Upon recovery, the spat collectors are returned to the FWRI laboratory for visual examination and enumeration of all recruits.

The aquatic preserve historically monitored 24 spat collectors at four sites in this southern portion of the bay, at a depth of approximately one meter. In 2011, FWRI assumed the monitoring efforts. Traps were allowed to soak for six to eight weeks prior to retrieval. An overlapping deployment/retrieval schedule was used to ensure that any recruitment event that occurred just prior to recovery of one series of collectors could be detected on the overlapping collector. The daily recruitment rate is found by dividing the total number of spat from each collector by the number of days deployed. Daily recruitment rates are compared among stations in St. Joseph Bay. Because larval supply may be a primary determinant of the following adult abundance, a more complete understanding of scallop larval dispersal patterns and scales, and subsequent larval supply, is necessary for the proper ecological and economic management of this marine resource.

To assess the status of bay scallops in Florida waters, FWRI scientists conduct adult population abundance surveys each June along the state's Gulf coast. Scallop populations must produce enough offspring to replenish themselves or receive offspring from neighboring populations to remain stable. Scallops are extremely sensitive to changing environmental conditions such as seagrass losses, increases in fresh water, suspension of sediments, pollution, and harmful algal blooms. Because of this sensitivity and their short life span, local populations are more susceptible to periodic collapses and natural recovery of a collapsed population can take years (Stephenson, 2016). In 2016 and 2017, FWRI also conducted randomized surveys with a randomized design (48 in 2017 and 64 in 2016). At each station, researchers deployed a 300-meter (984.3 feet), weighted transect line. Two divers – one on either side of the line – each counted all scallops within a 2-meter-wide area along the line. Researchers compared estimates between years and sites to determine if bay scallop populations are maturing at different rates. Populations were classified as collapsed (< 6 scallops per station), vulnerable (6 – 60 scallops per station), or stable (>60 scallops per station) (Stephenson, 2016). Using the results of these transect surveys, researchers can determine the health of a local scallop population based on abundance, distribution, and population.

Bay scallop populations within the SJBAP have decreased below the stable classification since 2011 (>60 scallops per station). While many other region's populations declined from heavy rains in 2012-2013, Gulf County did not experience this heavy rainfall, and it is unclear as to why the scallop numbers decreased (Stephenson, 2016). A prolonged red tide event in late 2015 negatively impacted the scallop population in St. Joseph Bay, which led to modified local scallop regulations for 2016 that included a shortened season and reduced bag limits. In 2017, a naturally occurring algal bloom (*Pseudo-nitzschia*) caused scallop season to be postponed. In 2018 and 2019, the scallop harvest season was shortened to allow scallop populations to continue to recover. FWC researchers have been conducting a scallop restoration project within St. Joseph Bay to help speed the recovery of the scallop population (FWC, n.d.-a). Aquatic preserve staff have and will continue to collaborate and coordinate with FWC concerning scallop restoration efforts in the bay. In 2019, the early summer scallop survey results indicated a drastic increase in the number of scallops in the bay, hopefully signifying the return of a healthy scallop population to St. Joseph Bay.

The bay scallop harvesting season historically occurred from July 1 through September 10 each year. However, the scalloping season has been set from August 16 through September 24 for 2020, and then later for each subsequent year (FWC, n.d.-b, 2020). Residents and visitors come to the bay in large numbers every year to participate in the season. Under FWC rules, the daily bag limit is one pint of dressed meat or two gallons of scallops in the shell per person per day. With five or more people on board a vessel, the maximum limit is 10 gallons of scallops in the shell or 0.5 gallon of meat. Law enforcement officers continue to encounter problems with visitors taking more than their daily limit and will continue to issue fines for this violation in the bay.

St. Joseph Bay Fish Distribution and Abundance Monitoring

In January 2006, the aquatic preserve established seven monitoring stations in St. Joseph Bay to collect data on the abundance, size structure and habitat associations of fishes and selected invertebrates. Each of these sites was monitored on a monthly basis with the intent to identify essential habitat that species requiring protection use during critical life stages. A 70-foot (21.3 meter) seine net was used to collect species. Fish standard length measurements were taken for up to 20 individuals per species and the rest were counted. This project was modeled after the juvenile fish-sampling project that the Fisheries Independent Monitoring of FWRI has conducted for 15 years in systems throughout the state. Metered water quality parameters, including, salinity, temperature, dissolved oxygen, and pH were collected at each site with a hand-held YSI meter. In addition, water samples were collected for turbidity measurements and tides, weather, wind speed and direction are noted. The goal of the project was to describe the major trends in the spatial and temporal distribution of major fish and invertebrate species between habitats within the St. Joseph Bay system and relate the occurrence, abundance, and seasonality of fish and invertebrate species to natural environmental variations, such as temperature and salinity regimes and periodic events such as storms (relationships to environmental factors). This project aimed to estimate relative

abundance and monitor the size class distribution of economically important fish species in seagrass areas but was discontinued in 2011.

St. Joseph Bay Coral Assessment Monitoring

A coral monitoring project was initiated in 2006 after aquatic preserve staff observed a stony coral species, ivory bush coral (*Oculina diffusa*), along the western shoreline of the bay. Goals of the project were to determine the distribution and abundance of the species through mapping efforts as well as to determine how it may be affected by future development pressures. This species provides habitat for a variety of commercially and recreationally important invertebrate and fish species and, therefore, has a positive economic impact on the bay. The project aimed to examine how this species of coral may act as an indicator in determining the health of the bay system and its water quality but was discontinued in 2011.

4.1.3 / Ecosystem Science Issue

Issue I: Water Quality

Water quality monitoring has increasingly become an important part of understanding the bay's natural processes. Monitoring water quality allows researchers to document short-term variability and long-term changes in the status of the bay's health and facilitates the implementation of appropriate protection for waterways. The collected data can be used to gain a better understanding of how water quality is impacted and will help people understand their important role in the hydrologic cycle. Water quality issues influence human and environmental health, therefore, monitoring changes to the bay's waterways and having an adequate monitoring program is essential to being able to recognize and prevent contamination problems.

A healthy bay contains a balanced amount of nutrients and normal fluctuations in salinity and temperature. It also has plenty of oxygen, which is a basic requirement for nearly all aquatic biota, and little suspended sediment, so that living aquatic resources can breathe or receive enough sunlight to grow. Nutrients, like nitrogen and phosphorus, occur naturally in water, soil, and air. Just as nutrient fertilizers are used to promote plant growth on lawns and farm fields, nutrients in the bay encourage the growth of aquatic plants and algae. Although nutrients are essential to all plant life within the bay, an excess of these nutrients is harmful. This is called nutrient pollution. The two general sources of pollutants that could adversely impact water quality are point and nonpoint source pollution. Point source pollution can be traced to a single identifiable source, such as a discharge pipe. Nonpoint source pollution comes from diffuse sources such as storm water runoff that contains sediment, nutrients, bacteria, pesticides, fertilizers, animal or human waste, heavy metals, oil, and grease. When rain moves over and through the ground, the water absorbs and assimilates many of the pollutants it encounters. Following a heavy rainstorm for example, water will flow across a parking lot and pick up oil left on the asphalt by cars. When these nutrient sources are not controlled, excess nutrients find their way into the ground water, creeks, rivers, and eventually the bay. Storm water runoff is considered one of the primary water quality threats in most of the watershed. It causes habitat degradation, fish kills and closure of shellfish beds and swimming areas (DEP, 2008). Continued long-term water quality monitoring is necessary and essential to protect the valuable natural resources in SJBAP.

Goal One: In collaboration with other entities currently doing monitoring, develop, implement, and adapt a strategic, long-term water quality monitoring program within SJBAP that will assist with identifying and addressing issues pertaining to the natural resources.

Objective One: Sustain a strategic long-term water quality monitoring program that includes biotic and abiotic parameters, and compile analyzed data to evaluate water quality status and trends.

Integrated Strategy One: Dataloggers will be established at priority locations, and continuous in-situ measurements will be collected for the following water quality parameters: temperature, specific conductivity, salinity, dissolved oxygen, pH, turbidity, and depth. Aquatic preserve staff will be responsible for the implementation of this project; with one staff member assigned to calibrate, deploy and retrieve, the dataloggers

approximately every two weeks. Additionally, approximately 20 hours each month will be dedicated to maintaining the meters and organizing, plotting, and analyzing the data.

Integrated Strategy Two: Monitor nutrients and water clarity in SJBAP through a partnership with the University of Florida's LAKEWATCH and DEP's DEAR Water Quality Monitoring programs to determine total nitrogen and phosphorous, chlorophyll, and water clarity. Monitoring efforts began in 2001 and 2019, respectively, and aquatic preserve staff will be available to conduct sampling efforts. These projects will also remain a high priority over the next 10 years as coastal development continues to increase.

Integrated Strategy Three: Evaluate and, if needed, expand LAKEWATCH and DEAR water quality sampling in SJBAP by adding more water quality monitoring sites within the aquatic preserve. This evaluation may include adjusting the monitoring schedule around major rain or storm events.

Goal One, Objective One - Performance Measures:

Performance Measure One: Collect high quality continuous and periodic water quality monitoring data within St. Joseph Bay.

Performance Measure Two: Identify additional water quality monitoring sites, and if needed, install dataloggers at additional water quality monitoring sites.

Objective Two: Analyze and interpret the status and trends of water quality in SJBAP to identify potential impacts to natural resources and provide quality scientific data and recommendations to address such issues.

Integrated Strategy One: Partner with other state and local agencies to identify potential point and nonpoint sources of pollution in St. Joseph Bay and develop a monitoring plan to effectively evaluate the impacts from this type of pollution. Efforts may include integrating current water quality data with geographic information system (GIS) technology to trace possible pollution sources.

Integrated Strategy Two: Support the review of numeric nutrient criteria. In 2014, numeric nutrient criteria were established in St. Joseph Bay. In a collaborative effort with other state agencies, staff contributes water quality data to assist in the review of those criteria. The list of impaired waters is scheduled to be reviewed again in 2021.

Integrated Strategy Three: Support the development of TMDLs as needed. Staff will contribute water quality data to assist in the development of an assessment report documenting scientific data, results, conclusions, and recommendations regarding TMDLs within SJBAP.

Goal One, Objective Two - Performance Measures:

Performance Measure One: Produce an annual report detailing scientific results, including status and trends of nutrients, clarity and chlorophyll *a*, and recommendations regarding the water quality within SJBAP.

Performance Measure Two: In coordination with other agencies, analyze data and identify potential pollution threats and other water quality issues.

Performance Measure Three: In coordination with other agencies and stakeholders (i.e. St. Andrew and St. Joseph Bays Estuary Program, NFWMD, etc.), identify and implement appropriate planning, action, and prevention strategies to address water quality issues, i

Performance Measure Four: Maintain an archive of all water quality monitoring projects within SJBAP.

Goal Two: Provide timely and accurate water quality data and information to the public and other entities/agencies.

Objective One: Submit data to a repository to store water quality data in a centralized database that is user-friendly, provides quality assurance and quality control for the data collection effort, and can be accessed via the

internet to provide site specific information, generate reports, graphs, tables and metadata for review by the public and other entities/agencies.

Integrated Strategy One: Work with the University of Florida's LAKEWATCH and DEP's DEAR Program to ensure their data are entered into WIN, DEP's centralized water quality storage database. LAKEWATCH samples are collected and evaluated, and results are available in WIN and SEACAR.

Integrated Strategy Two: Submit continuous water quality data to SEACAR.

Goal Two, Objective One - Performance Measure One: Water quality data is submitted to databases, in collaboration with DEP and the University of Florida, to ensure data are available to the public.

Goal Two, Objective One - Performance Measure Two: Implement and adapt a quality assurance (QA) plan to ensure that the data generated are verifiable, and that the procedures used to generate data are designed to produce data that are reproducible, comparable, and defensible within known limits of precision and accuracy. The department's quality assurance requirements for analytical laboratories and field activities are codified in Chapter 62-160, Florida Administrative Code (F.A.C.), Quality Assurance (QA Rules).

4.2 / The Resource Management Program

The Resource Management Program addresses how ORCP manages the St. Joseph Bay Aquatic Preserve and its resources. The primary concept of St. Joseph Bay Aquatic Preserve Resource Management projects and activities are guided by ORCP's mission statement: "Conserving, protecting, restoring and improving the resilience of Florida's coastal, aquatic and ocean resources for the benefit of people and the environment." ORCP's sites accomplish resource management by physically conducting management activities on the resources for which they have direct management responsibility, and by influencing the activities of others within and adjacent to their managed areas and within their watershed. Watershed and adjacent area management activities, and the resultant changes in environmental conditions, affect the condition and management of the resources within their boundaries. ORCP managed areas are especially sensitive to upstream activities affecting water quality and quantity. ORCP works to ensure that the most effective and efficient techniques used in management activities are used consistently within ORCP sites, throughout our program and, when possible, throughout the state. The strongly integrated Ecosystem Science, Education and Outreach and Public Use Programs, provide guidance and support to the Resource Management Program. These programs work together to provide direction to the various agencies that manage adjacent properties, partners and stakeholders. SJBAP also collaborates with these groups by reviewing various protected area management plans. The sound science provided by the Ecosystem Science Program is critical in the development of effective management projects and decisions. The nature and condition of natural and cultural resources within St. Joseph Bay Aquatic Preserve are diverse. This section explains the history and current status of the Resource Management efforts.

4.2.1 / Background of Resource Management at St. Joseph Bay Aquatic Preserve

Resource management activities have focused on both the impacts of an individual action, as well as the cumulative impacts of all changes and actions on the natural system. SJBAP staff have been responsible for reviewing and commenting on proposed environmental regulatory permits, Minimum Flows and Levels, TMDLs, land acquisition projects, and adjacent state lands management reviews. Staff provides technical support to other land managers and regulatory authorities on a regular basis such as, conducting field assessments, making comments and recommendations to appropriate agencies, ensuring consistency with all established rules and regulations, notifying the appropriate regulatory agencies of violations and illegal activities. Maintaining good communication between all local, state, and federal environmental regulatory agencies is essential to protecting the resources of SJBAP. Protection of adjacent lands is one of the best ways to protect SJBAP's resources and an effort has been made by state, federal, and other entities to purchase lands adjacent to SJBAP.

4.2.2 / Current Status of Resource Management at St. Joseph Bay Aquatic Preserve

Listed Species Management

A species must be federally listed as endangered or threatened to be protected under the Endangered Species Act. An endangered species is in danger of extinction throughout all or a significant portion of its living range. A threatened species is likely to become endangered in the near future, if measures are not taken to reverse its decline. Species of Special Concern are those that are undergoing a review to determine whether they are either threatened or endangered. Habitat destruction, invasive species, disease and pollution are common causes of extinction. In many cases, these listed species will benefit most from proper management of their natural communities. Natural systems management will simultaneously help preserve the listed species which inhabit those systems. At times, however, additional management measures, such as increasing public awareness through interpretive literature and programs, are needed because of the disturbed condition of some communities, or because of unusual circumstances which aggravate the particular problems of the species.

With increasing development in the area, there is a future need to continue to monitor population trends of listed species within the aquatic preserve by direct or indirect research. Priority species will be chosen based on their listing and their susceptibility to impacts due to habitat alterations. Efforts will continue to provide technical and logistical support to research and monitoring projects and stranding events and to provide educational information to citizens, coastal decision-makers, and government agencies on these species and the habitat they utilize within the aquatic preserve. SJBAP will work with FWC to monitor and manage imperiled species, following the guidelines of FWC's Species Action Plans. Listed species currently monitored within the aquatic preserve are discussed in the following sections.

Shorebird nesting research and monitoring

Shorebird nesting surveys are completed each year in Gulf County as a partnership between FWC, DEP's Florida Park Service, and Audubon Florida. Breeding season for shorebirds is typically recognized as February 15 to August 15; however, surveys end when the last brood fledges, which can be as late as the last week of September. FWC lists the nesting season in the Florida Panhandle as February 15 – September 1 (FWC, n.d.-m). Emergent lands are posted each spring to protect nesting shorebirds. Shorebird nesting data for Gulf County has been available in FWC's Shorebird Database since 2011 (See Table 3). All nesting surveys are completed following established protocol by FWC, Florida Shorebird Alliance, and the Division of Recreation and Parks standard and specific requirements for the district (FWC, n.d.-m).

Nests are located and monitored for fate (hatch or fail). If nests fail, efforts are made to determine the cause for failure (e.g., predation, overwash, abandonment, etc.). During the non-nesting season, biweekly surveys are conducted to collect detailed spatial information of select focal species (all breeding species, plus red knots and piping plovers), spatial information on flocks (i.e., any group of shorebirds greater than 10), and spatial locations of any banded individual regardless of species. For each of these groups, time, tide, behavior (i.e., roosting vs foraging), habitat type, observed disturbances, amount of wrack present, and other characteristics are collected. This is a state-wide survey developed by FWC, but only used by a few groups until a web-based database is completed (R. Pruner, personal communication March 9, 2020).

Year	Type	Total # of Nests	# Nests Hatched	Species
2011	Solitary	52	12	Snowy Plover, American Oystercatcher
2011	Colonial	1	0	Least Tern
2012	Solitary	71	35	Snowy Plover, Wilson's Plover, American Oystercatcher
2012	Colonial	2	0	Least Tern; Black Skimmer, Gull-billed Tern, Royal Tern, or Sandwich Tern
2013	Solitary	88	27	Snowy Plover, Wilson's Plover, American Oystercatcher
2013	Colonial	1	0	Black Skimmer or Least Tern

Year	Type	Total # of Nests	# Nests Hatched	Species
2014	Solitary	122	25	Snowy Plover, Wilson's Plover, American Oystercatcher
2014	Colonial	5	1	Least Tern, Brown Pelican
2015	Solitary	107	42	Snowy Plover, Wilson's Plover, American Oystercatcher
2015	Colonial	6	0	Least Tern, Brown Pelican
2016	Solitary	88	39	Snowy Plover, Wilson's Plover
2016	Colonial	4	1	Least Tern
2017	Solitary	114	31	Snowy Plover, Wilson's Plover
2017	Colonial	3	1	Least Tern
2018	Solitary	13	2	Snowy Plover, Wilson's Plover
2018	Colonial	1	0	Least Tern

Table 4 / Shorebird nesting at St. Joseph Bay Aquatic Preserve (2011-2018).

For Wilson's hatched plover and snowy plover nests, efforts are made to color-band adults and chicks. Bands are used in the short term to monitor fledge rates and establish local population abundance. Over the long term, banding is used for survival analysis. For the banding program, emphasis is placed on the chicks because doing so establishes known-age cohorts. All banding efforts are in collaboration with FWC, USFWS, and the University of Florida. For colonial nesting species (i.e., least terns (*Sternula antillarum*), black skimmers (*Rynchops niger*), and gull-billed terns (*Gelochelidon nilotica*), nests are monitored for fate. Once nests hatch, chicks at various stages are counted (e.g., downy, pin-feather, or fledged) to get an idea of hatch and fledge rates by species for the colony.

Until 2011, the aquatic preserve staff assisted with weekly surveys on the adjacent St. Joseph Peninsula between the state park boundaries and the Stump Hole area to monitor beach activities and perform shorebird surveys. Currently, surveys are completed by FWC, Audubon, DEP's Florida Park Service, and volunteers (R. Pruner, personal communication, August 7, 2018). The St. Joseph Peninsula is indicated as critical habitat for the piping plover and the St. Andrew's beach mouse (*Peromyscus polionotus peninsularis*). Shorebird survey data is reported to USFWS. Participating in these surveys has greatly improved staff understanding of shorebird migration requirements. The land surrounding the aquatic preserve is an important stopover during the Gulf Coast fall and spring bird migrations. St. Joseph Bay lies between the Mississippi and east coast flyways, and therefore, receives birds from both the Midwest and Atlantic seaboard. These surveys are important and necessary because many of these species are of special interest due to their scarcity or declining populations.

Sea turtle nesting and monitoring

FWRI coordinates monitoring of sea turtle nesting activity through two separate programs: The Statewide Nesting Beach Survey and the Index Nesting Beach Survey. Currently, turtle nesting is monitored on five Statewide Nesting Beach Survey sites and two Index Nesting Beach Survey sites in Gulf County. Index beaches in the Florida Panhandle had the second highest loggerhead nest counts in 2017 since these surveys to detect trends began in that area in 1997. This count does not include three additional beaches that joined the Index Nesting Beach Survey program in the Florida Panhandle in 2016 - Dr. Julian Bruce St. George Island State Park, SJSPS, and Gulf Islands National Seashore. The surveys are conducted through a network of permit holders consisting of federal, state, and local park personnel; other government agency personnel; members of conservation organizations, university researchers; and private citizens. FWRI staff coordinate data collection, provide training, and compile annual survey data for distribution to management entities, the research community, the press, and the public. Managers use the results to evaluate and minimize the effects of human activities (e.g., coastal construction, beach nourishment, and recreation) on turtles and their nests and identify important areas for enhanced protection or land acquisition (FWC, n.d.-I).

The beaches adjacent to the aquatic preserve on the St. Joseph Peninsula serve as valuable nesting habitat for the threatened loggerhead sea turtle green sea turtle. These turtles nest along the entire 17-mile stretch of the peninsula. The six-mile stretch of beaches adjacent to the aquatic preserve from the state park boundaries to the Stump Hole is monitored by a volunteer-based turtle patrol that is sponsored by the Gulf Coast Conservation Association. This group has monitored loggerhead and green turtle nesting on this portion of the beach since 2002 (Table 4). All sea turtles are protected under the Endangered Species Act of 1973 and the nesting season runs from May 1st to October 31st. Genetic studies have shown that the loggerhead sea turtles nesting in the Florida Panhandle are a separate population from those nesting in other parts of the Southeast United States (Gulf Coast Conservation Association, 2004). This means that the loggerheads that nest along the St. Joseph Peninsula do not nest anywhere else in the world.

Species	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Loggerhead	307	236	187	251	561	292	328	451	692	551	392	514
Green Turtle	9	0	7	1	0	10	0	14	0	24	0	44
Leatherback	1	0	0	0	0	0	0	0	0	0	0	2

Table 5 / Sea turtle nesting at St. Joseph Bay Aquatic Preserve (2008-2019)

Data Source: FWC/FWRI Statewide Nesting Beach Survey Program Database as of 21 January 2020

St. Joseph Peninsula has the highest density of nesting loggerheads in the Florida Panhandle (FWC, n.d.-I). Increasing development, lighting issues, recreational impacts due to beach driving, severely eroded shorelines, and human presence on beaches during the nesting season can negatively impact sea turtles. Human activity including noise, use of flashlights, campfires, and construction on the beach at night can deter nesting females and disorientate hatchlings. The nesting female may then shift to other nesting beaches, delay nesting, or choose poor nesting sites. Litter left by humans can obstruct both nesting females and hatchlings and food may attract predators to the nest area. Litter and recreational beach equipment left on the beach at night, including beach furniture, cabanas, umbrellas, small boats, and beach cycles can obstruct both nesting females and hatchlings, damage nests, and hamper hatchlings' progress towards the sea (Butler, 2018). In areas where motor vehicles are allowed on the beach or where illegal beach driving occurs, the use of headlights during night driving can also disrupt the nesting process and disorient hatchlings. Tire ruts can interfere with the hatchlings' ability to reach the sea and vehicles can damage nests and run over hatchlings. Beach cleaning equipment may also cause similar problems. In addition to the creation of ruts and compaction of nests by heavy machinery, beach cleaning rakes can penetrate or uncover nests.

In 2001, Gulf County established a lighting ordinance to create regulations for the protection of sea turtles and other enumerated species within certain beaches of the county (see Appendix A). The intent of this ordinance is to protect state and federally listed species that utilize the beach habitat of Gulf County, more specifically, nesting female and hatchling marine turtles, beach mice and shorebirds, from the adverse effects of artificial lighting and from injury or harassment caused by such lighting and its effects. Artificial light or lighting refers to light emanating from any device other than natural celestial light sources. Beachfront lighting on or near beaches can deter female sea turtles from emerging from the sea to nest and can interfere with their sea-finding ability after nesting is completed. Emergent sea turtle hatchlings rely on visual brightness cues to find the sea, and artificial beachfront lighting causes hatchlings to become misdirected during their crucial and dangerous trip from the nest to the water. Hatchlings in this situation often die from exhaustion, dehydration, predation, entrapment in vegetation or debris, or wandering onto roadways and parking lots where they are struck by vehicles (Butler, 2018). Artificial lighting can also cause hatchling disorientation while in the surf and even draw them back out of the water. Although some beachfront lighting is necessary for safety and security, light management measures can help prevent interference with sea turtle nesting habitat while still addressing human safety concerns (Butler, 2018). These measures include turning off unnecessary lights during the nesting season; using a smaller number or lower lumens of lights; repositioning, shielding, redirecting, lowering, or recessing fixtures so light does not reach the beach; using timers and motion detector switches; planting native dune vegetation to screen light; and reducing

interior lighting by moving lights from windows, drawing curtains or blinds after dark, and tinting windows (Butler, 2018). In addition, sea turtles are less affected by red, yellow, and low-pressure sodium-vapor lights, which can be substituted for ordinary lights. It is important to educate residents and renters to the impacts of lighting on these species to avoid manipulation of nests and hatchlings as much as possible.

In addition to the valuable habitat on the Gulf side beaches adjacent to the aquatic preserve, the extensive seagrass beds of St. Joseph Bay provide significant foraging habitat for the threatened juvenile green sea turtle and the Kemp's ridley sea turtle, the most endangered sea turtle in the world. Juvenile green turtles use specific foraging habitats and are capable of navigating to specific habitats if artificially displaced due to cold stunning events. St. Joseph Bay has recently been documented as a very important developmental habitat for green turtles in the northeastern Gulf of Mexico (McMichael, 2005). Population models have suggested that the most crucial stages for sea turtle population recovery include juveniles, which rely on the nearshore environment (Crouse, Crowder & Caswell, 1987). Juveniles utilize nearshore habitats as development grounds, while larger juveniles or sub-adults use them as foraging areas (McMichael, 2005).

FWRI staff members coordinate the Florida Sea Turtle Stranding and Salvage Network, which is responsible for gathering data on stranded (sick or dead) sea turtles found in Florida. Debilitated turtles are rescued and transported to rehabilitation facilities. On Florida's Gulf Coast, cold stunning typically occurs in the Panhandle area, primarily in St. Joseph Bay ([National Oceanic and Atmospheric Administration [NOAA], 2018). This excellent habitat for green turtles has wide flats of sea grass for food, but it also has shallow water where water temperatures can drop quickly during cold periods. In January 2001, when water temperatures in St. Joseph Bay dropped below normal, 403 marine turtles were found stranded and cold-stunned within the bay. Ten Kemp's ridley, five loggerheads and 388 green turtles were collected (Blackwelder, 2001). In 2003, 42 juvenile turtles stranded in St. Joseph Bay, including 39 green turtles, two Kemp's ridleys, and one loggerhead. The presence of juvenile turtles in northwestern Florida waters at this time of year suggests that these turtles were overwintering in this area and entered a lethargic state once water temperatures decreased below an unspecified threshold temperature (McMichael, 2005), thus it is likely that green sea turtles are utilizing the bay habitat year-round. The largest cold stunning event recorded in Florida occurred in 2010, with more than 4500 sea turtles rescued throughout the state; approximately 1800 cold-stunned turtles were found in St. Joseph Bay (Gulf World Marine Institute, n.d.). In January 2018, more than 1000 turtles, mainly juvenile greens, were rescued after becoming cold-stunned in St. Joseph Bay (NOAA, 2018). Further research is needed to fully understand how sea turtles utilize near shore habitats throughout their life cycle so that adequate protection can be given to these threatened and endangered species.

Habitat Restoration and Enhancement

Ecological restoration is activity that starts or accelerates the recovery of an ecosystem. Restoration activities should reestablish the ecological integrity of degraded ecosystems including structure, composition, and the natural processes of biotic communities and the physical environmental. Healthy ecosystems are self-sustaining and resilient natural systems that can accommodate stress and change. Restoration activities should be designed to achieve ecological integrity at the greatest extent that is practical under current environmental conditions and limitations. An important step in any restoration project is to identify the causes of degradation and eliminate or remediate those causes. Restoration efforts are likely to fail if the sources of degradation persist. Early in the planning stage, it is important to identify if the restoration project is scientifically, financially, socially, and ecologically feasible to ensure that limited fiduciary resources are used in the most appropriate manner and to increase the probability of success. Restoration projects must have clear, measurable and achievable goals to help guide project implementation activities and provide the standard for measuring project success. Each restoration project presents a unique set of environmental conditions, variables and project goals. Therefore, it is important to evaluate each project on a case by case basis. SJBAP is conducting seagrass restoration projects in SJBAP and providing comments on beach and shoreline restoration and beach nourishment projects that affect SJBAP.

Seagrass Restoration

The extensive seagrass habitat in St. Joseph Bay is valuable to Gulf County's economy and has remained an area of focus over the years. In recent years, the loss and decline of seagrass beds has been well documented throughout the Gulf of Mexico. Stormwater discharge, fugitive sediments, and physical stressors from prop scarring and dredging are some of the potential factors that result in secondary and cumulative impacts to these seagrass communities. Another commonly overlooked impact to seagrass habitat is installing docks or piers where seagrass is present. The standard practice of installing pilings in seagrass communities causes a displacement of the grasses within the piling footprint and the decking material can detrimentally shade the seagrass. Seagrasses typically take a long time to recover when damaged or cut. The actual recovery time is different for each species and depends on the type of growth of each species, the degree of damage, water quality conditions and sediment characteristics. Repairing damaged areas will, in turn, protect vital coastal habitats and those commercial and recreational industries dependent on them.

High resolution spectral imagery and analyses provide invaluable information about seagrass distribution. Mapping efforts should continue to be performed approximately every three to five years to determine changes in the amount and condition of the submerged habitats. The protection of critical resources is a high priority item for each of the Central Panhandle's aquatic preserves. To adequately manage the aquatic preserve, natural and historical resources, which are integral to maintaining the productivity of the bay, must be monitored, documented, and mapped. This will allow for the identification of areas within the aquatic preserves where increased management and/or restoration is necessary.

As a result of the Deepwater Horizon oil spill and related response activities, SAV habitat in Florida's Panhandle was adversely impacted. In 2015, the aquatic preserve received funding through the Natural Resource Damage Assessment and initiated The Florida Seagrass Recovery project, which will address boat damage to shallow seagrass beds in the Florida Panhandle by restoring scars located primarily in turtle grass habitats in SJBP. The project will include surveying and mapping scars in St. Andrews, Alligator Harbor, and St. Joseph Bay aquatic preserves; however, seagrass restoration will primarily occur in SJBP. A boater outreach and education component of the project will install non-regulatory "Caution Shallow Seagrass Area" buoys, update existing signage and buoys where applicable, and install educational signage and provide educational brochures about best practices for protecting seagrass habitats at popular boat ramps in St. Joseph Bay. The buoy system was installed in late 2015; 49 buoys were installed in the southern end of St. Joseph Bay to help boaters navigate the natural deep-water channels, avoid shallow seagrass areas, and reduce prop scar damage to seagrass beds. Boaters can follow the numbered buoys to their destination, keeping in mind that they may have to double back to stay in the deep-water channel. In some areas, fringe buoys are located on both sides of the channel to further aid boaters to stay in the channel. Hurricane Michael struck Gulf County on October 10, 2018 and damaged many of the buoys and kiosks. CPAP is coordinating the removal of the damaged buoys and will determine whether to replace them or employ a different navigational system to help boaters avoid impacts to shallow seagrass beds. CPAP plans to install new kiosks at Gulf County boat ramps to increase seagrass protection awareness.

In 2018-19, the seagrass beds in St. Joseph Bay were mapped using unmanned aerial vehicles, or drones, and the imagery will be analyzed to determine the severity of propeller scarring in each waterbody. Aerial imagery identified 789 scars in St. Joseph Bay, measuring approximately 2.5 acres of prop scars. The severity (width and depth) of propeller scars varies depending on many factors including the size of the vessel, the extent to which the propeller is forced into the seagrass bed, and the depth of the water column at the time of impact. When the underground seagrass rhizome system is damaged, and the surrounding sediment altered by structural injuries such as vessel groundings, the seagrass community often has a difficult time reestablishing itself without supplemental restoration efforts. These exposed roots and sediments can expand due to wave action, currents, and other disturbances and ultimately result in habitat fragmentation. Unfortunately, the shallow bathymetry in St. Joseph Bay create conditions for scarring and numerous unintended propeller scars are found throughout the seagrass beds in St. Joseph Bay. Implementing seagrass restoration projects can prevent the injuries from

expanding in size or increasing in severity, create the site conditions necessary for the injured areas to recover to pre-incident conditions, and compensate the public and the environment for the services lost from the time of injury until full recovery (NOAA & DEP, 2004). The Florida Seagrass Recovery project will address boat damage to shallow seagrass beds by restoring scars located primarily in turtle grass habitats in SJBAP. Sediment tubes will be manufactured, filled with local fine grain sediment, and deployed in approximately two acres of seagrass propeller scars in the bay. Installation of the sediment tubes was completed November 2020. Two growing seasons (approximately 18 to 24 months) after placement of sediment tubes and bird stakes is completed, scars that do not naturally revegetate to a minimum score of 3 (25 to 50 percent coverage) on the Braun-Blanquet (B&B) scale will either be planted with seagrass species transplanted from potential donor sites within SJBAP, or planted with purchased seagrass planting units, as funding allows. If additional funding is available after the restoration of two acres of propeller scars in St. Joseph Bay, staff will look to restore propeller scars in St. Andrews Aquatic Preserve and/or Alligator Harbor Aquatic Preserve. No ground disturbance, including that below the mean high water line, will be taken by staff until the Division of Historical Resources has provided a review and recommendations for the proposed activity

Shoreline and Beach Restoration

Extreme high tides, wave action, strong currents, human impacts, and storm events can all contribute to shoreline erosion. Storm surge and wave activity from hurricanes can have devastating erosive effects along beaches and sparsely vegetated shorelines. Also, human impacts such as bulkheads or seawalls can be poor dissipaters of wave energy. This can cause scouring of the bottom beneath seawalls and accelerated erosion, adjacent to seawalls. The use of environmentally friendly practices such as rip rap, vegetative planting and biologically manufactured logs have shown success in stabilizing eroding shorelines. Restoring and preserving shorelines is necessary for the protection of critical habitat that is home to much of Florida's wildlife. Landowners and volunteers alike can play a role in maintaining Florida in its natural state. Planting natural vegetation along shorelines can help prevent erosion, improve water quality, and improve access to the water. Along with the aesthetic appeal, natural vegetation also creates habitat for animals like wading birds, migratory birds, fish, and crabs (NFWFMD, 2017). SJBAP is a supporter of "Living Shorelines Initiative" that is sponsored by USFWS.

The Living Shoreline Initiative assists property owners by assessing the feasibility of using native plants instead of armoring for shoreline stabilization. Homeowners pay for native marsh plants (smooth cordgrass [*Spartina alterniflora*]) and help with the planting. These opportunities are a solution where everyone benefits. Additionally, a breakwater, typically constructed of bagged fossilized oyster shell or fossilized limestone boulders, is typically installed just offshore to reduce wave action and prevent further erosion of the shoreline. In most cases, restoring a shoreline using natural techniques is less expensive than armoring with seawalls, provides valuable habitat for wildlife, and has proven to be effective at preventing additional erosion. There are many benefits to a natural marsh shoreline over a modified hardened shoreline. Marsh grasses help to prevent erosion by buffering the impact of wind and waves on the shoreline. As the plants grow, they trap sediment which will stabilize and build the shoreline, a benefit not provided by shoreline armoring. They help improve water quality by filtering pollutants that run off the land and into the bays, creeks, and bayous (Ray-Culp, 2007). SJBAP plans to coordinate and/or participate in any future living shoreline projects in or near the aquatic preserve. St. Joseph Bay State Buffer Preserve, in coordination with SJBAP, has applied for a permit to install a 450-foot living shoreline, consisting of a breakwater and native plants at Richardson Hammock in the southern portion of the bay. As with the seagrass restoration project, no ground disturbance, including that below the mean high water line, will be taken by staff until the Division of Historical Resources has provided a review and recommendations for the proposed activity.

Beach erosion threatens the very resource that residents and visitors enjoy. Florida has 825 miles of sandy beaches fronting the Atlantic Ocean, Straits of Florida, Gulf of Mexico, and the roughly 66 coastal barrier tidal inlets, and

many are experiencing critical erosion; a level of erosion which threatens substantial development, recreational, cultural, and environmental interests. In 2019, it was reported that Florida has 419.6 miles of critically eroded beach, 8.7 miles of critically eroded inlet shoreline, 90.9 miles of beaches with non-critical erosion, and 3.2 miles of inlet shoreline with non-critical erosion (DEP, 2020b). "Critically eroded" is defined as "a segment of shoreline where natural processes or human activities have caused or contributed to erosion and recession of the coastal system to such a degree that upland development, recreation, wildlife habitat, or important cultural resources are threatened or lost." Critical erosion areas may also include peripheral segments or gaps between identified critical erosion areas which, although they may be stable or slightly erosional now, their inclusion is necessary for continuity of management of the coastal system or for the design integrity of adjacent beach management projects (DEP, 2020b).

In 1995, Hurricane Opal ravaged the beaches of the St. Joseph Peninsula, displacing thousands of tons of sand and destroying the dune system. Between 1995 and 2005, repetitive damaging storms have continued to erode sand from the already depleted peninsula beaches. After Hurricane Kate in 1985, the U.S. Air Force constructed a rock mound structure in front of their road to the rocket launch site, but both the road and the rock mound structure were destroyed by Hurricane Opal in 1995. After the hurricane, a rock mound structure was also constructed at Stump Hole to protect County Road 30A. The rock mound at Stump Hole was later extended, but then was damaged by Hurricane Ivan in 2004 and Hurricane Dennis in 2005. Then a replacement was engineered in 2009 (DEP, 2020b). Cape San Blas is designated as one of the most severely eroding areas in Florida. It is currently eroding at a pace of about 40 feet per year, and more severely with each passing storm. A combination of storm events and beach erosion has resulted in narrowed beach widths and minimal or non-existent dunes adjacent to the aquatic preserve on St. Joseph Peninsula. These conditions provide inadequate protection to upland property from damage due to storm-induced erosion. The present condition of the shoreline has resulted in the destruction and relocation of a number of structures. Further, the narrowed beaches are often inadequate to support recreational use and constitute stressed habitat for sea turtles, beach mice, and marine life. Continued erosion on the peninsula has significantly reduced the amount of beach available for public use and for recreation such as beach driving, leading to increased user conflicts.

As many homes are located along the peninsula, many beach nourishment projects have occurred. The St. Joseph Peninsula Beach Restoration project was completed in the winter of 2009 (DEP, 2020b). Approximately 3.6 million cubic yards of beach compatible sand was obtained from an offshore borrow area(s). The initial 7.5-mile restoration project consisted of two segments - the 5.9-mile County Beach Segment and the 1.6-mile State Park Beach Segment within SJPS.

In 2017/2018, Gulf County received funds from The Resources and Ecosystems Sustainability, Tourist Opportunities and Revived Economies of the Gulf Coast States (RESTORE) Act for another nourishment project that consists of the placement of more than 700,000 cubic yards of clean white beach compatible sand to mitigate for the long-term erosion of the beach and restore the storm damaged dunes. Placing sand along the southern portion of the project limits will have an immediate benefit by mitigating for the long-term erosion but also over time, the beach to the north of Rish Park will gain sand from material transported to the north. This concept was in the original design for the 2008/2009 beach fill project and was verified in the results of the post-construction monitoring (Gulf County RESTORE, 2018).

The aquatic preserve is primarily concerned how each beach nourishment project may affect the existing environmental resources on the peninsula. The placement of sand may increase sea turtle nesting habitat provided that the sand is highly compatible with naturally occurring beach sediments, and that compaction and escarpment remediation measures are incorporated into the project (Coastal Tech, 2006). Potential negative effects to sea turtles include possible nest destruction, harassment in the form of disturbing or interfering with female turtles attempting to nest within the construction area or on adjacent beaches, disorientation of hatchlings on beaches adjacent to the construction area, and behavior modification of nesting female turtles due to escarpment

formation within the project area during the nesting season, resulting in false crawls or situations where they choose marginal or unsuitable nesting areas to deposit their eggs (Coastal Tech, 2006).

In 2014, Gulf County was awarded a grant by USFWS to develop a Coastal Habitat Conservation Plan (CHCP) for federally listed species that rely upon the coast and near-coastal parts of the county. Specific species and activities to be included in the plan have been determined with input from a steering committee consisting of community stakeholders and wildlife experts, with the committee membership approved by the Gulf County Board of County Commissioners. The Gulf County CHCP is a required part of an application to USFWS for an Incidental Take Permit authorizing the take of federally listed species incidental to otherwise lawful activities. This will facilitate legal compliance with the Endangered Species Act for all public and private stakeholders within the plan boundaries. The CHCP outlines what will be done to "minimize and mitigate" the effect of the permitted take or impacts on the covered listed species. The species covered by the plan (currently in final stages of review) includes four species of sea turtles - green, Kemp's ridley, leatherback (*Dermochelys coriacea*), and loggerhead; piping plover; red knot; and St. Andrew beach mouse. These species were selected for inclusion in the plan based on their federal listed status, occurrence within coastal areas of Gulf County, and the likelihood of "take" or negative effects to their populations resulting from development, recreation, or resource management (Gulf County, 2018).

The beach nourishment project has been delayed by many issues such as reduced funding, contractor issues, and most importantly, the impacts of Hurricane Michael. Originally, the project was slated to begin in October of 2018; however, Hurricane Michael made landfall on October 10, 2018 causing further delays. Most of St. Joseph Peninsula is eroded or critically eroded. Cape San Blas has the highest erosion rate along the coast of Florida, and the entire peninsula is highly dynamic. Damage from multiple hurricanes have exacerbated the situation. In addition to the impacts to residents, the erosion has destroyed nesting sea turtle habitats. After assessing the post-storm beach conditions and altering the design of the project to account for changes to the beach, the project began in early September 2019 and was completed in November 2019 (Gulf County & MRD Associates, Inc. 2019).

