

Final Evaluation Findings

Apalachicola National Estuarine Research Reserve

August 2014 to August 2021

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Summary of Findings

The Coastal Zone Management Act (CZMA) requires the National Oceanic and Atmospheric Administration (NOAA) to conduct periodic evaluations of the performance of state programs participating in the National Estuarine Research Reserve System. This evaluation examined the operation and management of the Apalachicola National Estuarine Research Reserve by the Florida Department of Environmental Protection, the designated lead agency, for the period from August 2014 to August 2021. The evaluation focused on two target areas: 1) the reserve's role in serving different audiences—communication, messaging and education opportunities and 2) reserve collaboration and engagement addressing regional resource management issues.

The findings in this evaluation will be considered by the NOAA Office for Coastal Management in making future financial award decisions concerning the reserve. The evaluation came to these conclusions:

Accomplishment: The Office for Coastal Management commends the professionalism and openness of Apalachicola Reserve staff as valued partners in the Apalachicola Bay area. The reserve has been successful at remaining a neutral source of trusted information and data, and communicating this information and data in a way that their community embraces and accepts, resulting in behavior changes that benefit the resources of the reserve.

Accomplishment: The Office for Coastal Management applauds the Apalachicola Reserve's efforts to support crucial capacity building activities for partners and engagement of visitors and new residents. The reserve does this by providing trainings to raise stewardship awareness, offering talks and SciCafe presentations, and providing high-quality meeting space, technical support, and assistance to partners to gather appropriate collaborators on various topics important to the reserve and the region.

Accomplishment: The Apalachicola Reserve is commended for its delivery of a long-awaited research symposium highlighting different research and data generated at the reserve. This was a collaborative effort by many reserve staff and partners, and was well received by partners and collaborators in the area.

Accomplishment: The Office for Coastal Management recognizes the Apalachicola Reserve's continued efforts to expand reserve-managed lands through land acquisition to connect important habitats. Additionally, the reserve has significantly expanded passive recreational opportunities for the public and demonstrated exceptional management of critical reserve habitats, serving as a model for other public land managers and private landowners.

Accomplishment: The Office for Coastal Management recognizes the Apalachicola Reserve for its fantastic work providing long-term data and place-based expertise, convening area partners, and using their facilities and equipment to inform and support multiple significant investments

to restore the Apalachicola Bay ecosystem.

Accomplishment: The Office for Coastal Management applauds the Apalachicola Reserve's commitment to convening strong regional partnerships that have resulted in improved local resilience. Stakeholders reflected on multiple examples including the many living shoreline projects within the reserve, the Franklin 98 project, and the reserve's role in standing up the Panhandle Estuarine Restoration Team (PERT).

Accomplishment: The Office for Coastal Management recognizes the reserve's exceptional leadership in understanding climate change impacts and associated transitions affecting the Apalachicola Bay ecosystem through foundational research and long-term data. The reserve has fostered conversation and actions to further community resilience and support the social and ecological resilience of the region.

Accomplishment: The Office for Coastal Management commends the Apalachicola Reserve for developing a strong partnership with the Conservation Corps of the Forgotten Coast to implement on-the-ground stewardship activities and priorities of the reserve, while raising the capacity of corps youth.

Accomplishment: The Apalachicola Reserve and Florida Department of Environmental Protection are commended for entering into a memorandum of agreement with Florida State University. Through this agreement, multiple Other Personal Services staff will transition to Florida State University contract employees through a purchase agreement. This approach replicates similar personnel actions by the other Florida research reserves, and will provide significant benefits to both the reserve and the Florida State University Coastal and Marine Lab.

Recommendation: The Office for Coastal Management encourages the Apalachicola Reserve to make steady, continued progress toward developing an updated management plan for NOAA review.

Recommendation: The Office for Coastal Management recommends that the Apalachicola Reserve explore additional mechanisms, including social media and an updated website, to communicate with partners and the public. Access to reserve data, information, and publications is essential to the reserve's continued and trusted engagement with community members and stakeholders.

Recommendation: The Office for Coastal Management recommends that the Florida Department of Environmental Protection strategically support a robust and resilient Apalachicola Reserve that includes staff capacity commensurate with the challenges and opportunities they face, including the work to restore the collapsed oyster fishery, increased development and tourism, and adapting to a changing climate, while protecting their historic investments in the region.

Recommendation: The Office for Coastal Management encourages the Apalachicola Reserve to take advantage of lessons learned and opportunities that arose from the COVID-19 pandemic

transition to a virtual presence, and to continue to utilize virtual technology and video to reach a wider audience, including more teachers.