SJBAP will continue to actively provide comments related to the nourishment projects to the appropriate regulatory offices. The aquatic preserve will continue to assist Gulf County and USFWS with the development of the CHCP and provide necessary environmental monitoring, data, and technical support with beach nourishment projects, such as recommending that projects take place outside of sea turtle nesting season (May 1 – October 31).

Invasive Non-native and Native Removal and Treatment

Invasive animals can be detrimental to many aquatic habitats and the organisms within them. Coyotes are opportunistic scavengers that have been known to decimate sea turtle nests in pursuit of eggs. The beach is routinely monitored during the nesting season. Coyotes have been a terrestrial problem because they prey on threatened or endangered species, specifically sea turtle eggs and hatchlings, and the St. Joseph Peninsula Turtle Patrol has reported that coyotes are the main predation issue on Cape San Blas and tend to be worse in the areas of Rish Park and closest to SJPSP (J. Swindall, personal communication, Dec 11, 2019). Any signs of nest depredation by coyotes should be reported to the Florida State Park's District biological section so that the U.S. Department of Agriculture contracted trappers can be notified and directed to remove the non-indigenous predators (DEP, 2014).

Invasive Indo-Pacific lionfish are proving to be an ever-present danger to the balance of marine ecosystems along the Gulf of Mexico. In recent years, lionfish have become successfully established in nonnative ranges and are classified as the worst marine invasion to date (FWC, 2019). Lionfish continue to be documented in coastal areas along the Florida Panhandle. In 2011, three lionfish were documented within SJBAP (U.S. Geological Survey, 2019). Currently, FWC is encouraging the harvest of lionfish which are reported as excellent table fare. Effective August 2012, FWC announced changes to the lionfish harvest. Harvesting invasive lionfish no longer will require a fishing license when using certain gear, and there is no recreational or commercial bag limit. FWC has also hosted several "Lionfish Derby" events and workshops to encourage divers to spear lionfish (FWC, n.d.-k). If lionfish become established, SJBAP will coordinate with FWC to organize workshops and derby events to work toward eradicating

lionfish in the aquatic preserve and surrounding waters. In 2013 and 2018, FWC hosted a Lionfish Summit where processes and management actions implemented by state and federal agencies to address the lionfish invasion and mitigate their impacts on native species and habitats were reviewed (FWC, 2018).

4.2.3 / Resource Management Issue

Issue II: Protection of Seagrass Habitat

Seagrass communities are considered to be the most productive ecosystems in the world. They are a vital component of Florida's coastal ecology and economy. Seagrasses are a major habitat within St. Joseph Bay and are an important natural resource that performs several significant functions. Seagrasses provide nurseries, nutrition, and shelter for a wide variety of commercial and recreational fish and invertebrate species; they provide critical habitat for animals such as wading birds, manatees, and sea turtles; and their extensive root systems stabilize sediments on the bay bottom, helping to improve water quality and clarity which in turn, keeps the bay healthy. The health and status of many commercially and recreationally important seafood species such as shrimp, crabs, scallops, redfish, trout, and mullet is directly proportional to the health and acreage of seagrass habitat. For these reasons, many areas in Florida have implemented seagrass monitoring programs to determine the health and trends of local seagrass populations.

During the rapid population increase over the past 30 to 40 years, seagrass habitat has declined in inshore marine areas around Florida. As human populations continue to concentrate along the coastline, impacts to seagrass habitats increase through nutrient loading, light reduction, increased boat traffic, and more direct vessel impacts such as propeller scarring (Fonseca, Kenworthy, & Thayer, 1998). Deterioration in seagrass habitat has been attributed to both natural and human-induced disturbance, but human mediated disturbance is now the most serious cause of seagrass loss worldwide (Sargent, Leary, Crews, & Kruer, 1995). Propeller scarring occurs in shallow water when a boat's propeller tears and cuts up seagrass roots, stems and leaves, leaving a long, narrow furrow devoid of seagrasses. This damage can take eight to 10 years to repair and with severe scarring these areas may never completely recover. Recovery time is different for each species and depends on the type of growth of each species, the degree of damage, water quality conditions, and sediment characteristics. The amount of destruction from an event depends on water depth and the size, speed, and path of the vessel. Some vessels create scars in areas at low tide that would not do so at high tides. Although linear features are most often associated with the term propeller scar, repeated scarring has completely denuded some areas of seagrass habitats. In other instances, a linear scar can become a larger feature if the sediments are scoured to undercut the seagrass bed. This erosion can result in detachment of large sections of seagrasses that then float away leaving behind patches of bare sediment wider than the original propeller scar (Dawes, Phillips, & Morrison, 2004).

According to aerial seagrass surveys conducted by FWRI, Florida has more than 2.2 million acres of seagrass in its shallow coastal waters (Johnsey et al., 2018). Seagrasses that are affected by propeller scarring may never completely recover and areas that have been damaged have the potential to expand and merge with other injuries resulting in even greater cumulative impacts. Additional potential reasons for seagrass loss include: decreased water clarity and quality, propeller scarring, acidification of coastal marine resources, and fluctuating climatic conditions. Impaired water clarity due to turbidity, algal blooms, and improper disposal of dredged material as well as excessive nutrients and disease may also degrade valuable seagrass habitat. Elevated nitrogen levels stemming from increased commercial and residential development may lead to a decline in the relative abundance of seagrasses compared to phytoplankton and macroalgae, including epiphytes. High nutrient levels may also make seagrasses more susceptible to epiphyte loading and/or algal blooms that block sunlight necessary for seagrass growth, consequently resulting in habitat loss (Johnsey et al., 2018).

St. Joseph Bay is a unique and fragile ecosystem that is host to abundant concentrations of marine grasses. Three different species of seagrasses have historically occurred within the aquatic preserve (shoal grass, manatee grass, and turtle grass); however, seagrass populations are declining. These communities are critically important to the health and vitality of the waters of the bay; however, prominent and increasing propeller scar damage, decreased

water quality and clarity, and an increase in nutrient levels is evident and increasing in many areas (Wren & Yarbro, 2016). With increasing development and visitor use, these trends are expected to continue. Continued mapping and monitoring of seagrass communities, as well as other associated communities (such as algal beds), is essential to preserving this valuable resource.

Goal One: Manage seagrass communities through research and monitoring, education and outreach efforts, continued resource management and collaborative mapping efforts with other state agencies to effectively protect and maintain this habitat as a valuable, natural resource throughout SJBAP.

Objective One: Monitor the status and trends of seagrass distribution within SJBAP to determine the overall health and identify potential threats to the habitat.

Integrated Strategy One: Implement and sustain a Seagrass Monitoring Plan for SJBAP that maintains a strategic, long-term seagrass monitoring project to include water quality indicators, percent coverage of seagrass and algae species, algae identification, density, epiphyte load, and sediment depths. This will be done in coordination with FWC-FWRI and other partners (such as FSU-Panama City).

Integrated Strategy Two: Continue to collaborate with FWC and other state agencies on the Seagrass Integrated Mapping and Monitoring report to produce a resource for seagrass monitoring, mapping, and data sharing.

Integrated Strategy Three: Utilize advanced GIS technology and hyperspectral imagery to quantify gains or losses to seagrass acreages, identify severely scarred areas to determine restoration needs, assess management options, and develop a seagrass restoration plan for SJBAP.

Integrated Strategy Four: Establish and maintain close communication with all federal, state, and local land managers that are responsible for making resource management decisions that could affect water quality or seagrass habitat in SJBAP. Work with DEP district's and water management district's permitting and regulatory offices to provide input on proposed projects, site inspections, and projects designed to assess potential impacts to the bay and participate in quarterly DEP Environmental Resource Permit meetings.

Goal One, Objective One – Performance Measures:

Performance Measure One: Produce an annual SJBAP Seagrass Monitoring Report. This report will include information on the project's background, status of the resources, goals, data collection methods, sampling results, areas of concern, recommendations, and conclusions on the effectiveness of the project. At a minimum, this report will be updated every five years.

Performance Measure Two: Maintain an archive of all submerged aquatic vegetation monitoring projects within SJBAP.

Objective Two: Ensure the sustainability of scallop, fish, and other concerned species as well as saltmarsh and seagrass habitats through the development of a tiered approach to water quality monitoring that integrates biological assessments and multiple tools to define a core set of baseline indicators to possibly explain causes and/or sources of any impairment within SJBAP.

Integrated Strategy One: Partner with other local and state agencies to assist in monitoring the distribution and abundance of specific indicator species, including scallops and seagrass, to determine the ecological health of the bay system. As needed, staff will contribute and assist in the data collecting and development of a technical report assessing the status of these resources, areas of concern, and recommendations. An annual bay scallop report that discusses the status and trends of bay scallop populations around the state is supplied by FWRI.

Integrated Strategy Two: Determine the biodiversity of SJBAP by establishing baseline data and broad scale characterizations of benthic communities that are practical indicators of habitat quality in an aquatic environment and contribute to the development of a biological assessment report.

Goal One, Objective Two - Performance Measures:

Performance Measure One: Work with stakeholders and state and federal agencies to develop a database of all relevant indicator species

Performance Measure Two: Utilize water quality data and other indicators to create an approach to protect/ensure sustainability. Coordinate priority projects with local government and stakeholders.

Performance Measure Three: Contribute to the development of a biological assessment plan/report that includes an archive of relevant research and monitoring projects. The St. Joseph Bay Water Quality Initiative is planning to lead this effort.

Goal Two: Restore areas of seagrass loss and severely scarred seagrass to prevent further loss of the resource.

Objective One: Develop and implement a seagrass restoration plan for SJBAP.

Integrated Strategy One: Partner with DEP's Florida Park Service and FWC to survey the regions with the greatest habitat loss and the most severely scarred areas to prioritize areas with the greatest need for restoration.

Integrated Strategy Two: Secure and implement funding for future seagrass habitat restoration projects in SJBAP.

Integrated Strategy Three: Coordinate with FWC law enforcement to ensure enforcement of the seagrass law prohibiting destruction of seagrasses in SJBAP.

Goal Two, Objective One Performance Measure: Measure acreage of restored areas and track the percentage of success of the restored areas and the percentage of seagrass to be restored.

Goal Three: Identify and locate unknown archaeological and historical resources within and adjacent to seagrass habitats.

Objective One: Assist with management and monitoring of existing archaeological and historical resources.

Integrated Strategy One: Staff will monitor for unidentified cultural resources during activities in the aquatic preserve.

Integrated Strategy Two: Staff will partner with archaeologists from the Division of Historic Resources' Bureau of Archaeological Research, or the University of West Florida for field inspections and site identifications.

Goal Three, Objective One Performance Measures:

Performance Measure One: Track the number and condition of archaeological sites within the aquatic preserve.

Performance Measure Two: Staff will obtain Archaeological Resource Management training.

4.3 / The Education and Outreach Management Program

The Education and Outreach Management Program components are essential management tools used to increase public awareness and promote informed stewardship by local communities. Education programs include on and off-site education and training activities. These activities include field studies for students and teachers; the development and distribution of media; the distribution of information at local events; the recruitment and management of volunteers; and, training workshops for local citizens and decision-makers. The design and implementation of education programs incorporates the strategic targeting of select audiences. These audiences include all ages and walks of life; however, each represents key stakeholders and decision-makers. These efforts by the Education and Outreach Program allow the aquatic preserve to build and maintain relationships and convey knowledge to the community; invaluable components to successful management.

4.3.1 / Background of Education and Outreach at St. Joseph Bay Aquatic Preserve

Education and outreach programs conducted by SJBAP are designed to promote the goal of maintaining aquatic preserves at their current level of environmental quality for future generations. Coordinating and participating in education and outreach events proves difficult at times due to a lack of staff and budget. Common target

audiences for education and outreach events include landowners and developers, commercial and recreational resource users, students at all grade levels, organized groups, the public, and government agencies (local, regional, state, and federal). Specific examples of education and outreach activities include: presenting research and resource management goals to local communities; coordinating volunteer networks; developing and distributing informational brochures, posters, kiosks, and signage; participating in local events and festivals; organizing coastal marine debris removal programs and participating in a variety of workshops and conferences. In the Florida Panhandle, classroom lectures, public events and festivals, constructing kiosks, and publishing brochures, pamphlets and posters are the most effective methods to communicate information about coastal resources. Specific areas of volunteer involvement include but are not limited to assisting with field sampling, data entry, routine maintenance, kiosk construction, and providing support at outreach events.

4.3.2 / Current Status of Education and Outreach at St. Joseph Bay Aquatic Preserve

The human dimension is an essential component of resource and ecosystem management. Education and outreach are tools managers can use to address the human dimensions of resource issues. Combined with research, regulations, and habitat management, education and outreach provide a comprehensive approach to resource protection. The adoption and implementation of education and outreach programs improves the public's knowledge for species and habitat protection and conservation. The intent of the aquatic preserve education and outreach efforts is to foster informed and responsible stakeholders of the natural resources in the bay. Goals include educating citizens, coastal managers, target groups and developers to use the environment in ways that preserve it, consider environmental issues when planning and making decisions which could affect the environment, and take part in decisions affecting nearby natural resources.

SJBAP strives to provide accurate and comprehensible information about the natural resources within the aquatic preserve to the stakeholders, the general public, and local, state, and federal agencies. Staff has worked with other agencies and local governments to install signage in the area, providing important information regarding SJBAP, boater safety, recreational issues, the Caution Shallow Seagrass Area buoy system, and protecting seagrasses and other habitats. An informational kiosk is located at the Stump Hole kayak launch, and staff work with St. Joseph Bay State Buffer Preserve staff to maintain this access point to the bay. This is a popular access point, and staff have updated information in the kiosk about the aquatic preserve and the buoy system. Staff installed three kiosks at popular boat ramps in Gulf County to provide information about the buoy system: Eagle Harbor at St. Joseph Peninsula State Park, Presnell's Bayside Marina and RV Resort, and the Frank Pate Park Boat Ramp in downtown Port. St. Joe. Additionally, a Boating and Angling Guide to Gulf County has been designed through a partnership with FWC, and the buoy system, with coordinates, is included on the map portion of the guide. This project was funded through the National Fish and Wildlife Foundation. The public can obtain the boaters guides at the kiosks or the Gulf County Tourist Development Council. Informational brochures with a map of the buoy system are also available and have been distributed to local marinas and outdoor recreation vendors, as well as the Gulf County Tourist Development Council. Staff restock the kiosks and redistribute brochures and boaters guides to local businesses approximately every month.

The kiosk at Frank Pate Park Boat Ramp was lost during Hurricane Michael and has not been replaced to date. The kiosks at Eagle Harbor and Presnell's Bayside Marina and RV Resort were both uprooted; the SJPSP staff reinstalled the kiosk at Eagle Harbor while CPAP staff are currently working to reinstall the kiosk at Presnell's Marina. CPAP is coordinating the installation of additional kiosks at Gulf County boat ramps.

In 2015, SeaGrant and UF/IFAS started the Be Seagrass Safe campaign to promote safe boating techniques and seagrass protection. The Be Seagrass Safe campaign provides information to the public on how they can help keep seagrass beds healthy and boating enjoyable for everyone. To help promote the Be Seagrass Safe campaign, two-piece "Scars Hurt" educational signs were created; these brightly colored signs simulate a "prop scar" through the sign and provide valuable safe boating techniques to help protect seagrasses. To compliment the Caution Shallow Seagrass kiosks, preserve staff have installed Scars Hurt signs at the Eagle Harbor in T.H. Stone St. Joseph Peninsula

State Park (SJPS) and Frank Pate Park boat ramps in Gulf County; the Friends of St. Joseph State Parks and Friends of St. Joseph Bay Preserves (respectively) purchased the signs for SJBP. Staff hope to install more Scars Hurt signs in Gulf County in the future.

Staff attends local and regional meetings and working groups to present and disseminate relevant information, such as data trends in water quality and seagrass, about SJBP, focusing on the protection, preservation, and enhancement of the environment and encouraging sound decision-making regarding land use and natural resources. Additionally, staff participates in a variety of local events that promote environmental protection and resource conservation; these include, but are not limited to: International Coastal Cleanup, Urchin Round Ups, Seagrass Awareness Month, St. Joseph Bay State Buffer Preserve's Bay Day, Earth Day, Estuaries Day, and many others. The SJBP aims to manage seagrass communities through research and monitoring, education and outreach efforts, continued resource management, and collaborative efforts with other state agencies to effectively protect and maintain the valuable, natural resources. For example, Urchin Round Ups provide an opportunity to engage and educate the public in a fun and hands-on way. By allowing them to participate in the restoration effort, they gain a better understanding of the importance of seagrass and seagrass protection.

In the future, SJBP aims to maintain and continue current education and outreach efforts to educate the public, stakeholders, and local, state, and regional officials. Staff will continue to update and distribute informational handouts and brochures. Additionally, kiosks will be maintained, updated, or installed at new locations, as new and more pertinent information needs to be presented. Also, SJBP staff will continue to attend local and regional meetings and conferences to obtain, discuss, and distribute vital information pertaining to the protection, conservation, and enhancement of resources within the aquatic preserve. Social media has become an increasingly popular and convenient way to reach a wide range of audiences. SJBP will work toward a bigger presence in social media, particularly Facebook and Twitter, to update local residents and visitors about upcoming events, research, and other pertinent information.

Aquatic preserve staff also plans to continue participating in many outreach events and festivals to encourage sound resource management and the conservation and protection of SJBP. Furthermore, expanding the volunteer network within SJBP is a major goal. Volunteer support enables staff to more effectively complete field work and participate in many outreach events. Volunteer activities in the past have included, but are not limited to water quality sampling, seagrass monitoring, kiosk and sign installation, vehicle and vessel maintenance, as well as many educational and outreach opportunities SJBP staff rely heavily on other agencies for volunteer coordination when participating in local events throughout the Florida Panhandle; with such a small staff, maintaining current records of volunteers proves difficult.

There is also a need to further develop a school-based program to bring the bay to the local students. The aquatic preserve will coordinate with local schools in the future to develop and implement an educational program that will involve lectures, information, and field trips to the bay to discuss the importance of the ecosystem. Staff currently assist the St. Joseph Bay State Buffer Preserve with educational programs for students during the school year or in summer programs.

4.3.3 / Education and Outreach Issues

Issue I: Water Quality (Continued from same issue in Ecosystem Science section.)

Goal Two: Provide timely and accurate water quality data and information to the public and other entities/agencies. (Numbering continued from the same issue in Ecosystem Science section.)

Objective Two: Utilize a variety of methods to inform the public and other entities regarding water quality conditions, the importance of water quality, and suggestions to improve water quality within SJBP.

Integrated Strategy One: Utilize educational signage at strategic access points to SJBP to educate the public on the ecological significance of the bay and how the public can assist in conserving natural resources.

Integrate Strategy Two: Coordinate and participate in public lectures and other events where staff can address water quality issues and discuss methods for improving water quality.

Integrated Strategy Three: Provide and/or create opportunities for the public to volunteer to assist with monitoring efforts and unique events (i.e. Earth Day).

Goal Two, Objective Two - Performance Measures

Performance Measure One: Create and revise informational brochures to disseminate to the public.

Performance Measure Two: Track number of SJBAP kiosks that are installed, updated, or repaired throughout the Gulf County area.

Performance Measure Three: Track number of volunteers that assist with SJBAP programs.

Performance Measure Four: Track the number of people that attend public lectures or other outreach events.

Issue II: Protection of Seagrass Habitat (Continued from same issue in Resource Management section.)

Goal One: Manage seagrass communities through research and monitoring, education and outreach efforts, continued resource management and collaborative mapping efforts with other state agencies to effectively protect and maintain this habitat as a valuable, natural resource throughout SJBAP. *(Continued from same goal in Resource Management section.)*

Objective Three: Promote the importance of seagrass habitats by generating a variety of informational outlets that target recreational, commercial, and scientific user groups operating in SJBAP. (Numbering continued from the same goal in Resource Management section.)

Integrated Strategy One: Design and distribute brochures and other outreach materials that include information on the importance of seagrass habitat, water quality, and sound user practices that can be used to prevent destruction of seagrasses.

Integrated Strategy Two: Repair, replace, or install education signage pertaining to resource protection at public and private boat ramps and marinas throughout SJBAP.

Integrated Strategy Three: Provide educational and informational materials, such as boater's guides and brochures to local businesses, marinas, and tour operators.

Integrated Strategy Four: Continue to organize and participate in education and outreach events throughout the Panhandle to promote the importance of seagrass and other estuarine habitats. This would include the Urchin Round Ups, St. Joseph Bay State Buffer Preserve's Bay Day, FWC's Lionfish Derbies, and others.

Integrated Strategy Five: Coordinate with local boat and personal watercraft rental companies, fishing charter companies, and other tourism-driven businesses to inform visitors of proper boating practices to reduce the amount of propeller scarring in seagrasses. This could include but is not limited to informational brochures, public service announcements or videos to be shown prior to outings in the bay.

Goal One, Objective Three – Performance Measures:

Performance Measure One: Produce and acquire brochures and signage informing users of the importance of seagrass habitat, water quality, and good boating practices that can be used to prevent destruction of seagrasses.

Performance Measure Two: Track number of signs that are repaired or installed.

Performance Measure Three: Track number of events attended.

Performance Measure Four: Track education and outreach measures used by rental companies.

4.4 / The Public Use Management Program

The Public Use Management Program addresses the delivery and management of public use opportunities at the aquatic preserve. The components of this program focus on providing the public recreational opportunities within the site's boundaries which are compatible with resource management objectives. The goal for public access management in ORCP managed areas is to promote and manage public use of preserves and reserves that is consistent with natural and cultural resource protection and supports the research, education, and stewardship mission of ORCP.

While access by the general public has always been a priority, the conservation of ORCP's sites is the primary management concern for ORCP. It is essential for staff to analyze existing public uses and define management strategies that balance these activities where compatible in a manner that protects natural, cultural, and aesthetic resources. This requires gathering existing information on use, needs, and opportunities, as well as a thorough consideration of the existing and potential impacts to critical upland, wetland, and submerged habitats. This includes the coordination of visitor program planning with social science research. One of ORCP's critical management challenges during the next 10 years is balancing anticipated increases in public use with the need to ensure preservation of site resources. This section explains the history and current status of public use efforts.

4.4.1 / Background of Public Use at St. Joseph Bay Aquatic Preserve

Popular recreational activities in SJBAP include fishing, boating, kayaking, swimming, sunbathing, and beachcombing. Primary public use issues in SJBAP include boater use and safety, water quality, seagrass protection, and marine debris. As development and population pressures increase, potential negative impacts may affect water quality in the aquatic preserve. Water quality is very important within SJBAP, and it is a major goal of SJBAP to maintain and improve water quality. Seagrass beds are vital habitat for many commercially important species; monitoring data indicates that the occurrence of seagrass species was stable but that the density of seagrass beds was variable and thinning (Wren & Yarbro, 2016). Extensive and increasing prop scar damage has also resulted in seagrass loss in the bay. The shallow waters and unmarked sandbars, coupled with boater carelessness, pose a threat to seagrass beds. Staff will continue to monitor seagrass health and water quality in the aquatic preserve to assess effects of recreational and developmental pressures.

Until 1986, there were no wet storage facilities or shellfish propagation leases located in St. Joseph Bay, 11 mechanical clam harvesting permits had been issued, and there were six certified shellfish processing plants in Gulf County. Species harvested commercially within the aquatic preserve included bay scallops, mullet, hardshell clams, blue crabs, and shrimp. The primary species of shellfish harvested were the hardshell clam or quahog. Sunray venus clams were also available in the bay, but not in commercial quantities. Hardshell clams congregated in large numbers buried in firm mud and sand substrates and were harvested by permitted dredging from the central portion of the bay. Commercial harvesting of bay scallops was also permitted within the bay, but this proved to be a controversial aspect of the marine harvest since it competed with the recreational harvesting of scallops. This issue was manifested locally in the early 1980s through a petition by county residents to their Board of County Commissioners to stop commercial harvesting. A compromise was initially reached in which commercial scalloping was banned in the earlier part of the scallop season and on weekends until Labor Day, and with a limit placed on recreational harvesters. By 1994, however, commercial scalloping was banned completely.

The Port St. Joe Marina was completed in 1999 and lies along the northeastern shoreline of the bay which is adjacent to the preserve boundaries. This six-acre marina overlooking St. Joseph Bay features 109 wet slips, 79 dry storage units, fuel pumps, pump out facilities, ship store and dockside café. Unfortunately, much of the marina facility was destroyed by Hurricane Michael in October 2018.

Presnell's RV Resort & Bayside Marina lies along the eastern shoreline and offers boat access to the bay. Located right on the calm waters of St. Joseph Bay, Presnell's is very popular destination RV park in northwest Florida; the facility has a marina that provides bay boat, pontoon, kayak, and paddle board rentals with access to boating, fishing, snorkeling, fishing guides and more. Presnell's offers 70 RV camping sites with 30 and 50-amp service and full sewer hookups. The RV campground and facilities were decimated by Hurricane Michael in October 2018;

however, the RV park has since rebuilt and expanded some facilities including more RV sites, a clubhouse and pool, and new marina store. While public use is encouraged in aquatic preserves, this type of development along the coastline has potential to impact water quality (stormwater runoff), shallow seagrass beds, and other aquatic habitats in SJBAP. Contiguous and lush seagrasses occur just seaward of the RV park and marina, as well as in their channel leading from the marina out to open water on the bay. CPAP has previously provided seagrass awareness outreach materials to the marina to help keep boaters informed of the precious seagrass habitat and how they can avoid impacting resources. CPAP will continue to provide educational materials to the resort owners.

Black's Island is a seven-acre private island that lies within the southern portion of the bay. A large variety of birds including egrets, osprey and pelicans once nested on the island and it served as a valuable bird rookery. In 2002, a permit was granted to run a utility cable to Black's Island and 26 single family bungalows, community center, restaurant, bar and public restrooms were developed. In 2006, the Gulf County Department of Health issued multiple aerobic treatment units and drip irrigation permits to serve as the island's wastewater treatment. There are concerns for this type of development within the aquatic preserve because of potential impacts that may be caused due to low elevation levels, the ability of the island to handle this kind of development, storm events and emergency response and wastewater leakage, etc. In October 2018, Hurricane Michael created a large storm surge that damaged some trees and low-lying structures on the island; however, the bungalows and clubhouse received very little damage. Most of the marsh vegetation surrounding the island has recovered, and normal recreational operations have resumed (S. Seymour, personal communication, July 6, 2020). The aquatic preserve will continue to monitor the seagrasses and water quality in this area and will establish additional monitoring sites to detect any changes in the resources because of this development.

Historically, motorized vehicular traffic has been permitted by county ordinance below the natural vegetation line on the beaches adjacent to the aquatic preserve on St. Joseph Peninsula. Rapid erosion rates, however, have left areas of the beach extremely narrow in this area. Because of this, high tides and exposed tree stumps often force drivers up onto the dry, sand area, damaging foredunes, pioneer dune vegetation, sea turtle nesting habitat as well as other important wildlife habitat. In areas where motor vehicles are allowed on the beach or where illegal beach driving occurs, the use of headlights during night driving can disrupt the nesting process and disorient hatchlings. Tire ruts can also interfere with the hatchlings' ability to reach the sea, and vehicles can damage nests and/or run over hatchlings. In 2003, to reduce the adverse impacts to the natural resources on the peninsula from vehicular traffic, the aquatic preserve coordinated with USFWS and Gulf County to develop a Memorandum of Agreement. This Memorandum of Agreement outlined necessary requirements for beach driving on the six-mile stretch of beach between the Stump Hole area and the state park boundaries, which lie adjacent to the aquatic preserve. Provisions of this agreement included the establishment of a buffer zone, closing the beach to vehicular traffic on certain high tides, provision of extra law enforcement on public holidays, and closing the beach at night during sea turtle nesting season, with the exception of emergency vehicles, law enforcement, and permitted turtle patrol. In April 2004, Gulf County and the DEP collaborated to install a second beach gate approximately 150 yards north of the Stump Hole access.

In 2015, the county passed Ordinance 2015-08 that updated the conditions that allow for vehicular traffic on certain coastal beaches within Gulf County. This includes developing permit requirement and fees, establishing a system for monitoring the issuance of permits (decals), limiting and designating beach access points, providing a speed limit (<15mph) and other rules for operation of vehicles on the beach, and developing penalties for violations of the rules. This ordinance prohibits vehicles from entering, driving or parking landward of the vehicular buffer zone on the beaches adjacent to SJBAP. The county has designated this by signage which is physically located on the beach in the affected areas. This restriction applies to both adjacent beach waterfront property owners, as well as all other permit holders. Additionally, the public beaches adjacent to the aquatic preserve are closed to vehicular traffic on days when extremely high tides make that beach impassable without travel over dunes or vegetation (Gulf County Sheriff, 2015). This ordinance is intended to help protect sensitive environmental areas, reduce erosion, and prevent disruptions to turtle nesting, while still providing public access. Enforcement

due to low staff has been a concern. Gulf County is working on providing more staff and is collaborating with the aquatic preserve to update and increase signage.

The growing occurrence of marine events, such as the barge parties where a large number of boats congregate for days, is an issue at other various aquatic preserves across the state. While not yet prevalent in SJBAP, these large marine events pose a threat to shallow submerged resources. When large enough, event planners need to apply to the U.S. Coast Guard (USCG) for permission to hold the event. Typically, aquatic preserve staff are notified in this process and coordinate with the applicant, law enforcement, USCG, as well as NOAA National Marine Fisheries Service staff to better site this event to avoid and minimize impacts to resources. Proactive measures, such as distributing seagrass scarring information flyers and posting seagrass and SJBAP information on the event's website, are recommended to reduce impacts to seagrass areas during the event. Seagrass site inspections (before, during and after the event) and utilizing aerial images can document seagrass impacts.

The coordination and partnering with stakeholders for these events takes time to develop; however, an underlying issue develops with the occurrence of the marine events. DEP's Environmental Resource Permitting does not issue permits to use state owned submerged land for marine events. An aquatic preserve office is typically only notified of an event if the applicant applies to the USCG, which issues a letter of non-permit. Aquatic preserve staff can coordinate with the applicant and other stakeholders but do not have any regulatory teeth with the USCG. The aquatic preserves would benefit from a requirement that stipulates event coordinators obtain Division of State Lands authorization for marine events.

4.4.2 / Current Status of Public Use at St. Joseph Bay Aquatic Preserve

SJBAP encourages sustainable use of natural resources while minimizing user impacts. Public support and participation are imperative to protecting natural resources. Strong citizen support is vital to the success of the aquatic preserve's programs. Public participation in resource management enables them to understand the important ecological and economic issues of the system. The goal is to foster understanding of the problems facing these fragile ecosystems and the steps needed to adequately manage this important habitat. In addition, it is important to target specific user groups that enjoy the area. Knowledge of how the bay system works and the resources that make up the system can contribute to the reduction of habitat and species decline. Providing factual, timely information that is appropriate to the target user groups, coastal managers, citizens, and developers is a major goal of the aquatic preserve. Additionally, upland development activity has the potential to have a significant adverse impact on the natural resources of the aquatic preserve. Regularly scheduled meetings between the county and the aquatic preserve should be coordinated to discuss the effectiveness of the management plan and to discuss the enforcement of applicable resource laws and ordinances.

The environment within the aquatic preserve boundaries and on surrounding managed land, such as the St. Joseph Bay State Buffer Preserve land and SJSPS, provides a wide variety of outdoor, resource-based recreational opportunities including bay and offshore fishing, diving, snorkeling, scalloping, beach-going activities, birding, hiking, and boating. In, 2002, ORCP developed a kayak and canoe launch in the southern portion of the bay that is accessible from Cape San Blas Road. This area, also known as Richardson's Hammock, offers an excellent paddling opportunity. The Florida Circumnavigational Saltwater Paddling Trail passes through SJBAP on either side of St. Joseph Peninsula connecting it with St. Andrews Aquatic Preserve and Apalachicola Bay National Estuarine Research Reserve.

The major use of SJBAP continues to revolve around recreational activities. The clear and shallow waters of the aquatic preserve offer excellent fishing opportunities due to the lush seagrass habitat that supports a variety of commercial and recreational fish species. Most of the vessels in SJBAP are recreational boaters, although some commercial vessels utilize the bay. There are four boat ramps that provide access directly into the St. Joseph Bay. An additional boat ramps can be utilized to the north and west of SJBAP, although some are private, only to be used by government officials, or require a fee. The closest public boat ramps that provide access to the aquatic

preserve include Eagle Harbor at SJSPS, Highland View Public Boat Ramp, Frank Pate Port St. Joe City Park Boat Ramp, and Presnell's Bayside Marina and RV Resort. St. Joseph Bay State Buffer Preserve and SJBAP staff manage the public kayak/canoe launch located in the southwest corner bay. Map 13 shows the closest access points to SJBAP.

Many users of the bay may not be aware of how their daily activities impact the natural resources in the aquatic preserve; therefore, an education and outreach component is crucial to accomplishing the aquatic preserve's goals and ensuring effective management of the bay system from future impacts. Beach driving is still allowed and is permitted and regulated through the Gulf County Sheriff's Office. Black's Island is still a popular tourist destination, and increased seagrass scarring and loss has been documented in adjacent areas to the island. Increased use of the aquatic preserve, for recreation and visitation, coupled with development pressure, results in increased potential to degrade water quality through storm water runoff and other nonpoint pollution sources. A need exists to acquire information regarding visitor use to provide recreation access that is consistent with resource protection.

SJBAP will continue to assist the local government with public access issues by providing recommendations based on natural resource information and data. Management efforts will continue to focus on research and monitoring activities that provide sound, scientific data to make appropriate management decisions and improve public education with signage, presentations, brochures, and marked channels.

4.4.3 / Public Use Issue

Water quality and protection of seagrass habitat are two key issues for SJBAP. While both have public use components, those components overlap with components for other management programs, particularly the Education and Outreach Program. Since they were addressed in that section, those objectives and strategies will not be repeated here.

Issue III: Sustainable Public Use

SJBAP and the surrounding areas are popular tourist destinations, especially in the summer months. Sandy beaches and boating and fishing opportunities bring in visitors from near and far. The area surrounding SJBAP provides many opportunities for the public to enjoy the aquatic preserve's natural resources such as fishing, boating, kayaking, hiking (St. Joseph Bay State Buffer Preserve and SJSPS), birding and beach-oriented activities such as surf-fishing, swimming, and sunbathing.

SJBAP encourages sustainable use of natural resources while minimizing user impacts. Public support and interagency participation are imperative to protecting natural resources. Public participation in resource management enables them to understand the important ecological and economic issues of the system. By examining existing public use and natural resource patterns and trends, SJBAP staff can proactively identify potential conflicts and work with stakeholders to prioritize strategies to sustain a healthy ecosystem for the benefit of Florida residents and visitors. Ecological services derived from healthy ecosystems include aesthetics, water, food, carbon storage, storm buffers, and pollution abatement. These can sustain human life and support social and economic prosperity (Turner et al., 2007). Raising public awareness for the valuable services that a healthy bay provides is a priority objective to build stakeholder support to conserve and restore this important natural resource.

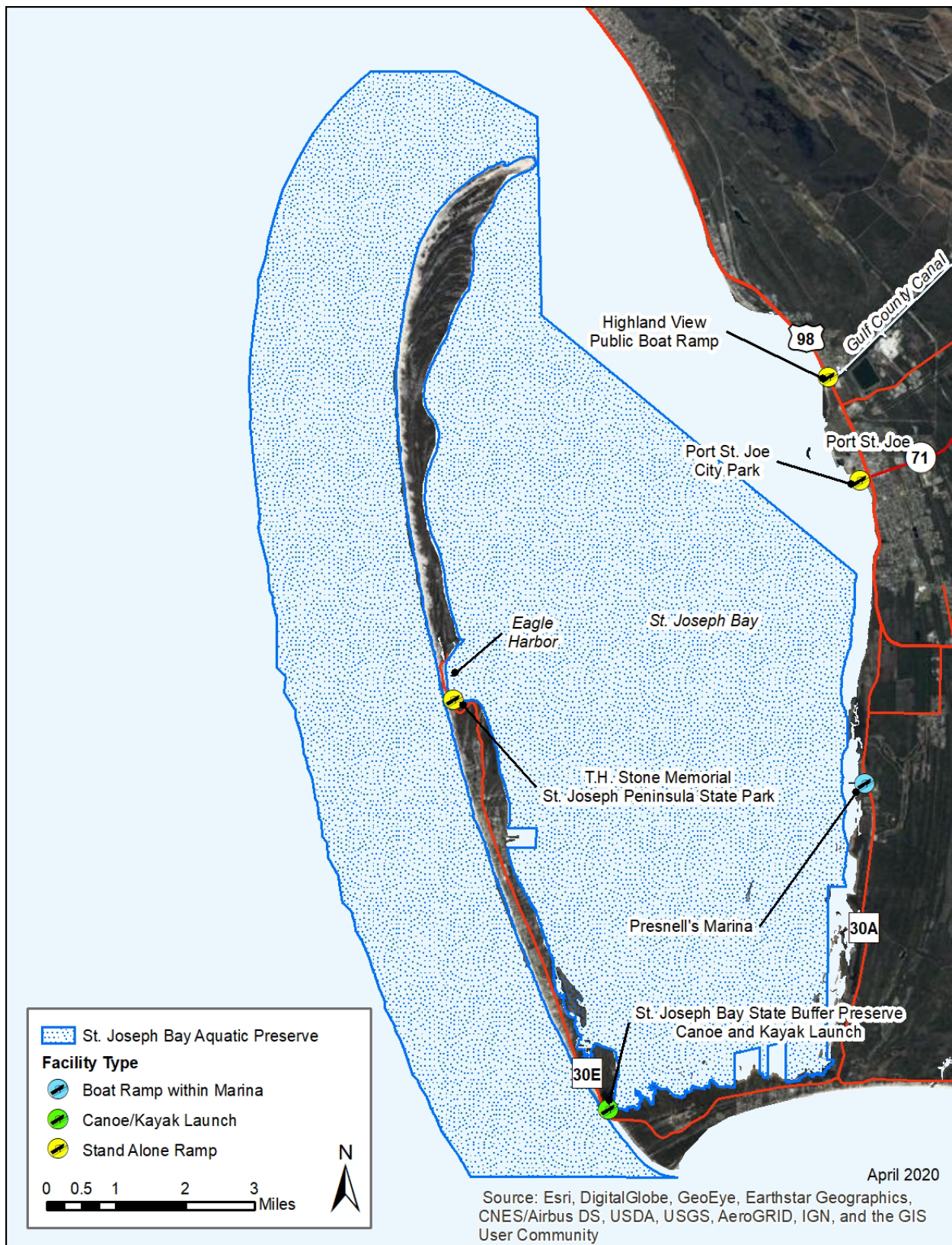
Addressing issues, such as marine debris, are important in assessing the overall health of the aquatic preserve. Marine debris presents a real and chronic threat to wildlife and public safety; entanglement, ingestion, and the release of toxins into the environment are issues related to debris. Additionally, the presence of debris detracts from the aesthetic value of natural landscapes. Marine debris can include paper and plastic products, construction debris, derelict vessels, and derelict aquaculture and fisheries gear (ropes, buoys, nets, PVC, etc.). As a result of Hurricane Michael in October 2018, enormous amounts of marine debris were dispersed into and adjacent to St. Joseph Bay. In 2019, the St. Joseph Bay State Buffer Preserve conducted a marine debris cleanup and removed approximately 33 tons of debris from the bay and adjacent areas; items removed included boats, appliances,

furniture, wood decking and stairs, beach toys and chairs, and more. Lost and abandoned stone crab and blue crab traps have been identified as a problem in Florida's marine environment by various stakeholders, including the commercial fishing industry. Once traps become derelict, they may create user conflicts, "ghost fish" (continue to trap marine organisms until traps degrade enough to allow escape), visually pollute, cause damage to sensitive habitats, and become hazards to navigation (FWC, n.d.-d).

Goal One: Encourage user experiences and public recreation opportunities consistent with natural resource conservation.

Objective One: Inform residents and visitors about actions they can take to conserve and restore resources of SJBAP.

Integrated Strategy One: Partner with other agencies to develop and distribute information identifying potential use conflicts and methods of prevention (Leave No Trace principles, beach driving, large marine events, etc.).



Map 13 / Public access at St. Joseph Bay Aquatic Preserve.

Integrated Strategy Two: Develop informational brochures and/or participate in local meetings to educate user groups of potential impacts to the natural resources associated with user activities.

Integrated Strategy Three: Post educational signage at public access points. Partnerships with public access managers will be formed to install educational kiosks at high-use public boat ramps within and near SJBAP. Informational and aesthetic displays that highlight natural resources found in the aquatic preserve will be constructed at additional public access points.

Goal One, Objective One - Performance Measures:

Performance Measure One: Continue to attend (and track) meetings with regulatory staff and NFWFMD staff to provide updates and discuss relevant issues within St. Joseph Bay (St. Andrews Watershed).

Performance Measure Two: Track quantity of brochures distributed and/or public education meetings attended.

Performance Measure Three: Track quantity and location of educational signage at public access ramps.

Objective Two: Examine public use patterns and trends within the SJBAP to proactively identify potential resource/public use conflicts and by working with key stakeholders, develop conservation strategies to minimize damage to the natural resources.

Integrated Strategy One: Work with regulatory agencies, law enforcement, USCG, and other resource management entities to identify and address uses within SJBAP (e.g. camping, marine events) that are potentially illegal or harmful to natural resources, and other marine activities that do not currently require state regulatory approval and/or DEP's Division of State Lands authorization.

Integrated Strategy Two: In an effort to identify resource/public use conflicts and develop conservation strategies, SJBAP staff will create an aquatic preserve visitor use survey.

Goal One, Objective Two - Performance Measure: Produce a summary report on visitor use survey.

Goal Two: Promote low-impact, sustainable recreational opportunities.

Objective One: Increase awareness of non-consumptive use opportunities such as paddle boarding, sailing, kayaking, canoeing, swimming, and snorkeling.

Integrated Strategy One: Promote the Florida Circumnavigational Saltwater Paddling Trail through educational signage paddling launch sites. Staff will work with DEP's Office of Greenways and Trails within the Division of Recreation and Parks to provide updated information pertaining to resources found along the trail.

Integrated Strategy Two: Work with adjacent land managers and government agencies to promote expansion of non-consumptive activities (e.g., kayaking, nature viewing).

Goal Two, Objective One Performance Measure: Produce a summary report on the visitor use survey.

Goal Three: Address areas impacted by human use while educating users of the effects of improper use.

Objective One: Reduce the amount of debris, contaminants, and other resource damages associated with user groups.

Integrated Strategy One: Coordinate with other resource agencies and law enforcement to support efforts to address and remove illegal fisheries gear and harvesting activities, and/or marine debris in SJBAP.

Integrated Strategy Two: Partner with FWC and other agencies to secure funding for and develop habitat restoration projects involving the removal of derelict vessels from SJBAP.

Goal Three, Objective One – Performance Measures:

Performance Measure One: Partner with local citizens, state agencies, and federal agencies to complete at least one marine debris removal project annually in areas of concern to protect and restore resources.

Performance Measure Two: Track quantity of education and outreach measures regarding marine debris.

Performance Measure Three: Produce a summary report of efforts made in marine debris field removal/restoration.



Chapter 5 / Administrative Plan

Successful implementation of the St. Joseph Bay Aquatic Preserve research, education and resource management programs outlined in this management plan is dependent on an effective administration strategy and framework that provides for adequate staffing, facilities, funding, and cooperation with other agencies and citizen support. The objectives of the aquatic preserve's administrative program include the following: 1) to supervise and administer programs and maintain facilities; 2) to comply with all legal rules, contracts, agreements and regulations; 3) to maintain all records needed for operating, budgeting, planning and purchasing; and 4) to communicate and coordinate with all entities involved in research, education, commercial, and recreational utilization or management within the aquatic preserve.

Staffing

The Central Panhandle Aquatic Preserves (CPAP) office is responsible for the management of four aquatic preserves in Bay, Gulf, and Franklin counties; these include St. Andrews State Park Aquatic Preserve (25,000 acres), St. Joseph Bay Aquatic Preserve (55,675 acres), Apalachicola Bay Aquatic Preserve (80,875 acres), and Alligator Harbor Aquatic Preserve (14,184 acres), respectively. Prior to 2011, staff included the aquatic preserve manager (Environmental Specialist III, full time equivalent [FTE]), as well as two Environmental Specialist I positions (Other Personal Services [OPS], limited benefits). As of FY 2021-22, staff is composed of the aquatic preserve manager (FTE Environmental Specialist III), and Environmental Specialist II (OPS), and two Environmental Specialist I (OPS).

The Environmental Specialist II and two Environmental Specialist I positions are grant-funded through Natural Resource Damage Assessment and RESTORE funding.

The plan's recommended actions, time frames, and cost estimates will guide the Office of Resilience and Coastal Protection's (ORCP) planning and budgeting activities over the period of this plan. These recommendations are based on the information that exists at the time the plan was prepared. A high degree of adaptability and flexibility must be built into this process to ensure that ORCP can adjust to changes in the availability of funds, unexpected events such as hurricanes, and changes in statewide issues, priorities and policies. While most of the strategies identified in this plan will be implemented using existing staff and funding. However, several objectives and the strategies necessary to accomplish them cannot be completed during the life of this plan without additional resources.

Statewide priorities for management and restoration of submerged and coastal resources are evaluated each year as part of the process for planning ORCP's annual budget. When preparing ORCP's budget, it considers the needs and priorities of the entire aquatic preserve program, other programs within ORCP, and the projected availability of funding from all sources during the upcoming fiscal year. ORCP pursues supplemental sources of funds and staff resources whenever possible, including grants, volunteers, and partnerships with other entities. ORCP's ability to accomplish the specific actions identified in the plan will be determined largely by the availability of resources, which may vary from year to year. Consequently, the target schedules and estimated costs identified in Appendix D may need to be adjusted during the ten-year management planning cycle.



Chapter 6 / Facilities Plan

Facilities

The Central Panhandle Aquatic Preserves (CPAP) office is currently housed within the Apalachicola National Estuarine Research Reserve's (ANERR's) Eastpoint, Florida facility. The ANERR facility is sited on 26 acres along the shore of Apalachicola Bay near the northern terminus of the St. George Island bridge. The facility is approximately 18,000 square feet and was funded by both National Oceanic and Atmospheric Administration (NOAA) acquisition and construction grant funds and money appropriated by the Florida Legislature.

Upon the occasion of a hurricane storm event, all vessels and vehicles of CPAP will follow the procedures outlined in the ANERR Hurricane Plan, which is updated annually. This plan accounts for how all facilities, equipment and data sources are to be protected in the event of a storm, and provides for the relocation of vehicles, vessels and sensitive equipment.

Vehicles

The CPAP office acquired a Ford F-250 in the spring of 2019 that is dedicated to all CPAP projects. Vehicles can be borrowed from ANERR's fleet when needed.

Vessels

- **19' Twin Vee Bay Cat** – In 2004, CPAP acquired a 19-foot Twin Vee Bay Cat Skiff and trailer that are utilized to accomplish program management goals. In 2011, the Twin Vee was transferred to ANERR's research program. The

aquatic preserve office now borrows this boat from ANERR when it is available. However, a dedicated vessel is needed for the aquatic preserve to better accomplish program management goals.

- **Tandem Kayak** – Acquired in 2002 to use while monitoring seagrass habitat in shallow areas.

List of Appendices

Appendix A / Legal Documents

A.1 / Aquatic Preserve Resolution

WHEREAS, the State of Florida, by virtue of its sovereignty, is the owner of the beds of all navigable waters, salt and fresh, lying within its territory, with certain minor exceptions, and is also the owner of certain other lands derived from various sources; and

WHEREAS, title to these sovereignty and certain other lands has been vested by the Florida Legislature in the State of Florida Board of Trustees of the Internal Improvement Trust Fund, to be held, protected and managed for the long range benefit of the people of Florida; and

WHEREAS, the State of Florida Board of Trustees of the Internal Improvement Trust Fund, as a part of its overall management program for Florida's state-owned lands, does desire to insure the perpetual protection, preservation and public enjoyment of certain specific areas of exceptional quality and value by setting aside forever these certain areas as aquatic preserves or sanctuaries; and

WHEREAS, the ad hoc Florida Inter-Agency Advisory Committee on Submerged Land Management has selected through careful study and deliberation a number of specific areas of state—owned land having exceptional biological, aesthetic and scientific value, and has recommended to the State of Florida Board of Trustees of the Internal Improvement Trust Fund that these selected areas be officially recognized and established as the initial elements of a statewide system of aquatic preserves for Florida;

NOW, THEREFORE, BE IT RESOLVED by the State of Florida Board of Trustees of the Internal Improvement Trust Fund:

THAT it does hereby establish a statewide system of aquatic preserves as a means of protecting and preserving in perpetuity certain specially selected areas of state-owned land: and

THAT specifically described, individual areas of state-owned land may from time to time be established as aquatic preserves and included in the statewide system of aquatic preserves by separate resolution of the State of Florida Board of Trustees of the Internal Improvement Trust Fund; and

THAT the statewide system of aquatic preserves and all individual aquatic preserves established thereunder shall be administered and managed, either by the said State of Florida Board of Trustees of the Internal Improvement Trust Fund or its designee as may be specifically provided for in the establishing resolution for each individual aquatic preserve, in accordance with the following management policies and criteria:

(1) An aquatic preserve is intended to set aside an exceptional area of state-owned land and its associated waters for preservation essentially in their natural or existing condition by reasonable regulation of all human activity which might have an effect on the area.

(2) An aquatic preserve shall include only lands or water bottoms owned by the State of Florida, and such private lands or water bottoms as may be specifically authorized for inclusion by appropriate instrument from the owner. Any included lands or water bottoms to which a private ownership claim might subsequently be proved shall upon adjudication of private ownership be automatically excluded from the preserve, although such exclusion shall not preclude the State from attempting to negotiate an arrangement with the owner by which such lands or water bottoms might be again included within the preserve.

(3) No alteration of physical conditions within an aquatic preserve shall be permitted except: (a) minimum dredging and spoiling for authorized public navigation projects, or (b) other approved activity designed to enhance the quality or utility of the preserve itself. It is inherent in the concept of the aquatic preserve that, other than as contemplated above, there be: no dredging and filling to create land, no drilling of oil wells or excavation for shell or minerals, and no erection of structures on stilts or otherwise unless associated with authorized activity, within the confines of a preserve - to the extent these activities can be lawfully prevented.

(4) Specifically, there shall be no bulkhead lines set within an aquatic preserve. When the boundary of a preserve is intended to be the line of mean high water along a particular shoreline, any bulkhead line subsequently set for that shoreline will also be at the line of mean high water.

(5) All human activity within an aquatic preserve shall be subject to reasonable rules and regulations promulgated and enforced by the State of Florida Board of Trustees of the Internal Improvement Trust Fund and/or any other specifically designated managing agency. Such rules and regulations shall not interfere unduly with lawful and traditional public uses of the area, such as fishing (both sport and commercial), hunting, boating, swimming and the like.

(6) Neither the establishment nor the management of an aquatic preserve shall infringe upon the lawful and traditional riparian rights of private property owners adjacent to a preserve. In furtherance of these rights, reasonable improvement for ingress and egress, mosquito control, shore protection and similar purposes may be permitted by the State of Florida Board of Trustees of the Internal Improvement Trust Fund and other jurisdictional agencies, after review and formal concurrence by any specifically designated managing agency for the preserve in question.

(7) Other uses of an aquatic preserve, or human activity within a preserve, although not originally contemplated, may be permitted by the State of Florida Board of Trustees of the Internal Improvement Trust Fund and other jurisdictional agencies, but only after a formal finding of compatibility made by the said Trustees on the advice of any specifically designated managing agency for the preserve in question.

IN TESTIMONY WHEREOF, the Trustees for and on behalf of the State of Florida Board of Trustees of the Internal Improvement Trust Fund have hereunto subscribed their names and have caused the official seal of said State of

Florida Board of Trustees of the Internal Improvement Trust Fund to be hereunto affixed, in the City of Tallahassee, Florida, on this the 24th day of November A. D. 1969.

CLAUDE R. KIRK, JR, Governor

TOM ADAMS, Secretary of State

EARL FAIRCLOTH, Attorney General

FRED O. DICKINSON, JR., Comptroller

BROWARD WILLIAMS, Treasurer

FLOYD T. CHRISTIAN, Commissioner of Education

DOYLE CONNER, Commissioner of Agriculture

As and Constituting the State of Florida Board of Trustees of the Internal Improvement Trust Fund

A.2 / Florida Statutes

All the statutes can be found according to number at <http://www.leg.state.fl.us/Statutes>

- Florida Statutes, Chapter 253: State Lands
- Florida Statutes, Chapter 258: State Parks and Preserves, Part II (Aquatic Preserves)
 - **Chapter 258.39 Boundaries of preserves.**—The submerged lands included within the boundaries of Nassau, Duval, St. Johns, Flagler, Volusia, Brevard, Indian River, St. Lucie, Charlotte, Pinellas, Martin, Palm Beach, Miami-Dade, Monroe, Collier, Lee, Citrus, Franklin, Gulf, Bay, Okaloosa, Marion, Santa Rosa, Hernando, and Escambia Counties, as hereinafter described, with the exception of privately held submerged lands lying landward of established bulkheads and of privately held submerged lands within Monroe County where the establishment of bulkhead lines is not required, are hereby declared to be aquatic preserves. Such aquatic preserve areas include:
 - (17) St. Joseph Bay Aquatic Preserve, as described in the Official Records of Gulf County in Book 46, pages 73-76.
- Florida Statutes, Chapter 267: Historical Resources
- Florida Statutes, Chapter 370: Saltwater Fisheries
- Florida Statutes, Chapter 372: Wildlife
- Florida Statutes, Chapter 403: Environmental Control (Statute authorizing the Florida Department of Environmental Protection (DEP) to create Outstanding Florida Waters is at 403.061(27))
- Florida Statutes, Chapter 597: Aquaculture

A.3 / Florida Administrative Code

All rules can be found according to number at <https://www.flrules.org/Default.asp>

- Florida Administrative Code, Chapter 18-20: Florida Aquatic Preserves:
<https://www.flrules.org/gateway/ChapterHome.asp?Chapter=18-20>
- Florida Administrative Code, Chapter 18-21: Sovereignty Submerged Lands Management
<https://www.flrules.org/gateway/ChapterHome.asp?Chapter=18-21>
- Florida Administrative Code, Chapter 62-302: Surface Water Quality Standards (Rule designating Outstanding Florida Waters is at 62-302.700)
<https://www.flrules.org/gateway/ChapterHome.asp?Chapter=62-302>

A.4 / Management Agreements

MEMORANDUM OF UNDERSTANDING
BETWEEN
THE FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION's
DIVISION OF WATER RESTORATION ASSISTANCE
AND
DIVISION OF FLORIDA COASTAL OFFICE

This Memorandum of Understanding ("MOU") is entered into between the FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION, DIVISION OF WATER RESTORATION ASSISTANCE, DEEPWATER HORIZON PROGRAM, a state agency, whose address is 3900 Commonwealth Boulevard, Tallahassee, Florida 32399-3000 ("DWH") and the FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION, DIVISION OF FLORIDA COASTAL OFFICE, CENTRAL PANHANDLE AQUATIC PRESERVES PROGRAM, a state agency, whose address is 108 Island Drive, Eastpoint, Florida 32328 ("CPAP").

The purpose of the MOU is to facilitate implementation of specified Natural Resource Damage Assessment Phase III early restoration projects' monitoring plans.

RECITALS

WHEREAS, on or about April 20, 2010, the mobile offshore drilling unit *Deepwater Horizon* experienced an explosion, fire and subsequent sinking in the Gulf of Mexico resulting in a release of oil into the Gulf of Mexico and response actions ("Oil Spill"); and

WHEREAS, in response to the Oil Spill, the Governor, under the Oil Pollution Act and pursuant to 33 U.S.C. § 2706, designated DEP to act as the lead natural resource Trustee and Florida Fish and Wildlife Conservation Commission to act as an additional natural resource Trustee for the State of Florida (collectively referred to as the "Florida Trustees"); and

WHEREAS, the Florida Trustees, in conjunction with the other state and federal natural resource trustees (collectively referred to as the "Trustees"), conducted a Natural Resource Damage Assessment ("NRDA"), as that term is defined in 15 C.F.R. § 990.30 and corresponding state law provisions, to determine Natural Resource Damages resulting from the Oil Spill in accordance with federal and state laws and authorities; and

WHEREAS, on April 20, 2011, the Trustees and BP Exploration & Production Inc. ("BXP") entered into an agreement, titled "Framework for Early Restoration Addressing Injuries Resulting from the Deepwater Horizon Oil Spill" ("Framework Agreement") whereby BXP agreed to provide up to \$1 billion toward early restoration projects in the Gulf of Mexico to address injuries to natural resources and loss of services provided by those natural resources caused by the Oil Spill; and

Department MOU# DWH-N1704

WHEREAS, the Trustees approved the Deepwater Horizon Oil Spill Programmatic and Phase III Early Restoration Plan and Early Restoration Programmatic Environmental Impact Statement ("Phase III Plan"), on October 2, 2014; and

WHEREAS, the Phase III Plan included forty-four NRDA early restoration projects (collectively referred to as "Phase III NRDA early restoration projects"), with twenty-eight of the Phase III NRDA early restoration projects being implemented by the Florida Trustees; and

WHEREAS, one of the twenty-eight Phase III NRDA early restoration projects being implemented by the Florida Trustees includes a monitoring plan, DWH will work with CPAP to implement this monitoring plan; and

WHEREAS, after approving the Phase III Plan, the Trustees, the Department of Justice, and BPXP executed project stipulations for the Phase III NRDA early restoration projects ("Project Stipulations") on October 2, 2014.

NOW, THEREFORE, in consideration of the mutual benefits to be derived from, DWH and CPAP hereby mutually agree as follows:

1. CPAP will implement the monitoring plan for the Florida Seagrass Recovery Project a Phase III NRDA early restoration project pursuant to **Attachment A, Scope of Work**, attached hereto and made apart hereof.
2. DWH will provide funding totaling \$255,176.82 ("Phase III Early Restoration Funding") for the monitoring project listed above. The Phase III Early Restoration Funding represents the monitoring costs identified in Paragraph 1. above and includes both administrative cost and actual monitoring cost.
3. DWH's performance and obligation to pay under this MOU is contingent upon an annual appropriation by the Legislature and the Trustees. The Parties hereto understand that this MOU is not a commitment of future appropriations. Authorization for continuation and completion of work and payment associated therewith may be rescinded with proper notice at the discretion of DWH if state or federal appropriations are reduced or eliminated.
4. In accepting this MOU, CPAP agrees to:
 - a. Complete all of the monitoring portions of the projects listed in Paragraph 1. above in accordance with the provisions outlined in the attached Project Monitoring Plan.
 - b. Complete all reporting requirements outlined in the attached Project Monitoring Plan (Appendix 1).
5. DWH and CPAP shall meet as necessary to review progress on the projects. If any issues are identified during the review processes, DWH and CPAP staff will work together to address and resolve the identified issues. If the issues cannot be resolved within 30 days, then either DWH or CPAP staff can elevate to their respective Division Director for resolution.

6. Amendments to this MOU shall be in writing only and executed by both DWH and CPAP. It shall remain in effect until it is dissolved by mutual agreement by DWH and CPAP or terminated by either division after giving 30 days written notice to the other division.
7. This MOU may be executed in counterparts, each of which shall be deemed to be an original, but all of which, taken together, shall constitute one and the same agreement.
8. This MOU shall still be applicable should the Florida Coastal Office and its CPAP transfer from the DEP to the Florida Fish and Wildlife Conservation Commission (FWC).
9. DWH and CPAP acknowledge their duties under Florida Public Records law Chapter 119, F.S. and shall comply with **Attachment B, Public Records Requirements**, attached hereto and made apart hereof.

IN WITNESS WHEREOF, DWH and CPAP have caused this MOU to be duly executed upon the day and year written below.

FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION

DIVISION OF FLORIDA COASTAL OFFICE
CENTRAL PANHANDLE AQUATIC PRESERVE

DIVISION OF WATER RESTORATION ASSISTANCE
DEEPWATER HORIZON PROGRAM

By: Kevin Claridge, Division Director

By: Trina Vielhauer, Division Director

Date: _____

Date: _____

By: Jonathan Brucker, CPAP Project Manager

By: Pearce Barrett, DWH Project Manager

Approved as to form and legality:

Betsy, Hewitt, DEP Attorney

List of attachments included as part of this MOU:

Type	Number	Description (include number of pages)
Attachment	A	Grant Work Plan (7 pages)
Attachment	B	Public Records Requirements (2 pages)
Appendix	1	Florida Seagrass Recovery Project Monitoring Plan (7 pages)

Department MOU# DWH-N1704

SCOPE OF WORK

Objective: The overall objective is to provide administrative and monitoring services to the Florida Department of Environmental Protection's (Department or DEP), Division of Water Restoration Assistance, *Deepwater Horizon* Program (DWH) for restoration planning and natural resource damage assessment activities associated with the *Deepwater Horizon* oil spill.

Agreement Overview: The Florida Coastal Office's Central Panhandle Aquatic Preserves ("CPAP") shall provide administrative and monitoring services for the following *Deepwater Horizon* Natural Resource Damage Assessment (NRDA) Early Restoration Phase III Florida Seagrass Recovery Project.

Any supplies and materials to be purchased for this process will need to be approved by the DWH Project Manager prior to purchase.

The section below outlines the scope of work to be performed by CPAP under Department MOU Agreement No DWH-N1704 ("Agreement").

Florida Seagrass Recovery Project Location

- Gulf County, St. Joseph Bay
- Franklin County, Alligator Harbor
- Bay County, St. Andrew Bay

Project Description: The project will address boat damage to submerged aquatic vegetation (SAV) in the Florida Panhandle by restoring scars located primarily in turtle grass (*Thalassia testudinum*) habitats. Scarring occurs when boat propellers in shallow water cut up roots, stems, and leaves of seagrasses, producing long, narrow furrows devoid of vegetation. Turtle grass is a common species of seagrass in the Panhandle that is particularly slow to rejuvenate naturally when injured. Turtle grass with propeller damage can take many years to rejuvenate, or in severely scarred areas may never completely recover. The project will primarily be located in St. Joseph Bay Aquatic Preserve (AP) in Gulf County, with potential additional sites in Alligator Harbor AP in Franklin County, and St. Andrew State Park AP in Bay County.

This project will utilize a combination of two (2) restoration methods to repair severely scarred seagrass in St. Joseph Bay including the use of sediment tubes and bird roosting stakes. These methods have proved successful in other areas of the state with high success rates. Sediment tubes will be used to restore two (2) acres of severely

Department MOU# DWH-N1704, Attachment A

scarred seagrass habitat in St. Joseph Bay Aquatic Preserve therefore improving seagrass recruitment and the return of associated flora and fauna, which will in turn enhance recreational and/or commercial water based activities in the area. This restoration project aims to stabilize injured seagrass areas in St. Joseph Bay and protect thousands of acres of this critical habitat. The restoration of these sites, which are surrounded by healthy seagrass, will further save the ecosystems in the area reducing the expansion and erosion of the injured seagrass areas and supporting the long term ecological benefit of seagrasses by halting the ongoing destruction.

The project will restore SAV habitat by addressing boat scars, which will include surveying and mapping scars in three Aquatic Preserves in the Florida Panhandle. Additionally, sediment tubes will be manufactured, filled with local fine grain sediment, and deployed in approximately two (2) acres of seagrass propeller scars in St. Joseph Bay AP. However, if approximately two (2) acres of propeller scars are not found to be available for this restoration project in St. Joseph Bay AP after initial assessments, then additional sites will be selected in Alligator Harbor AP and/or St. Andrew AP to achieve the overall project goal of restoring approximately two (2) acres of scars.

The sediment tubes, which are made of biodegradable cotton fabric filled with sediment, will be placed into propeller scars to enhance seagrass recovery by raising the scar elevation to ambient grade with clean sediment of appropriate grain size, thereby offering suitable habitat for seagrass recruitment. Restoration will be facilitated by placing bird stakes in the restoration project area. The stakes attract birds to perch and supply natural fertilizer in the form of feces, which is rich in phosphorus and nitrogen (Kenworthy et al. 2000). Bird stakes will be installed in water depths of 1.5m or less at mean high tide. Following completion of installation, any bird stakes remaining after two years will be removed.

After placement of sediment tubes and bird stakes is completed, and after two (2) growing seasons (approximately a total of 18 to 24 months), scars that do not naturally re-vegetate to a minimum score of three (3) (25 to 50% coverage) on the Braun-Blanquet scale will either be re-planted with seagrass species transplanted from potential donor sites within the AP, or re-planted with purchased seagrass planting units, as funding allows.

A boater education and outreach component of the project will install seagrass signage at the restoration site to prevent further damage, install educational signage at local boat ramps and marinas, provide demonstration buoys at local Tourist Development Council (TDC) offices, update existing non-regulatory buoys throughout the southern portion of the bay to keep boaters in the natural, deep water channels, provide information for local TV/newspapers, develop a brochure/map illustrating sensitive seagrass areas and how to avoid damaging grasses in these areas, and work with ANERR's Coastal Training Program to develop a workshop for local ecotour businesses, boaters, fishermen, etc. to discuss restoration activities and how to navigate the southern end of bay safely utilizing the seagrass buoy system. The established seagrass buoy system in St. Joseph Bay Aquatic Preserve is in critical need of updating. Thirteen skirted buoys were placed in the southern portion of St. Joseph Bay in 2008 to aid boaters in navigating the natural, deep water channels to avoid damage to shallow water seagrass. The Preserve has installed a new buoy system using a post-driven sliding buoy at 49 locations in the bay (See Figure 1).

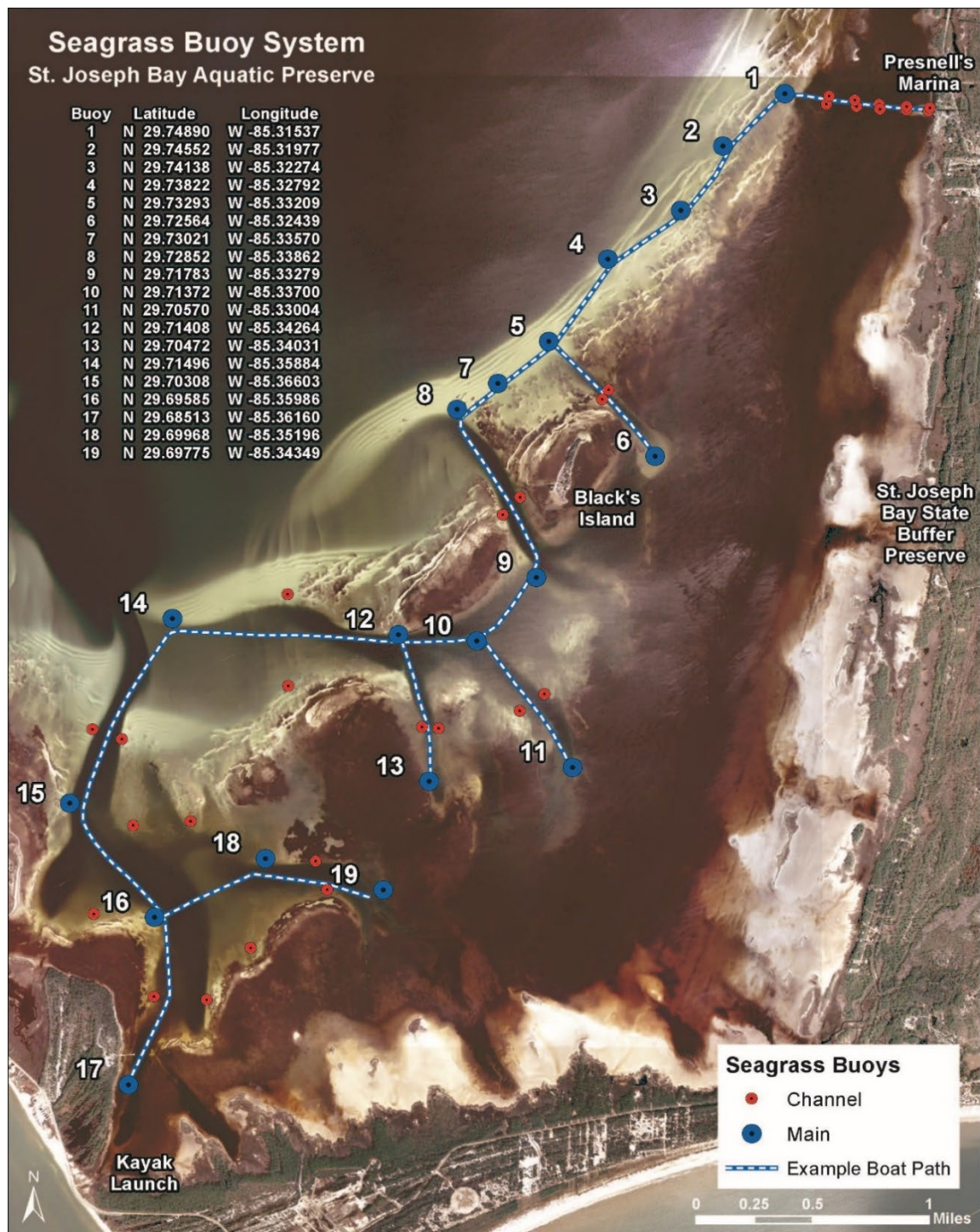


Figure 1. Detailed photo showing the Seagrass Buoys installed in St. Joseph Bay Aquatic Preserve

See attached Monitoring Plan (Appendix 1) for more detail.

TASKS AND DELIVERABLES

Department MOU# DWH-N1704, Attachment A

Task 1: Develop monitoring work plan, for seagrass construction oversight and post-monitoring

CPAP will oversee and coordinate the monitoring of the Florida Seagrass Recovery Project. CPAP will participate in all aspects of the construction oversight and management as well as the actual on-site monitoring and report writing associated with the project.

Deliverable: CPAP will submit to the DWH Project Manager a monitoring work plan and schedule detailing the extent of prop scars in the bay(s), along with protocols and a schedule for accomplishing the monitoring tasks identified in this agreement.

Performance Measure: The DWH Project Manager will review the deliverables to confirm that they are complete, accurate, and timely. CPAP shall be notified by the DWH Project Manager of any deficiencies in the deliverables and shall be given reasonable opportunity to provide revised deliverables.

Schedule: The monitoring work plan and schedule will be submitted within six (6) months of the final execution of this agreement.

Task 2: Provide Oversight of aerial surveys, review and approval of assessment imagery of scarred seagrass areas for all three AP's, review of contractor's draft and final restoration plan.

CPAP will coordinate with the DWH Project Manager and contractor and provide oversight during field surveys to collect updated aerial imagery. CPAP along with the DWH Project Manager and Contractor will review the high-resolution imagery aerial surveys to determine that they accurately map the spatial extent of scarred seagrass habitat in moderate/severely scarred areas of the three (3) AP areas and delineate two (2) acres of scars to be restored.

Deliverable: CPAP will submit to the DWH Project Manager:

1. Monthly reports on contractor's progress regarding surveying of the three (3) AP's with assessment of quality of work being performed, problems encountered and update of schedule for completion.
2. Attendance log and minutes from monthly project progress meetings with Contractor and DEP Project Manager.
3. Notes from review and approval of aerial imagery of scarred seagrass areas provided by contractor.
4. Comments from review of Contractor's draft assessment and recovery plan.
5. Comments from review of Contractor's final assessment and recovery plan and final approval of the plan.

Performance Measure: The DWH Project Manager will review the deliverables to confirm that they are complete, accurate, and timely. CPAP shall be notified by the DWH Project Manager of any deficiencies in the deliverables and shall be given reasonable opportunity to provide revised deliverables.

Department MOU# DWH-N1704, Attachment A

Schedule: CPAP will submit to the DWH Project Manager the deliverables according to the following schedule:

1. Monthly progress reports and minutes from monthly progress meetings may be combined and shall be submitted to the DEP Project Manager within five (5) working days of the of the monthly progress meetings.
2. Notes from review of the aerial imagery provided by the contractor shall be submitted to the DEP Project Manager within ten (10) working days of Contractor's submittal of the aerial imagery to DEP.
3. Comments on draft recovery plan and final recovery plan shall be submitted to DEP Project Manager within ten (10) working days of Contractor's submittal to DEP.

Task 3: Monitoring of Implementation of Approved Seagrass Recovery Plan for Two (2) acres of Propeller Scarring.

CPAP personnel shall coordinate with restoration contractor on areas that restoration will be performed on a daily basis and observe restoration activities to determine that restoration efforts are being performed in accordance with the approved Seagrass Restoration Plan (SRP) and schedule. CPAP monitoring personnel shall keep daily logs on Contractor's work including activities performed, number and type of personnel (i.e. labors, boat operators, supervisory etc.) employed on the job, equipment, weather conditions encountered, area of recovery completed and any issues or encounters that affected the projects progress. CPAP personnel shall meet weekly with the contractor's job foreman or supervisor to review weekly work in progress, and update the schedule as necessary. CPAP personnel will also review contractors "as built" plans or maps to determine that a minimum of two (2) acres of propeller scared area has been satisfactorily restored.

Deliverable: CPAP monitoring staff will submit to the DWH Project Manager:

1. A twice monthly consolidated report summarizing work progress for the proceeding two (2) weeks and an updated schedule. The reports will be submitted throughout the implementation period of seagrass restoration activities;
2. Upon completion of implementation restoration activities, a post-activity report reviewing contractors performance, amount of restoration achieved and approval of contractors As Built Survey or maps.

Performance Measure: The DWH Project Manager will review the deliverables to confirm that they are complete, accurate, and timely. CPAP shall be notified by the DWH Project Manager of any deficiencies in the deliverables and shall be given reasonable opportunity to provide revised deliverables.

Schedule: CPAP will submit twice monthly work reports in the first and third weeks of the month. The post activity report shall be submitted to the DEP Project Manager within thirty (30) days following receipt of the "As Built" drawings from the implementation contractor. .

Task 4: CPAP will perform field surveys in accordance with the post-monitoring schedule during the spring and fall to monitor the progress of restoration activities for the duration of the project

Monitoring will be conducted to ensure project designs were correctly implemented and to evaluate project effectiveness. Monitoring has been designed around the overall project objective, which is to restore injured SAV habitat, primarily turtle grass (*Thalassia testudinum*), in the Florida Panhandle. Specific restoration objectives are the creation of new SAV habitat in previously scarred areas that meets project design criteria and is sustained for the expected life of the project.

Post-construction performance monitoring will initially focus on re-vegetation of the previously scarred areas. This monitoring will include collection of habitat information such as percent vegetative cover of scars using the Braun-Blanquet assessment method (Braun-Blanquet 1972) or other appropriate techniques. Pre- and post-project monitoring will compare restoration progress in both treated, untreated, and control (adjacent seagrass that is unaffected by scarring) areas. A select number of randomly chosen untreated scars will be compared to treated scars to determine if sediment tubes create conditions more suitable for rapid seagrass recovery. Photos or aerial imagery will be used to document success of project if applicable and funding allows.

CPAP staff will monitor the progress of the restoration site bi-annually in the spring and fall. If after two (2) growing seasons, treated scars do not re-vegetate to a score of three (3) on the Braun Blanquet scale (25 to 50% coverage), seagrass transplants or purchased plots can be re-planted in the scars (if applicable and if funding allows).

Annual monitoring reports will be produced that will include all raw data gathered in pre-post surveys, an analysis of collected data, updates on project status/success, and recommendations for further restoration efforts.

Deliverable: Based on monitoring data, CPAP will provide biannual progress reports and annual monitoring report that includes all raw data, an analysis of processed data, conclusions on the success of the project and recommendations for further restoration efforts.

Performance Measure: The DWH Project Manager will review the deliverables to confirm that they are complete, accurate, and timely. CPAP shall be notified by the DWH Project Manager of any deficiencies in the deliverables and shall be given reasonable opportunity to provide revised deliverables.

Schedule: CPAP will submit to the DWH Project Manager quarterly progress reports on April 1, July 1, October 1 and Jan. 1 with the annual monitoring report due on Jan. 1.

Task 5: CPAP will monitor and maintain 49 shallow seagrass buoys and Installed Bird Stakes monthly or as necessary

As part of the Florida Seagrass Recovery project, 49 non-navigational "Caution Shallow Seagrass" buoys were installed by a third-party contractor as well as bird stakes to enhance seagrass recovery in St. Joseph Bay. CPAP will complete visual observations of the buoys and bird stakes monthly. All bird stakes remaining after two (2) years post implementation shall be removed and properly disposed of by CPAP personnel. More attention may be needed if project site is vandalized or impacted by weather. CPAP will continue to provide and update educational materials such as brochures, kiosks, boater's guides, maps, outreach presentations, etc. to local businesses/marinas/public on the buoy system

Deliverable: CPAP will submit to the DWH Project Manager an annual report with photographs detailing the condition/status of the 49 buoys and bird stakes including any information on routine maintenance completed and results of bird stakes on enhancing seagrass restoration. This information will also be submitted to FWC annually to meet permitting requirements.

Performance Measure: The DWH Project Manager will review the deliverables to confirm that they are complete, accurate, and timely. CPAP shall be notified by the DWH Project Manager of any deficiencies in the deliverables and shall be given reasonable opportunity to provide revised deliverables.

Schedule: An annual report with photographs detailing the condition/status of the 49 buoys and bird stakes including any information on routine maintenance completed and submitted annually for the duration of the project within 45 days of the end of each calendar year.

Task 6: CPAP will monitor water quality

CPAP will monitor water quality, on a monthly basis, at the restoration site to monitor changes in conditions that could potentially impact adjacent seagrass habitat. CPAP will measure dissolved oxygen, salinity, temperature, depth, and pH prior to project implementation and following project construction throughout the duration of the project. The establishment of baseline water quality data sets will be developed to enable staff to better understand the impacts of changes in water quality within the bay(s). Data will go through a QA/QC process and be entered into the Department's STORET database.

Deliverable: CPAP will submit to the DWH Project Manager annual reports including all water quality data, documenting any major events that may have impacted seagrass growth. Additionally, CPAP will submit all samples and data collected to the University of Florida LAKEWATCH program.

Performance Measure: The DWH Project Manager will review the deliverables to confirm that they are complete, accurate, and timely. CPAP shall be notified by the DWH Project Manager of any deficiencies in the deliverables and shall be given reasonable opportunity to provide revised deliverables.

Schedule: Annual reports including all water quality data, documenting any major events that may have impacted seagrass growth within 45 days of the end of each calendar year.

Department MOU# DWH-N1704, Attachment A

Monitoring Schedule

The schedule for the project monitoring is shown in Table 1, separated by monitoring activity. Pre-construction monitoring will occur before project implementation. Construction monitoring typically occurs within 90 days following project construction (year 0). Performance monitoring will occur in the years following project construction (years 1 to 3).

Table 1: Monitoring Schedule

Monitoring Parameters	Monitoring Timeframe				
	Construction		Performance		
	Pre-Const. Monitoring	Const. Monitoring	Post-Construction Monitoring		
	2017	As-built (Year 2017)	Year 2018	Year 2019	Year 2020
Length, number and/or area of scars (GPS data)	X	X			X
Vegetation survey (composition, % cover, density)	X		2X	2X	2X
Observations of buoy system		X	X	X	X
Percent survival of planting units or transplants (if used)				2X	

Costs Tasks 1 – 6: Not to exceed \$ \$255,176.82

DEPARTMENT OF ENVIRONMENTAL PROTECTION

Public Records Requirements

ATTACHMENT B

1. Public Records

- a. If the Agreement exceeds \$35,000.00, and if the Grantee is acting on behalf of the Department in its performance of services under the Agreement, the Grantee must allow public access to all documents, papers, letters, or other material, regardless of the physical form, characteristics, or means of transmission, made or received by the Grantee in conjunction with the Agreement (Public Records), unless the Public Records are exempt from section 24(a) of Article I of the Florida Constitution or section 119.07(1), F.S.
- b. The Department may unilaterally terminate the Agreement if the Grantee refuses to allow public access to Public Records as required by law.

2. Additional Public Records Duties of Section 119.0701, F.S., If Applicable.

For the purposes of this paragraph, the term “contract” means the “Agreement.” If the Grantee is a “contractor” as defined in section 119.0701(1)(a), F.S., the following provisions apply:

- a. Keep and maintain Public Records required by the Department to perform the service.
- b. Upon request, provide the Department with a copy of requested Public Records or allow the Public Records to be inspected or copied within a reasonable time at a cost that does not exceed the cost provided in Chapter 119, F.S., or as otherwise provided by law.
- c. A contractor who fails to provide the Public Records to the Department within a reasonable time may be subject to penalties under section 119.10, F.S.
- d. Ensure that Public Records that are exempt or confidential and exempt from Public Records disclosure requirements are not disclosed except as authorized by law for the duration of the contract term and following completion of the contract if the contractor does not transfer the Public Records to the Department.
- e. Upon completion of the contract, transfer, at no cost, to the Department all Public Records in possession of the contractor or keep and maintain Public Records required by the Department to perform the service. If the contractor transfers all Public Records to the Department upon completion of the contract, the contractor shall destroy any duplicate Public Records that are exempt or confidential and exempt from Public Records disclosure requirements. If the contractor keeps and maintains Public Records upon completion of the contract, the contractor shall meet all applicable requirements for retaining Public Records. All Public Records stored electronically must be provided to the Department, upon request from the Department’s custodian of Public Records, in a format specified by the Department as compatible with the information technology systems of the Department. These formatting requirements are satisfied by using the data formats as authorized in the contract or Microsoft Word, Outlook, Adobe, or Excel, and any software formats the contractor is authorized to access.
- f. IF THE CONTRACTOR HAS QUESTIONS REGARDING THE APPLICATION OF CHAPTER 119, F.S., TO THE CONTRACTOR’S DUTY TO PROVIDE PUBLIC RECORDS RELATING TO THE CONTRACT, CONTACT THE DEPARTMENT’S CUSTODIAN OF PUBLIC RECORDS AT:

Telephone: (850) 245-2118

Email: ombudsman@dep.state.fl.us

Mailing Address: Department of Environment Protection

ATTN: Office of Ombudsman and Public Services

Public Records Request

3900 Commonwealth Boulevard, MS 49

Tallahassee, Florida 32399

Attachment B

Rev. 12/30/16

Appendix 1

State of Florida's Monitoring Plan for *Deepwater Horizon* NRDA

Early Restoration Phase III Project:

Florida Seagrass Recovery Project

Prepared by: State of Florida DWH NRDA Trustees

October 27, 2015

● Introduction

As a result of the *Deepwater Horizon* oil spill and related response activities, submerged aquatic vegetation (SAV) habitat in Florida's Panhandle was adversely impacted. The Florida Seagrass Recovery project will address boat damage to shallow seagrass beds in the Florida Panhandle by restoring scars located primarily in turtle grass (*Thalassia testudinum*) habitats in St. Joseph Bay Aquatic Preserve in Gulf County, with additional potential sites in Alligator Harbor Aquatic Preserve in Franklin County, and St. Andrew State Park Aquatic Preserve, in Bay County. A boater outreach and education component of the project will install non-regulatory *Shallow Seagrass Area* signage, update existing signage and buoys where applicable, and install educational signage and provide educational brochures about best practices for protecting seagrass habitats at popular boat ramps in St. Joseph Bay, Alligator Harbor, and St. Andrew Bay (see Figure 1).