Recommendation: The Office for Coastal Management encourages the Apalachicola Reserve to explore opportunities to strategically reorganize existing positions and expand collaborations with partners vested in complementary efforts to increase capacity focused on resilience and recovery of Apalachicola Bay. The reserve is reaching its capacity to support the research and stewardship needs of the bay.

Recommendation: The Office for Coastal Management encourages the Apalachicola Reserve to continue pursuing opportunities to restore a sustainable oyster fishery, maintain the local seafood culture, and work with local communities and visitors to engage them in stewardship and develop their appreciation of the Apalachicola Bay ecosystem.

Program Review Procedures

The Coastal Zone Management Act of 1972 (CZMA, 16 U.S.C. 1451 *et seq.*), as amended, requires that state coastal zone management programs and national estuarine research reserves (reserves) that are developed under the CZMA and approved by the secretary of the Department of Commerce be evaluated periodically. Section 315 of the CZMA and implementing regulations at 15 CFR part 921, subpart E, require that the National Oceanic and Atmospheric Administration (NOAA) periodically evaluate reserves with regard to 1) their operation and management, including education and interpretive activities; 2) the research being conducted within the research reserve; and 3) adherence to the requirements of section 315(b)(2) of the CZMA.

NOAA evaluated the Apalachicola Reserve in fiscal year 2021. The evaluation team consisted of Susie Holst Rice, evaluation team lead, Office for Coastal Management; Heidi Stiller, South regional director, Office for Coastal Management; Ayesha Gray, director, Grand Bay Research Reserve; Matt Chasse, site liaison, Office for Coastal Management; Becky Allee, senior scientist, Gulf region, Office for Coastal Management; and Brenna Sweetman, social scientist, Office for Coastal Management. The support of the reserve program's staff members was crucial in conducting the evaluation, and their support is most gratefully acknowledged.

NOAA sent a notification of the scheduled evaluation to the secretary of the Florida Department of Environmental Protection, published a notice of "Intent to Evaluate" in the *Federal Register* on June 25, 2021, and notified members of the Florida congressional delegation ahead of the evaluation site visit. The reserve posted a notice of the public meeting and opportunity to comment in *The Apalachicola Times* on July 8, 2021.

The evaluation process included a review of relevant documents, a survey of stakeholders, the selection of two target areas, and discussions with staff members and stakeholders about the target areas. In addition, a virtual public meeting was held Wednesday, August 4, 2021, at 12:00 p.m. to provide an opportunity for members of the public to express their opinions about the implementation of the reserve program. Stakeholders and members of the public were also given an opportunity to provide written comments; however, no written comments were received. NOAA then developed draft evaluation findings, which were provided to the reserve program for review, and the program's comments were considered in drafting the final evaluation findings.

Final evaluation findings for the research reserves highlight each reserve's accomplishments in the target areas and include recommendations, which are of two types:

Necessary Actions address programmatic requirements of the Coastal Zone Management Act (CZMA) and its implementing regulations. These must be carried out by the date specified. Failure to address necessary actions may result in a future finding of non-adherence and the invoking of interim sanctions, as specified in CZMA §312(c).

Recommendations are actions that the office believes would improve the program, but which are not mandatory. The state is expected to have considered the recommendations by the time of the next evaluation or dates specified.

Evaluation Findings

The Apalachicola National Estuarine Research Reserve is managed by the Florida Department of Environmental Protection within the Office of Resilience and Coastal Protection. It is also one of 42 Aquatic Preserves managed by Florida's coastal management program. The reserve has demonstrated that it is a trusted and valued partner in the Apalachicola Bay ecosystem, Northwest Florida, and the broader Gulf region. Since 2014 when the reserve was last evaluated, the area has experienced a number of significant events impacting the reserve and its partners, including ongoing impacts from the Deep Water Horizon oil spill (2010) and oyster fishery collapse (2012), the impacts of a near direct hit by a category 5 hurricane (Michael, 2018), serving as a data provider for the court case *State of Fla. v. State of Georgia*, 141 S. Ct. 1175 (2021), and operating during the global COVID-19 pandemic (2020-2021). Through all these challenges the reserve has maintained close collaborations with the local communities and existing partners, established new partnerships to expand its role in regional resource management issues, and emerged as a trusted steward of the lands managed by the reserve.