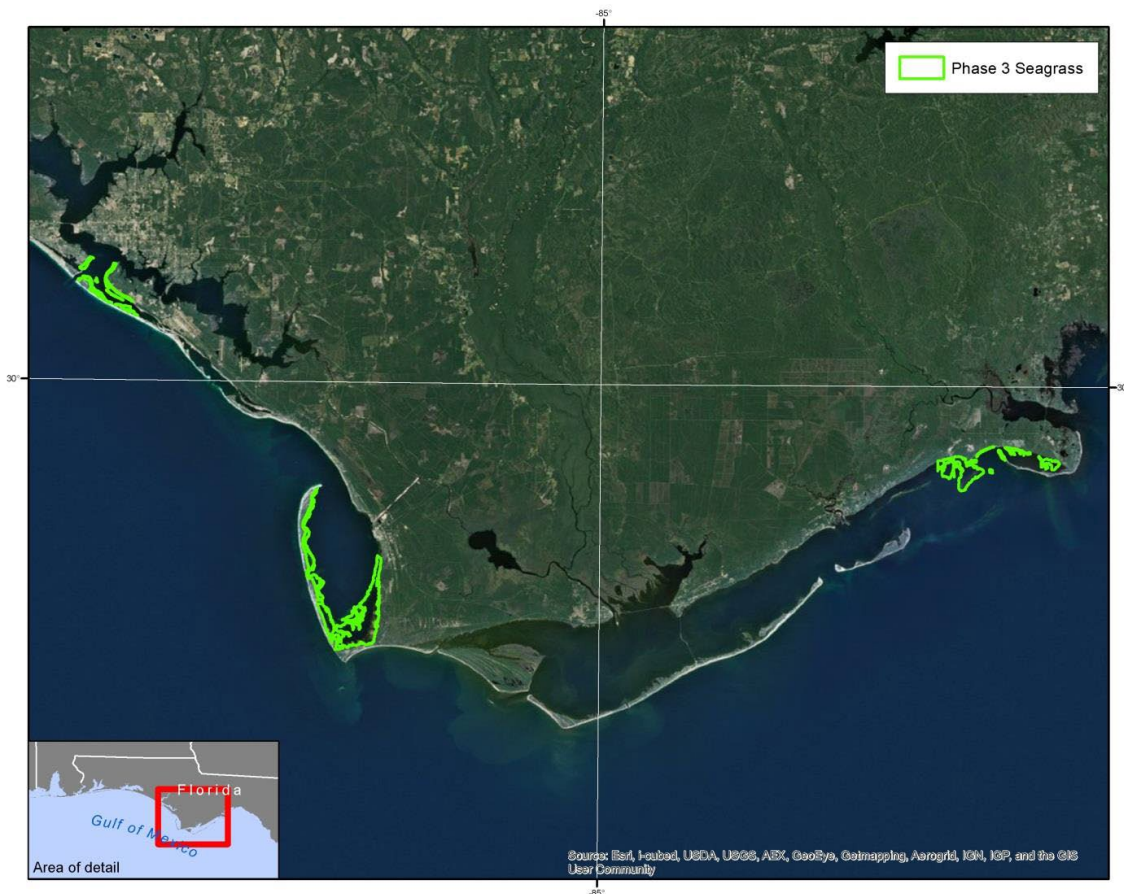


Figure 1. Location of Florida Seagrass Recovery Project.

Project Overview

The project will address boat damage to SAV in the Florida Panhandle by restoring scars located primarily in turtle grass (*Thalassia testudinum*) habitats. Scarring occurs when boat propellers in shallow water cut up roots, stems, and leaves of seagrasses, producing long, narrow furrows devoid of vegetation. Turtle grass is a common species of seagrass in the Panhandle that is particularly slow to rejuvenate naturally when injured. Turtle grass with propeller damage can take many years to rejuvenate, or in severely scarred areas may never completely recover. The project will primarily be located in St. Joseph Bay Aquatic Preserve in Gulf County, with additional potential sites in Alligator Harbor Aquatic Preserve in Franklin County, and St. Andrew State Park Aquatic Preserve in Bay County.

The project will restore SAV habitat by addressing boat scars, which will include surveying and mapping scars in three Aquatic Preserves in the Florida Panhandle. Additionally, sediment tubes will be manufactured, filled with local fine grain sediment, and deployed in approximately 2 acres of seagrass propeller scars in St. Joseph Bay Aquatic Preserve (AP). However, if approximately 2 acres of propeller scars are not found to be available for this restoration project in St. Joseph Bay AP after initial assessments, then additional potential sites will be selected in Alligator Harbor AP and/or St. Andrew AP to achieve the overall project goal of restoring approximately 2 acres of scars.

The sediment tubes, which are made of biodegradable cotton fabric filled with sediment, will then be placed into propeller scars to enhance seagrass recovery by raising the scar elevation to ambient grade with clean sediment of appropriate grain size, thereby offering suitable habitat for seagrass recruitment. Restoration will be facilitated by placing bird stakes in the restoration project area. The stakes attract birds to perch and supply natural fertilizer in the form of feces, which is rich in phosphorus and nitrogen (Kenworthy et al. 2000). Bird stakes will be installed in water depths of 1.5m or less at mean high tide. Following completion of installation, any bird stakes remaining after two years will be removed.

Two growing seasons (approximately 18 to 24 months) after placement of sediment tubes and bird stakes is completed, scars that do not naturally revegetate to a minimum score of 3 (25 to 50% coverage) on the Braun-Blanquet scale will either be planted with seagrass species transplanted from potential donor sites within the AP, or planted with purchased seagrass planting units, as funding allows.

Finally, a boater outreach and education component of the project will install non-regulatory *Shallow Seagrass Area* signage at sites where restoration takes place, update existing signage and buoys where applicable, install educational signage, and provide brochures about best practices for protecting seagrass habitats at popular boat ramps in St. Joseph Bay, Alligator Harbor, and St. Andrew Bay. The total budget for this project is \$2,691,867.

Restoration Objectives and Performance Criteria

The objective of this restoration project is to restore SAV habitat in Florida by addressing boat scars in up to three Aquatic Preserves in the Florida Panhandle.

Performance criteria will be used to determine restoration success or the need for corrective action (15 CFR 990.55(b)(1)(vii)). Specific performance criteria for this project are identified below.

Department MOU# DWH-N1704, Appendix 1

- Performance Criterion #1: Two growing seasons (approximately 18 to 24 months) after placement of sediment tubes, bird stakes, and signage, scars that do not naturally revegetate to a minimum score of 3 (25 to 50% coverage) on the Braun-Blanquet scale will be planted with seagrass species transplanted from potential donor sites within the AP, or seagrass planting units will be purchased and installed, as funding allows.
- Performance Criterion #2: At year 3, treated scars revegetate to a minimum score of 4 (50 to 75% coverage) on the Braun-Blanquet scale in scarred areas at the completion of the project, using the Braun-Blanquet assessment method, or other appropriate techniques.
- Performance Criterion #3: All installed buoys remain intact 1 year after installation.

Conceptual Model and Monitoring Questions

Table 1, below, outlines the conceptual model for this restoration type that forms the basis of the monitoring plan, including a summary of the project activities, the expected product or output of those activities, and the desired project outcomes.

Table 1. Conceptual Model for Restoration

Activity	Output	Short-term outcome	Long-term outcome
Construction: • Install a seagrass buoy system • Survey and map seagrass scars • Fill in scars using sediment tubes • Install bird stakes and temporary signage • Install educational signage Monitoring: • Monitor SAV growth and plant seagrass only if restoration is deemed unsuccessful after 18 to 24 months	• Approximately 2 acres of seagrass beds are restored and protected	• Scars fill to ambient grade with sediment	• Seagrass growth occurs and habitat is restored for the expected lifespan of the project

This monitoring plan has been designed around the objectives and desired outcomes for this restoration project, and is intended to address the following monitoring questions:

Objective: Restore SAV habitat in Florida by addressing boat scars in up to three Aquatic Preserves in the Florida Panhandle.

- Was the project implemented as designed?
- Are the seagrass buoys intact?
- Is planted seagrass surviving (if planting occurred)?
- Are seagrass beds recovering?

Roles and Responsibilities

The Florida Department of Environmental Protection or its contractor will be responsible for the monitoring for this project. Aquatic Preserve staff will be consulted on all aspects of the restoration project.

Project Monitoring

The proposed monitoring for this restoration project is outlined below. For each of the identified monitoring parameters, information is provided on the methods, timing and frequency, sample size, and sites. In addition, performance criteria for each parameter are identified, including corrective actions that could be taken if the performance criteria are not met. Monitoring will be conducted to ensure project designs were correctly implemented and to evaluate project effectiveness. Performance criteria will be used to determine project success or the need for corrective actions. Monitoring has been designed around the overall project objective, which is to restore injured SAV habitat, primarily turtle grass (*Thalassia testudinum*), in the Florida Panhandle. Specific restoration objectives are the creation of new SAV habitat in previously scarred areas that meets project design criteria and is sustained for the expected life of the project. Field surveys will be performed in accordance

with the monitoring schedule (see Table 2) during early spring and/or late summer depending upon the parameters being surveyed, to monitor the progress of restoration activities.

Post-construction performance monitoring will initially focus on revegetation of the previously scarred areas. This monitoring will include collection of habitat information such as percent vegetative cover of scars using the Braun-Blanquet assessment method (Braun-Blanquet 1972) or other appropriate techniques. Pre- and post-project monitoring will compare restoration progress in both treated, untreated, and control (adjacent seagrass that is unaffected by scarring) areas. A select number of randomly chosen untreated scars will be compared to treated scars to determine if sediment tubes create conditions more suitable for rapid seagrass recovery (Gudeman et al. 2010). The criteria for choosing both treated and untreated propeller scars for comparison will require that they do not have statistically significant differences in dimension (length and width), and that they are located in areas that contain similar seagrass densities. Methods designed to measure percent cover and shoot counts will be used to compare recovery rates of propeller scars located within treated and untreated locations of the project area. Permanent (fixed) transects will be incorporated into the study to monitor changes in the number of untreated propeller scars.

Measurements will be taken along the perimeter or length/width of each scar using a differential Global Positioning System (GPS). Data layers will be created using spatial analysis software such as ArcMap to determine the increase or decrease in scar number, length, and area over time using GIS data. Additionally, as funding allows, aerial photography or a similar technique will be used to establish permanent visual documentation along selected portions of planted scars to document the progression of coverage of seagrass, and water quality parameters will be measured.

Objective: The objective of this restoration project is to restore SAV habitat in Florida by addressing boat scars in up to three Aquatic Preserves in the Florida Panhandle.

- Was the project implemented as designed?
- Are the seagrass buoys intact?
- Is planted seagrass surviving (if planting occurred)?
- Are seagrass beds recovering?

Parameter #1: Length, number and/or area of scars

- a) Method: Take continuous measurements along the perimeter or length of each scar using a differential Global Positioning System (GPS) and measure the width of the scar (Sargent et al. 1995). Import and analyze data using spatial analysis software.
- b) Timing and Frequency: Pre-construction (once); Post-construction at year 0 and at year 3.
- c) Sample Size: To be determined during project design.
- d) Sites: Restoration site(s).
- e) Performance Criteria: N/A
- f) Corrective Action: N/A

Parameter #2: Seagrass species composition, percent cover, and shoot density

- a) Method: Determine seagrass species composition, visually estimate percent cover of seagrass, and count shoot density within standard-sized quadrats using Braun-Blanquet methodology (Braun-Blanquet 1972)

- or other appropriate techniques.
- b) Timing and Frequency: Pre-construction (once); Post-construction [Biannually (early spring and late summer) for year 1, and then at least annually (late summer) for years 2 and 3].
- c) Sample Size: To be determined during project design.
- d) Sites: Restoration site(s) (treated and untreated) and control site(s).
- e) Performance Criteria:
 - i. Two growing seasons (approximately 18 to 24 months) after placement of sediment tubes, bird stakes, and signage, scars that do not naturally revegetate to a minimum score of 3 (25 to 50% cover) on the Braun-Blanquet scale will be planted with seagrass species transplanted from potential donor sites within the AP, or seagrass planting units will be purchased and installed, as funding allows.
 - ii. At year 3, treated scars revegetate to a minimum score of 4 (50 to 75% coverage) on the Braun-Blanquet scale in scarred areas at the completion of the project, using the Braun-Blanquet assessment method, or other appropriate techniques.
- f) Corrective Action: Add planting units and/or transplant seagrass from potential donor sites within the Preserve. Add signage, buoys, and/or bird stakes, prioritized as appropriate and as funding allows.

Parameter #3: Seagrass buoy system

- a) Method: Conduct visual observations. At the completion of installation (year 0) the contractor shall provide FDEP with the compass headings from buoy to buoy, distance between buoys in nautical miles, and the Global Positioning System (GPS) locations for each installed buoy.
- b) Timing and Frequency: Post-construction at year 0 and on an annual basis following completion of installation ¹.
- c) Sample Size: 41 buoys
- d) Sites: St. Joseph Bay Aquatic Preserve.
- e) Performance Criteria: All installed buoys remain intact 1 year after installation.
- f) Corrective Action: Replace all buoys that have failed within the first year after installation, and in subsequent years as funding allows.

Parameter #4: Survival of seagrass planting units or transplants, if they are used. SAV would be planted only if restoration is deemed unsuccessful after 18 to 24 months.

- a) Method: Count live and dead seagrass planting units or transplants to estimate the percent survival within the planted area (Gudeman et al. 2010).
- b) Timing and Frequency: 30 and 90 days after planting of seagrass units or transplants, which would potentially occur in year 2.
- c) Sample Size: To be determined during project design.
- d) Sites: Planted areas within restoration site(s).
- e) Performance Criteria: N/A
- f) Corrective Action: N/A

Additional activities may be undertaken if necessary and as budget allows. As available, other existing information will be used, such as aerial imagery.

¹ Additional surveys may be warranted if the project site is directly impacted by a major storm.
Department MOU# DWH-N1704, Appendix 1

Example #1: Underwater photographs

- a) Method: Take underwater photographs of the restoration site(s) and reference site(s).
- b) Timing and Frequency: Pre-construction (once); Post-construction (at year 0, and biannually at years 1 to 3 in early spring and late summer).
- c) Sample Size: To be determined during project design.
- d) Sites: Restoration site(s) (treated and untreated) and control site(s).

Example #2: Water depth, temperature, salinity, and light penetration

- a) Method: Measure water depth, water temperature, salinity, and light penetration using appropriate instrumentation (e.g., Photosynthetically Active Radiation [PAR]).
- b) Timing and Frequency: Pre-construction (once); Post-construction (biannually for years 1 to 3).
- c) Sample Size: To be determined during project design.
- d) Sites: Restoration site(s) and control site(s).

● Monitoring Schedule

The schedule for the project monitoring is shown in Table 2, separated by monitoring activity. Pre-construction monitoring will occur before project implementation. Construction monitoring typically occurs within 90 days following project construction (year 0). Performance monitoring will occur in the years following project construction (years 1 to 3).

Table 2. Monitoring Schedule.

Monitoring Parameters	Monitoring Timeframe				
	Construction		Performance		
	Pre-Const. Monitoring	Const. Monitoring	Post-Construction Monitoring		
		As-built (Year 0)	Year 1	Year 2	Year 3
Length, number and/or area of scars (GPS data)	X	X			X
Vegetation survey (composition, % cover, density)	X		2X	X	X
Observations of buoy system		X	X	X	X
Percent survival of planting units or transplants (if used)				2X	

● Reporting and Data Requirements

Reporting of monitoring progress, data, and analysis will be conducted and submitted as required by the stipulations agreed to by the NRDA Trustee Council. Quarterly progress reports and annual monitoring reports will

be produced that will include all raw data gathered in pre-post surveys, an analysis of collected data, conclusions of the project's success, and recommendations for further restoration efforts.

• References

Braun-Blanquet, J. 1972. Plant Sociology: the study of plant communities. Hafner, New York.

Gudeman, C., R. Mezich, K. Smith, and P. Carlson. 2010.

Restoration, monitoring and management of boat propeller scars in St. Andrew Bay, Florida. Florida Fish and Wildlife Conservation Commission Tech. Rep. Project number: FWS – T-13-R-1 - CFDA# 15.634. 26p.

Kenworthy, W.J., M.S. Fonseca, P.E. Whitfield, K. Hammerstrom, and A.C. Schwartzschild. 2000.

A Comparison of Two Methods for Enhancing the Recovery of Seagrass into Propeller Scars: Mechanical injection of a nutrient and growth hormone solution vs. defecation by roosting seabirds. Final report submitted to the Florida Keys Environmental Restoration Trust Fund.

Sargent, F.J., T.J. Leary, D.W. Crews, and C.R. Kruer. 1995.

Scarring of Florida's seagrasses: assessment and management options. FMRI Tech. Rep. TR-1. Florida Marine Research Institute, St. Petersburg, Florida. 37 p. plus appendices.

A.5 / Other Rules and Ordinances

A.5.1 / Gulf County Sea Turtle Lighting Ordinance

ORDINANCE NO. 2001-09

AN ORDINANCE OF GULF COUNTY, FLORIDA , CREATING REGULATIONS FOR THE PROTECTION OF SEA TURTLES AND OTHER ENUMERATED SPECIES WITHIN CERTAIN BEACHES OF GULF COUNTY;.PROVIDING FOR THE PURPOSE AND INTENT OF SUCH ORDINANCE; PROVIDING FOR DEFINITIONS, PROHIBITED ACTIVITIES, LIGHTING STANDARDS FOR NEW CONSTRUCTION, LIGHTING STANDARDS FOR EXISTING LIGHTING, PROVIDING FOR PUBUC AWARENESS, PROVIDING FOR ENFORCEMENT AND PENALTIES, PROVIDING AN INTERPRETATION, PROVIDING A SEVERABILITY CLAUSE AND PROVIDING AN EFFECTIVE DATE.

WHEREAS, it has been determined that artificial lighting upon certain beaches of Gulf County adversely effects the nesting habits of the endangered and threatened marine turtle population and other enumerated species of Gulf County, and

WHEREAS, it is the policy of the Board of County Commissioners of Gulf County, Florida, that no enumerated artificial light source improperly illuminate the beaches of unincorporated Gulf County,

NOW, THEREFORE, be it ordained by the Board of County Commissioners of Gulf County, Florida, as follows:

I PURPOSE AND INTENT

This Ordinance is intended to protect state and federally listed species from the adverse effects of artificial lighting and from injury or harassment caused by such lighting and its effects. These species include all animals categorized by the United States Fish and Wildlife Service (50 CFR 17) or the Florida Fish & Wildlife Conservation Commission or the Marine Turtle Protection Act (Florida Statute 370. 12, Florida Administrative Code, Rules 62-01, 62-B33, 62-B55) as either endangered, threatened, or species of special concern which utilize the beach habitat of Gulf County, Florida, specifically nesting female and hatchling marine turtles, beach mice, and shorebirds.

II DEFINITIONS

- 1) "Artificial light" or "artificial lighting" means the light emanating from any device other than natural celestial light sources.
- 2) "Beach" means the zone of unconsolidated material that extends landward from the mean low water line to the place where there is a marked change in material or physiographic form, or to the line of permanent vegetation, usually the effective limit of storm waves.
- 3) "Bug" type bulb means any yellow colored light bulb that is marketed as being specifically treated in such a way so as to reduce the attraction of bugs to the light.
- 4) "Coastal construction activities" means any work or development that is likely to have a material physical effect on existing coastal conditions or natural shore and inlet processes.
- 5) "Coastal Construction Control Line (CCCL)" means the portion of the Coastal Construction Control Line established pursuant to the provisions of Section 161.053 Florida Statutes that lies within Gulf County.
- 6) "Cumulatively illuminated" means illuminated by numerous artificial light sources that as a group illuminate any portion of the beach.
- 7) "Department" means the Florida Department of Environmental Protection.
- 8) "Directly illuminated" means the source of artificial light, i.e. lamps or reflectors, is visible to an observer located beyond the frontal dune.
- 9) "Dune" means a mound or ridge of loose sediments, usually sand -sized, lying landward of the beach and deposited by any natural or artificial mechanism.
- 10) "Frontal dune" means the first natural or man-made mound or bluff of sand which is located landward of the beach and which has sufficient vegetation, height, continuity, and configuration to offer protective value

- 11) "Ground-level barrier" means any vegetation, natural feature or artificial structure rising from the ground which prevents beachfront lighting from shining directly onto the beach-dune system.
- 12) "Gulf County Beaches" includes all beaches within Gulf County located seaward of SRJOA and County Road CJOB and CJOE commencing at the Indian Pass public boat ramp and extending to the southern boundary of the St. Joseph Peninsula State Park and also including those boundaries lying south of Highway 98 commencing at the western -boundary of the Gulf County Canal and extending to the Gulf/Bay County boundary line .
- 13) "Hatchling" means any species of marine turtle, within or outside of a nest, that has recently hatched from an egg.
- 14) "Indirectly illuminated" is the term used when the source element of an artificial light source is not visible by an observer located beyond the frontal dune, but the lumen output is.
- 15) "Listed species" includes all animals categorized by the United States Fish and Wildlife Service (50 CFR 17) or the Florida Fish & Wildlife Conservation Commission or the Marine Turtle Protection Act (Florida Statute 370-12, Florida Administrative Code, Rules 62-01, 62-B33, 62-855) as either endangered, threatened, or species of special concern.
- 16) "Low-pressure sodium luminaries (LPS)" means an electric discharge lamp containing sodium, neon, and argon, that when illuminated appears orange in color, and under which colors are indiscernible.
- 17) "Marine turtle" means any marine-dwelling reptile of the families Cheloniidae or Dermochelyidae found in Florida waters or using the beach as nesting habitat, including the species *Caretta caretta* (loggerhead), *Chelonia mydas* (green), *Dermochelys coriacea* (leatherback), *Eretmochelys imbricata* (hawksbill), and *Lepidochelys kemp* (Kemp's ridley). For purposes of this rule, marine turtle is synonymous with sea turtle.
- 18) "Nest" means an area where marine turtle eggs have been naturally deposited or subsequently relocated.
- 19) "Nesting season" means the period from May 1 through October 31 of each years, as defined by F.A.C. 62B 55.002(17) for all counties
- 20) "Nighttime" means the locally effective time period between sunset and sunrise.
- 21) "Person" means individuals, firms, associations, Joint ventures, partnerships, estates, trusts, syndicates, fiduciaries , corporations, and all other groups or combinations.
- 22) "Pole lighting" means a light fixture set on a base or pole which raises the source of the light higher than twenty four inches (24") off the ground.
- 23) "Shield" means a covering, canopy, or other such device fitted over and extended below an artificial light source
- 24) "Tinted glass" means any glass treated to achieve an industry-approved, inside-to-outside light transmittance value of 45% or less. Such transmittance is limited to the visible spectrum (400 to 700 nanometers) and is measured as the percentage of light that is transmitted through the glass.

III PROHIBITION OF ACTIVITIES DISRUPTIVE TO MARINE TURTLES AND OTHER LISTED SPECIES

The following activities involving direct illumination of the beach shall be prohibited at nighttime on Gulf County Beaches, as defined in Sec. II.12 above, from May 1 through October 31 of each year for the protection of listed species, specifically marine turtle nesting females, hatchlings, and nests:

- 1) The use of artificial lighting, including flashlights, to directly observe marine turtle nesting and hatching activities.
- 2) Any transient lighting which purposely or flagrantly illuminates nesting sea turtles or hatchlings such that it disrupts their behavior patterns.

IV STANDARDS FOR UTILITY LEASED LIGHTING

A. New Construction

Utility lighting will be constructed within the following guidelines:

- 1) Distances Greater Than 300 ft. From The Mean High Water Mark:
Cut-off HPS Luminaries; 150 watts or less; mounting height of 25ft or less. Where direct light source is visible by observer from beyond the frontal dune, a shield will also be installed.
- 2) Distances Up to 300 ft From the Mean High Water Mark: Cut-off HPS Luminaries; 150 watts or less with amber filtered lenses; mounting height of 25 ft or less. Where direct light source is visible by observer from beyond the frontal dune, a shield will also be installed.

B. Existing Lighting

Upon failure of existing fixtures, the utility will install replacement fixtures utilizing the following guidelines:

- 1) Distances Greater Than 300 ft From The Mean High Tide Mark: Cut-off HPS Luminaries; 150 watts or less; mounting height of 25 ft or less. Where direct light source is visible by observer from beyond the frontal dune a shield will also be installed.
- 2) Distance 100 ft -300 ft From The Mean High Tide Mark: Cut-off HPS Luminaries ; 150 watts or less with amber filtered lens; mounting height of 25 ft or less . Where direct light source is visible by observer from beyond the frontal dune a shield will also be installed.

Upon an agreement between the FDEP, Fish & Wildlife, local county government and the utility, that an existing fixture is posing a significant threat, replacement will occur prior to failure.

V STANDARDS FOR NEW CONSTRUCTION ACTIVITIES (EXCLUDING UTILITY LEASED LIGHTING)

In order to provide the highest level of protection for nesting marine turtles, hatchlings, and other listed species, the following standards for artificial light sources on all new coastal construction within the Beaches of Gulf County as defined in Section II. 12, above:

- 1) Exterior artificial light fixtures shall be designed and positioned so that:
 - (a) The point source of light or any reflective surface of the light fixture is not directly visible from the beach.
 - (b) Areas seaward of the frontal dune are not directly or indirectly illuminated; and
 - (c) Areas seaward of the frontal dune are not cumulatively illuminated.
- 2) Exterior artificial light fixtures within direct line-of-sight of the beach will be permitted only if designed and installed as follows:
 - (a) Completely shielded down light only fixtures or recessed fixtures having low wattage type bulbs and non-reflective interior surfaces are used. Other fixtures that have appropriate shields, louvers, or cutoff features may also be used if they are in compliance with subsection (1)(a), (b), and (c) above: 25 watts or less bug lights and
 - (b) All fixtures are mounted as low in elevation as possible through use of low-mounted wall fixtures, low bollards, and ground-level fixtures.
- 3) Floodlights, up lights or spotlights for decorative and accent purposes that are directly visible from the beach, or which indirectly or cumulatively illuminate the beach, shall not be used.
- 4) Exterior lights used expressly for safety or security purposes must comply with subsections 2(a) and (b) and shall be limited to the minimum number and configuration required to achieve their functional role(s). The use of motion detector switches that keep lights off except when approached and that switch lights on for the minimum duration possible are required.
- 5) Only low intensity lighting shall be used in parking areas within line- of-sight of the beach. Such lighting shall be:
 - (a) Set on a base which raises the source of light no higher than 45 inches off the ground; and
 - (b) Positioned or shielded so that the light is cast downward and the source of light or

any reflective surface of the light fixture is not visible from the beach and does not directly or indirectly illuminate the beach.

- 6) Parking area lighting, and roadway lighting shall be shielded from the beach through the use of ground-level barriers. Ground-level barriers must not interfere with marine turtle nesting or hatchling emergence, or cause short or long term damage to the beach/dune system.
- 7) Tinted glass shall be installed on all windows and glass doors of single or multi-story structures within line-of-sight of the beach.
- 8) Use of appropriately shielded low-pressure sodium-vapor lamps and fixtures shall be required for high-intensity lighting such as lighting parking areas and roadways, providing security, and similar applications.
- 9) Lights on dune walkovers are prohibited seaward of the CCCL. Lights on the walkovers landward of the CCCL shall utilize low profile shielded luminaries directed and positioned so that the point source of light or any reflective surface of the light fixture is not directly visible to a person on the beach.
- 10) Temporary lighting of construction sites during the marine turtle nesting season shall be required to abide by the standards of this section.

VI STANDARDS FOR EXISTING LIGHTING (EXCLUDING UTILITY LEASED LIGHTING)

In order to provide the highest level of protection for nesting marine turtles, hatchlings, and other listed species, the following standards for all existing artificial light sources, with the Gulf County Beaches as defined within Section II. 12 above shall be brought into compliance by April 1, 2002.

- 1) Existing artificial light fixtures shall be repositioned, modified, disconnected, or removed so that:
 - (a) The point source of light or any reflective surface of the light fixture is not directly visible from the beach.
 - (b) Areas seaward of the frontal dune are not directly or indirectly illuminated; and
 - (c) Areas seaward of the frontal dune are not cumulatively illuminated.
- 2) Existing artificial light fixtures that are replaced for any reason shall comply with Section IV, Standards for New Construction Activities and the following measures taken:
 - (a) Reposition fixtures so that the point source of light or any reflective surface of the light fixture is no longer visible from the beach;
 - (b) Replace fixtures having an exposed light source with fixtures containing recessed light sources or shields;
 - (c) Replace non-directional fixtures with directional fixtures that point down and away from the beach;
 - (d) Replace pole lamps with low-profile, low-level luminaries so that the light source or any reflective surface of the light fixture is not visible from the beach;
 - (e) Replace incandescent, fluorescent, and high intensity lighting with the lowest wattage low-pressure sodium-vapor lighting possible for the specific application;
 - (f) Plant or improve vegetation buffers between the light source and the beach to screen light from the beach;
- 3) The following measures shall be taken as applicable to reduce or eliminate the negative effects of interior light emanating from doors and windows within line-of-sight of the beach:
 - (a) Apply window tint or film that meets the standards for tinted glass;
 - (b) Rearrange lamps and other moveable fixtures away from windows;

- (c) Use window treatments (e.g., blinds, curtains) to shield interior lights from the beach; and
 - (d) Turn off unnecessary lights.
- 4) Any and all lighting which fails to meet the requirements of Section VI as to standard for existing lighting shall be subject to termination of lighting pending full compliance.

VII PUBLIC AWARENESS

Any person submitting an application for coastal construction activities within the jurisdictional boundaries of Gulf County shall be informed of the existence of and the requirements concerning artificial lighting and marine turtle protection by the Gulf County Planning and Building Department.

VIII ENFORCEMENT AND PENALTIES

Upon notification, the Gulf County Code Enforcement Officer shall give notice to any person who violates this Ordinance by a certified letter/return receipt requested to the property owner's address listed at the Gulf County Tax Collector's Office for the location of the offending light. Such notice shall be provided within twenty-four (24) hours of the report of the disorientation event, or within forty-eight (48) hours of the report of the disorientation event if reported on the weekend. Additionally, in the event that the Code Enforcement Officer ascertains that the offending property is under the care of a rental (realty) agency or property manager, then and in that event, the Code Enforcement Officer shall provide to such rental agency a Notice of Violation letter within forty-eight (48) hours of the disorientation event. Further, in the event that the Code Enforcement Officer ascertains that the offending property is occupied, then and in that event, a copy of the Notice of Violation shall be provided to an occupant at the location of the offending light within twenty-four (24) hours of the report of the disorientation event, or within forty-eight (48) hours of the report of the disorientation event if reported on the weekend. Such letters shall describe the violation and shall enclose a brochure provided by the Department of Environmental Protection and a copy of this Ordinance. Failure to correct any noticed violation within seven (7) days of the date of notice of such violation shall be punishable in the same manner as a misdemeanor punishable as provided by Section 125.69, Florida Statutes (2001). Each day of any such violations shall constitute a separate and distinct offense. The Florida Department of Environmental Protection, Gulf County Sheriff's Department, Florida Fish & Wildlife Conservation Commission, and Gulf County Code Enforcement officers shall have authority to enforce the Ordinance. Any person may exercise their right to report any and all violations of this Ordinance to the proper enforcement authorities. In addition to any other remedy herein set forth or otherwise provided by law, the County may restrain any violation of this Ordinance by suit in a court or administrative body of competent jurisdiction.

IX INTERPRETATION

The provisions of this Ordinance shall be liberally construed in order to effectively carry out its purpose. Where any provision of this Ordinance refers to or incorporates another provision, ordinance, statute, rule, regulation, policy, official publication, or other authority, it refers to the most current version, incorporating any amendments thereto or re-designation thereof.

X SEVERABILITY

If any section, subsection, sentence, clause or provision of this Ordinance is held invalid by a court of competent jurisdiction, the remainder of this Ordinance shall not be affected.

XI EFFECTIVE DATE

This Ordinance shall take effect immediately upon its adoption.

Duly adopted by the Board of County Commissioners of Gulf County, Florida, this 11th day of September, 2001.

BOARD OF COUNTY COMMISSIONERS
GULF COUNTY, FLORIDA

A.5.2 / Gulf County Beach Driving Ordinance

ORDINANCE NO. 2015-08

AN EMERGENCY ORDINANCE OF GULF COUNTY, FLORIDA; WHEREBY REPEALING GULF COUNTY ORDINANCE NO. 97-02 AND THERAFTER AMENDMENTS GULF COUNTY ORDINANCE NO. 13-09 AND 14-03 THERETO TITLED "ALLOWING FOR VEHICULAR TRAFFIC ON CERTAIN COASTAL BEACHES WITHIN GULF COUNTY, FLORIDA"; REPEALING THE ORDINANCE IN ITS ENTIRETY AND REPLACING ALL PRIOR AMENDMENTS AND REGULATIONS TO THE ORDINANCE HEREIN; HEREINAFTER PROVIDING FOR A PERMIT AND REQUIEMENTS TO OBTAIN THE SAME; PROVIDING FOR A PERMIT FEE; ESTABLISHING A SYSTEM FOR MONITORING THE ISSUANCE OF DECALS; ESTABLISHING THE FORMAT FOR DECALS; LIMITING AND DESIGNATING BEACH ACCESS POINTS; PROVIDING FOR A SPEED LIMIT; PROVIDING FOR RULES FOR OPERATION OF VEHICLES ON THE BEACHES; PROVIDING FOR PENALTY FOR VIOLATION; PROVIDING FOR REPEALER, SEVERABILITY, MODIFICATIONS THAT MAY ARISE FROM CONSIDERATION AT PUBLIC HEARING; PROVIDING FOR EMERGENCY PROVISION AND CLASSIFICATION FOR WAIVING STATUTORY NOTICE REQUIREMENTS FOR ITS IMMEDIATE ADOPTION AND PROVIDING FOR AN EFFECTIVE DATE.

WHEREAS, the Board of County Commissioners of Gulf County, Florida (hereinafter "Commissioners"), found and determined at its regular meeting of June 23, 2015 that Gulf County (hereinafter "County") shall amend its beach driving ordinance and regulations; and

WHEREAS, the Commissioners duly authorized, motioned and properly voted to adopt this emergency ordinance following recent public discussion, community involvement and the input and contributions of various county officials; and

WHEREAS, the Commissioners have publically discussed and revised the prior regulations through various ordinance amendments and have deemed it a time sensitive public issue demanding immediate action and revision of the current regulations through ordinance to promote and ensure continued public safety as well as preserve environmental sensitive areas of the County and the ability for proper implementation and enforcement of both; and

WHEREAS, Gulf County, Florida contains many miles of beaches which are inaccessible to the public without the availability of vehicular traffic along those beaches, and

WHEREAS, the Commissioners have found it necessary to regular the traffic along the beaches described in Section I of this Ordinance in order to protect and promote the health and safety of the citizens of this County and simultaneously protect the environment; and

WHEREAS, the Commissioners have historically addressed and met the changing needs and growth of Gulf County's beaches in use and accessibility beginning with Gulf County ordinances in whole or part of their language and regulations and herein incorporated by reference (Gulf County Ordinances 84-03, 87-03, 88-05, 89-05, 90-10, 90-14, 92-07, 94-11, 97- 02, 13-09, 14-03) and for complete repeal and replacement by the following updated regulations, and

WHEREAS, pursuant to Florida Statute 125.01 the County shall have the power to carry on county government inclusive of the power to adopt its own rules that which are not inconsistent with general or special law; and

WHEREAS, pursuant to Florida Statute 125.01 the County shall reserve the powers to adopt ordinances necessary for the exercise of its powers and perform acts which are in the common interest of the people of Gulf County and exercise all powers and privileges not specifically prohibited by law; and

WHEREAS, the Commissioners have acknowledged the statutory notice requirements (Florida Statute 125.66) of consideration and adoption of an emergency ordinance and hereby vote in the affirmative by the required four/fifths of membership of declaring the emergency and authorizing vote to waive the required notice requirements and hereby adopt for immediate enactment as necessary; and

WHEREAS, pursuant to Florida Constitution Article VIII Section I(f) the County shall have such power of self-government as is provided by general or special law and this Commission may enact, in a manner prescribed by general law, county ordinances not inconsistent with general or special law; and

NOW THEREFORE, BE IT ORDAINED by the Board of County Commissioners of Gulf County, Florida, that:

Section 1. Beaches driving areas of regulation

It shall be unlawful for any person, firm, corporation, or other entity, to drive, or cause to be driven any vehicle on the following described beaches of Gulf County, in the State of Florida:

Those beaches fronting on the Gulf of Mexico, running from Indian Pass to the East to the T.H. Stone Park in the North. Said beaches lying and being in the following Sections: Section 25 and 36, Township 8 South, Range 12 West; Sections 1 & 12, Township 9 South, Range 12 West; Section 6, 7, 18, 19, 20, 21, 22, 23, 24, 28, 29 and 33, Township 9 South, Range 11 West; and Section 19, 20, 21 and 22, Township 9 South, Range 11 West.

Unless said vehicle and driver have complied with the requirements of this Ordinance. Upon compliance with the registration requirements of this Ordinance, driving on the above described beaches shall be allowed subject to the restrictions of this Ordinance.

Section 2. Definitions and Prohibitions

- a. A vehicle is defined as any mode of transportation with two, three, four or any other number of wheels if propelled by power other than human muscular power. For purposes of this Ordinance, the following vehicles as defined in Florida Statutes 320.01, are specifically prohibited, are specifically prohibited driving on the beach; recreational vehicles, travel trailers, camping trailers, campers, motor homes, private motor coaches, conversion vans, tractor-trailers or semi-trailer, vehicles primarily designed as temporary living quarters for recreational, camping or travel use, either with motor power or mounted on or drawn by another vehicle.
- b. Beach access areas (also referred to as legal access points herein) is defined as those public beach access points within Gulf County, Florida identified by the Gulf County Public Parks and or Tourist Development Council signage, including boardwalks, walkways, and dedicated parking areas, and the areas on the Public Beach beginning at the entrance of the beach access point perpendicular with the applicable road right of way to the water's edge. (Gulf County beach and waterfront property owners with proper annual permitting of vehicle(s) shall be permitted access directly to those authorized beach areas for driving from their directly adjacent beach and waterfront properties that remain in strict compliance with all other state and local laws). Gulf County designated beach access areas/legal access points shall be identified by the Board of County Commission through its administrative staff and shall amend and modify as is necessary and authorized by vote of the Board. Those identified exempt property owners shall be held to strict adherence with all local and state regulations including but not limited to Florida Statute 161.58 as well as protection and non-disturbance of coastal native vegetation consistent with the Beach and Shore Preservation Act and related state restrictions.
- c. Pursuant to Gulf County Leave No Trace Ordinance No. 2015-07 and hereinafter authorized by this Ordinance, the use of authorized and identified motor vehicles is hereby authorized on the designated public beaches of Gulf County for enforcement of this ordinance and other Gulf County beaches ordinances, provided that such vehicles and trailers are owned, leased or otherwise controlled by Gulf County. Such vehicles must use designated and approved dune

cross-overs for ingress and egress to aforementioned public beaches.

- d. Before any vehicle shall be allowed to access via beach access areas and operate on the beaches of Gulf County, Florida, in the above described area, a beach driving permit must be obtained for said vehicle.
- e. Beach driving permits shall not be issued to any prohibited vehicle.

Section 3. Permitting and Fees

- a. Beach driving permits shall be issued by the Tax Collector of Gulf County, Florida, at the Gulf County Courthouse and the Tourism Development Council (TDC) Offices located at the Gulf County Welcome Center both located in Port St. Joe, Florida during regular business hours and where TDC staff develops and receives prior Board approval for additional locations for sale and issuance of permits.
- b. Beach driving permits shall be issued for a period of one (1) year and shall thereafter expire unless expressly provided otherwise herein.
- c. The beach driving permit fees shall be structured as follows:
 - i. Annual Beach Driving Permits - Gulf County Resident and or Property Owner \$30.00
 - ii. Annual Beach Driving Permits - Non County Resident \$300.00
 - iii. Senior Citizens (65 or older)/ Disabled Citizens that are either documented Gulf County Taxpayer or Gulf County Resident special exemption and one time administrative fee of \$3.00
 - iv. Annual commercial driving permits issued to local Gulf County businesses for beach rental vehicles shall have the annual fee and allotment of permits determined by the county administrator.

Section 4. Decal system

A decal shall be provided with each Beach Driving Permit sold.

- a. The decal system for vehicles permitted to drive on the beaches shall include the following:
 - i. One decal shall be issued for each vehicle.
 - ii. The decal shall be of different colors based on the expiration date.
 - iii. The decal shall be numbered to provide for monitoring and accounting.
 - iv. The Gulf County Sheriff's office shall be notified of the number and name of lost or stolen decals.
 - v. A replacement fee of \$20.00 shall be charged for lost or stolen decals.
 - vi. The decal shall be affixed to the permitted vehicle on the vehicle's rear window on the driver's side. If no such space is available, the decal shall be otherwise conspicuously displayed on the vehicle.

Section 5. Application and Affidavit

Any individual applying for a permit must provide the following information:

- a. Name.
- b. Address.
- c. Type of vehicle.
- d. Tag number.
- e. Valid drivers license.
- f. Proof of current insurance through expiration date of proposed permit
- g. Proof of Ownership of Vehicle

Each applicant shall sign the beach driving application and an accompanying statement of responsibility acknowledging the rules and regulations governing the operation of vehicles on the beaches of Gulf County, Florida, and agreeing to be bound by the terms and conditions thereof.

Section 6. Rules and Regulations Compliance

A pamphlet and copy of this Ordinance shall be provided with each permit sold stating the following rules which, by this Ordinance, are adopted by Gulf County, Florida:

- a. Maximum speed allowed on the described beaches is to be 15 mph or such lesser speed as posted;
- b. Pedestrians and pets shall have the right of way.
- c. Driving in, on or over sand dunes is strictly prohibited.
- d. Obtaining access to the above described beaches by a route other than a county designated beach access point is strictly prohibited.
- e. Driving in, on or over vegetation is strictly prohibited.
- f. No litter is to be left on the beaches; litter shall include, but not be limited to, fish bait, discarded fish or any other form of waste, whether taken from the gulf or removed from the vehicle.
- g. The person to whom the permit is issued is responsible under this ordinance for the conduct of the occupants of his or her vehicle.
- h. Reckless driving along the public beach as designated in this Ordinance is prohibited.
- i. Any person driving or operating a vehicle on the public beaches as designated in this Ordinance must possess a valid driver's license.
- j. Vehicles are prohibited from entering, driving or parking landward of the vehicular buffer zone on the beaches adjacent to the St. Joseph Bay Aquatic Preserve. This zone is designated by signage which is physically located on the beach in the affected areas. This restriction applies to both adjacent beach waterfront property owners as well as all other permit holders.
- k. The public beaches adjacent to the Aquatic Preserve shall be closed to vehicular traffic on those days when extremely high tides make that beach impassable without travel over dunes or vegetation.
- l. Vehicular driving is prohibited on the beaches adjacent to the Aquatic Preserve from May 1 until October 31 of each year during the time after Sunset and before Sunrise.

The Gulf County Tax Collector and/or Gulf County Tourist Development Council staff shall provide each purchaser of a permit with a map showing the beaches designated for permitted driving and the current legal access points to the beaches described above and as defined by the Board of Commissioners.

Section 7. Violation and Fines

Violation of this Ordinance shall be punishable as follows:

- a. Driving on the beach without first having obtained a valid permit shall result in a fine of \$500.00** for a first time offense. For a second offense, the fine shall be \$750.00.
**Upon issuance of a citation, the violator may purchase a beach driving permit through Gulf County Tax Collectors Office within seven (7) calendar days of receipt the violation and thereafter upon proof of identification and proof of purchase of annual permit to the Clerk of Court may elect to enter a guilty plea to the citation and simultaneously shall reduce the penalty to a total of \$100 in addition to the annual permit fee paid.
- b. Racing vehicles on the beach or pulling skiers from any moving vehicle on land shall result in a \$500.00 fine.
- c. Production of any excess noise from any vehicle which shall disturb the peace shall result in a \$250.00 fine. Failure of any vehicle to have proper mufflers, or having a muffler for which bafflers have been removed shall be prima facie evidence of violation of this Section.
- d. Gaining access to the beaches by a route other than a designated legal access point shall result in a fine of \$500.00 in addition to any other fines or penalties imposed pursuant to state law.
- e. Any other violations of this Ordinance shall result in a \$250 fine for the first offense and \$400 fine for a subsequent offense.
- f. Any permit holder accumulating three or more violations of this ordinance shall have his or her beach

driving permit revoked and shall be thereafter ineligible to apply for or obtain any other Gulf County beach driving permit. An applicant whose rights have been affected by such a revocation may petition the Gulf County Commission for reinstatement.

Section 8. Repealer.

Any and all ordinances including but not limited to Gulf County Ordinances 84- 03, 87-03, 88-05, 89-05, 90-10, 90-14, 92-07, 94-11, 97-02, 13-09, 14-03 as well as any and all ordinances in conflict herewith are hereby repealed to the extent of any conflict.

Section 9. Conflicts.

All ordinances or parts of ordinances in conflict with the provisions of this ordinance are hereby repealed to the extent of such conflict, except to the extent of any conflicts with any conflicting state general or special law controlling the Gulf County Beach Driving Permit Fees, which provisions shall prevail over any parts of this ordinance which are inconsistent, either in whole or in part.

Section 10. Modification.

It is the intent of the Board of County Commissioners that the provisions of this Ordinance may be modified as a result of considerations that may arise during public hearings. Such modifications shall be incorporated into the final version of the Ordinance adopted by the Board and filed by the Clerk to the Board.

Section 11. Severability.

If any provisions or portion of this Ordinance is declared by any court of competent jurisdiction to be void, unconstitutional, or unenforceable, then all remaining provisions and portions of this Ordinance shall remain in full force and effect.

Section 12. Effective Date.

This ordinance shall have an effective date of June 23rd, 2015.

Following the emergency introduction, reading and discussion, the foregoing Ordinance was offered by Commissioner Yeager, who moved its adoption. The motion was seconded by Commissioner McLemore and, being put to vote requiring a 4/5 majority approval for emergency adoption, the vote as follows:

Commissioner Yeager	yes
Commissioner Quinn	yes
Commissioner McDaniel	yes
Commissioner McLemore	yes
Commissioner Bryan	no

DULY PASSED AND ADOPTED THIS 23rd day of June, 2015

Appendix B / Resource Data

B.1 / Glossary of Terms

aquaculture – the cultivation of aquatic organisms (Lincoln, Boxshall & Clark, 2003).

aquifer – a body of porous rock or soil through which water passes and in which water gathers (Collin, 2004).

biodiversity – the range of species, subspecies or communities in a specific habitat such as a rainforest or a meadow (Collin, 2004).

codify – to arrange laws and rules systematically (Neufeldt & Sparks, 1990).

diversity – a measure of the number of species and their relative abundance in a community (Lincoln et al., 2003).

drainage basin (catchment) – the area from which a surface watercourse or a groundwater system derives its water; watershed (Allaby, 2005).

easement – a right that one may have in another's land (Neufeldt & Sparks, 1990).

ecosystem – a community of organisms and their physical environment interacting as an ecological unit (Lincoln et al., 2003).

endangered species – an animal or plant species in danger of extinction throughout all or a significant portion of its range (U.S. Fish and Wildlife Service [USFWS], 2015).

endemic – native to, and restricted to, a particular geographical region (Lincoln et al., 2003).

epifauna – the total animal life inhabiting a sediment surface or water surface; epibenthos (Lincoln et al., 2003).

estuary – a part of a river where it meets the sea and is partly composed of salt water (Collin, 2004).

extinction – the disappearance of a species from a given habitat (Lincoln et al., 2003).

fauna – the animal life of a given region, habitat or geological stratum (Lincoln et al., 2003).

flora – the plant life of a given region, habitat or geological stratum (Lincoln et al., 2003).

foredune – a dune ridge, more or less stabilized by the initial stages of the primary sere (Lincoln et al., 2003).

geographic information system (GIS) – computer system supporting the collection, storage, manipulation and query of spatially referred data, typically including an interface for displaying geographical maps (Lincoln et al., 2003).

habitat – the type of environment in which a specific organism lives (Collin, 2004).

infauna – the animal life within a sediment (Lincoln et al., 2003).

intertidal zone – the shore zone between the highest and lowest tides; littoral (Lincoln et al., 2003).

listed species – a species, subspecies, or distinct population segment that has been added to the Federal list of endangered and threatened wildlife and plants (USFWS, 2015).

mandate – an order or command; the will of constituents expressed to their representative, legislature, etc. (Neufeldt & Sparks, 1990).

midden – a refuse heap; used especially in archaeology (Lincoln et al., 2003).

monitoring – a process of regular checking on the progress of something (Collin, 2004).

neritic – pertaining to the shallow waters overlying the continental shelf (Lincoln et al., 2003).

pollution – the presence of unusually high concentrations of harmful substances in the environment, as a result of human activity or a natural process (Collin, 2004).

population – all individuals of one or more species within a prescribed area. A group of organisms of one species, occupying a defined area and usually isolated to some degree from other similar groups (Lincoln et al., 2003).

psammophyte – a plant growing or moving in unconsolidated sand (Lincoln et al., 2003).

runoff – part of precipitation that is not held in the soil but drains freely away (Lincoln et al., 2003).

salinity – a measure of the total concentration of dissolved salts in seawater (Lincoln et al., 2003).

sere – a succession of plant communities in a given habitat leading up to a particular climax association; a stage in a community succession (Lincoln et al., 2003).

sessile – non-motile; permanently attached at the base (Lincoln et al., 2003).

species – a group of organisms, minerals or other entities formally recognized as distinct from other groups; the basic unit of biological classification (Lincoln et al., 2003).

stakeholder – any person or organization who has an interest in the actions discussed or is affected by the resulting outcomes of a project or action (USFWS, 2015).

subtidal – environment which lies below the mean low water level (Allaby, 2005).

supratidal – the zone on the shore above mean high tide level (Lincoln et al., 2003).

threatened species – an animal or plant species likely to become endangered within the foreseeable future throughout all or a significant portion of its range (USFWS, 2015).

turbid – cloudy; opaque with suspended matter (Lincoln et al., 2003).

upland – land elevated above other land (Neufeldt & Sparks, 1990).

vegetation – plant life or cover in an area; also used as a general term for plant life (Lincoln et al., 2003).

water column – the vertical column of water in a sea or lake extending from the surface to the bottom (Lincoln et al., 2003).

watershed – an elevated boundary area separating tributaries draining in to different river systems; drainage basin (Lincoln et al., 2003).

wetland – an area of low lying land, submerged or inundated periodically by fresh or saline water (Lincoln et al., 2003).

wildlife – any undomesticated organisms; wild animals (Allaby, 2005).

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B.3 / Species Lists

B.3.1 / Native Species

Legend: FT = Federally- and State-Designated Threatened • FE = Federally-and State-Designated Endangered • ST = State-Designated Threatened • SE = State-Designated Endangered • (S/A) = listed due to similarity of appearance • BGEPA = Bald and Golden Eagle Protection Act

Common Name	Species Name	Status
Macroalgae		
	<i>Acanthophora sp.</i>	
Mermaid's wineglass	<i>Acetabularia crenulata</i>	
	<i>Caulerpa sp.</i>	
	<i>Gracilaria sp.</i>	
	<i>Hypnea sp.</i>	
	<i>Sargassum sp.</i>	
	<i>Ulva flexuosa</i>	
Sea lettuce	<i>Ulva lactuca</i>	
	<i>Ulva linza</i>	
	<i>Ulva prolifera</i>	
Vascular plants		
Bushy bluestem	<i>Andropogon glomeratus</i>	
Fewflower milkweed	<i>Asclepias lanceolata</i>	
Black mangrove	<i>Avicennia germinans</i>	
False willow	<i>Baccharis angustifolia</i>	
Silverling	<i>Baccharis glomeruliflora</i>	
Saltbush	<i>Baccharis halimifolia</i>	
Saltwort	<i>Batis maritima</i>	
Bushy seaside oxeye	<i>Borrchia frutescens</i>	
Apalachicola dolls daisy	<i>Boltonia apalachicolensis</i>	
Watergrass	<i>Bulbostylis barbata</i>	
Capillary hairsedge	<i>Bulbostylis ciliatifolia</i>	
Ware's hairsedge	<i>Bulbostylis warei</i>	
Coastal searocket	<i>Cakile lanceolata</i>	
Vanillaleaf	<i>Carphephorus odoratissimus</i>	

Common Name	Species Name	Status
Godfrey's goldenaster	<i>Chrysopsis godfreyi</i>	
Woody goldenrod	<i>Chrysoma pauciflosculosa</i>	
Sawgrass	<i>Cladium jamaicense</i>	
Baldwin's flatsedge	<i>Cyperus croceous</i>	
Swamp flatsedge	<i>Cyperus distinctus</i>	
Haspan flatsedge	<i>Cyperus haspan</i>	
Epiphytic flatsedge	<i>Cyperus lanceolatus</i>	
Leconte's flatsedge	<i>Cyperus lecontei</i>	
Fragrant flatsedge	<i>Cyperus odoratus</i>	
Many-spike flatsedge	<i>Cyperus polystachyos</i>	
Low flatsedge	<i>Cyperus pumilus</i>	
Pinebarren flatsedge	<i>Cyperus ovatus</i>	
Tropical flatsedge	<i>Cyperus surinamensis</i>	
Spoon-leaf sundew	<i>Drosera intermedia</i>	
Gulf Coast spikerush	<i>Eleocharis cellulosa</i>	
Canada spikerush	<i>Eleocharis geniculata</i>	
Carolina fimbry	<i>Fimbristylis caroliniana</i>	
Forked fimbry	<i>Fimbristylis dichotoma</i>	
Marsh fimbry	<i>Fimbristylis spadicea</i>	
Saltmarsh umbrella sedge	<i>Fuirena breviseta</i>	
Southern umbrella sedge	<i>Fuirena scirpoidea</i>	
Swamp rosemallow	<i>Hibiscus grandiflorus</i>	
Largeleaf marsh pennywort	<i>Hydrocotyle bonariensis</i>	
Mayflower marsh pennywort	<i>Hydrocotyle umbellate</i>	
Swamp pennywort	<i>Hydrocotyle verticillata</i>	
St. John's-wort	<i>Hypericum fasciculatum</i>	
St. Andrew's-cross	<i>Hypericum hypericoides</i>	
Gallberry	<i>Ilex glabra</i>	
Yaupon	<i>Ilex vomitoria</i>	
Saltmarsh morning glory	<i>Ipomea sagittata</i>	
Marsh elder	<i>Iva frutescens</i>	

Common Name	Species Name	Status
Tapertip rush	<i>Juncus acuminatus</i>	
Toad rush	<i>Juncus bufonius</i>	
Leathery rush	<i>Juncus coriaceus</i>	
Forked rush	<i>Juncus dichotomus</i>	
Soft rush	<i>Juncus effuses</i>	
Shore rush	<i>Juncus marginatus</i>	
Bighead rush	<i>Juncus megacephalus</i>	
Annual rush	<i>Juncus pelocarpus</i>	
Black needlerush	<i>Juncus roemarianus</i>	
Needlepod rush	<i>Juncus scirpoides</i>	
Path rush	<i>Juncus tenuis</i>	
Saltmarsh mallow	<i>Kosteletzkya pentacarpos</i>	
Bogbutton	<i>Lachnocaulon digynum</i>	
Godfrey's blazing star	<i>Liatris provincialis</i>	
Dense gayfeather	<i>Liatris spicata</i>	
Sea-lavender	<i>Limonium carolinianum</i>	
Primrose-willow	<i>Ludwigia alata</i>	
Christmasberry	<i>Lycium carolinianum</i>	
Wax myrtle	<i>Morella cerifera</i>	
Gulf coast swallowwart	<i>Pattalia palustre</i>	
Slash pine	<i>Pinus elliottii</i>	
Large-leaved jointweed	<i>Polygonella macrophylla</i>	
Sand live oak	<i>Quercus geminata</i>	
Live oak	<i>Quercus virginiana</i>	
Red mangrove	<i>Rhizophora mangle</i>	
Cabbage palm	<i>Sabal palmetto</i>	
Largeflower marsh pink	<i>Sabatia grandiflora</i>	
Rose of Plymouth	<i>Sabatia stellaris</i>	
Virginia glasswort	<i>Salicornia ambigua</i>	
Annual glasswort	<i>Salicornia biglovii</i>	
Perennial glasswort	<i>Salicornia perennis</i>	

Common Name	Species Name	Status
Chickenclaws	<i>Sarcocornia perennis</i>	
Fringed nutrush	<i>Scleria ciliata</i>	
Saw palmetto	<i>Serenoa repens</i>	
Sea-purslane	<i>Sesuvium portulacastrum</i>	
Giant bristlegrass	<i>Setaria magna</i>	
Marsh bristlegrass	<i>Setaria parviflora</i>	
Seaside goldenrod	<i>Solidago sempervirens</i>	
Solidago stricta	<i>Solidago stricta</i>	
Smooth cordgrass	<i>Spartina alterniflora</i>	
Saltmeadow cordgrass	<i>Spartina patens</i>	
Gulf cordgrass	<i>Spartina spartinae</i>	
Virginia dropseed	<i>Sporobolus virginicus</i>	
Annual saltmarsh American aster	<i>Symphyotrichum subulatum</i>	
Perennial saltmarsh aster	<i>Symphyotrichum tenuifolium</i>	
Sea oats	<i>Uniola paniculata</i>	
Submerged Aquatic Vegetation		
Shoal grass	<i>Halodule wrightii</i>	
Star grass	<i>Halophia engelmannii</i>	
Manatee grass	<i>Syringodium filiforme</i>	
Turtle grass	<i>Thalassia testudinum</i>	
Mollusks		
Atlantic abra	<i>Abra aequalis</i>	
Transverse ark	<i>Anadara transversa</i>	
Eared ark	<i>Anadara notabilis</i>	
Rayed creekshell	<i>Anodontooides radiatus</i>	
Atlantic paper mussel	<i>Arcuatula papyrium</i>	
Bay scallop	<i>Argopecten irradians</i>	
Rigid penshell	<i>Atrina rigida</i>	
Scorched mussel	<i>Brachiodontes exustus</i>	
Common Atlantic bubble	<i>Bulla striata</i>	

Common Name	Species Name	Status
Lightning whelk	<i>Busycon contrarium</i>	
Pear whelk	<i>Busycon spiratus</i>	
Channeled whelk	<i>Busycotypus canaliculatus</i>	
Sculptured topshell	<i>Calliostoma euglyptum</i>	
Cancellate cantharus	<i>Cantharus cancellarius</i>	
Broad-ribbed cardita	<i>Carditamera floridana</i>	
Florida cross-barred venus	<i>Chione elevata</i>	
Gray pygmy venus	<i>Chioneryx grus</i>	
Eastern oyster	<i>Crassostrea virginica</i>	
Cuminga	<i>Cumingia tellinoides</i>	
Thin cyclinella	<i>Cyclinella tenuis</i>	
Atlantic dipledon	<i>Diplodonta punctata</i>	
Minor jackknife	<i>Ensis minor</i>	
Ponderous ark	<i>Eontia ponderosa</i>	
Sharp-rib drill	<i>Eupleura sulcidentata</i>	
Banded tulip	<i>Fasciolaria hunteria</i>	
True tulip	<i>Fasciolaria tulipa</i>	
Southern ribbed mussel	<i>Geukensia granosissima</i>	
Lampshell	<i>Glottidia pyramidata</i>	
Morton eggcockle	<i>Laevicardium mortoni</i>	
Chestnut mussel	<i>Lioberus castaneus</i>	
Atlantic brief squid	<i>Lolliguncula brevis</i>	
Florida lucine	<i>Lyonsia floridana</i>	
Sunray venus	<i>Macrocallista nimbosa</i>	
Sunray venus	<i>Macrocallista nimbosa</i>	
Fragile surf clam	<i>Macrotrotoma fragilis</i>	
Boring clam	<i>Martesia smithi</i>	
Gulf moccasinshell	<i>Medionidus penicillatus</i>	
Florida crown conch	<i>Melongena corona</i>	
Southern quahog	<i>Mercenaria campechiensis</i>	
American horsemussel	<i>Modiolus americanus</i>	

Common Name	Species Name	Status
Dwarf surfclam	<i>Mulinia lateralis</i>	
Lace murex	<i>Murex florifer</i>	
Bruised nassa	<i>Nassarius vibex</i>	
Shark eye	<i>Neverita duplicata</i>	
Impressed odostome	<i>Odostomia impressa</i>	
Crested oyster	<i>Ostrea equestris</i>	
Ice cream cine worm	<i>Pectinaria gouldii</i>	
Chalky pitar	<i>Pitar simpsoni</i>	
Lobed moon snail	<i>Polinices duplicatus</i>	
Common Atlantic marginella	<i>Prunum apicinum</i>	
Atlantic wing oyster	<i>Pteria colymbus</i>	
Sculptured pigtoe	<i>Quincuncina infucata</i>	
Purplish tagelus	<i>Tagelus divisus</i>	
White crested tellin	<i>Tellidora cristata</i>	
Alternate tellin	<i>Tellina alternata</i>	
Eastern auger	<i>Terebra dislocata</i>	
Southern oyster drill	<i>Thais haemastoma</i>	
Florida prickly cockle	<i>Trachycardium egmontianum</i>	
Horse conch	<i>Triplofusus giganteus</i>	
Chestnut turban	<i>Turbo castaneus</i>	
Gulf oyster drill	<i>Urosalpinx perrugata</i>	
Echinoderms		
Atlantic purple sea urchin	<i>Arbacia punctulata</i>	
Spiny sea star	<i>Echinaster spinulosus</i>	
Netted sea star	<i>Luidia clathrata</i>	
Variegated sea urchin	<i>Lytechinus variegatus</i>	
Sand dollar	<i>Mellita tenuis</i>	
Brittle star	<i>Ophioderma brevispinum</i>	
Sponges		
Branching candle sponge	<i>Aplysina cauliformis</i>	

Common Name	Species Name	Status
Red boring sponge	<i>Cliona celata</i>	
	<i>Halichondria melanodocia</i>	
Breadcrumb sponge	<i>Halichondria panicea</i>	
Purple encrusting sponge	<i>Haliclona permollis</i>	
	<i>Halicometes stellata</i>	
Sheepswool sponge	<i>Hippospongia lachne</i>	
Sun sponge	<i>Hymeniacidon heliophila</i>	
	<i>Lissodendoryx isodictyalis</i>	
Red beard sponge	<i>Microciona prolifera</i>	
	<i>Plakortis halichondrioides</i>	
	<i>Sarcotragus fasciculatus</i>	
Loggerhead sponge	<i>Spheciospongia vesparium</i>	
	<i>Suberites aurantiacus</i>	
	<i>Suberites sp.</i>	
	<i>Sycon acanthoxea</i>	
Corals		
Ivory brush Coral	<i>Oculina diffusa</i>	
Cnidarians		
Moon jelly	<i>Aurelia aurita</i>	
American tube-dwelling sea anemone	<i>Ceriantheopsis americanus</i>	
Arthropods		
Aviu shrimp	<i>Actes americanus</i>	
Banded snapping shrimp	<i>Alpheus armillatus</i>	
Green snapping shrimp	<i>Alpheus normanni</i>	
Shrimp	<i>Ambidexter symmetricus</i>	
Flame crab	<i>Calappa ocellata</i>	
Blue crab	<i>Callinectes sapidus</i>	
Lesser blue crab	<i>Callinectes similis</i>	

Common Name	Species Name	Status
Thinstripe hermit crab	<i>Clibanarius vittatus</i>	
Gulf grassflat crab	<i>Dyspanopeous texana</i>	
Shrimp species	<i>Farfantepenaeus spp.</i>	
Brown shrimp	<i>Farfantepenaeus aztecus</i>	
Pink shrimp	<i>Farfantepenaeus duorarum</i>	
Smooth mud crab	<i>Hexapanopeous angustifrons</i>	
False zostera shrimp	<i>Hippolyte pleuracanthus</i>	
Zostera shrimp	<i>Hippolyte zostericola</i>	
Brown grass shrimp	<i>Leander tenuicornis</i>	
Longnose spider crab	<i>Libinia dubia</i>	
White shrimp	<i>Litopenaeus setiferus</i>	
Stone crab	<i>Menippe spp.</i>	
Florida grassflat crab	<i>Neopanope packardii</i>	
Mud crab	<i>Neopanope texana</i>	
Florida lady crab	<i>Ovalipes floridanus</i>	
Hermit crab	<i>Pagurus spp.</i>	
Florida grass shrimp	<i>Palaemon floridanus</i>	
Green porcelain crab	<i>Petrolisthes armatus</i>	
Portunus crab	<i>Portunus spp.</i>	
Rock shrimp	<i>Sicyonia brevirostris</i>	
Kinglet rock shrimp	<i>Sicyonia typica</i>	
Arrow crab	<i>Tozeuma carolinense</i>	
Fiddler crab	<i>Uca spp.</i>	
Mud crabs	<i>Xanthidae spp.</i>	
Fishes		
Scrawled cowfish	<i>Acanthostracion quadricornis</i>	
Gulf sturgeon	<i>Acipenser oxyrinchus desotoi</i>	FT
Hardhead catfish	<i>Acropsis felis</i>	
Spotted eagle ray	<i>Aetobatus narinari</i>	
Striped anchovy	<i>Anchoa hepsetus</i>	
Bay anchovy	<i>Anchoa mitchilli</i>	

Common Name	Species Name	Status
Ocellated flounder	<i>Ancylopsetta quadrocellata</i>	
Sheepshead	<i>Archosargus probatocephalus</i>	
Hardhead catfish	<i>Ariopsis felis</i>	
Gafftopsail catfish	<i>Bagre marinus</i>	
Silver perch	<i>Bairdiella chrysoura</i>	
Menhaden	<i>Brevoortia spp.</i>	
Gulf menhaden	<i>Brevoortia patronus</i>	
Yellowfin menhaden	<i>Brevoortia smithi</i>	
Grass porgy	<i>Calamus arctifrons</i>	
Blue runner	<i>Caranx crysos</i>	
Crevalle jack	<i>Caranx hippos</i>	
Horse-eye jack	<i>Caranx latus</i>	
Blacknose shark	<i>Carcharhinus acronotus</i>	
Spinner shark	<i>Carcharhinus brevipinna</i>	
Finetooth shark	<i>Carcharhinus isodon</i>	
Bull shark	<i>Carcharhinus leucas</i>	
Blacktip shark	<i>Carcharhinus limbatus</i>	
Sandbar shark	<i>Carcharhinus plumbeus</i>	
Black sea bass	<i>Centropristis striata</i>	
Atlantic spadefish	<i>Chaetodipterus faber</i>	
Florida blenny	<i>Chasmodes saburrae</i>	
Striped burrfish	<i>Chilomycterus schoepfii</i>	
Atlantic bumper	<i>Chloroscombrus chrysurus</i>	
Spotted whiff	<i>Citharichthys macrops</i>	
Bay whiff	<i>Citharichthys spilopterus</i>	
Darter goby	<i>Ctenogobius boleosoma</i>	
Sand seatrout	<i>Cynoscion arenarius</i>	
Spotted seatrout	<i>Cynoscion nebulosus</i>	
Sheepshead minnow	<i>Cyprinodon variegatus</i>	
Southern stingray	<i>Dasyatis americana</i>	
Atlantic stingray	<i>Dasyatis sabina</i>	

Common Name	Species Name	Status
Bluntnose stingray	<i>Dasyatis say</i>	
Sand perch	<i>Diplectrum formosum</i>	
Spottail pinfish	<i>Diplodus holbrookii</i>	
Gizzard shad	<i>Dorosoma cepedianum</i>	
Threadfin shad	<i>Dorosoma petenense</i>	
Sharksucker	<i>Echeneis naucrates</i>	
Ladyfish	<i>Elops saurus</i>	
Fringed flounder	<i>Etropus crossotus</i>	
Silver jenny	<i>Eucinostomus gula</i>	
Tidewater mojarra	<i>Eucinostomus harengulus</i>	
Mojarra	<i>Eucinostomus spp.</i>	
Little tunny	<i>Euthynnus alletteratus</i>	
Gulf killifish	<i>Fundulus grandis</i>	
Striped killifish	<i>Fundulus majalis</i>	
Tiger shark	<i>Galeocerdo cuvier</i>	
Mosquitofish	<i>Gambusia holbrooki</i>	
Nurse shark	<i>Ginglymostoma cirratum</i>	
Darter goby	<i>Gobionellus boleosoma</i>	
Naked goby	<i>Gobiosoma bosc</i>	
Smooth butterfly ray	<i>Gymnura micrura</i>	
Scaled sardine	<i>Harengula jaguana</i>	
Lined seahorse	<i>Hippocampus erectus</i>	
Dwarf seahorse	<i>Hippocampus zosterae</i>	
False silver halfbeak	<i>Hyporhamphus meeki</i>	
Pinfish	<i>Lagodon rhomboides</i>	
Spot	<i>Leiostomus xanthurus</i>	
Spotted gar	<i>Lepisosteus oculatus</i>	
Longnose gar	<i>Lepisosteus osseus</i>	
Bluegill	<i>Lepomis macrochirus</i>	
Tripletail	<i>Lobotes surinamensis</i>	
Rainwater killifish	<i>Lucania parva</i>	

Common Name	Species Name	Status
Gray snapper	<i>Lutjanus griseus</i>	
Lane snapper	<i>Lutjanus synagris</i>	
Rough silverside	<i>Membras martinica</i>	
Silversides	<i>Menidia spp.</i>	
Kingfish	<i>Menticirrhus sp.</i>	
Southern kingfish	<i>Menticirrhus americanus</i>	
Gulf kingfish	<i>Menticirrhus littoralis</i>	
Northern kingfish	<i>Menticirrhus saxatilis</i>	
Clown goby	<i>Microgobius gulosus</i>	
Atlantic croaker	<i>Micropogonias undulatus</i>	
Largemouth bass	<i>Micropterus salmoides</i>	
Planehead filefish	<i>Monacanthus hispidus</i>	
Striped mullet	<i>Mugil cephalus</i>	
White mullet	<i>Mugil curema</i>	
Florida smooth hound	<i>Mustelus norrisi</i>	
Gag	<i>Mycteroperca microlepis</i>	
Speckled worm eel	<i>Myrophis punctatus</i>	
Lemon shark	<i>Negraprion brevirostris</i>	
Polk-dot batfish	<i>Ogcocephalus cubifrons</i>	
Leatherjacket	<i>Oligoplites saurus</i>	
Atlantic thread herring	<i>Opisthonema oglinum</i>	
Gulf toadfish	<i>Opsanus beta</i>	
Pigfish	<i>Orthopristis chrysoptera</i>	
Gulf flounder	<i>Paralichthys albigutta</i>	
Southern flounder	<i>Paralichthys lethostigma</i>	
Gulf butterfish	<i>Peprilus burti</i>	
Harvestfish	<i>Peprilus paru</i>	
Black drum	<i>Pogonias cromis</i>	
Bluefish	<i>Pomatomus saltatrix</i>	
Leopard searobin	<i>Prionotus scitulus</i>	
Bighead searobin	<i>Prionotus tribulus</i>	

Common Name	Species Name	Status
Bluenose shiner	<i>Pteronotropis welaka</i>	
Cobia	<i>Rachycentron canadum</i>	
Clearnose ray	<i>Raja eglanteria</i>	
Cownose ray	<i>Rhinoptera bonasus</i>	
Atlantic sharpnose shark	<i>Rhizoprionodon terraenovae</i>	
Red drum	<i>Sciaenops ocellatus</i>	
King mackerel	<i>Scomberomorus cavalla</i>	
Spanish mackerel	<i>Scomberomorus maculatus</i>	
Barbfish	<i>Scorpaena brasiliensis</i>	
Bigeye scad	<i>Selar crumenophthalmus</i>	
Look-down	<i>Selene vomer</i>	
Pygmy sea bass	<i>Serraniculus pumilio</i>	
Southern puffer	<i>Sphoeroides nephelus</i>	
Northern sennet	<i>Sphyrna borealis</i>	
Scalloped hammerhead	<i>Sphyrna lewini</i>	
Great hammerhead	<i>Sphyrna mokarran</i>	
Bonnethead shark	<i>Sphyrna tiburo</i>	
Planehead filefish	<i>Stephanolepis hispidus</i>	
Atlantic needlefish	<i>Strongylura marina</i>	
Redfin needlefish	<i>Strongylura notata</i>	
Blackcheeked tonguefish	<i>Symphurus plagiusa</i>	
Dusky pipefish	<i>Syngnathus floridae</i>	
Chain pipefish	<i>Syngnathus louisianae</i>	
Gulf pipefish	<i>Syngnathus scovelli</i>	
Inshore lizardfish	<i>Synodus foetens</i>	
Florida pompano	<i>Trachinotus carolinus</i>	
Permit	<i>Trachinotus falcatus</i>	
Hogchoker	<i>Trinectes maculatus</i>	
Houndfish	<i>Tylosurus crocodilus</i>	
Reptiles		
American alligator	<i>Alligator mississippiensis</i>	FT(S/A)

Common Name	Species Name	Status
Loggerhead sea turtle	<i>Caretta caretta</i>	FT
Green sea turtle	<i>Chelonia mydas</i>	FT
Leatherback sea turtle	<i>Dermochelys coriacea</i>	FE
Eastern indigo snake	<i>Drymarchon corais couperi</i>	
Hawksbill sea turtle	<i>Eretmochelys imbricata imbricata</i>	FE
Gopher tortoise	<i>Gopherus polyphemus</i>	ST
Barbour's map turtle	<i>Graptemys barbouri</i>	
Kemp's ridley sea turtle	<i>Lepidochelys kempii</i>	FE
Alligator snapping turtle	<i>Macrolemys temminckii</i>	
Gulf salt marsh snake	<i>Nerodia clarkii clarkii</i>	
Florida pine snake	<i>Pituophis melanoleucus mugitus</i>	
Suwannee cooter	<i>Pseudemys concinna suwanniensis</i>	
Birds		
Cooper's hawk	<i>Accipiter cooperii</i>	
Sharp-shinned hawk	<i>Accipiter striatus</i>	
Spotted sandpiper	<i>Actitis macularia</i>	
Red-winged blackbird	<i>Agelaius phoeniceus</i>	
Bachman's sparrow	<i>Aimophila aestivalis</i>	
Wood duck	<i>Aix sponsa</i>	
Seaside sparrow	<i>Ammodramus maritimus</i>	
Nelson's sharp-tailed sparrow	<i>Ammodramus nelsoni</i>	
Northern pintail	<i>Anas acuta</i>	
American widgeon	<i>Anas americana</i>	
Northern shoveler	<i>Anas clypeata</i>	
Green-winged teal	<i>Anas crecca</i>	
Blue-winged teal	<i>Anas discolor</i>	
Mallard	<i>Anas platyrhynchos</i>	
Gadwall	<i>Anas strepera</i>	
Anhinga	<i>Anhinga anhinga</i>	

Common Name	Species Name	Status
Chuck-will's widow	<i>Anthrostomus carolinensis</i>	
Golden eagle	<i>Aquila chrysaetos</i>	
Black-chinned hummingbird	<i>Archilochus alexandri</i>	
Ruby-throated hummingbird	<i>Archilochus colubris</i>	
Great egret	<i>Ardea alba</i>	
Great blue heron	<i>Ardea herodias</i>	
Ruddy turnstone	<i>Arenaria interpres</i>	
Short-eared owl	<i>Asio flammeus</i>	
Lesser scaup	<i>Aythya affinis</i>	
Redhead	<i>Aythya americana</i>	
Ring-necked duck	<i>Aythya collaris</i>	
Greater scaup	<i>Aythya marila</i>	
Canvasback	<i>Aythya valisineria</i>	
Tufted titmouse	<i>Baeolophus bicolor</i>	
Upland sandpiper	<i>Bartramia longicauda</i>	
Cedar waxwing	<i>Bombycilla cedrorum</i>	
American bittern	<i>Botaurus lentiginosus</i>	
Great horned owl	<i>Bubo virginianus</i>	
Cattle egret	<i>Bubulcus ibis</i>	
Bufflehead	<i>Bucephala albeola</i>	
Common goldeneye	<i>Bucephala clangula</i>	
Red-tailed hawk	<i>Buteo jamaicensis</i>	
Red-shouldered hawk	<i>Buteo lineatus</i>	
Broad-winged hawk	<i>Buteo platypterus</i>	
Swainson's hawk	<i>Buteo swainsoni</i>	
Green heron	<i>Butorides virescens</i>	
Lark bunting	<i>Calamospiza melanosorys</i>	
Sanderling	<i>Calidris alba</i>	
Dunlin	<i>Calidris alpina</i>	
Red knot	<i>Calidris canutus nufa</i>	FT
Western sandpiper	<i>Calidris mauri</i>	

Common Name	Species Name	Status
Pectoral sandpiper	<i>Calidris melanotis</i>	
Least sandpiper	<i>Calidris minutilla</i>	
Semipalmated sandpiper	<i>Calidris pusilla</i>	
Canada warbler	<i>Cardellina canadensis</i>	
Wilson's warbler	<i>Cardellina pusilla</i>	
Northern cardinal	<i>Cardinalis cardinalis</i>	
American goldfinch	<i>Carduelis tristis</i>	
Turkey vulture	<i>Cathartes aura</i>	
Veery	<i>Catharus fuscescens</i>	
Hermit thrush	<i>Catharus guttatus</i>	
Gray-cheeked thrush	<i>Catharus minimus</i>	
Wood thrush	<i>Catharus mustelinus</i>	
Swainson's thrush	<i>Catherus ustulatus</i>	
Belted kingfisher	<i>Ceryle alcyon</i>	
Chimney swift	<i>Chaetura pelagica</i>	
Snowy plover	<i>Charadrius alexandrinus</i>	ST
Piping plover	<i>Charadrius melodus</i>	FT
Semipalmated plover	<i>Charadrius semipalmatus</i>	
Killdeer	<i>Charadrius vociferus</i>	
Wilson's plover	<i>Charadrius wilsonia</i>	
Blue goose	<i>Chen caerulescens</i>	
Black tern	<i>Chlidonias niger</i>	
Common nighthawk	<i>Chordeiles minor</i>	
Northern harrier	<i>Circus cyaneus</i>	
Marian's marsh wren	<i>Cistothorus palustris marianae</i>	
Sedge wren	<i>Cistothorus platensis</i>	
Yellow-billed cuckoo	<i>Coccyzus americanus</i>	
Black-billed cuckoo	<i>Coccyzus erythrophthalmus</i>	
Northern flicker	<i>Colaptes auratus</i>	
Black vulture	<i>Coragyps atratus</i>	
American crow	<i>Corvus brachyrhynchos</i>	

Common Name	Species Name	Status
Fish crow	<i>Corvus ossifragus</i>	
Blue jay	<i>Cyanocitta cristata</i>	
Bobolink	<i>Dolichonyx oryzivorus</i>	
Pileated woodpecker	<i>Dryocopus pileatus</i>	
Gray catbird	<i>Dumetella carolinensis</i>	
Little blue heron	<i>Egretta caerulea</i>	ST
Reddish egret	<i>Egretta rufescens</i>	ST
Snowy egret	<i>Egretta thula</i>	
Tricolored heron	<i>Egretta tricolor</i>	ST
American swallow-tailed kite	<i>Elanoides forficatus</i>	
Yellow-bellied flycatcher	<i>Empidonax flaviventris</i>	
Least flycatcher	<i>Empidonax minimus</i>	
Acadian flycatcher	<i>Empidonax virescens</i>	
White ibis	<i>Eudocimus albus</i>	
Rusty blackbird	<i>Euphagus carolinus</i>	
Merlin	<i>Falco columbarius</i>	
Peregrine falcon	<i>Falco peregrinus</i>	
Southeastern American kestrel	<i>Falco sparverius paulus</i>	
Magnificent frigatebird	<i>Fregata magnificens</i>	
American coot	<i>Fulica americana</i>	
Common snipe	<i>Gallinago gallinago</i>	
Common gallinule	<i>Gallinula galeata</i>	
Common loon	<i>Gavia immer</i>	
Pacific loon	<i>Gavia pacifica</i>	
Red-throated loon	<i>Gavia stellata</i>	
Connecticut warbler	<i>Geothlypis agilis</i>	
Kentucky warbler	<i>Geothlypis formosus</i>	
Common yellowthroat	<i>Geothlypis trichas</i>	
Sandhill crane	<i>Grus canadensis</i>	
Blue grosbeak	<i>Guiraca caerulea</i>	
American oystercatcher	<i>Haematopus palliatus</i>	ST

Common Name	Species Name	Status
House finch	<i>Haemorhous mexicanus</i>	
Bald eagle	<i>Haliaeetus leucocephalus</i>	BGEPA
Worm-eating warbler	<i>Helmitheros vermivorus</i>	
Cliff swallow	<i>Hirundo pyrrhonota</i>	
Barn swallow	<i>Hirundo rustica</i>	
Harlequin duck	<i>Histrionicus histrionicus</i>	
Baltimore oriole	<i>Icterus galbula</i>	
Orchard oriole	<i>Icterus spurius</i>	
Mississippi kite	<i>Ictinia mississippiensis</i>	
Least bittern	<i>Ixobrychus exilis</i>	
Dark-eyed junco	<i>Junco hyemalis</i>	
Herring gull	<i>Larus argentatus</i>	
Laughing gull	<i>Larus atricilla</i>	
Ring-billed gull	<i>Larus delawarensis</i>	
Lesser black-backed gull	<i>Larus fuscus</i>	
Glaucous gull	<i>Larus hyperboreus</i>	
Bonaparte's gull	<i>Larus philadelphia</i>	
Franklin gull	<i>Larus pipixcan</i>	
Short-billed dowatcher	<i>Limnodromus griseus</i>	
Swainson's warbler	<i>Limnothlypis swainsonii</i>	
Marbled godwit	<i>Limo safedoa</i>	
Hooded merganser	<i>Lophodytes cucullatus</i>	
Red-bellied woodpecker	<i>Melanerpes carolinus</i>	
Red-headed woodpecker	<i>Melanerpes erythrocephalus</i>	
Greater white-fronted Goose	<i>Melanitta fusca</i>	
Black scoter	<i>Melanitta nigra</i>	
Surf scoter	<i>Melanitta perspicillata</i>	
Swamp sparrow	<i>Melospiza georgiana</i>	
Lincoln's sparrow	<i>Melospiza lincolnii</i>	
Song sparrow	<i>Melospiza melodia</i>	
Red-breasted merganser	<i>Mergus serrator</i>	

Common Name	Species Name	Status
Northern mockingbird	<i>Mimus polyglottos</i>	
Black-and-white warbler	<i>Mniotilta varia</i>	
Bronzed cowbird	<i>Molothrus aeneus</i>	
Brown-headed cowbird	<i>Molothrus ater</i>	
Shiny cowbird	<i>Molothrus bonariensis</i>	
Wood stork	<i>Mycteria americana</i>	FT
Ash-throated flycatcher	<i>Myiarchus cinerascens</i>	
Great crested flycatcher	<i>Myiarchus crinitus</i>	
Brown-crested flycatcher	<i>Myiarchus tyrannulus</i>	
Long-billed curlew	<i>Numenius americanus</i>	
Whimbrel	<i>Numenius phaeopus</i>	
Yellow-crowned night-heron	<i>Nyctanassa violacea</i>	
Snowy owl	<i>Nyctea scandiaca</i>	
Black-crowned night heron	<i>Nycticorax nycticorax</i>	
Orange-crowned warbler	<i>Oreothlypis celata</i>	
Tennessee warbler	<i>Oreothlypis peregrina</i>	
Nashville warbler	<i>Oreothlypis ruficapilla</i>	
Eastern screech owl	<i>Otus asio</i>	
Ruddy duck	<i>Oxyura jamaicensis</i>	
Osprey	<i>Pandion haliaetus</i>	
Louisiana waterthrush	<i>Parkesia motacilla</i>	
Northern waterthrush	<i>Parkesia noveboracensis</i>	
Fox sparrow	<i>Passerella iliaca</i>	
Painted bunting	<i>Passerina ciris</i>	
American white pelican	<i>Pelecanus erythrorhynchos</i>	
Brown pelican	<i>Pelecanus occidentalis</i>	
Double-crested cormorant	<i>Phalacrocorax auritus</i>	
Black-headed grosbeak	<i>Pheucitus melanocephalus</i>	
Downy woodpecker	<i>Picoides pubescens</i>	
Rufous-sided towhee	<i>Pipilo erythrophthalmus</i>	
Western tanager	<i>Piranga ludoviciana</i>	