Throughout the evaluation meetings, the evaluation team heard recurring statements of praise for reserve staff. Overall, stakeholders noted that partnerships with the reserve have been exceptional, and staff were described as committed, very approachable, engaged, and adaptable. Reserve staff were commended for being accessible and very accommodating, for example, providing logistical support including boat and laboratory time to key partners and researchers. Many partners emphatically identified the reserve as an important and collaborative partner, willing to talk out project ideas through open communications and ongoing dialogue. Through its staff and open access to the public, the reserve supports and encourages locals who want to step up and actively work to improve the bay. Collectively, they foster community stewardship of the reserve's resources through successful implementation across all sectors.

As with each reserve, regular management plan updates are required, and the reserve successfully completed the 2015-2020 plan as described in the necessary action from the prior findings in October 2015. The next iteration of Apalachicola Reserve's management plan covering 2021-2025 is currently underway, with NOAA receiving a preliminary draft in October 2020. Staff have made substantial progress towards developing a new 2021-2025 reserve management plan. The reserve has developed new or revised goals and objectives, and the bulk of individual chapter writing is complete. A further draft for review by the Office for Coastal Management is expected in Fall-Winter 2021 and is in line with expected timelines.

Recommendation: The Office for Coastal Management encourages the Apalachicola Reserve to make steady, continued progress toward developing an updated management plan for NOAA review.

The reserve provides significant data, information, and programming about the estuary to partners, groups and the public at large. More recently, educational programming has evolved

using virtual program formats for different grade levels, teachers, and the general public. These virtual options have enabled the reserve to extend its reach beyond the local area to other audiences throughout the Florida panhandle and the region. Numerous evaluation participants commented on their appreciation of the information and publications provided by the reserve, but also shared frustration with approval times and constraints on the use of well-known social media tools. These constraints limit the reserve's ability to advertise training opportunities and workshops that are clearly valued by local community members. There is a history of strong engagement with the local community, and reserve staff continually try to communicate about programs and special events through local print media, regular public service announcements through local radio, attending meetings and events hosted by civic groups and women's clubs, and through their reserve newsletter (i.e., *The Oystercatcher*). However, the reserve has some challenges in using new technologies and methods to effectively communicate with the public, and press releases often get held up in review at the state level making them less beneficial.

To reach new residents more efficiently, participants suggested that the reserve consider using social media. Additionally, stakeholders stated that a state-of-the-art website for the reserve would help accommodate the distribution of data and provide a more accessible and cohesive web source responsive to their needs for local information about the estuary. Given limited opportunities for face-to-face interactions, the reserve may also consider incorporating online calendars, listservs, or targeted social media to foster stronger connections and communications. Additionally, an investment in audio technology and video editing training for staff would provide near-term improvements in the quality of field-based virtual programming and professional training classes and workshops.

Recommendation: The Office for Coastal Management recommends that the Apalachicola Reserve explore additional mechanisms, including social media and an updated website, to communicate with partners and the public. Access to reserve data, information, and publications is essential to the reserve's continued and trusted engagement with community members and stakeholders.

The reserve has been a consistent and dependable collaborator in the Apalachicola Bay area for over 40 years. With noticeably increased tourism and many people buying second homes in the area, additional engagement will be needed with the public. Meanwhile, there are increased needs for adapting to and mitigating the effects of a changing climate in the region, and the reserve has been in the forefront of research for living shoreline restoration and has implemented successful demonstration projects. Scaling up these efforts will likely be needed in the near future. At the same time, the reserve has ongoing investments dedicated to maintaining the long-term monitoring data in the region that many have come to depend on to help better understand the Apalachicola Bay ecosystem, including the issues contributing to the oyster fishery collapse. Participants suggested cross-training reserve staff, new employee training, succession planning, and further leveraging the reserve's partnership with the Conservation Corps of the Forgotten Coast to support these efforts. Without additional staff, the reserve's capacity to lead on these efforts may be hindered.

Recommendation: The Office for Coastal Management recommends that the Florida

Department of Environmental Protection strategically support a robust and resilient Apalachicola Reserve that includes staff capacity commensurate with the challenges and opportunities they face, including the work to restore the collapsed oyster fishery, increased development and tourism, and adapting to a changing climate, while protecting their historic investments in the region.

Reserve Role in Serving Different Audiences: Communication, Messaging, and Education Opportunities

During the evaluation, area land managers, environmental advocates, state and federal resource management agency representatives, local government planners, educators, tourism and development interests, and private business owners all spoke about the value of the reserve's information and its engagement with the community. It is truly impressive that the reserve serves all these interests, and is seen as a trusted and unbiased source of information. The information provided is making a difference in both local government policies and in individual level stewardship actions. Science-based information from the reserve has supported land use policies that protect the health of the bay and informed a local lighting ordinance related to nesting sea turtles. Trainings provided by the reserve on living shorelines have spurred individual property owners to use these techniques to control erosion along their properties rather than build new seawalls.