Common Name	Species Name	Status
Scarlet tanager	<i>Piranga olivacea</i>	
Summer tanager	<i>Piranga rubra</i>	
Roseate spoonbill	<i>Platalea ajaja</i>	FT
Glossy ibis	<i>Plegadis falcinellus</i>	
Black-bellied plover	<i>Pluvialis squatarola</i>	
Horned grebe	<i>Podiceps auritus</i>	
Pied-billed grebe	<i>Podilymbus podiceps</i>	
Carolina chickadee	<i>Poecile carolinensis</i>	
Blue-gray gnatcatcher	<i>Polioptila caerulea</i>	
Sora	<i>Porzana carolina</i>	
Purple martin	<i>Progne subis</i>	
Prothonotary warbler	<i>Protonotaria citrea</i>	
Sooty shearwater	<i>Puffinus griseus</i>	
Boat-tailed grackle	<i>Quiscalus major</i>	
Common grackle	<i>Quiscalus quiscula</i>	
King rail	<i>Rallus elegans</i>	
Virginia rail	<i>Rallus limicola</i>	
Clapper rail	<i>Rallus longirostris</i>	
American avocet	<i>Recurvirostra americana</i>	
Ruby-crowned kinglet	<i>Regulus calendula</i>	
Golden-crowned kinglet	<i>Regulus satrapa</i>	
Bank swallow	<i>Riparia riparia</i>	
Black skimmer	<i>Rynchops niger</i>	ST
Eastern phoebe	<i>Sayornis phoebe</i>	
Say's pheobe	<i>Sayornis saya</i>	
Woodcock	<i>Scolopax minor</i>	
Ovenbird	<i>Seiurus aurocapillus</i>	
Rufous hummingbird	<i>Selasphorus rufus</i>	
Allen's hummingbird	<i>Selasphorus sasin</i>	
Northern parula	<i>Setophaga americana</i>	
Black-throated blue warbler	<i>Setophaga caerulescens</i>	

Common Name	Species Name	Status
Bay-breasted warbler	<i>Setophaga castanea</i>	
Cerulean warbler	<i>Setophaga cerulea</i>	
Hooded warbler	<i>Setophaga citrina</i>	
Yellow-rumped warbler	<i>Setophaga coronata</i>	
Prairie warbler	<i>Setophaga discolor</i>	
Yellow-throated warbler	<i>Setophaga dominica</i>	
Blackburnian warbler	<i>Setophaga fusca</i>	
Magnolia warbler	<i>Setophaga magnolia</i>	
Black-throated gray warbler	<i>Setophaga nigrescens</i>	
Palm warbler	<i>Setophaga palmarum</i>	
Chestnut-sided warbler	<i>Setophaga pensylvanica</i>	
Yellow warbler	<i>Setophaga petechia</i>	
Pine warbler	<i>Setophaga pinus</i>	
American redstart	<i>Setophaga ruticilla</i>	
Blackpoll warbler	<i>Setophaga striata</i>	
Cape May warbler	<i>Setophaga tigrina</i>	
Black-throated green warbler	<i>Setophaga virens</i>	
Eastern bluebird	<i>Sialia sialis</i>	
Brown-headed nuthatch	<i>Sitta pusilla</i>	
Yellow-bellied sapsucker	<i>Sphyrapicus varius</i>	
Dickcissel	<i>Spiza americana</i>	
Northern rough-winged swallow	<i>Stelgidopteryx serripennis</i>	
Calliope hummingbird	<i>Stellula calliope</i>	
Parasitic jaeger	<i>Stercorarius parasiticus</i>	
Bridled tern	<i>Sterna anaethetus</i>	
Caspian tern	<i>Sterna caspia</i>	
Forster's tern	<i>Sterna forsteri</i>	
Sooty tern	<i>Sterna fuscata</i>	
Common tern	<i>Sterna hirundo</i>	
Royal tern	<i>Sterna maxima</i>	
Gull-billed tern	<i>Sterna nilotica</i>	

Common Name	Species Name	Status
Sandwich tern	<i>Sterna sandvicensis</i>	
Least tern	<i>Sternula antillarum</i>	ST
Barred owl	<i>Strix varia</i>	
Eastern meadowlark	<i>Sturnella magna</i>	
Northern gannet	<i>Sula bassanus</i>	
Masked booby	<i>Sula dactylatra</i>	
Brown booby	<i>Sula leucogaster</i>	
Tree swallow	<i>Tachycineta bicolor</i>	
Carolina wren	<i>Thryothorus ludovicianus</i>	
Brown thrasher	<i>Toxostoma rufum</i>	
Lesser yellowlegs	<i>Tringa flavipes</i>	
Greater yellowlegs	<i>Tringa melanoleuca</i>	
Willet	<i>Tringa semipalmatus</i>	
Solitary sandpiper	<i>Tringa solitaria</i>	
House wren	<i>Troglodytes hiemalis</i>	
Buff-breasted sandpiper	<i>Tryngites subruficollis</i>	
American robin	<i>Turdus migratorius</i>	
Eastern kingbird	<i>Tyrannus tyrannus</i>	
Barn owl	<i>Tyto alba</i>	
Golden-winged warbler	<i>Vermivora chrysoptera</i>	
Blue-winged warbler	<i>Vermivora cyanoptera</i>	
Black-whiskered vireo	<i>Vireo altiloquus</i>	
Bell's Vireo	<i>Vireo bellii</i>	
Yellow-throated vireo	<i>Vireo flavifrons</i>	
White-eyed vireo	<i>Vireo griseus</i>	
Red-eyed vireo	<i>Vireo olivaceus</i>	
Philadelphia vireo	<i>Vireo philadelphicus</i>	
Solitary vireo	<i>Vireo solitarius</i>	
Yellow-headed blackbird	<i>Xanthocephalus xanthocephalus</i>	
White-winged dove	<i>Zenaida asiatica</i>	
Mourning dove	<i>Zenaida macroura</i>	

Common Name	Species Name	Status
Gold-crowned sparrow	<i>Zonotrichia atricapilla</i>	
White-crowned sparrow	<i>Zonotrichia leucophrys</i>	
Mammals		
Shorttailed shrew	<i>Blarina carolinensis</i>	
Coyote	<i>Canis latrans</i>	
North American beaver	<i>Castor canadensis</i>	
Least shrew	<i>Cryptotis parva</i>	
Nine-banded armadillo	<i>Dasypus novemcinctus</i>	
Virginia opossum	<i>Didelphis virginiana</i>	
Big brown bat	<i>Eptesicus fuscus</i>	
Bobcat	<i>Felis rufus</i>	
River otter	<i>Lutra canadensis</i>	
Striped skunk	<i>Mephitis mephitis</i>	
Long-tailed weasel	<i>Mustela frenata</i>	
Southeastern myotis bat	<i>Myotis austroriparius</i>	
Gray bat	<i>Myotis grisescens</i>	
Round-tailed muskrat	<i>Neofiber alleni</i>	
Eastern woodrat	<i>Neotoma floridana</i>	
St. Andrews beach mouse	<i>Peromyscus polionotus peninsularis</i>	FE
Eastern pipistrelle	<i>Pipistrellus subflavus</i>	
Southeastern big-eared bat	<i>Plectotus rafinesquii</i>	
Florida mouse	<i>Podomys floridanus</i>	
Raccoon	<i>Procyon lotor</i>	
Eastern mole	<i>Scalopus aquaticus</i>	
Gray squirrel	<i>Sciurus carolinensis</i>	
Marsh rabbit	<i>Sylvilagus palustris</i>	
Florida manatee	<i>Trichechus manatus latirostris</i>	FT
Bottle-nosed dolphin	<i>Tursiops truncatus</i>	
Gray fox	<i>Urocyon cinereoargenteus</i>	

Common Name	Species Name	Status
Florida black bear	<i>Ursus americanus floridanus</i>	

B.3.2 / Listed Species

Legend: FT = Federally- and State-Designated Threatened • FE = Federally-and State-Designated Endangered • ST = State-Designated Threatened • SE = State-Designated Endangered • (S/A) = listed due to similarity of appearance • BGEPA = Bald and Golden Eagle Protection Act

Common Name	Species Name	Status
Fishes		
Gulf sturgeon	<i>Acipenser oxyrinchus desotoi</i>	FT
Reptiles		
American alligator	<i>Alligator mississippiensis</i>	FT(S/A)
Loggerhead sea turtle	<i>Caretta caretta</i>	FT
Green sea turtle	<i>Chelonia mydas</i>	FT
Leatherback sea turtle	<i>Dermochelys coriacea</i>	FE
Hawksbill sea turtle	<i>Eretmochelys imbricata imbricata</i>	FE
Gopher tortoise	<i>Gopherus polyphemus</i>	ST
Kemp's ridley sea turtle	<i>Lepidochelys kempii</i>	FE
Birds		
Red knot	<i>Calidris canutus rufa</i>	FT
Snowy plover	<i>Charadrius alexandrinus</i>	ST
Piping plover	<i>Charadrius melodus</i>	FT
Marian's marsh wren	<i>Cistothorus palustris marianae</i>	ST
Little blue heron	<i>Egretta caerulea</i>	ST
Reddish egret	<i>Egretta rufescens</i>	ST
Tricolored heron	<i>Egretta tricolor</i>	ST
American oystercatcher	<i>Haematopus palliatus</i>	ST
Bald eagle	<i>Haliaeetus leucocephalus</i>	BGEPA
Wood stork	<i>Mycteria americana</i>	FT

Common Name	Species Name	Status
Roseate spoonbill	<i>Platalea ajaja</i>	FT
Black skimmer	<i>Rynchops niger</i>	ST
Least tern	<i>Sternula antillarum</i>	ST
Mammals		
Florida manatee	<i>Trichechus manatus latirostris</i>	FT
St. Andrews beach mouse	<i>Peromyscus polionotus peninsularis</i>	FE

B.3.3 / Invasive Non-Native or Problem Species

Common Name	Species Name	Type
Fishes		
Lionfish	<i>Pterois volitans</i>	Invasive non-native
Mammals		
Coyote	<i>Canis latrans</i>	Problem

B.4 / Arthropod Control Plan

Spatial data (e.g. shapefiles) for the boundaries of the aquatic preserve have been made accessible to the appropriate mosquito control district. The aquatic preserve is deemed highly productive and environmentally sensitive. By policy of DEP since 1987, aerial adulticiding is not allowed, but larviciding and ground adulticiding (truck spraying in public use areas) is typically allowed. Mosquito control plans temporarily may be set aside under declared threats to public or animal health, or during a Governor's Emergency Proclamation. Mosquito control plans are typically proposed by local mosquito control agencies when they desire to treat on public lands.

B.5 / Archaeological and Historic Sites Associated with St. Joseph Bay Aquatic Preserve

The list below was derived from shapefiles obtained from the Florida Department of State, Division of Historical Resources on December 18, 2020, and includes sites within 50 meters (164 feet) of St. Joseph Bay Aquatic Preserve.

Site ID	Site Name	Site Description	Location
GU00008	PRESIDIO SAN JOSE	Historic fort	Within SJBAP.
GU00010	RICHARDSON HAMMOCK	Prehistoric burial(s)	Within 164 ft (50 m) of SJBAP.
GU00011	BLACK'S ISLAND LIGHTHOUSE REMAINS	Campsite (prehistoric)	Within SJBAP.
GU00013	PORT ST JOSEPH CONFEDERATE SALT WORKS	Saltworks	Within SJBAP.
GU00020	CONCH ISLAND	Campsite (prehistoric)	Within SJBAP.
GU00085	OLD CEDAR	Specialized site for procurement of raw materials	Within 164 ft (50 m) of SJBAP.
GU00096	HUDSON	Building remains	Within SJBAP.
GU00097	SPANISH/FRENCH BRICK	Building remains	Within SJBAP.
GU00106	FISH CAMP	Building remains	Within 164 ft (50 m) of SJBAP.
GU00107	HARRIER	Other	Within SJBAP.
GU00109	SHIPWRECK	Other	Within SJBAP.
GU00110	BOMB TARGET	Land-terrestrial	Within SJBAP.
GU00133	X654-A	Land-terrestrial	Within 164 ft (50 m) of SJBAP.
GU00139	Firetower South	Campsite (prehistoric)	Within 164 ft (50 m) of SJBAP.
GU00220	Picnic Shelter 9	Built c1967	Within 164 ft (50 m) of SJBAP.
GU00229	Wildfire Site	Campsite (prehistoric)	Within 164 ft (50 m) of SJBAP.

B.6 / Water Quality Tables for St. Joseph Bay Aquatic Preserve

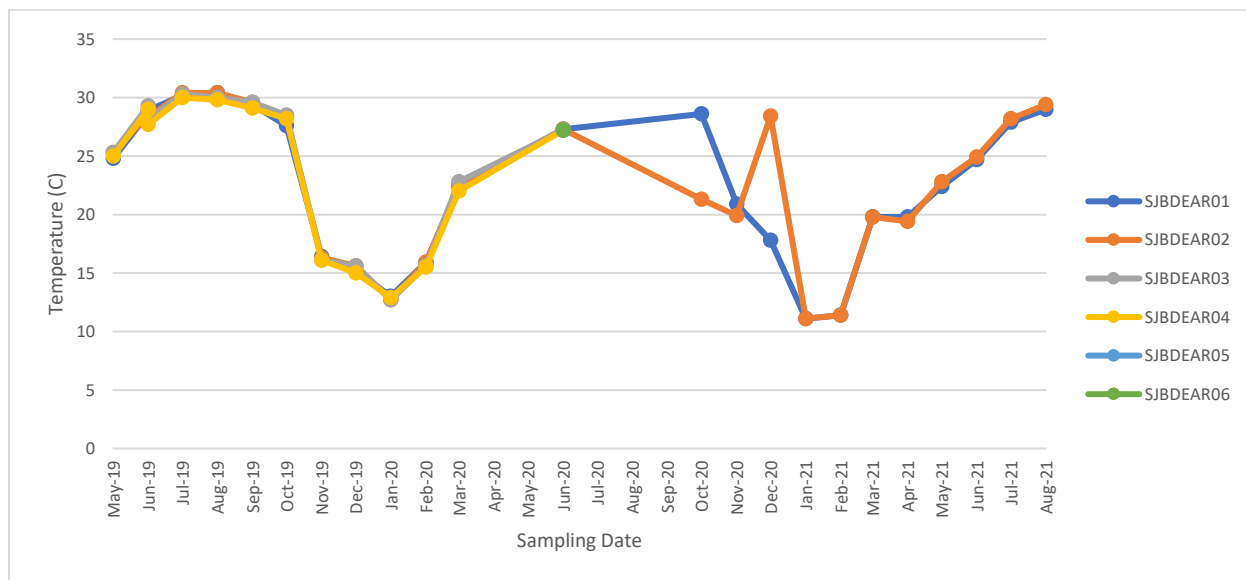


Figure 2 / St. Joseph Bay Temperature – 2019-present

Source: DEP's Division of Environmental Assessment and Restoration

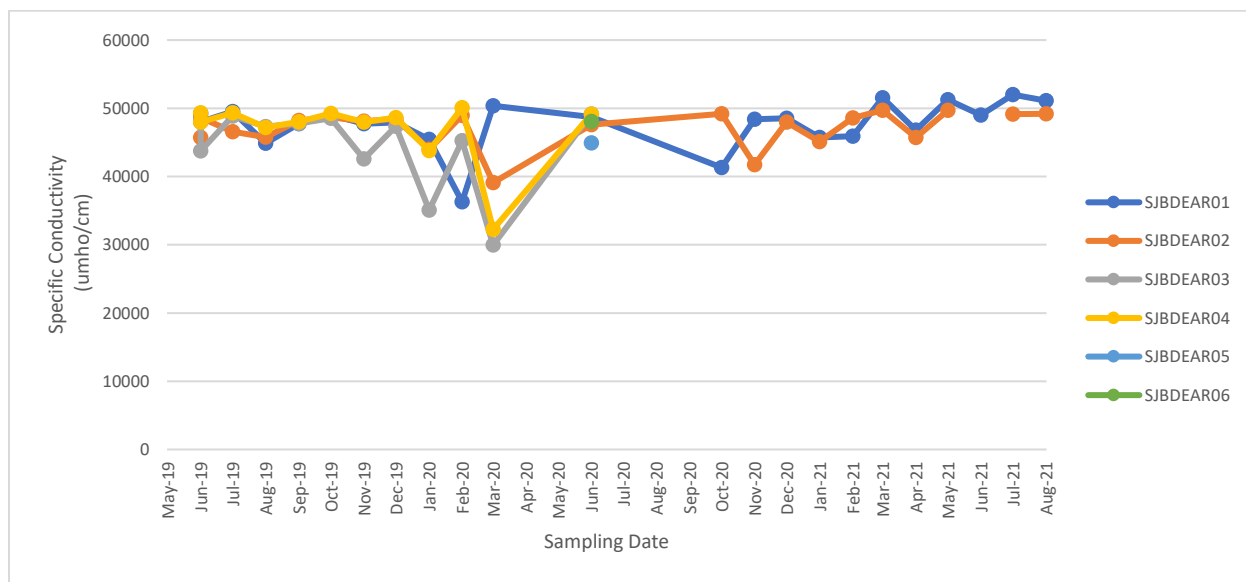


Figure 3 / St. Joseph Bay Specific Conductivity – 2019-present

Source: DEP's Division of Environmental Assessment and Restoration

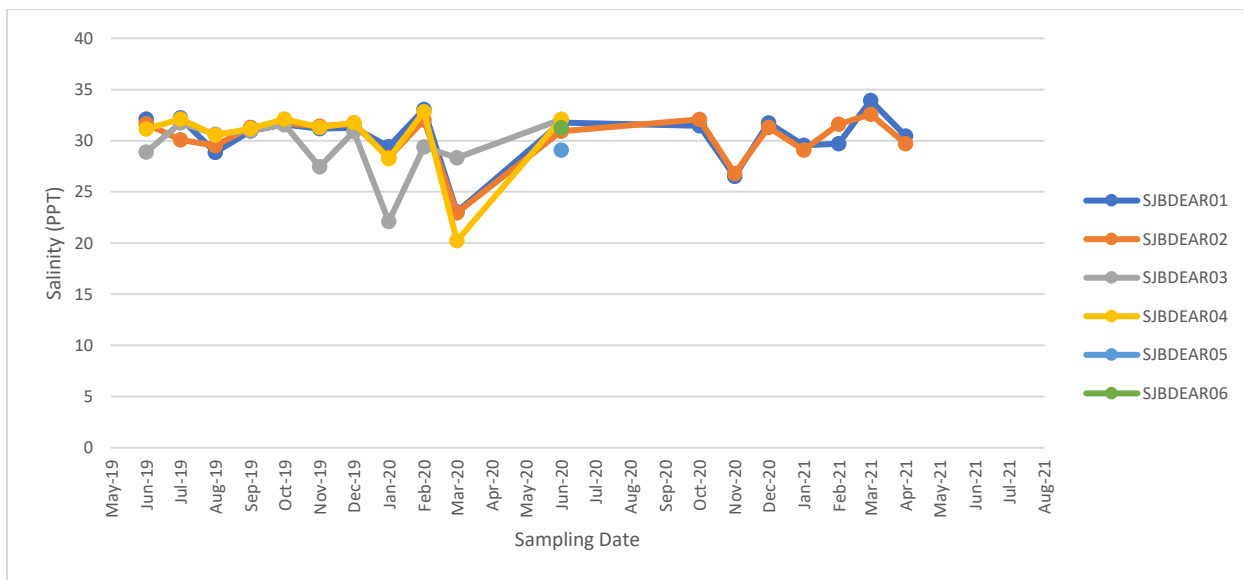


Figure 4 / St. Joseph Bay Salinity – 2019-present
Source: DEP's Division of Environmental Assessment and Restoration

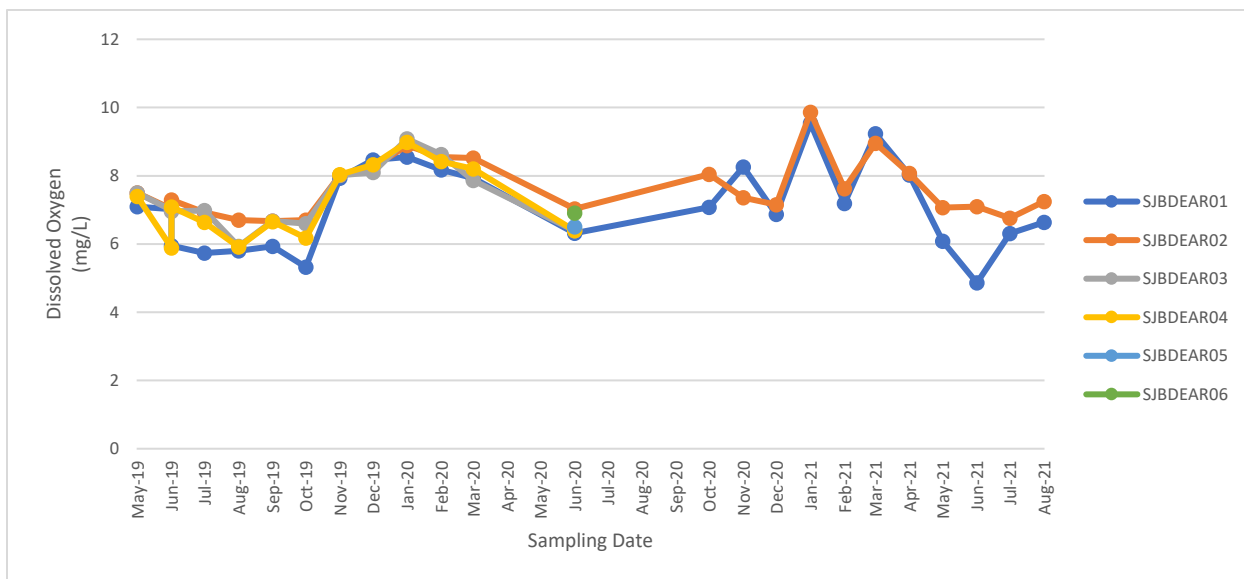


Figure 5 / St. Joseph Bay Dissolved Oxygen – 2019-present
Source: DEP's Division of Environmental Assessment and Restoration

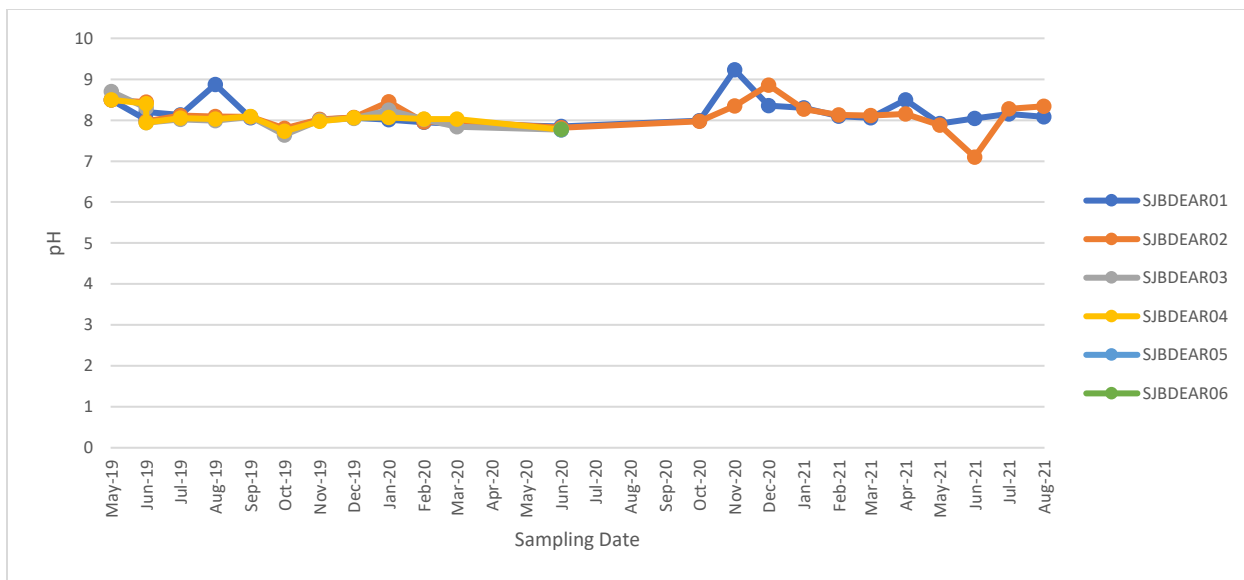


Figure 6 / St. Joseph Bay pH – 2019-present
Source: DEP's Division of Environmental Assessment and Restoration

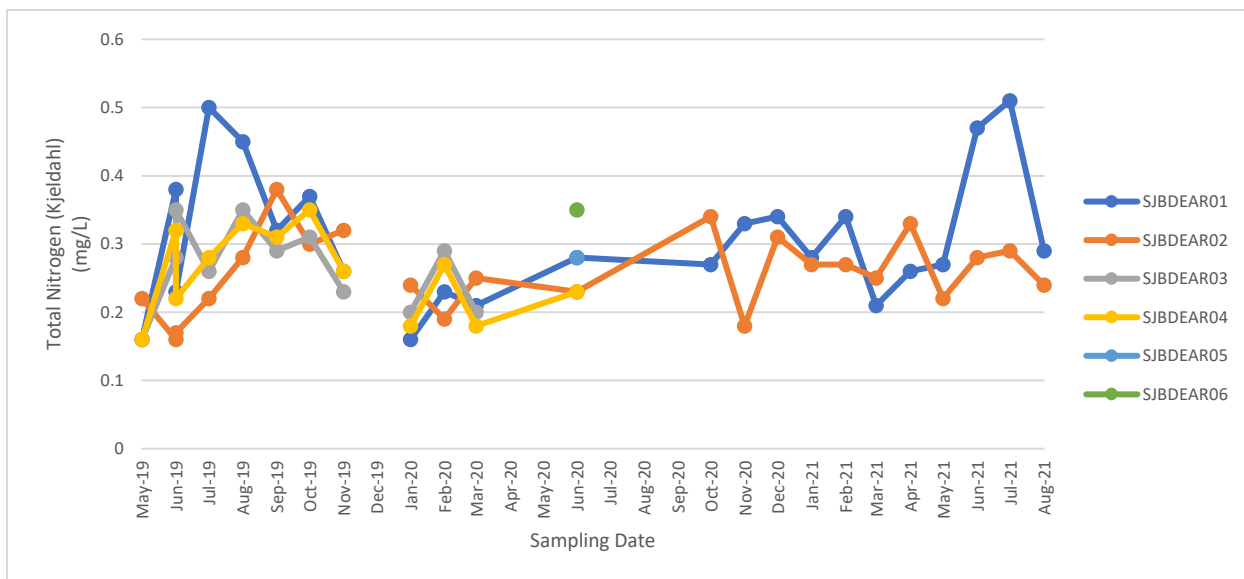


Figure 7 / St. Joseph Total Nitrogen (Kjeldahl) – 2019-present
Source: DEP's Division of Environmental Assessment and Restoration

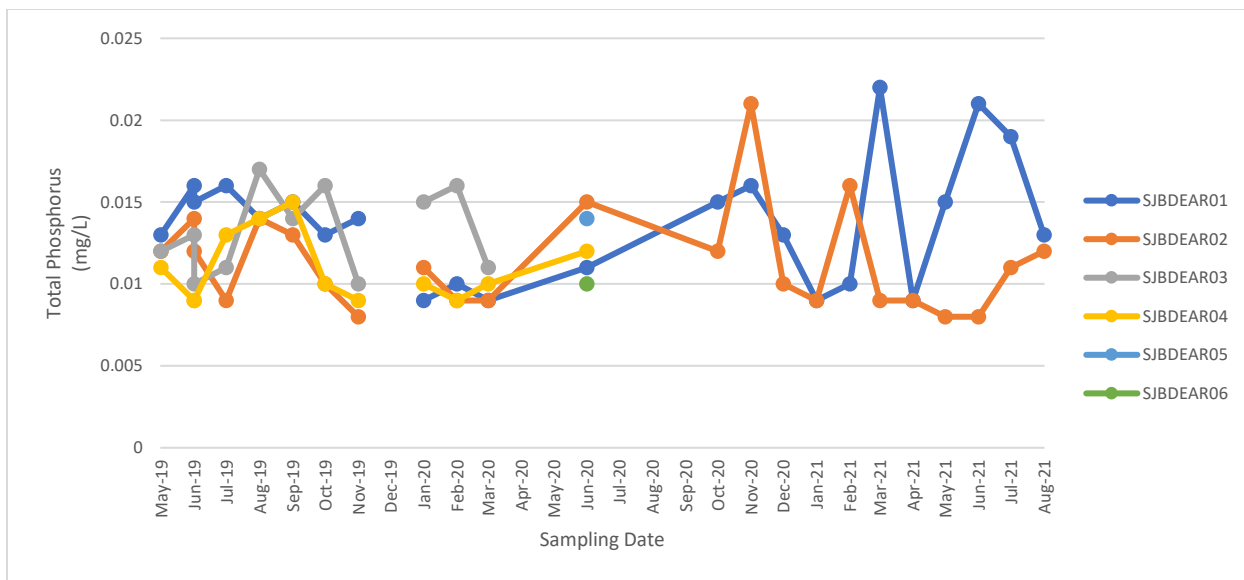


Figure 8 / St. Joseph Bay Total Phosphorus – 2019-present
Source: DEP's Division of Environmental Assessment and Restoration

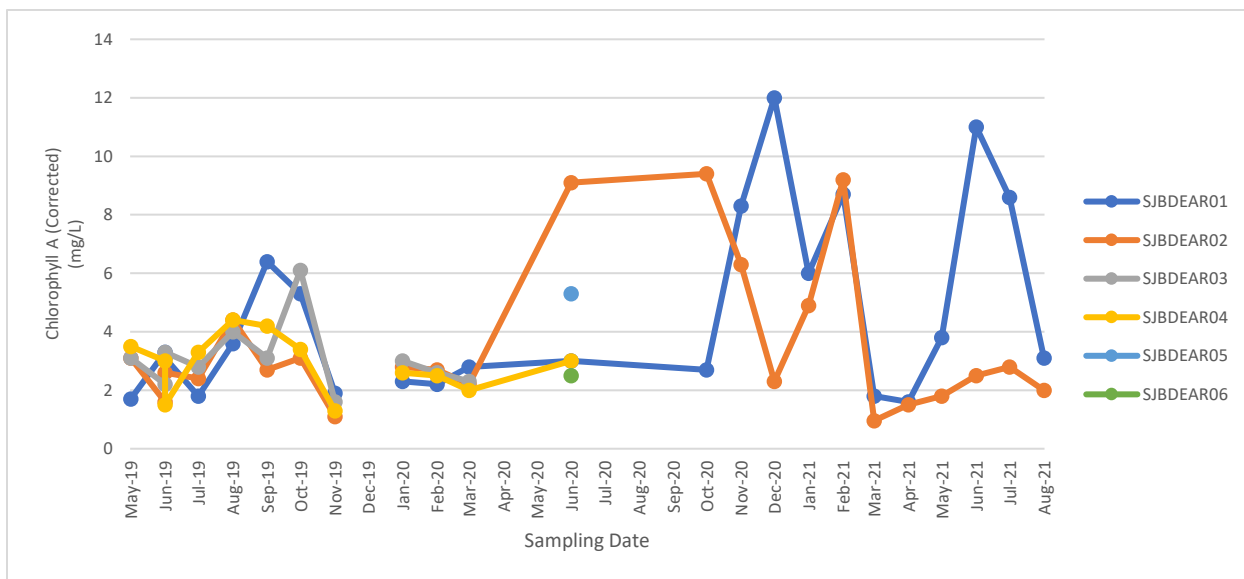


Figure 9 / St. Joseph Bay Chlorophyll A (Corrected) – 2019-present
Source: DEP's Division of Environmental Assessment and Restoration

Appendix C / Public Involvement

C.1 / Advisory Committee

The following Appendices contain information about the advisory committee meeting which was held in order to obtain input from the St. Joseph Bay Aquatic Preserve Management Plan Advisory Committee regarding the draft management plan.

C.1.1 / List of members and their affiliations

Name	Affiliation
Nijole "Nia" Wellendorf	DEP-DEAR
Katie Konchar	FWC
Lainie Edwards	DEP-ORCP
Kent Smith	FWC
Carrie Jones	FDACS
Jenna Harper	DEP-ORCP
Jon Brucker	DEP-ORCP
Paul Carlson	FWC
Bud Bohannon	Presnell's
Ann Daly	Daly's Dock and Dive Center
Dusty May	Baysavers
Sandy Quinn	Gulf County Commission
Linda Palma	Friends of St. Joseph Preserves
Adrianne Woodward	Gulf County TDC
Scott Seymour	Black's Island
Mark Moore	St. Joe Shrimp Company
Daniel Fussell	Port St. Joe Marina
Christine Lutz	Private landowner
Bill McGee	Friends of St. Joseph State Parks
Lynda White	Friends of St. Joseph Preserves
Aaron Miller	DEP – T.H. Stone Memorial St. Joseph Peninsula State Park
Dylan Shoemaker	DEP – St. Joseph Bay State Buffer Preserve
Warren Yeager	Gulf County RESTORE
Ray Bodey	UF/IFAS
Melody Ray-Culp	FWS
Bonnie Samuelson	Audubon
Darryl Boudreau	NWFWMD
Capt. Mark Clements	FWC Law Enforcement
Lt. Michael Guy	FWC Law Enforcement
Major Rob Beaton	FWC Law Enforcement
Kim Wren	DEP-ORCP
Philip McCroan	Gulf County Commission

Section VI Notice of Meetings, Workshops and Public Hearings

DEPARTMENT OF STATE

Division of Historical Resources

The Division of Historical Resources announces a public meeting to which all persons are invited.

DATE AND TIME: Thursday, February 25, 2021, 2:00 p.m. to conclusion

PLACE: Registration URL:
<https://attendee.gotowebinar.com/register/2393220511487802892>

Webinar ID: 450-072-251

GENERAL SUBJECT MATTER TO BE CONSIDERED: A meeting of the Florida Historical Marker Council to discuss and review submitted historical marker applications.

A copy of the agenda may be obtained by contacting: Michael Hart, flheritage@dos.myflorida.com, (850)245-6333.

Pursuant to the provisions of the Americans with Disabilities Act, any person requiring special accommodations to participate in this workshop/meeting is asked to advise the agency at least 48 hours before the workshop/meeting by contacting: Michael Hart, flheritage@dos.myflorida.com, (850)245-6333. If you are hearing or speech impaired, please contact the agency using the Florida Relay Service, 1(800)955-8771 (TDD) or 1(800)955-8770 (Voice).

If any person decides to appeal any decision made by the Board with respect to any matter considered at this meeting or hearing, he/she will need to ensure that a verbatim record of the proceeding is made, which record includes the testimony and evidence from which the appeal is to be issued.

For more information, you may contact: Michael Hart, flheritage@dos.myflorida.com, (850)245-6333.

DEPARTMENT OF EDUCATION

Education Practices Commission

The Education Practices Commission announces a hearing to which all persons are invited.

DATE AND TIME: A New Member Training is being conducted at 9:00 a.m. or as soon thereafter on March 3, 2021.

A Teacher Hearing Panel will begin at 1:30 p.m. or as soon thereafter as can be heard on March 3, 2021.

An All Member Training is being conducted immediately following the Teacher Hearing Panel on March 3, 2021. This training is in-person only at the location below. The below Zoom information is not applicable to this training.

A Business Meeting will begin at 9:00 a.m. or as soon thereafter on March 4, 2021.

An Administrator Hearing Panel will begin at 8:00 a.m. or as soon thereafter as can be heard on March 5, 2021.

A Teacher Hearing Panel will begin at 8:30 a.m. or as soon thereafter as can be heard on March 5, 2021.

PLACE: Embassy Suites by Hilton Orlando North, 225 Shorecrest Drive, Altamonte Springs, Florida 32701, (407)834-2400

AND

Zoom

Meeting:

<https://zoom.us/j/93493020198?pwd=SzhaSU0vekFrZXBaEHdqT0F2Q0wrdz09>

Meeting ID: 934 9302 0198, Passcode: 3h2cHR

The following conference number will only be activated if the Zoom Video Hearing needs to be terminated.

Phone Meeting: United States Toll-Free: 1(888)585-9008, Conference Room Number: 847-456-389

GENERAL SUBJECT MATTER TO BE CONSIDERED: The Hearing Panels of the Education Practices Commission will consider final agency action in matters dealing with the disciplining of certified educators. The New Member and All Member Trainings are being held to train members of the Commission. The Business Meeting is being held to discuss the business of the Commission.

A copy of the agenda may be obtained by contacting: Lisa Forbess at (850)245-0455.

Pursuant to the provisions of the Americans with Disabilities Act, any person requiring special accommodations to participate in this workshop/meeting is asked to advise the agency at least 5 days before the workshop/meeting by contacting: Lisa Forbess at (850)245-0455. If you are hearing or speech impaired, please contact the agency using the Florida Relay Service, 1(800)955-8771 (TDD) or 1(800)955-8770 (Voice).

If any person decides to appeal any decision made by the Board with respect to any matter considered at this meeting or hearing, he/she will need to ensure that a verbatim record of the proceeding is made, which record includes the testimony and evidence from which the appeal is to be issued.

For more information, you may contact: Lisa Forbess at (850)245-0455.

BOARD OF TRUSTEES OF THE INTERNAL IMPROVEMENT TRUST FUND

The Florida Department of Environmental Protection's Office of Resilience and Coastal Protection announces a public meeting to which all persons are invited.

DATE AND TIME: Tuesday, March 23, 2021, 9:00 a.m. – 12:00 Noon

PLACE: Due to COVID-19 social distancing requirements, the Department will hold the meeting by webinar only. Please join

at <https://floridadep.gov/sjbapmacm> or by phone at (850)629-7330, ext 949743529#

GENERAL SUBJECT MATTER TO BE CONSIDERED: The St. Joseph Bay Aquatic Preserve Management Plan Advisory Group will be meeting to review and discuss the draft management plan. The draft management plan is available at <http://publicfiles.dep.state.fl.us/CAMA/plans/St-Joseph-Bay-AP-Management-Plan-DRAFT.pdf>. Members of the public are invited to attend and listen to comments. A separate public meeting will be held to present the management plan to the public for their comments.

A copy of the agenda may be obtained by contacting: Aquatic Preserve Manager, Jonathan Brucker at Jonathan.Brucker@FloridaDEP.gov.

Pursuant to the provisions of the Americans with Disabilities Act, any person requiring special accommodations to participate in this workshop/meeting is asked to advise the agency at least 48 hours before the workshop/meeting by contacting: Jonathan Brucker at Jonathan.Brucker@FloridaDEP.gov. If you are hearing or speech impaired, please contact the agency using the Florida Relay Service, 1(800)955-8771 (TDD) or 1(800)955-8770 (Voice).

PUBLIC SERVICE COMMISSION

RULE NO.: RULE TITLE:

25-6.04355 Effective Date of Approved Rates and Charges for Investor-Owned Electric Utilities.

The FLORIDA PUBLIC SERVICE COMMISSION announces a workshop to which all persons are invited.

DATE AND TIME: March 5, 2021, 9:30 a.m.

PLACE: All public participation in the workshop will be by telephone. To participate in the workshop by telephone, persons may call: 1(888)585-9008 and, when prompted, enter in the following Access Code: 416-925-719. The workshop will be available to view via livestream on the Commission's website at

<http://www.floridapsc.com/Conferences/AudioVideoEventCoverage>. One or more Commissioners may be in attendance and participate in this workshop.

GENERAL SUBJECT MATTER TO BE CONSIDERED: To obtain comments on potential adoption of Rule 25-6.04355.

Undocketed.

The contact person for this rule development workshop is: Margo DuVal, at mduval@psc.state.fl.us. A copy of the agenda and materials for the workshop will be posted on the Commission's website, www.floridapsc.com, under the Rule Development tab by February 19, 2021.

In accordance with the Americans with Disabilities Act, persons needing a special accommodation to participate at this workshop should contact the Office of Commission Clerk no

later than five days prior to the workshop at 2540 Shumard Oak Boulevard., Tallahassee, Florida 32399-0850 or (850)413-6770 (Florida Relay Service, 1(800)955-8770 Voice or 1(800)955-8771 TDD).

PUBLIC SERVICE COMMISSION

RULE NO.: ULE TITLE:

25-7.0405 Effective Date of Approved Rates and Charges for Investor-Owned Natural Gas Utilities.

The FLORIDA PUBLIC SERVICE COMMISSION announces a workshop to which all persons are invited.

DATE AND TIME: March 5, 2021, 9:30 a.m.

PLACE: All public participation in the workshop will be by telephone. To participate in the workshop by telephone, persons may call: 1(888)585-9008 and, when prompted, enter in the following Access Code: 416-925-719. The workshop will be available to view via livestream on the Commission's website at

<http://www.floridapsc.com/Conferences/AudioVideoEventCoverage>. One or more Commissioners may be in attendance and participate in this workshop.

GENERAL SUBJECT MATTER TO BE CONSIDERED: To obtain comments on potential adoption of Rule 25-7.0405.

Undocketed.

The contact person for this rule development workshop is: Margo DuVal at mduval@psc.state.fl.us. A copy of the agenda and materials for the workshop will be posted on the Commission's website, www.floridapsc.com, under the Rule Development tab by February 19, 2021.

In accordance with the Americans with Disabilities Act, persons needing a special accommodation to participate at this workshop should contact the Office of Commission Clerk no later than five days prior to the workshop at 2540 Shumard Oak Boulevard., Tallahassee, Florida 32399-0850 or (850)413-6770 (Florida Relay Service, 1(800)955-8770 Voice or 1(800)955-8771 TDD).

REGIONAL PLANNING COUNCILS

Northeast Florida Regional Planning Council

The Northeast Florida Regional Council announces a public meeting to which all persons are invited.

DATE AND TIMES: March 4, 2021: 9:00 a.m., Personnel, Budget & Finance Policy Committee; 10:00 a.m. Board of Directors

PLACE: 100 Festival Park Avenue, Jacksonville, FL 32202 AND virtually via Zoom. Joining information can be found at www.nefrc.org.

GENERAL SUBJECT MATTER TO BE CONSIDERED: Regular Meeting.

A copy of the agenda may be obtained by contacting: (904)279-0880.

through distance learning courses to meet the requirements. Comments on this petition should be filed with the Board of Professional Engineers within 14 days of publication of this notice.

A copy of the Petition for Variance or Waiver may be obtained by contacting: Zana Raybon, Executive Director, Board of Professional Engineers, 2639 North Monroe Street, Tallahassee, Florida 32303 or telephone: (850)521-0500, or by electronic mail to zraybon@fbpe.org.

DEPARTMENT OF BUSINESS AND PROFESSIONAL REGULATION

Board of Professional Engineers

RULE NO.: RULE TITLE:

61G15-20.002 Experience

NOTICE IS HEREBY GIVEN that on January 28, 2021, the Board of Professional Engineers, received a petition for variance or waiver filed by Dung-Ning (Tony) Yu regarding subsection 61G15-20.002(2), F.A.C., Experience. Petitioner requests that the Board grant two additional years of experience credit, for a total of 20 years, to qualify petitioner for a license in this state for applicants with foreign education. Petitioner holds US-obtained master's and doctorate degrees in engineering from educational programs accredited by ABET at the baccalaureate level in civil engineering. Comments on this petition should be filed with the Board of Professional Engineers within 14 days of publication of this notice.

A copy of the Petition for Variance or Waiver may be obtained by contacting: Zana Raybon, Executive Director, Board of Professional Engineers, 2639 North Monroe Street, Tallahassee, Florida 32303 or telephone: (850)521-0500, or by electronic mail to zraybon@fbpe.org.

Section VI

Notice of Meetings, Workshops and Public Hearings

DEPARTMENT OF REVENUE

RULE NO.: RULE TITLE:

12-9.008 Hearing on Certification Application and Expiration

The DEPARTMENT OF REVENUE announces a hearing to which all persons are invited.

DATE AND TIME: May 5, 2021, 10:00 a.m.

PLACE: 2450 Shumard Oak Boulevard, Building 2, Room 1220, Tallahassee, Florida.

SPECIAL COVID-19 CONSIDERATIONS: The Governor of the State of Florida has declared a state of emergency due to the COVID-19 pandemic. To minimize exposure to COVID-19 and

help protect visitors and employees, Department offices are temporarily closed to the public. If Department offices remain closed to the public at the time of this hearing due to the COVID-19 pandemic, the hearing will take place using electronic media. Anyone wishing to participate in this public hearing must register at <https://attendee.gotowebinar.com/register/1913493693478587920>. Additional updates, including any potential developments regarding the closure status of Department offices, may be found on the Department's website at: <http://floridarevenue.com/rules/>.

GENERAL SUBJECT MATTER TO BE CONSIDERED: The Department will receive comments on proposed Rule 12-9.008, F.A.C., in addition to the rules published in the Florida Administrative Register December 22, 2020 (Vol. 46, No. 247, pp. 5609-5617), as amended by the Notice of Change published March 18, 2021 (Vol. 47, No. 53, p. 1401-1404).

A copy of the agenda may be obtained by contacting: Mike Cotton, Property Tax Oversight Program, telephone (850)617-8870, or email: RuleComments@floridarevenue.com.

Pursuant to the provisions of the Americans with Disabilities Act, any person requiring special accommodations to participate in this workshop/meeting is asked to advise the agency at least 48 hours before the workshop/meeting by contacting: Mike Cotton at (850)617-8870. If you are hearing or speech impaired, please contact the agency using the Florida Relay Service, 1(800)955-8771 (TDD) or 1(800)955-8770 (Voice).

For more information, you may contact: Mike Cotton at (850)617-8870 or email: RuleComments@floridarevenue.com.

BOARD OF TRUSTEES OF THE INTERNAL IMPROVEMENT TRUST FUND

The Florida Department of Environmental Protection, Office of Resilience and Coastal Protection announces a public meeting to which all persons are invited.

DATE AND TIME: Tuesday, March 23, 2021, 9:00 a.m. – 12:00 Noon

PLACE: Due to COVID-19 social distancing requirements, the Department will hold the meeting by webinar only. Please join at <https://floridadep.gov/sjbapmacm> or by phone at (850)629-7330, ext 810454740#

GENERAL SUBJECT MATTER TO BE CONSIDERED: This is a correction of the previous meeting notice from February 19, 2021, and the conference phone number extension has been changed to the number above.

The St. Joseph Bay Aquatic Preserve Management Plan Advisory Group will be meeting to review and discuss the draft management plan. The draft management plan is available at <http://publicfiles.dep.state.fl.us/CAMA/plans/St-Joseph-Bay-AP-Management-Plan-DRAFT.pdf>. Members of the public are

invited to attend and listen to comments. A separate public meeting will be held to present the management plan to the public for their comments.

A copy of the agenda may be obtained by contacting: Aquatic Preserve Manager, Jonathan Brucker at Jonathan.Brucker@FloridaDEP.gov.

WATER MANAGEMENT DISTRICTS

Southwest Florida Water Management District

The Southwest Florida Water Management District (SWFWMD) announces a public meeting to which all persons are invited.

DATE AND TIME: Wednesday, April 7, 2021, 10:00 a.m.

PLACE: Brooksville Office: 2379 Broad St., Brooksville, FL 34604

GENERAL SUBJECT MATTER TO BE CONSIDERED:

Northern Region Cooperative Funding Initiative Public Meeting: Governing Board members will receive public input, review final rankings/recommendations and approve FY2022 rankings/recommendations for funding in Citrus, Hernando, Lake, Levy, Marion and Sumter counties of SWFWMD. All or part of this meeting may be conducted by means of communications media technology. Participants can provide public input by registering in advance for this Zoom webinar at https://zoom.us/webinar/register/WN_NwdsLXibRRSUVKR00KrQUA. The public can view the meeting through our livestream at WaterMatters.org.

A copy of the agenda may be obtained by contacting: WaterMatters.org – Boards, Meetings & Event Calendar, 1(800)423-1476 (FL only) or (352)796-7211.

Pursuant to the provisions of the Americans with Disabilities Act, any person requiring special accommodations to participate in this workshop/meeting is asked to advise the agency at least 5 days before the workshop/meeting by contacting: SWFWMD Human Resources Office Chief at 1(800)423-1476 (FL only) or (352)796-7211, x4747, or email to ADACoordinator@WaterMatters.org. If you are hearing or speech impaired, please contact the agency using the Florida Relay Service, 1(800)955-8771 (TDD) or 1(800)955-8770 (Voice).

If any person decides to appeal any decision made by the Board with respect to any matter considered at this meeting or hearing, he/she will need to ensure that a verbatim record of the proceeding is made, which record includes the testimony and evidence from which the appeal is to be issued.

For more information, you may contact: Lori.Manuel@WaterMatters.org, 1(800)423-1476 (FL only) or (352)796-7211, x4606 EXE0779.

WATER MANAGEMENT DISTRICTS

Southwest Florida Water Management District

The Southwest Florida Water Management District (SWFWMD) announces a public meeting to which all persons are invited.

DATE AND TIME: Thursday, April 8, 2021, 10:00 a.m.

PLACE: Tampa Office: 7601 Hwy. 301 N., Tampa, FL 33637

GENERAL SUBJECT MATTER TO BE CONSIDERED:

Southern Cooperative Funding Initiative Public Meeting: Governing Board members will receive public input, review final rankings/recommendations and approve FY2022 rankings/recommendations for funding in Charlotte, DeSoto, Manatee and Sarasota counties of SWFWMD. All or part of this meeting may be conducted by means of communications media technology. Participants can provide public input by registering in advance for this Zoom webinar at https://zoom.us/webinar/register/WN_nNHcCftbT-mvxIKxqL7Zgw. The public can view the meeting through our livestream at WaterMatters.org.

A copy of the agenda may be obtained by contacting: WaterMatters.org – Boards, Meetings & Event Calendar, 1(800)423-1476 (FL only) or (352)796-7211.

Pursuant to the provisions of the Americans with Disabilities Act, any person requiring special accommodations to participate in this workshop/meeting is asked to advise the agency at least 5 days before the workshop/meeting by contacting: SWFWMD Human Resources Office Chief at 1(800)423-1476 (FL only) or (352)796-7211, x4747, or email to ADACoordinator@WaterMatters.org. If you are hearing or speech impaired, please contact the agency using the Florida Relay Service, 1(800)955-8771 (TDD) or 1(800)955-8770 (Voice).

If any person decides to appeal any decision made by the Board with respect to any matter considered at this meeting or hearing, he/she will need to ensure that a verbatim record of the proceeding is made, which record includes the testimony and evidence from which the appeal is to be issued.

For more information, you may contact: Lori.Manuel@WaterMatters.org, 1(800)423-1476 (FL only) or (352)796-7211, x4606 EXE0780.

WATER MANAGEMENT DISTRICTS

Southwest Florida Water Management District

The Southwest Florida Water Management District (SWFWMD) announces a public meeting to which all persons are invited.

DATE AND TIME: Thursday, April 15, 2021, 10:00 a.m.

PLACE: This is a meeting conducted by means of communications media technology (CMT).

C.1.3 / Meeting Summary

St. Joseph Bay Aquatic Preserve Advisory Committee Meeting Notes

March 23, 2021

Attendees:

Jon Brucker- DEP - ORCP	Kim Wren- DEP - ORCP
Nijole Willendorf- DEP - DEAR	Jenna Harper- DEP - ORCP
Capt. Mark Clements- FWC Law Enforcement	Alex Reed- DEP - ORCP
Lt. Mike Guy- FWC Law Enforcement	Dylan Shoemaker- DEP - ORCP
Major Rob Beaton- FWC Law Enforcement	Paul Carlson- FWC
Carrie Jones- FDACS	Daniel Alsentzer- DEP - FPS
Larry Wagner- Bay Savers	Darryl Boudreau- NFWFMD
Katie Konchar- FWC	Kent Smith- FWC

Staff:

Earl Pearson – DEP-ORCP
Lauren Christensen- DEP - ORCP
Megan Christopher- DEP - ORCP
Jordan Williams- DEP - ORCP

Chapter 3:

- Need to include information about the new St. Andrews/St. Joe Bay Estuary Program (SASJBEP)
- Page 22 - Paragraph 3
 - Paragraph 1- Hydrology- large freshwater inflow rephrasing or remove sizeable
 - Paragraph 2- Hydrology- Flow out of Gulf County canal 3000 cfs flow; verify 300 cfs value and cite
 - Old language re: City of Port St. Joe and water flow is now only spray fields
 - Discharge into the bay – should only be from spray fields now and not the city.
 - Carrie Jones verified
- Page 26 – Algal and Octocoral comments from Katie Konchar.
 - Are these actual goals? Do we want to keep monitoring?
 - Make comment about how programs are not part of current strategy and that the monitoring of these communities will be left up to partners or outside researchers. Possibly coordinate with SASJBEP.
- Page 36 – Eagle Harbor breach information – update and check for any needed changes
- Include a map of sediment transport in the aquatic preserve. Alex said RCP Beaches should have maps and other resources that can assist with this.
- Prop Scarring- Consider including an objective specifically for public outreach.

Chapter 4:

- Water Quality
 - Obj 1 – Change “develop” to maintain, implement, etc. The program has already been

- developed. Use more specific language.
 - Obj 2 – Clarify what WQ data are going to be used for. Expand on Numeric Nutrient Criteria (NNC), TMDLs, FWC WQ uses, etc.
 - Update WQ map to reflect new datalogger station
 - Include information as to how SJBAP may work with new SASJBEP to improve/expand WQ programs.
 - Suggestion to include some LAKEWATCH or DEAR data – we already have a table summarizing the data, but will evaluate if anything else is needed.
 - Need for a WQ or seagrass appendix?
 - Compare LAKEWATCH and FWC data to see if getting the same chl A readings. May not be needed in the plan, but it may be good to do in terms of evaluating success or efficacy of our programs.
 - Change “develop” to maintain, implement, etc in the strategies and measures.
 - Provide more specifics in some of the strategies and measures on why we do certain programs, specific outcomes (i.e. getting a waterbody off impairment list), develop a QA plan, etc.
 - Update NNC information – Nia will send
 - Paul Carlson asked DEAR if septic tracers may be added to the analyte suite in the future. This may provide insight into urchin blooms (excess septic cause plankton blooms which lead to urchin feeding frenzy and blooms)
 - Add monitoring for septic tracers (i.e. artificial sweetener) to assess sources of nutrient input
 - Is there budgetary allotment for these studies?
 - Monitor turbidity, chlorophyll, -
 - Starting to see more chlorophyll in the water column than in the past
 - Plankton biomass may place a major role in simulating urchin population explosion
 - Consider using SeaBird- Ecotriple data logger for in situ water quality measurements
 - Funding for using shrimpers’ roller frame trawls- shrimpers are already working in St. Joseph Bay
 - Is the main goal to continue the existing water quality strategies or to analyze previous data to reassess/expand?
 - Many of the newer instruments are not approved for current methodology
 - Multiple methods for side by side data comparisons are helpful for justification and verification of data uses
 - DEAR is assessing water bodies on a 2 year rotation for impairment
 - Point source studies usually done as special cases, not regularly monitored
 - Top down controls, predator-prey interactions, coordination with FDACS & FWC on fishing resources and data and how does this data translate to fishing seasons, resource use, etc.?
- Seagrass
 - Goal 2, Obj 1 – change “develop”
 - Clarify language about seeking funding – who is going to do the projects? Timelines? Goals? Add more specifics!
 - Goal 2 Obj 1 PM – report acreage as to what has been restored. Include restoration goals?
 - Update sea urchin project information in the plan
 - Add more info and updated photos about the urchin project. Get with Paul Carlson on 3/29 to discuss more. Get new document from Paul Carlson.
 - Need to develop separate urchin and seagrass plan in the future?
 - May want to discuss how urchins have always existed in the bay – recent increase may be due to lack of predators or septic or nutrient influx

- Effects of urchins on organisms that live seagrass communities (i.e. scallops)
 - Previous urchin exclusion studies (Ken Heck)- found that at certain densities urchins were overgrazing
 - Historically the system has equilibrated fine so something may be out of balance, such as lack of urchin predation
 - Loggerheads, Kemp's, and green sea turtles may predate on the urchins and be responsible for the current urchin numbers; in other areas such as Big Bend and the Keys urchin populations have subsided eventually. Shared info/slides of urchin exclusion study
 - Not as much visual evidence of turtle predation but finding whole urchin tests (outer skeletons) suggesting they are dying off naturally rather than via predation
- Prop Scar
 - Limited resources for public awareness – make use of volunteers or citizen science groups to assist.
 - Provide specific tasks, timelines, etc.
 - Include as much in the plan now, so if looking for future funding, can point to the management strategy in the plan as justification.
- Law Enforcement
 - Five officers and one lieutenant in Gulf County
 - Give outreach stuff to FWC Law Enforcement to pass out
 - In terms of exclusion zones, counties need to work with FWC boating and waterways to develop.
 - Email Major Rob Beaton about St. Andrews Aquatic Preserve issues.
 - FWC Law Enforcement is spread thin but are very concerned about seagrasses and public safety.
 - Consider including some info about party barges – reach out to other aquatic preserve managers to see if anything in management plans.
 - Improve coordination on brochures and other outreach material between FWC and aquatic preserve
- Public Use/Sustainable Use
 - Use volunteers or citizen science to complete monitoring or outreach tasks and goals
 - Involving the public increases awareness at a local level
 - Include information about how we manage fisheries groups?
 - Fisheries management is more delegated to FDACS and FWC but see if any additional info can be added.

C.2 / Formal Public Meetings

The following Appendices contain information about the Formal Public Meetings which were held in order to obtain input from the public about the St. Joseph Bay Aquatic Preserve Draft Management Plan.

C.2.1 / Florida Administrative Register Postings

participate in this workshop/meeting is asked to advise the agency at least 72 hours before the workshop/meeting by contacting: Sarah Howard, Curator of Public Art and Social Practice, USF Institute for Research in Art, showard@usf.edu. If you are hearing or speech impaired, please contact the agency using the Florida Relay Service, 1(800)955-8771 (TDD) or 1(800)955-8770 (Voice). If any person decides to appeal any decision made by the Board with respect to any matter considered at this meeting or hearing, he/she will need to ensure that a verbatim record of the proceeding is made, which record includes the testimony and evidence from which the appeal is to be issued. For more information, you may contact: Sarah Howard, Curator of Public Art and Social Practice, USF Institute for Research in Art, showard@usf.edu.

BOARD OF TRUSTEES OF THE INTERNAL IMPROVEMENT TRUST FUND

The Florida Department of Environmental Protection, Office of Resilience and Coastal Protection announces a public meeting to which all persons are invited.

DATE AND TIME: Thursday, September 9, 2021, 6:00 p.m. – 7:30 p.m.

PLACE: St. Joseph Bay State Buffer Preserve, 3915 Highway C-30, Port St. Joe, FL 32456

GENERAL SUBJECT MATTER TO BE CONSIDERED: A draft management plan for St. Joseph Bay Aquatic Preserve has been prepared by the Office of Resilience and Coastal Protection. The draft plan is available for viewing or download at <http://publicfiles.dep.state.fl.us/CAMA/plans/St-Joseph-Bay-AP-Management-Plan-DRAFT.pdf>. The Office of Resilience and Coastal Protection seeks public comment on the draft.

A copy of the agenda may be obtained by contacting: Aquatic Preserve Manager, Jonathan Brucker at Jonathan.Brucker@FloridaDEP.gov.

Pursuant to the provisions of the Americans with Disabilities Act, any person requiring special accommodations to participate in this workshop/meeting is asked to advise the agency at least 48 hours before the workshop/meeting by contacting: Jonathan Brucker at Jonathan.Brucker@FloridaDEP.gov. If you are hearing or speech impaired, please contact the agency using the Florida Relay Service, 1(800)955-8771 (TDD) or 1(800)955-8770 (Voice).

DEPARTMENT OF CORRECTIONS

The Florida Department of Corrections announces a public meeting to which all persons are invited.

DATE AND TIME: Thursday, August 19, 2021, 10:00 a.m.

PLACE: Reception and Medical Center (Training Building), 7765 South County Road 231, Lake Butler, Florida 32054

GENERAL SUBJECT MATTER TO BE CONSIDERED: Regular Quarterly Meeting of the RMC Hospital Governing Body.

A copy of the agenda may be obtained by contacting: Colby Elwood at (386)496-7204 or celwood@TeamCenturion.com.

Pursuant to the provisions of the Americans with Disabilities Act, any person requiring special accommodations to participate in this workshop/meeting is asked to advise the agency at least 3 days before the workshop/meeting by contacting: Colby Elwood at (386)496-7204 or celwood@TeamCenturion.com. If you are hearing or speech impaired, please contact the agency using the Florida Relay Service, 1(800)955-8771 (TDD) or 1(800)955-8770 (Voice).

DEPARTMENT OF MANAGEMENT SERVICES

Commission on Human Relations

The Florida Commission on Human Relations announces a public meeting to which all persons are invited.

DATE AND TIME: Thursday, August 19, 2021, 10:00 a.m. ET
PLACE: Call: (850)270-6017, and when prompted to enter the phone conference I.D., enter 817 229 825 followed by the #key.

GENERAL SUBJECT MATTER TO BE CONSIDERED: Disposition of cases before the Florida Commission on Human Relations. No public testimony will be taken. No oral argument from the public or oral comment from the public will be taken.

A copy of the agenda may be obtained by contacting: A copy of the agenda may be obtained by contacting: John Scotese at (850)907-6823 or John.Scotese@fchr.myflorida.com.

DEPARTMENT OF ENVIRONMENTAL PROTECTION

The Department of Environmental Protection / Clean Boating Programs announces a workshop to which all persons are invited.

DATE AND TIME: August 26, 2021, 2:00 p.m. – 3:00 p.m.

PLACE: Webinar presentation

Contact Pamela.Grainger@FloridaDEP.gov for the Microsoft Teams link for the Clean Marina and Clean & Resilient Marina Webinar on August 26, 2021, 2:00 p.m. ET

GENERAL SUBJECT MATTER TO BE CONSIDERED: The Florida Clean Boating Programs will present a live webinar on the Clean Marina and Clean & Resilient Marina Programs. This webinar is for new and existing marinas, boatyards, and marine retail owners, their staff and other interested parties to learn how to achieve a “Clean Marina” and/or “Clean and Resilient Marina” designation.

For additional information on the Clean Marina Program, please visit the website, www.floridadep.gov/rcp/clean-marina

A copy of the agenda may be obtained by contacting: A copy of the agenda can be obtained by contacting: Pamela Grainger at (850)245-2846 or Pamela.Grainger@FloridaDEP.gov.

Pursuant to the provisions of the Americans with Disabilities Act, any person requiring special accommodations to

A copy of the agenda may be obtained by contacting: Nichole Enfinger at Nichole.Enfinger@FDACS.gov.
For more information, you may contact: Nichole Enfinger at Nichole.Enfinger@FDACS.gov.

BOARD OF TRUSTEES OF THE INTERNAL IMPROVEMENT TRUST FUND

The Florida Department of Environmental Protection, Office of Resilience and Coastal Protection announces a public meeting to which all persons are invited.

DATE AND TIME: Thursday, September 16, 2021, 6:00 p.m. – 7:00 p.m.

PLACE: Online: Please join at <https://floridadep.gov/sjbap-meeting> or by phone at 1(850)629-7330, ext 24038947#

GENERAL SUBJECT MATTER TO BE CONSIDERED: A draft management plan for St. Joseph Bay Aquatic Preserve has been prepared by the Office of Resilience and Coastal Protection. The draft plan is available for viewing or download at <http://publicfiles.dep.state.fl.us/CAMA/plans/St-Joseph-Bay-AP-Management-Plan-DRAFT.pdf>. The Office of Resilience and Coastal Protection seeks public comment on the draft.

This online meeting is being held in addition to the in-person meeting which is being held Sept. 9, and was noticed separately in Vol. 47, #152 on August 6, 2021.

A copy of the agenda may be obtained by contacting: Aquatic Preserve Manager, Jonathan Brucker at Jonathan.Brucker@FloridaDEP.gov.

Pursuant to the provisions of the Americans with Disabilities Act, any person requiring special accommodations to participate in this workshop/meeting is asked to advise the agency at least 48 hours before the workshop/meeting by contacting: Jonathan Brucker at Jonathan.Brucker@FloridaDEP.gov. If you are hearing or speech impaired, please contact the agency using the Florida Relay Service, 1(800)955-8771 (TDD) or 1(800)955-8770 (Voice).

REGIONAL PLANNING COUNCILS

North Central Florida Regional Planning Council

The North Central Florida Regional Planning Council announces a public meeting to which all persons are invited.

DATE AND TIME: August 26, 2021, 7:00 p.m.

PLACE: Virtual Meeting via Communications Media Technology

To join the meeting from your computer, tablet or smartphone. <https://global.gotomeeting.com/join/809702941>

DIAL IN NUMBER: Toll free 1(866)899-4679, ACCESS CODE: 809-702-941

Communications media technology facilities will be available at 2009 NW 67th Place, Gainesville, Florida 32653-1603 for persons interested in accessing the virtual meeting.

GENERAL SUBJECT MATTER TO BE CONSIDERED: To conduct the regular business of

the North Central Florida Regional Planning Council.

A copy of the agenda may be obtained by contacting: North Central Florida Regional Planning Council, 2009 NW 67th Place, Gainesville, Florida 32653-1603.

Pursuant to the provisions of the Americans with Disabilities Act, any person requiring special accommodations to participate in this workshop/meeting is asked to advise the agency at least 2 business days before the workshop/meeting by contacting: (352)955-2200. If you are hearing or speech impaired, please contact the agency using the Florida Relay Service, 1(800)955-8771 (TDD) or 1(800)955-8770 (Voice).

If any person decides to appeal any decision made by the Board with respect to any matter considered at this meeting or hearing, he/she will need to ensure that a verbatim record of the proceeding is made, which record includes the testimony and evidence from which the appeal is to be issued.

REGIONAL PLANNING COUNCILS

North Central Florida Regional Planning Council

The North Central Florida Regional Planning announces a public meeting to which all persons are invited.

DATE AND TIME: August 26, 2021, 6:00 p.m.

PLACE: Virtual Meeting via Communications Media Technology

The meeting will be conducted via communications media technology in the following format:

DIAL IN NUMBER: Toll free 1(888)585-9008, CONFERENCE CODE: 568 124 316

Communications media technology facilities will be available at 2009 NW 67th Place, Gainesville, Florida 32653-1603 for persons interested in accessing the virtual meeting.

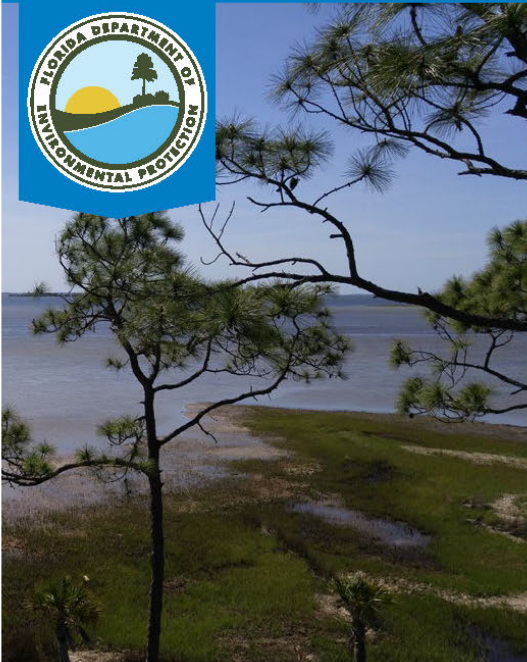
GENERAL SUBJECT MATTER TO BE CONSIDERED: To conduct the regular business of the Executive Committee of the North Central Florida Regional Planning Council.

A copy of the agenda may be obtained by contacting: North Central Florida Regional Planning Council, 2009 NW 67th Place, Gainesville, Florida 32653-1603.

Pursuant to the provisions of the Americans with Disabilities Act, any person requiring special accommodations to participate in this workshop/meeting is asked to advise the agency at least 2 business days before the workshop/meeting by contacting: (352)955-2200. If you are hearing or speech impaired, please contact the agency using the Florida Relay Service, 1(800)955-8771 (TDD) or 1(800)955-8770 (Voice).

If any person decides to appeal any decision made by the Board with respect to any matter considered at this meeting or hearing, he/she will need to ensure that a verbatim record of the proceeding is made, which record includes the testimony and evidence from which the appeal is to be issued.

C.2.2 / Advertisement Flyer



St. Joseph Bay Aquatic Preserve Management Plan

Public Meetings

6 to 7:30 p.m. EDT
Thursday, Sept. 9, 2021

6 to 7 p.m. EDT
Thursday, Sept. 16, 2021

St. Joseph Bay State Buffer Preserve
3915 State Road 30A
Port St. Joe, FL 32456

Virtual Meeting:
[FloridaDEP.gov/sjbap-meeting](https://www.floridadep.gov/sjbap-meeting)

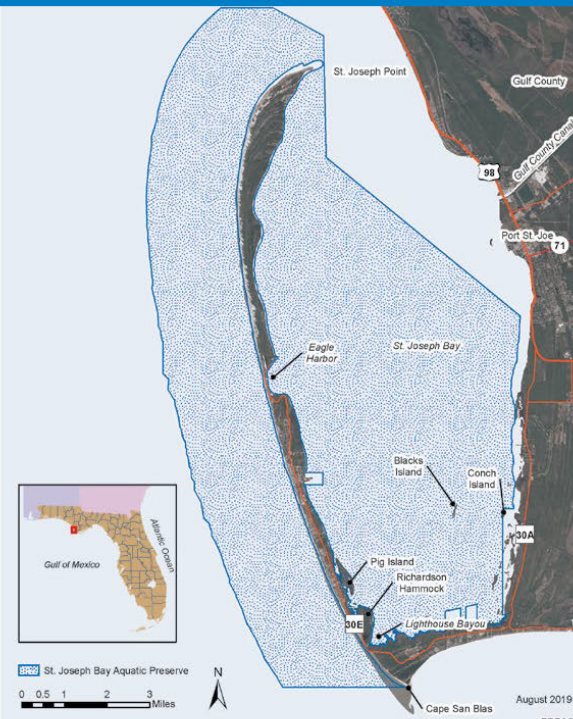
The management plan for St. Joseph Bay Aquatic Preserve is in the process of being updated by the Florida Department of Environmental Protection's Office of Resilience and Coastal Protection. Members of the public are invited to attend a meeting from 6 to 7:30 p.m. EDT, Thursday, Sept. 9, 2021, or a meeting from 6 to 7 p.m. EDT, Thursday, Sept. 16, 2021, to learn about the proposed plans for the preserve and provide comments.

To view the draft, please visit <http://publicfiles.dep.state.fl.us/cama/plans/St-Joseph-Bay-AP-Management-Plan-DRAFT.pdf>. Copies also may be obtained by emailing Jonathan.Brucker@FloridaDEP.gov. Additionally, the public is invited to submit comments to the Office of Resilience and Coastal Protection at FloridaCoasts@FloridaDEP.gov by Sept. 23, 2021.

To learn about St. Joseph Bay Aquatic Preserve, visit [FloridaDEP.gov/rcp/aquatic-preserve/locations/st-joseph-bay-aquatic-preserve](https://www.floridadep.gov/rcp/aquatic-preserve/locations/st-joseph-bay-aquatic-preserve).

Pursuant to the provisions of the Americans with Disabilities Act, any person requiring special accommodations to participate in this meeting is asked to advise the agency at least 48 hours in advance by emailing Jonathan.Brucker@FloridaDEP.gov or calling 850-670-7723.

If you have a hearing or speech impairment, please contact the agency using the Florida Relay Service, 800-955-8771 (TDD) or 800-955-8770 (voice).





Scan to learn about St. Joseph Bay Aquatic Preserve

The Florida Department of Environmental Protection's Office of Resilience and Coastal Protection (RCP) manages more than 4.9 million acres of submerged lands and coastal uplands. RCP manages 42 aquatic preserves and three national estuarine research reserves and oversees programs to protect and conserve beaches, coastlines, waterways and Florida's Coral Reef.

NOTICE OF MEETING/ WORKSHOP HEARING

BOARD OF TRUSTEES OF THE INTERNAL IMPROVEMENT TRUST FUND

The Florida Department of Environmental Protection, Office of Resilience and Coastal Protection announces a public meeting to which all persons are invited.

DATE AND TIME: Thursday, Sept. 9, 2021, 6 - 7:30 p.m.

PLACE: St. Joseph Bay State Buffer Preserve, 3915 Highway State Road 30-A, Port St. Joe, FL 32456

GENERAL SUBJECT MATTER TO BE CONSIDERED: A draft management plan for St. Joseph Bay Aquatic Preserve has been prepared by the Office of Resilience and Coastal Protection. The draft plan is available for viewing or download at <http://publicfiles.dep.state.fl.us/CAMA/plans/St-Joseph-Bay-AP-Management-Plan-DRAFT.pdf>. The Office of Resilience and Coastal Protection seeks public comment on the draft.

A copy of the agenda may be obtained by contacting: Aquatic Preserve Manager, Jonathan Brucker at Jonathan.Brucker@FloridaDEP.gov.

Pursuant to the provisions of the Americans with Disabilities Act, any person requiring special accommodations to participate in this workshop/meeting is asked to advise the agency at least 48 hours before the workshop/meeting by contacting: Jonathan Brucker at Jonathan.Brucker@FloridaDEP.gov. If you are hearing or speech impaired, please contact the agency using the Florida Relay Service, 1(800)955-8771 (TDD) or 1(800)955-8770 (Voice).

Publish Date: September 2, 2021

NOTICE OF MEETING/ WORKSHOP HEARING

BOARD OF TRUSTEES OF THE INTERNAL IMPROVEMENT TRUST FUND

The Florida Department of Environmental Protection, Office of Resilience and Coastal Protection announces a public meeting to which all persons are invited.

DATE AND TIME: Thursday, Sept. 16, 2021, 6 - 7 p.m.

PLACE: Online: Please join at <https://floridadep.gov/sjbap-meeting> or by phone at 1(850)629-7330, ext 24038947#

GENERAL SUBJECT MATTER TO BE CONSIDERED: A draft management plan for St. Joseph Bay Aquatic Preserve has been prepared by the Office of Resilience and Coastal Protection. The draft plan is available for viewing or download at <http://publicfiles.dep.state.fl.us/CAMA/plans/St-Joseph-Bay-AP-Management-Plan-DRAFT.pdf>. The Office of Resilience and Coastal Protection seeks public comment on the draft.

This online meeting is being held in addition to the in-person meeting which is being held Sept. 9. A copy of the agenda may be obtained by contacting: Aquatic Preserve Manager, Jonathan Brucker at Jonathan.Brucker@FloridaDEP.gov.

Pursuant to the provisions of the Americans with Disabilities Act, any person requiring special accommodations to participate in this workshop/meeting is asked to advise the agency at least 48 hours before the workshop/meeting by contacting: Jonathan Brucker at Jonathan.Brucker@FloridaDEP.gov. If you are hearing or speech impaired, please contact the agency using the Florida Relay Service, 1(800)955-8771 (TDD) or 1(800)955-8770 (Voice).

Publish Date: September 2, 2021

C.2.4 / Summaries of the Formal Public Meetings

St. Joseph Bay Aquatic Preserve Draft Management Plan: Public Meeting #1

Thursday, September 9, 2021, 6:00-7:30 p.m.

St. Joseph Bay State Buffer Preserve

3915 State Road 30-A

Port St. Joe, FL 32456

Attendees (5): Sandra Chafin, Scott Smith, Fran Vellanti, Dusty May, Wendy Weitzel

Staff: Jonathan Brucker, Megan Christopher, Lauren Christensen, Jordan Williams, Earl Pearson

Earl welcomed everyone, gave a brief introduction about the purpose of the meeting, and introduced staff from the aquatic preserve and Tallahassee.

Jonathan gave a PowerPoint presentation about St. Joseph Bay Aquatic Preserve, accomplishments, work being conducted, and issues identified in the management plan.

After the presentation, Earl explained the commenting process. The room was set up so there were three stations, one for each of the three issues identified in the management plan. Staff provided background on each issue and recorded comments the public had pertinent to each issue (listed below).

Issue One: Water Quality

- Are there any flow pattern studies available?
- What is the prevailing flow in the bay?
- Increase and broaden turbidity monitoring in the bay, particularly on the sea floor.
- Concerns regarding sedimentation rates into the bay from the Gulf County Canal. Any sedimentation monitoring being conducted? Any plans to monitor sediment transport in the bay?
- What is being done to address the impacts of drainage ditches into the bay? The ditches built to drain Pine Swamp are direct sources of runoff into the bay.

Issue Two: Protection of Seagrass Habitat

- Increase mapping efforts to show time lapse of increase scarring or progress of restoration efforts.
- Focus mapping efforts around scallop season, or other periods of increased public use, to identify “hot spots” of seagrass scarring. Conduct pre- and post-season surveys to identify scarring.

Issue Three: Sustainable Public Use

- During scallop season, boat ramps are exceeding traffic limits.
- How to address “overuse,” crowding, damage to habitat?
- Scallops are being overharvested during scallop season.
- Any way to limit boat size in the bay? Larger boats are damaging submerged resources in shallow areas.

After the comments were received, Earl explained the next steps in the management plan process: Acquisition and Restoration Council meeting (a public meeting in Tallahassee) and Governor and Cabinet meeting. The public was reminded that comments could still be submitted on or before September 23, 2021. They were thanked for taking time out of their busy schedules to attend and provide valuable feedback.

Meeting was adjourned.

St. Joseph Bay Aquatic Preserve Draft Management Plan: Public Meeting #2

Thursday, September 16, 2021, 6:00-7:00 p.m.

Microsoft Teams Virtual Meeting

Attendees (10): Amy Paulson, Jim Muller, Justin Grubich, Ken Heck, Rebecca Franklin, Christian Wagley, Jana Brucker, Kim Wren, Daniel Alsentzer, Marisa Figueroa

Staff: Jonathan Brucker, Megan Christopher, Lauren Christensen, Jordan Williams, Earl Pearson

Earl welcomed everyone, gave a brief introduction about the purpose of the meeting, and introduced staff from the aquatic preserve and Tallahassee.

Jonathan gave a PowerPoint presentation about St. Joseph Bay Aquatic Preserve, accomplishments, work being conducted, and issues identified in the management plan.

After the presentation, Earl opened the floor up for comments. Staff provided background on each issue and recorded comments the public had pertinent to each issue (listed below).

Issue One: Water Quality

- Is there a location where the public can access water quality data? (This data is available at <http://publicfiles.dep.state.fl.us/CAMA/CPAP/Water%20Quality/Dataloggers/>.)

Issue Two: Protection of Seagrass Habitat

- A study regarding sea turtle grazing on seagrasses was shared.
- Some seagrass beds may be impacted by sea turtles and urchins.
- Both can cause seagrass loss, and it will be interesting to see if the Urchin Round Ups prove effective.

Issue Three: Sustainable Public Use

- FDEP's Park Planning section shared updates and renovations to T.H. Stone Memorial St. Joseph Peninsula State Park.

After the comments were received, Earl explained the next steps in the management plan process: Acquisition and Restoration Council meeting (a public meeting in Tallahassee) and Governor and Cabinet meeting. The public was reminded that comments could still be submitted on or before September 23, 2021. They were thanked for taking time out of their busy schedules to attend and provide valuable feedback.

Meeting was adjourned.

Appendix D / Goals, Objectives, and Strategies

D.1 / Current Goals, Objectives, and Strategies Budget Table

The following table provides a cost estimate for conducting the management activities identified in this plan. The data is organized by year and Management Program with subtotals for each program and year. The following represents the actual budgetary needs for managing the resources of the aquatic preserve. This budget was developed using data from the Office of Resilience and Coastal Protection (ORCP) and other cooperating entities, and is based on actual costs for management activities, equipment purchases and maintenance, and for development of fixed capital facilities. This budget assumes optimal staffing levels to accomplish these strategies, and includes the costs associated with staffing such as salary or benefits. Budget categories identified correlate with the ORCP Management Program Areas. The Funding Source column depicts the source of funds with “S” designated for state, “F” for federal, and “O” for other funding sources (e.g. non-profit groups, etc.). Dollar figures in *italics* indicate funding not available at this time.

Large, beneficial projects, outside the current capacity of CPAP’s funding and staffing, are identified in Appendix D.4, in case opportunities become available to support those projects in the ten-year span of this management plan.