Much of the Apalachicola Bay area long-term data and information is only possible due to research and monitoring conducted at the reserve. The reserve systematically collects a lot of data within reserve boundaries to monitor abiotic and biotic factors, including water quality, surface elevation tables, salt marsh migration, vegetation transects, zooplankton, and trawl surveys for fish and invertebrates. Without the reserve and its inherent capabilities, there would be a big gap in data for the Apalachicola Bay ecosystem and a lack of information for collaborators and the public.

Furthermore, the reserve serves as the nexus for tying together research and management by facilitating connections between researchers and relevant stakeholder groups, and it was noted that reserve staff bring credibility to any project. Long-term monitoring data collected by the reserve are valuable for providing information about the ecosystem and can provide baselines for new projects going forward. The reserve works within both the natural space and the built environment, focusing on community resilience and on engaging stakeholders such as oyster fishers and citizen advisory groups. Staff provide technical expertise and have the capacity and willingness to share that expertise in ways the community can readily absorb.

Accomplishment: The Office for Coastal Management commends the professionalism and openness of Apalachicola Reserve staff as valued partners in the Apalachicola Bay area. The reserve has been successful at remaining a neutral source of trusted information and data, and communicating this information and data in a way that their community embraces and accepts, resulting in behavior changes that benefit the resources of the reserve.

Recently, tourism and new residents in Franklin County have dramatically increased and the area has been “discovered.” As a result, the reserve has more visitors and new residents to engage with as they are typically from out of state and unfamiliar with coastal issues in the area. Participants noted that the reserve’s visitor center in Eastpoint is one of the more popular places for visitors in the county. As such, the reserve is recognized as a tourism driver for the county. In 2016, the popular “Roadmap to Recreation” brochure was published to guide both visitors and locals to the abundance of outdoor recreational opportunities in and around the reserve, and to raise awareness of stewardship practices. For new homeowners moving to the area, the land available for purchase is often in low-lying, vulnerable areas that may be prone to erosion, and appropriate stewardship practices for these homeowners are important topics. Through the Coastal Training Program, the “Stewardship Series” adult training workshops are popular among residents and tourists. These workshops are designed to increase the public's knowledge about the Apalachicola watershed’s unique ecology and address behavior changes that benefit resources within the reserve boundary. The reserve also sponsors lectures meant to educate the public on a wide range of natural history issues, including Turtle Tuesdays (during the Summer only) and Reserve Wednesdays. Reserve staff also take these opportunities off site to galleries, restaurants, and other locations to present Sci-Cafes, an informal platform for scientists to share research projects conducted around the bay with the public. These events are popular and well attended by the local community—in fact, the event scheduled during the evaluation was standing room only. More importantly, according to the participants, these efforts have helped reduce visitor impacts to the bay environment.

The reserve frequently hosts stakeholder meetings for issues about the Apalachicola River and Bay. The evaluation team heard from numerous groups that depend on the facilities at the reserve for stakeholder meetings and the instrumental support provided by staff to host them. The reserve is viewed as an important neutral convener in the Apalachicola Bay area that connects disparate groups working on similar topics. For example, staff bring in stakeholders and partners with expertise to develop aquatic preserve management plans.

Accomplishment: The Office for Coastal Management applauds the Apalachicola Reserve’s efforts to support crucial capacity building activities for partners and engagement of visitors and new residents. The reserve does this by providing trainings to raise stewardship awareness, offering talks and SciCafe presentations, and providing high-quality meeting space, technical support, and assistance to partners to gather appropriate collaborators on various topics important to the reserve and the region.

In February 2021, the reserve presented a long-anticipated research symposium and stakeholders recognized the event as a great knowledge-sharing opportunity. The reserve invited collaborators to participate in this event and had 155 participants over two days. The symposium was a success and resulted in new collaborations between the reserve and outside researchers. Partners at the Florida State University Coastal and Marine Lab and others appreciated both the content shared and the connections they were able to make with other participants. In addition, the recent publication of reserve research on mangrove distribution and expansion in Apalachicola Bay with multiple collaborators was highlighted at the symposium. This work is leading to more collaboration with partners on this issue.

Accomplishment: The Apalachicola Reserve is commended for its delivery of a long-awaited research symposium highlighting different research and data generated at the reserve. This was a collaborative effort by many reserve staff and partners, and was well received by partners and collaborators in the area.