Goals, Objectives & Integrated Strategies	Management Program	Implementation Date (Planned)	Length of Initiative	Estimated Average Yearly Cost	Funding Source	21-22	22-23	23-24	24-25	25-26	26-27	27-28	28-29	29-30	30-31
Issue 1: Water Quality															
Goal 1: Develop, implement, and adapt a strategic, long-term water quality monitoring program within SJBP that will assist with identifying and addressing issues pertaining to the natural resources.															
Objective 1: Sustain a strategic long-term water quality monitoring program that includes biotic and abiotic parameters, and compile analyzed data to evaluate water quality status and trends.															
Strategy 1: Dataloggers will be established at priority locations, and continuous in-situ measurements will be collected.	Ecosystem Science	2016	Ongoing	\$13,500		\$35K	\$10K	\$10K	\$10K	\$10K	\$10K	\$10K	\$10K	\$10K	\$10K
Strategy 2: Monitor SJBP through a partnership with the UF’s LAKEWATCH program and DEP’s DEAR to determine total nitrogen and phosphorous, chlorophyll, and water clarity.	Ecosystem Science	2016	Ongoing	\$1K	S	\$1K	\$1K	\$1K	\$1K	\$1K	\$1K	\$1K	\$1K	\$1K	\$1K
Strategy 3: Evaluate and, if needed, expand LAKEWATCH and DEAR water quality sampling in SJBP by adding more water quality monitoring sites within the aquatic preserve.	Ecosystem Science	2018	Ongoing	\$1K	S	\$1K	\$1K	\$1K	\$1K	\$1K	\$1K	\$1K	\$1K	\$1K	\$1K

Goals, Objectives & Integrated Strategies	Management Program	Implementation Date (Planned)	Length of Initiative	Estimated Average Yearly Cost	Funding Source	21-22	22-23	23-24	24-25	25-26	26-27	27-28	28-29	29-30	30-31
Objective 2: Analyze and interpret the status and trends of water quality in SJBAP to identify potential impacts to natural resources and provide quality scientific data and recommendations to address such issues.															
Strategy 1: Partner with other state and local agencies to identify potential point and nonpoint sources of pollution in St. Joseph Bay and develop a monitoring plan to effectively evaluate the impacts from this type of pollution.	Ecosystem Science	2016	Ongoing	\$1K		\$1K	\$1K	\$1K	\$1K	\$1K	\$1K	\$1K	\$1K	\$1K	\$1K
Strategy 2: Support the review of numeric nutrient criteria.	Ecosystem Science	2016	Ongoing	\$1K	S	\$1K	\$1K	\$1K	\$1K	\$1K	\$1K	\$1K	\$1K	\$1K	\$1K
Strategy 3: Support the development of TMDLs as needed.	Ecosystem Science	2016	Ongoing	\$1K	S	\$1K	\$1K	\$1K	\$1K	\$1K	\$1K	\$1K	\$1K	\$1K	\$1K
Goal 2: Provide timely and accurate water quality data and information to the public and other entities/agencies.															
Objective 1: Submit data to a repository to store water quality data in a centralized database that is user-friendly, provides quality assurance and quality control for the data collection effort, and can be accessed via the internet to provide site specific information.															
Strategy 1: Work with UF's LAKEWATCH and DEP's DEAR Program to ensure their data are entered into WIN.	Ecosystem Science	2016	Ongoing	\$1K	S	\$1K	\$1K	\$1K	\$1K	\$1K	\$1K	\$1K	\$1K	\$1K	\$1K
Strategy 2: Submit continuous water quality data to SEACAR.	Ecosystem Science	2016	Ongoing	\$1K	S	\$1K	\$1K	\$1K	\$1K	\$1K	\$1K	\$1K	\$1K	\$1K	\$1K
Objective 2: Utilize a variety of methods to inform the public and other entities regarding water quality conditions, the importance of water quality, and suggestions to improve water quality within SJBAP.															
Strategy 1: Utilize educational signage at strategic access points to SJBAP to educate the public on the ecological significance of the bay and how the public can assist in conserving natural resources.	Education & Outreach	2017	Ongoing	\$1K		\$1K	\$1K	\$1K	\$1K	\$1K	\$1K	\$1K	\$1K	\$1K	\$1K
Strategy 2: Coordinate and participate in public lectures and other events where staff can address water quality issues and	Education & Outreach	2019	Ongoing	\$500		\$500	\$500	\$500	\$500	\$500	\$500	\$500	\$500	\$500	\$500

Goals, Objectives & Integrated Strategies	Management Program	Implementation Date (Planned)	Length of Initiative	Estimated Average Yearly Cost	Funding Source	21-22	22-23	23-24	24-25	25-26	26-27	27-28	28-29	29-30	30-31
discuss methods for improving water quality.															
Strategy 3: Provide and/or create opportunities for the public to volunteer to assist with monitoring efforts and unique events (i.e. Earth Day).	Education & Outreach	2016	Ongoing	\$500		\$500	\$500	\$500	\$500	\$500	\$500	\$500	\$500	\$500	\$500
Issue 2: Protection of Seagrass Habitat															
Goal 1: Manage seagrass communities to effectively protect and maintain this habitat as a valuable, natural resource throughout SJBAP.															
Objective 1: Monitor the status and trends of seagrass distribution within SJBAP to determine the overall health and identify potential threats to the habitat.															
Strategy 1: Implement and sustain a Seagrass Monitoring Plan for SJBAP.	Resource Management	2015	Ongoing	\$15K		\$15K	\$15K	\$15K	\$15K	\$15K	\$15K	\$15K	\$15K	\$15K	\$15K
Strategy 2: Continue to collaborate with FWC and other state agencies on the Seagrass Integrated Mapping and Monitoring report.	Resource Management	2016	Ongoing	\$1K	S	\$1K	\$1K	\$1K	\$1K	\$1K	\$1K	\$1K	\$1K	\$1K	\$1K
Strategy 3: Utilize advanced GIS technology and hyperspectral imagery to quantify gains or losses to seagrass acreages, identify severely scarred areas to determine restoration needs, assess management options, and develop a seagrass restoration plan for SJBAP.	Resource Management	2018	Ongoing	\$1,500		\$0	\$0	\$0	\$0	\$15K	\$0	\$0	\$0	\$0	\$0
Strategy 4: Establish and maintain close communication with all federal, state, and local land managers that are responsible for making resource management decisions that could affect water quality or seagrass habitat in SJBAP.	Resource Management	2016	Ongoing	\$1K		\$1K	\$1K	\$1K	\$1K	\$1K	\$1K	\$1K	\$1K	\$1K	\$1K

Goals, Objectives & Integrated Strategies	Management Program	Implementation Date (Planned)	Length of Initiative	Estimated Average Yearly Cost	Funding Source	21-22	22-23	23-24	24-25	25-26	26-27	27-28	28-29	29-30	30-31
Objective 2: Ensure the sustainability of scallop, fish, and other concerned species as well as salt marsh and seagrass habitats through the development of a tiered approach to water quality monitoring.															
Strategy 1: Partner with other local and state agencies to assist in monitoring the distribution and abundance of specific indicator species to determine the ecological health of the bay system.	Resource Management	2016	Ongoing	\$4K		\$4K	\$4K	\$4K	\$4K	\$4K	\$4K	\$4K	\$4K	\$4K	\$4K
Strategy 2: Determine the biodiversity of SJBAP by establishing baseline data and broad scale characterizations of benthic communities.	Resource Management	2015	Ongoing	\$2K		\$2K	\$2K	\$2K	\$2K	\$2K	\$2K	\$2K	\$2K	\$2K	\$2K
Objective 3: Promote the importance of seagrass habitats by generating a variety of informational outlets that target recreational, commercial, and scientific user groups operating in SJBAP.															
Strategy 1: Design and distribute brochures and other outreach materials that can be used to prevent destruction of seagrasses.	Education & Outreach	2016	Ongoing	\$1K	S	\$1K	\$1K	\$1K	\$1K	\$1K	\$1K	\$1K	\$1K	\$1K	\$1K
Strategy 2: Repair, replace, or install education signage pertaining to resource protection throughout SJBAP.	Education & Outreach	2016	Ongoing	\$800	F/S	\$4K	\$0	\$0	\$0	\$0	\$4K	\$0	\$0	\$0	\$0
Strategy 3: Provide educational and informational materials, such as boater’s guides and brochures to local businesses, marinas, and tour operators.	Education & Outreach	2016	Ongoing	\$1,100	F/S	\$2K	\$1K	\$1K	\$1K	\$1K	\$1K	\$1K	\$1K	\$1K	\$1K
Strategy 4: Continue to participate in education and outreach events throughout the Panhandle to promote the importance of seagrass and other estuarine habitats.	Education & Outreach	2015	Ongoing	\$1K	S	\$1K	\$1K	\$1K	\$1K	\$1K	\$1K	\$1K	\$1K	\$1K	\$1K

Goals, Objectives & Integrated Strategies	Management Program	Implementation Date (Planned)	Length of Initiative	Estimated Average Yearly Cost	Funding Source	21-22	22-23	23-24	24-25	25-26	26-27	27-28	28-29	29-30	30-31
Strategy 5: Coordinate with local tourism-driven businesses to inform visitors of proper boating practices to reduce the amount of propeller scarring in seagrasses.	Education & Outreach	2016	Ongoing	\$500	S	\$500	\$500	\$500	\$500	\$500	\$500	\$500	\$500	\$500	\$500
Goal 2: Restore areas of seagrass loss and severely scarred seagrass to prevent further loss of the resource.															
Objective 1: Develop and implement a seagrass restoration plan for SJBAP.															
Strategy 1: Partner with FPS and FWC to survey the regions with the greatest habitat loss and the most severely scarred areas.	Resource Management	2016	Ongoing	Partly included in other strategies	S	\$1K	\$1K	\$1K	\$1K	\$1K	\$1K	\$1K	\$1K	\$1K	\$1K
Strategy 2: Secure and implement funding for future seagrass habitat restoration projects in SJBAP.	Resource Management	2018	Ongoing	\$1K	S	\$1K	\$1K	\$1K	\$1K	\$1K	\$1K	\$1K	\$1K	\$1K	\$1K
Strategy 3: Coordinate with FWC law enforcement to ensure enforcement of the seagrass law prohibiting destruction of seagrasses in SJBAP.	Resource Management	2016	Ongoing	\$1K	S	\$1K	\$1K	\$1K	\$1K	\$1K	\$1K	\$1K	\$1K	\$1K	\$1K
Goal 3: Identify and locate unknown archaeological and historical resources within and adjacent to seagrass habitats.															
Objective 1: Manage and monitor existing archaeological and historical resources.															
Strategy 1: Staff will monitor for unidentified cultural resources during activities in the aquatic preserve.	Resource Management	2018	Ongoing	Cost included in other strategies	S	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Strategy 2: Staff will partner with archaeologists from the Division of Historic Resources, Bureau of Archaeological Research, or the University of West Florida for field inspections and site identifications.	Resource Management	2018	Ongoing	\$1K	S	\$1K	\$1K	\$1K	\$1K	\$1K	\$1K	\$1K	\$1K	\$1K	\$1K
Issue 3: Sustainable Public Use															
Goal 1: Encourage user experiences and public recreation opportunities consistent with natural resource conservation.															

Goals, Objectives & Integrated Strategies	Management Program	Implementation Date (Planned)	Length of Initiative	Estimated Average Yearly Cost	Funding Source	21-22	22-23	23-24	24-25	25-26	26-27	27-28	28-29	29-30	30-31
Objective 1: Inform local residents and visitors about actions they can take to conserve and restore resources of SJBAP.															
Strategy 1: Partner with other agencies to develop and distribute information identifying potential use conflicts and methods of prevention (Leave No Trace principles, beach driving, large marine events, etc.).	Education & Outreach	2016	Ongoing	\$1K	F/S	\$1K	\$1K	\$1K	\$1K	\$1K	\$1K	\$1K	\$1K	\$1K	\$1K
Strategy 2: Develop informational brochures and/or participate in local meetings to educate user groups of potential impacts to the natural resources associated with user activities.	Education & Outreach	2016	Ongoing	\$1,900	F/S	\$1K	\$2K	\$2K	\$2K	\$2K	\$2K	\$2K	\$2K	\$2K	\$2K
Strategy 3: Post educational signage at public access points.	Education & Outreach	2016	Ongoing	\$1K	F/S	\$1K	\$1K	\$1K	\$1K	\$1K	\$1K	\$1K	\$1K	\$1K	\$1K
Objective 2: Examine public use patterns and trends within SJBAP to proactively identify potential resource/public use conflicts and by working with key stakeholders, develop conservation strategies to minimize damage to the natural resources.															
Strategy 1: Work with regulatory agencies, law enforcement, USCG, and other resource management entities to identify and address uses within SJBAP (e.g. camping, marine events) that are potentially illegal or harmful to natural resources.	Resource Management	2016	Ongoing	TBD		TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
Strategy 2: In an effort to identify resource/public use conflicts and develop conservation strategies, SJBAP staff will create an aquatic preserve visitor use survey.	Resource Management	2018	Ongoing	TBD		TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
Goal 2: Promote low-impact, sustainable recreational opportunities.															
Objective 1: Increase awareness of non-consumptive use opportunities.															

Goals, Objectives & Integrated Strategies	Management Program	Implementation Date (Planned)	Length of Initiative	Estimated Average Yearly Cost	Funding Source										
						21-22	22-23	23-24	24-25	25-26	26-27	27-28	28-29	29-30	30-31
Strategy 1: Promote the Florida Circumnavigational Trail through educational signage at paddling launch sites.	Education & Outreach	2016	Ongoing	\$0		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Strategy 2: Work with adjacent land managers and government agencies to promote expansion of non-consumptive activities (e.g., kayaking, nature viewing).	Resource Management	2015	Ongoing	\$1K	S	\$1K	\$1K	\$1K	\$1K	\$1K	\$1K	\$1K	\$1K	\$1K	\$1K
Goal 3: Address areas impacted by human use while educating users of the effects of improper use.															
Objective 1: Reduce the amount of debris, contaminants, and other resource damages associated with user groups.															
Strategy 1: Coordinate with other resource agencies and law enforcement to support efforts to address derelict and/or illegal fisheries gear and harvesting activities and to assist in the removal of derelict fishing gear and/or illegal fisheries gear in SJBP.	Resource Management	2015	Ongoing	\$2K	S	\$2K	\$2K	\$2K	\$2K	\$2K	\$2K	\$2K	\$2K	\$2K	\$2K
Strategy 2: Partner with FWC and other agencies to secure funding for and develop habitat restoration projects involving the removal of marine debris.	Resource Management	2018	Ongoing	\$1K	S	\$1K	\$1K	\$1K	\$1K	\$1K	\$1K	\$1K	\$1K	\$1K	\$1K

D.2 / Budget Summary Table

Fiscal Year	Ecosystem Science	Resource Management	Education & Outreach	Public Use	Annual Total
2021-22	\$42,000	\$31,000	\$13,500	\$0	\$86,500
2022-23	\$17,000	\$31,000	\$9,500	\$0	\$57,500
2023-24	\$17,000	\$31,000	\$9,500	\$0	\$57,500
2024-25	\$17,000	\$31,000	\$9,500	\$0	\$57,500
2025-26	\$17,000	\$46,000	\$9,500	\$0	\$72,500
2026-27	\$17,000	\$31,000	\$13,500	\$0	\$61,500
2027-28	\$17,000	\$31,000	\$9,500	\$0	\$57,500
2028-29	\$17,000	\$31,000	\$9,500	\$0	\$57,500
2029-30	\$17,000	\$31,000	\$9,500	\$0	\$57,500
2030-31	\$17,000	\$31,000	\$9,500	\$0	\$57,500
Ten Year Totals	\$195,000	\$325,000	\$103,000	\$0	\$623,000

D.3 / Major Accomplishments Since the Approval of the Previous Plan

Although in 2011, budget cuts resulted in reduced oversight of St. Joseph Bay Aquatic Preserve (SJBAP) the management of the aquatic preserve was re-established as part of the Central Panhandle Aquatic Preserves office (CPAP) in 2014.

- Seagrass Monitoring:
 - Seagrass monitoring re-established at 15 stations in St. Joseph Bay in 2015.
 - As of 2021, 30 fixed-point stations are monitored annually.
 - CPAP partnered with Florida Fish and Wildlife Conservation Commission's Fish and Wildlife Research Institute (FWC/FWRI) in summer 2020 to assess the impacts of sea urchin grazing on seagrass beds within SJBAP. This pilot project will continue through 2021 and may lead to future monitoring and restoration projects.
- Water Quality Monitoring:
 - University of Florida's LAKEWATCH water quality monitoring program reinstated spring 2016 at nine locations.
 - Four monthly nutrient sampling locations added to the bay through partnership with DEP's Department of Environmental Assessment and Restoration (DEAR) program in June 2019. A fifth site was added in spring 2020.
 - A continuous water quality monitoring station will be re-installed at the Windmark location in early 2021. Historically, a SJBAP had YSI 6600 EDS datalogger recording water quality parameters at 30-minute intervals from 2006-2007. The re-establishment of this monitoring location will provide valuable insight to the overall health of the bay.
- Seagrass Restoration:
 - In 2015, the aquatic preserve received funding through Natural Resource Damage Assessment (NRDA) and initiated The Florida Seagrass Recovery project, which will address boat damage to shallow seagrass beds in the Florida Panhandle by restoring scars located primarily in turtle grass habitats in SJBAP.

- In 2018-19, the seagrass beds in St. Joseph Bay were mapped using unmanned aerial vehicles, or drones, and the imagery was analyzed to determine the severity of propeller scarring in the bay. Aerial imagery identified 789 scars in St. Joseph Bay, measuring approximately 2.5 acres of prop scars.
- Restoration of the identified scars through the placement of sediment tubes began in summer 2020 and was completed in November 2020. Approximately 45,000 sediment tubes were installed in 371 scars to restore more than two acres of propeller scars.

D.4 / Gulf Restoration Priority Projects

Florida's expansive coastline and wealth of aquatic resources have defined it as a subtropical oasis, attracting millions of residents and visitors, and the businesses that serve them. Florida's submerged lands play important roles in maintaining good water quality and hosting a diversity of wildlife and habitats (including economically and ecologically valuable nursery areas). The following projects are proposed by the Office of Resilience and Coastal Protection as top priorities for St. Joseph Bay in regards to creating and maintaining healthy ecosystems and economies, and the table identifies the St. Joseph Bay Aquatic Preserve management plan's issues, goals, objectives, and strategies with the projects. For project details go to <https://floridadep.gov/wra/deepwater-horizon>.

Project Name	Amount	Partners	Location in SJBP management plan
Mapping and Monitoring Seagrass Habitat	\$200,000	DEP/ORCP/CAMA	Issue II, Goal I, Objective I, Int. Strategy I, II & III AND Issue II, Goal II, Objective I, Int. Strategies I & II
Extend and Enhance Water Quality Monitoring	\$200,000	DEP/ORCP/CAMA	Issue I, Goal I, Objective I, Int. Strategies I, II, III AND Issue I, Goal I, Objective II, Int. Strategies II & III AND Issue I, Goal II, Objective I, Int. Strategies I, II AND Issue I, Goal II, Objective II, Int. Strategies I & II
Seagrass Restoration	\$3,000,000	Walton County BOCC	Issue II, Goal II, Objective I, Int. Strategy II
St. Andrews and St. Joseph Bay Estuary Program	\$2,200,000	Bay County BOCC	Issue I, II, & III - all goals and Int. Strategies
St. Joseph Bay Priority Shoreline Acquisition	\$1,000,000	DEP/ORCP/CAMA	Issue II, Goal I, Objective I, Int. Strategy IV AND Issue II, Goal I, Objective II, Int. Strategy I
G-10 Debris Removal and Restoration of Barrier Island Critical to Nesting Loggerhead Turtles along St. Joseph Peninsula, FL	\$1,235,240	University of Florida	Issue III, Goal III, Objective I, Int. Strategy I&II
Stormwater Planning and Retrofit	\$1,200,000	NWFWMD	Issue I, Goal I, Objective I, Int. Strategy II AND Issue I, Goal I, Objective II, Int. Strategy I AND Issue I, Goal II, Objective I, Int. Strategy I&II AND Issue I, Goal II, Objective II, Int. Strategy II
T.H. Stone Memorial St. Joseph Peninsula State Park	\$6,026,480	DEP, Division of Parks	Issue III, Goal I, Objective I, Int. Strategy I & III AND Issue III, Goal II, Objective I, Int. Strategy II

Project Name	Amount	Partners	Location in SJBAP management plan
St. Joseph Bay Buffer Preserve Deal Tract Dock Eco-friendly Improvement, Phase II	\$200,000	DEP/ORCP/CAMA	Issue III, Goal I, Objective I, Int Strategy I & III AND Issue III, Goal II, Objective I, Int. Strategy I&II
Gulf County Living Shoreline and Breakwater Protection Project	\$2,000,000	Gulf County BOCC	Issue III, Goal II, Objective I, Int. Strategy II
G-16 St. Joe Bay Buffer Florida Forever Project/ St. Joe Bay State Buffer Preserve/ St. Joe Bay Aquatic Preserve	\$22,188,000	DEP/ORCP/CAMA	Issue I, Goal I, Objective II, Int. Strategy I AND Issue II, Goal I, Objective I, Int. Strategy IV AND Issue III, Goal II, Objective I, Int. Strategy II

Appendix E / Other Requirements

E.1 / Acquisition and Restoration Council Management Plan Compliance Checklist

Land management Plan Compliance Checklist: Required for State-owned conservation lands over 160 acres

Section A: Acquisition Information Items

Item #	Requirement	Statute/Rule	Page Numbers and/or Appendix
1	The common name of the property.	18-2.018 & 18-2.021	Ex. Summ.
2	The land acquisition program, if any, under which the property was acquired.	18-2.018 & 18-2.021	p. 1
3	Degree of title interest held by the Board, including reservations and encumbrances such as leases.	18-2.021	p. 1, 6-11
4	The legal description and acreage of the property.	18-2.018 & 18-2.021	Ex. Summ., App. A.2
5	A map showing the approximate location and boundaries of the property, and the location of any structures or improvements to the property.	18-2.018 & 18-2.021	p. 17
6	An assessment as to whether the property, or any portion, should be declared surplus. <i>Provide Information regarding assessment and analysis in the plan, and provide corresponding map.</i>	18-2.021	n/a
7	Identification of other parcels of land within or immediately adjacent to the property that should be purchased because they are essential to management of the property. <i>Please clearly indicate parcels on a map.</i>	18-2.021	n/a
8	Identification of adjacent land uses that conflict with the planned use of the property, if any.	18-2.021	p. 43-45
9	A statement of the purpose for which the lands were acquired, the projected use or uses as defined in 253.034 and the statutory authority for such use or uses.	259.032(10)	p. 6
10	Proximity of property to other significant State, local or federal land or water resources.	18-2.021	p. 25-27, 39-43

Section B: Use Items

Item #	Requirement	Statute/Rule	Page Numbers and/or Appendix
11	The designated single use or multiple use management for the property, including use by other managing entities.	18-2.018 & 18-2.021	p. 16
12	A description of past and existing uses, including any unauthorized uses of the property.	18-2.018 & 18-2.021	p. 12-15, 36, 82-89
13	A description of alternative or multiple uses of the property considered by the lessee and a statement detailing why such uses were not adopted.	18-2.018	n/a
14	A description of the management responsibilities of each entity involved in the property's management and how such responsibilities will be coordinated.	18-2.018	p. 6-11, 64-89

15	Include a provision that requires that the managing agency consult with the Division of Historical Resources, Department of State before taking actions that may adversely affect archeological or historical resources.	18-2.021	p. 72, 73, App. E.2
16	Analysis/description of other managing agencies and private land managers, if any, which could facilitate the restoration or management of the land.	18-2.021	p. 39-43
17	A determination of the public uses and public access that would be consistent with the purposes for which the lands were acquired.	259.032(10)	p. 82-89
18	A finding regarding whether each planned use complies with the 1981 State Lands Management Plan, particularly whether such uses represent "balanced public utilization," specific agency statutory authority and any other legislative or executive directives that constrain the use of such property.	18-2.021	p. 6-11
19	Letter of compliance from the local government stating that the LMP is in compliance with the Local Government Comprehensive Plan.	BOT requirement	App. E.3
20	An assessment of the impact of planned uses on the renewable and non-renewable resources of the property, including soil and water resources, and a detailed description of the specific actions that will be taken to protect, enhance and conserve these resources and to compensate/mitigate damage caused by such uses, including a description of how the manager plans to control and prevent soil erosion and soil or water contamination.	18-2.018 & 18-2.021	p. 18-27, 64-89
21	*For managed areas larger than 1,000 acres, an analysis of the multiple-use potential of the property which shall include the potential of the property to generate revenues to enhance the management of the property provided that no lease, easement, or license for such revenue-generating use shall be entered into if the granting of such lease, easement or license would adversely affect the tax exemption of the interest on any revenue bonds issued to fund the acquisition of the affected lands from gross income for federal income tax purposes, pursuant to Internal Revenue Service regulations.	18-2.021 & 253.036	n/a
22	If the lead managing agency determines that timber resource management is not in conflict with the primary management objectives of the managed area, a component or section, prepared by a qualified professional forester, that assesses the feasibility of managing timber resources pursuant to section 253.036, F.S.	18-021	n/a
23	A statement regarding incompatible use in reference to Ch. 253.034(10).	253.034(10)	p. 82-89

*The following taken from 253.034(10) is not a land management plan requirement; however, it should be considered when developing a land management plan: The following additional uses of conservation lands acquired pursuant to the Florida Forever program and other state-funded conservation land purchase programs shall be authorized, upon a finding by the Board of Trustees, if they meet the criteria specified in paragraphs (a)-(e): water resource development projects, water supply development projects, storm-water management projects, linear facilities and sustainable agriculture and forestry. Such additional uses are authorized where: (a) Not inconsistent with the management plan for such lands; (b) Compatible with the natural ecosystem and resource values of such lands; (c) The proposed use is appropriately located on such lands and where due consideration is given to the use of other available lands; (d) The using entity reasonably compensates the titleholder for such use based upon an appropriate measure of value; and (e) The use is consistent with the public interest.

Section C: Public Involvement Items

Item #	Requirement	Statute/Rule	Page Numbers and/or Appendix
24	A statement concerning the extent of public involvement and local government participation in the development of the plan, if any.	18-2.021	App. C
25	The management prospectus required pursuant to paragraph (9)(d) shall be available to the public for a period of 30 days prior to the public hearing.	259.032(10)	App. C.2
26	LMPs and LMP updates for parcels over 160 acres shall be developed with input from an advisory group who must conduct at least one public hearing within the county in which the parcel or project is located. <i>Include the advisory group members and their affiliations, as well as the date and location of the advisory group meeting.</i>	259.032(10)	App. C.1
27	Summary of comments and concerns expressed by the advisory group for parcels over 160 acres	18-2.021	App C.1.3
28	During plan development, at least one public hearing shall be held in each affected county. Notice of such public hearing shall be posted on the parcel or project designated for management, advertised in a paper of general circulation, and announced at a scheduled meeting of the local governing body before the actual public hearing. <i>Include a copy of each County's advertisements and announcements (meeting minutes will suffice to indicate an announcement) in the management plan.</i>	253.034(5) & 259.032(10)	App. C.2
29	The manager shall consider the findings and recommendations of the land management review team in finalizing the required 10-year update of its management plan. <i>Include manager's replies to the team's findings and recommendations.</i>	259.036	n/a
30	Summary of comments and concerns expressed by the management review team, if required by Section 259.036, F.S.	18-2.021	n/a
31	If manager is not in agreement with the management review team's findings and recommendations in finalizing the required 10-year update of its management plan, the managing agency should explain why they disagree with the findings or recommendations.	259.036	n/a

Section D: Natural Resources

Item #	Requirement	Statute/Rule	Page Numbers and/or Appendix
32	Location and description of known and reasonably identifiable renewable and non-renewable resources of the property regarding soil types. <i>Use brief descriptions and include USDA maps when available.</i>	18-2.021	p. 23-25
33	Insert FNAI based natural community maps when available.	ARC consensus	p. 30
34	Location and description of known and reasonably identifiable renewable and non-renewable resources of the property regarding outstanding native landscapes containing relatively unaltered flora, fauna and geological conditions.	18-2.021	Ex. Summ.
35	Location and description of known and reasonably identifiable renewable and non-renewable resources of the property regarding unique natural features and/or resources including but not limited to virgin timber stands, scenic vistas, natural rivers and streams, coral reefs, natural springs, caverns and large sinkholes.	18-2.018 & 18-2.021	p. 28-34, 37-39
36	Location and description of known and reasonably identifiable renewable and non-renewable resources of the property regarding beaches and dunes.	18-2.021	p. 18-23
37	Location and description of known and reasonably identifiable renewable and non-renewable resources of the property regarding mineral resources, such as oil, gas and phosphate, etc.	18-2.018 & 18-2.021	p. 23
38	Location and description of known and reasonably identifiable renewable and non-renewable resources of the property regarding fish and wildlife, both game and non-game, and their habitat.	18-2.018 & 18-2.021	p. 28-35, App. B.3.1
39	Location and description of known and reasonably identifiable renewable and non-renewable resources of the property regarding State and Federally listed endangered or threatened species and their habitat.	18-2.021	p. 28-35, App. B.3.2
40	The identification or resources on the property that are listed in the Natural Areas Inventory. <i>Include letter from FNAI or consultant where appropriate.</i>	18-2.021	p. 28-34
41	Specific description of how the managing agency plans to identify, locate, protect and preserve or otherwise use fragile, nonrenewable natural and cultural resources.	259.032(10)	p. 28-36, 71-78, App. E.2
42	Habitat Restoration and Improvement	259.032(10) & 253.034(5)	
42-A.	Describe management needs, problems and a desired outcome and the key management activities necessary to achieve the enhancement, protection and preservation of restored habitats and enhance the natural, historical and archeological resources and their values for which the lands were acquired.	259.032(10) & 253.034(5)	p. 28-36, 71-78
42-B.	Provide a detailed description of both short (2-year planning period) and long-term (10-year planning period) management goals, and a priority schedule based on the purposes for which the lands were acquired and include a timeline for completion.	259.032(10) & 253.034(5)	App. D.1
42-C.	The associated measurable objectives to achieve the goals.	259.032(10) & 253.034(5)	p. 76-78, App. D.1
42-D.	The related activities that are to be performed to meet the land management objectives and their associated measures. <i>Include fire management plans - they can be in plan body or an appendix.</i>	259.032(10) & 253.034(5)	p. 76-78, App. D.1

42-E.	A detailed expense and manpower budget in order to provide a management tool that facilitates development of performance measures, including recommendations for cost-effective methods of accomplishing those activities.	259.032(10) & 253.034(5)	App. D.1
43	***Quantitative data description of the land regarding an inventory of forest and other natural resources and associated acreage. <i>See footnote.</i>	253.034(5)	Ex. Summ.
44	Sustainable Forest Management, including implementation of prescribed fire management	18-2.021, 253.034(5) & 259.032(10)	
44-A.	Management needs, problems and a desired outcome (see requirement for # 42-A).	18-2.021, 253.034(5) & 259.032(10)	n/a
44-B.	Detailed description of both short and long-term management goals (see requirement for # 42-B).	18-2.021, 253.034(5) & 259.032(10)	n/a
44-C.	Measurable objectives (see requirement for #42-C).	18-2.021, 253.034(5) & 259.032(10)	n/a
44-D.	Related activities (see requirement for #42-D).	18-2.021, 253.034(5) & 259.032(10)	n/a
44-E.	Budgets (see requirement for #42-E).	18-2.021, 253.034(5) & 259.032(10)	n/a
45	Imperiled species, habitat maintenance, enhancement, restoration or population restoration	259.032(10) & 253.034(5)	
45-A.	Management needs, problems and a desired outcome (see requirement for # 42-A).	259.032(10) & 253.034(5)	p. 34-35, 67-78, 81-89
45-B.	Detailed description of both short and long-term management goals (see requirement for # 42-B).	259.032(10) & 253.034(5)	p. 75-78, 81-89' App. D.1
45-C.	Measurable objectives (see requirement for #42-C).	259.032(10) & 253.034(5)	p. 75-78, 81-89, App. D.1
45-D.	Related activities (see requirement for #42-D).	259.032(10) & 253.034(5)	p. 75-78, 81-89, App. D.1, App. D.2
45-E.	Budgets (see requirement for #42-E).	259.032(10) & 253.034(5)	App. D.1
46	***Quantitative data description of the land regarding an inventory of exotic and invasive plants and associated acreage. <i>See footnote.</i>	253.034(5)	App. B.3.3
47	Place the Arthropod Control Plan in an appendix. If one does not exist, provide a statement as to what arrangement exists between the local mosquito control district and the management unit.	BOT requirement via lease language	App. B.4
48	Exotic and invasive species maintenance and control	259.032(10) & 253.034(5)	
48-A.	Management needs, problems and a desired outcome (see requirement for # 42-A).	259.032(10) & 253.034(5)	p. 35-36, 75, 82, App. D.1
48-B.	Detailed description of both short and long-term management goals (see requirement for # 42-B).	259.032(10) & 253.034(5)	p. 75, 82, App. D.1
48-C.	Measurable objectives (see requirement for #42-C).	259.032(10) & 253.034(5)	p. 75, 82, App. D.1
48-D.	Related activities (see requirement for #42-D).	259.032(10) & 253.034(5)	p. 75, 82, App. D.1
48-E.	Budgets (see requirement for #42-E).	259.032(10) & 253.034(5)	App. D.1

Section E: Water Resources

Item #	Requirement	Statute/Rule	Page Numbers and/or Appendix
49	A statement as to whether the property is within and/or adjacent to an aquatic preserve or a designated area of critical state concern or an area under study for such designation. <i>If yes, provide a list of the appropriate managing agencies that have been notified of the proposed plan.</i>	18-2.018 & 18-2.021	p. 1-4
50	Location and description of known and reasonably identifiable renewable and non-renewable resources of the property regarding water resources, including water classification for each water body and the identification of any such water body that is designated as an Outstanding Florida Water under Rule 62-302.700, F.A.C.	18-2.021	Ex. Summ., p. 1-4, 27
51	Location and description of known and reasonably identifiable renewable and non-renewable resources of the property regarding swamps, marshes and other wetlands.	18-2.021	p. 29-31
52	***Quantitative description of the land regarding an inventory of hydrological features and associated acreage. <i>See footnote.</i>	253.034(5)	Ex. Summ, p. 32
53	Hydrological Preservation and Restoration	259.032(10) & 253.034(5)	
53-A.	Management needs, problems and a desired outcome (see requirement for # 42-A).	259.032(10) & 253.034(5)	p. 64-89, App. D.1
53-B.	Detailed description of both short and long-term management goals (see requirement for # 42-B).	259.032(10) & 253.034(5)	p. 64-89, App. D.1
53-C.	Measurable objectives (see requirement for #42-C).	259.032(10) & 253.034(5)	p. 64-89, App. D.1
53-D.	Related activities (see requirement for #42-D).	259.032(10) & 253.034(5)	p. 64-89, App. D.1, App D.4
53-E.	Budgets (see requirement for #42-E).	259.032(10) & 253.034(5)	App. D.1

Section F: Historical Archaeological and Cultural Resources

Item #	Requirement	Statute/Rule	Page Numbers and/or Appendix
54	**Location and description of known and reasonably identifiable renewable and non-renewable resources of the property regarding archeological and historical resources. <i>Include maps of all cultural resources except Native American sites, unless such sites are major points of interest that are open to public visitation.</i>	18-2.018, 18-2.021 & per DHR's request	Ex. Summ., p. 36-37, App. B.5
55	***Quantitative data description of the land regarding an inventory of significant land, cultural or historical features and associated acreage.	253.034(5)	Ex. Summ., p. 36-37, App. B.5
56	A description of actions the agency plans to take to locate and identify unknown resources such as surveys of unknown archeological and historical resources.	18-2.021	p. 78, App. D.1, App. E.2
57	Cultural and Historical Resources	259.032(10) & 253.034(5)	
57-A.	Management needs, problems and a desired outcome (see requirement for # 42-A).	259.032(10) & 253.034(5)	p. 78, App. D.1, App. E.2
57-B.	Detailed description of both short and long-term management goals (see requirement for # 42-B).	259.032(10) & 253.034(5)	p. 78, App. D.1, App. E.2

57-C.	Measurable objectives (see requirement for #42-C).	259.032(10) & 253.034(5)	p. 78, App. D.1, App. E.2
57-D.	Related activities (see requirement for #42-D).	259.032(10) & 253.034(5)	p. 78, App. D.1, App. E.2
57-E.	Budgets (see requirement for #42-E).	259.032(10) & 253.034(5)	App. D.1

****While maps of Native American sites should not be included in the body of the management plan, the DSL urges each managing agency to provide such information to the Division of Historical Resources for inclusion in their proprietary database. This information should be available for access to new managers to assist them in developing, implementing and coordinating their management activities.**

Section G: Facilities (Infrastructure, Access, Recreation)

Item #	Requirement	Statute/Rule	Page Numbers and/or Appendix
58	***Quantitative data description of the land regarding an inventory of infrastructure and associated acreage. <i>See footnote.</i>	253.034(5)	p. 92-93
59	Capital Facilities and Infrastructure	259.032(10) & 253.034(5)	
59-A.	Management needs, problems and a desired outcome (see requirement for # 42-A).	259.032(10) & 253.034(5)	p. 92-93, App. D.1
59-B.	Detailed description of both short and long-term management goals (see requirement for # 42-B).	259.032(10) & 253.034(5)	App. D.1
59-C.	Measurable objectives (see requirement for #42-C).	259.032(10) & 253.034(5)	App. D.1
59-D.	Related activities (see requirement for #42-D).	259.032(10) & 253.034(5)	App. D.1
59-E.	Budgets (see requirement for #42-E).	259.032(10) & 253.034(5)	App. D.1
60	*** Quantitative data description of the land regarding an inventory of recreational facilities and associated acreage.	253.034(5)	p. 39-43, 82-89
61	Public Access and Recreational Opportunities	259.032(10) & 253.034(5)	
61-A.	Management needs, problems and a desired outcome (see requirement for # 42-A).	259.032(10) & 253.034(5)	p. 86-89, App. D.1
61-B.	Detailed description of both short and long-term management goals (see requirement for # 42-B).	259.032(10) & 253.034(5)	p. 86-89, App. D.1
61-C.	Measurable objectives (see requirement for #42-C).	259.032(10) & 253.034(5)	p. 86-89, App. D.1
61-D.	Related activities (see requirement for #42-D).	259.032(10) & 253.034(5)	p. 86-89, App. D.1, App. D.4
61-E.	Budgets (see requirement for #42-E).	259.032(10) & 253.034(5)	App. D.1

Section H: Other/ Managing Agency Tools

Item #	Requirement	Statute/Rule	Page Numbers and/or Appendix
62	Place this LMP Compliance Checklist at the front of the plan.	ARC and managing agency consensus	Front and App. E.1
63	Place the Executive Summary at the front of the LMP. Include a physical description of the land.	ARC and 253.034(5)	Ex. Summ.
64	If this LMP is a 10-year update, note the accomplishments since the drafting of the last LMP set forth in an organized (categories or bullets) format.	ARC consensus	App. D.3

65	Key management activities necessary to achieve the desired outcomes regarding other appropriate resource management.	259.032(10)	p. 64-89
66	Summary budget for the scheduled land management activities of the LMP including any potential fees anticipated from public or private entities for projects to offset adverse impacts to imperiled species or such habitat, which fees shall be used to restore, manage, enhance, repopulate, or acquire imperiled species habitat for lands that have or are anticipated to have imperiled species or such habitat onsite. The summary budget shall be prepared in such a manner that it facilitates computing an aggregate of land management costs for all state-managed lands using the categories described in s. 259.037(3) which are resource management, administration, support, capital improvements, recreation visitor services, law enforcement activities.	253.034(5)	App. D.1
67	Cost estimate for conducting other management activities which would enhance the natural resource value or public recreation value for which the lands were acquired, include recommendations for cost-effective methods in accomplishing those activities.	259.032(10)	App. D.1
68	A statement of gross income generated, net income and expenses.	18-2.018	n/a

*** = The referenced inventories shall be of such detail that objective measures and benchmarks can be established for each tract of land and monitored during the lifetime of the plan. All quantitative data collected shall be aggregated, standardized, collected, and presented in an electronic format to allow for uniform management reporting and analysis. The information collected by the DEP pursuant to s. 253.0325(2) shall be available to the land manager and his or her assignee.

E.2 / Management Procedures for Archaeological and Historical Sites on State-Owned or Controlled Lands

(revised June 2021)

These procedures apply to state agencies, local governments, and non-profits that manage state-owned properties.

A. Historic Property Definition

Historic properties include archaeological sites and historic structures as well as other types of resources. Chapter 267, Florida Statutes states: “ ‘Historic property’ or ‘historic resource’ means any prehistoric district, site, building, object, or other real or personal property of historical, architectural, or archaeological value, and folklife resources. These properties or resources may include, but are not limited to, monuments, memorials, Indian habitations, ceremonial sites, abandoned settlements, sunken or abandoned ships, engineering works, treasure trove, artifacts, or other objects with intrinsic historical or archaeological value, or any part thereof, relating to the history, government, and culture of the state.”

B. Agency Responsibilities

Per Chapter 267, F.S. and state policy related to historic properties, state agencies of the executive branch must provide the Division of Historical Resources (Division) the opportunity to comment on any undertakings with the potential to affect historic properties that are listed, or eligible for listing, in the National Register of Historic Places, whether these undertakings directly involve the state agency, i.e., land management responsibilities, or the state agency has indirect jurisdiction, i.e. permitting authority, grants, etc. No state funds should be expended on the undertaking until the Division has the opportunity to review and comment on the undertaking. (267.061(2)(a))

State agencies must consult with the Division when, as a result of state action or assistance, a historic property will be demolished or substantially altered in a way that will adversely affect the property. State agencies must take timely steps to consider feasible and prudent alternatives to the adverse effect. If no feasible or prudent alternatives exist, the state agency must take timely steps to avoid or mitigate the adverse effect. (267.061(2)(b))

State agencies must consult with Division to establish a program to locate, inventory and evaluate all historic properties under ownership or controlled by the agency. (267.061(2)(c))

State agencies are responsible for preserving historic properties under their control. State agencies are directed to use historic properties available to the agency when that use is consistent with the historic property and the agency’s mission. State agencies are also directed to pursue preservation of historic properties to support their continued use. (267.061(2)(d))

C. Statutory Authority

The full text of Chapter 267, F.S. and additional information related to the treatment of historic properties is available at:

<https://dos.myflorida.com/historical/preservation/compliance-and-review/regulations-guidelines/>

D. Management Implementation

Although the Division sits on the Acquisition and Restoration Council and approves land management plans, these plans are conceptual and do not include detailed project information. Specific information for individual projects must be submitted to the Division for review and comment.

Managers of state lands must coordinate any land clearing or ground disturbing activities with the Division to allow for review and comment on the proposed project. The Division’s recommendations may include, but are not

limited to: approval of the project as submitted, recommendation for a cultural resource assessment survey by a qualified professional archaeologist, and modifications to the proposed project to avoid or mitigate potential adverse effects.

Projects such as additions or alterations to historic structures as well as new construction must also be submitted to the Division for review. Projects involving structures fifty years of age or older must be submitted to the Division for a significance determination. In rare cases, structures under fifty years of age may be deemed historically significant.

Adverse effects to historic properties must be avoided when possible, and if avoidance is not possible, additional consultation with the Division is necessary to develop a mitigation plan. Furthermore, managers of state property should make preparations for locating and evaluating historic properties, both archaeological sites and historic structures.

E. Archaeological Resource Management (ARM) Training

The ARM Training Course introduces state land managers to the nature of archaeological resources, Florida archaeology, and the role of the Division in managing state-owned archaeological resources. Participants gain a better understanding of the requirements of state and federal laws with regard to protecting and managing archaeological sites on state managed lands. Participants also receive a certificate recognizing their ability to conduct limited monitoring activities in accordance with the Division's Review Procedure, thereby reducing the time and money spent to comply with state regulations. Additional information regarding the ARM Training Course is available at:

<https://dos.myflorida.com/historical/archaeology/education/arm-training-courses/>

F. Matrix for Ground Disturbance on State Lands

The matrix is a tool designed to help streamline the Division's Review Procedure. The matrix allows state land managers to make decisions about balancing ground disturbance and stewardship of historic resources. The matrix establishes types of undertakings that are either minor or major disturbances and then guides the land manager to consult the Division, conduct ARM-trained project monitoring, or proceed with the project.

Additional information regarding the matrix is available at:

<https://dos.myflorida.com/historical/archaeology/education/dhr-matrix-for-ground-disturbance-on-state-lands/>

G. Human Remains Treatment

Chapter 872, *Florida Statutes* makes it illegal to willfully and knowingly disturb human remains. In the event human remains are discovered, cease all activity in the area that may disturb the remains. Leave the bones and nearby items in place. Immediately notify law enforcement or the local district medical examiner of the discovery and follow the provisions of Chapter 872, FS. Additional information regarding the treatment of human remains and cemeteries is available at:

<https://dos.myflorida.com/historical/archaeology/human-remains/>

<https://dos.myflorida.com/historical/archaeology/human-remains/abandoned-cemeteries/what-are-the-applicable-laws-and-regulations/>

H. Division of Historical Resources Review Procedure

Projects on state owned or controlled properties may submit projects to the Division for review using the streamlined State Lands Consultation Form. The form provides instructions to submit projects for review and outlines the necessary information for the Division to complete the review process. The State Lands Consultation Form and additional information about the Division's review process is available at:

<https://dos.myflorida.com/historical/preservation/compliance-and-review/state-lands-review/>

* * *

Questions relating to the treatment of archaeological and historic resources on state lands should be directed to:

Compliance and Review Section
Bureau of Historic Preservation Division of Historical Resources
R. A. Gray Building
500 South Bronough Street
Tallahassee, FL 32399-0250

StateLandsCompliance@dos.myflorida.com

Phone: (850) 245-6333
Toll Free: (800) 847-7278
Fax: (850) 245-6435

E.3 / Letter of Compliance with County Comprehensive Plan

(This information will be provided in the final draft of this management plan.)

E.4 / Division of State Lands Management Plan Approval Letter

(This information will be provided in the final draft of this management plan.)



St. Joseph Bay Aquatic Preserve Management Plan
Florida Department of Environmental Protection
Office of Resilience and Coastal Protection
2600 Blair Stone Road, MS #235
Tallahassee, FL 32399
www.floridacoasts.org