The reserve directly manages almost 6,800 acres of uplands, and the diversity and separation of parcels is a challenge. There are also about a dozen cultural resources on the managed lands, with many more in the water. Staff maintain strong relationships with the large number of management agencies working both inside and outside of reserve boundaries, and they participate in regional and state management reviews. Reserve staff work with these land managers to facilitate land development regulations through public workshops and sharing of information and data, helping to explain why land management is important to the bay and individual property owners.

Land management requires significant coordination and staff resources to maintain the habitats and recreational opportunities within the reserve. The reserve has made significant progress to control invasive species and now is considered in “maintenance” status across all managed lands—a considerable achievement! Management of reserve lands and waters also requires mowing and controlled burns for fire management and marine debris cleanup, especially following storm events. As awareness and visitation of reserve lands increased, a corresponding need arose to maintain primitive campsites, trails, access points, and boat launches across these lands. Additionally, infrastructure investments such as kiosks and signage are important, as these areas have public interactions and are used to foster the “leave no trace” ethic among visitors.

Beyond maintenance, the reserve has installed multiple living shorelines to control erosion and serve as demonstration projects for the public to understand the benefits of this science-based habitat restoration approach for shorelines. Since the last evaluation, the reserve has acquired two parcels covering two acres on St. George Island within the Plantation community and continues to look for strategic opportunities to acquire lands. To continue improving land management, connect important habitats, and protect cultural resources, the reserve’s management plan includes acquisition of properties that are also part of the state’s Florida Forever program. In fact, there are two parcels noted in the latest draft plan, both part of Florida Forever acquisition priorities, which the reserve has identified as possible acquisition areas.

Accomplishment: The Office for Coastal Management recognizes the Apalachicola Reserve’s continued efforts to expand reserve-managed lands through land acquisition to connect important habitats. Additionally, the reserve has significantly expanded passive recreational opportunities for the public and demonstrated exceptional management of critical reserve habitats, serving as a model for other public land managers and private landowners.

The reserve is very important to area communities both through conservation and education efforts. Evaluation participants stated that the reserve has an excellent public education program. The reserve receives up to 30,000 visitors per year and most have a passive

experience through exhibits. The objective of the visitor experience is to educate the public on what an estuary is and why they are important. School programs at the reserve are very important and the students have a lot of pride in their work on the estuary. This is true especially in the wake of Hurricane Michael, when a student-planted salt marsh, part of the living shoreline protecting the Eastpoint facility, remained intact. The reserve takes advantage of a unique opportunity to work with the same students up to six times between Pre-K and 10th grade, and each successive class visit builds on the last to instill a deeper understanding of the Apalachicola Bay estuary. According to teachers at partner schools, these programs provide students with an opportunity to use real-world data and science skills that is priceless and is reflected in higher testing scores following reserve programs. These programs have been wildly successful despite high turnover at both the teacher and school administration levels in Franklin County.

During the pandemic, reserve staff initially did not have the capacity to build virtual offerings. Over time, virtual programming improved through creative and meaningful educational efforts and increased use of impressive and inspiring videos. Reserve staff, however, need new technology to further build this capability to reach more students and teachers, as well as the public: for example, continuation of virtual field trips where seine collections were filmed on the beach and posted to Google classrooms for students to view. Given the rural nature of the area and long distances that visiting students need to travel to get to the reserve, it may be useful to continue using a virtual format to expand the reach of the education programming already made available by the reserve. Likewise, there may be ongoing use for broader outreach via virtual platforms for general public engagement as well.

Staff are also looking at individualized programs for teachers participating in the school programs and working to align the student experience with existing classes for grades that do not currently visit the reserve. There is a newly available classroom version of *The Watershed Game* that may be of interest that provides an interactive, educational tool to help individuals understand the connection between land use and water quality. More information about the game is available through the Minnesota Sea Grant Program.

Recommendation: The Office for Coastal Management encourages the Apalachicola Reserve to take advantage of lessons learned and opportunities that arose from the COVID-19 pandemic transition to a virtual presence, and to continue to utilize virtual technology and video to reach a wider audience, including more teachers.

Reserve Collaboration and Engagement Addressing Regional Resource Management Issues

Since 2010 the Apalachicola Bay area has experienced the dual disasters of the Deepwater Horizon Oil Spill and the collapse of the oyster fishery. Significant investments are now being made to restore and recover area natural resources, and the reserve is making these investments smarter and more impactful. Numerous stakeholders involved in restoration efforts supported by Deepwater Horizon-associated funding streams (e.g., Natural Resource

Damage Assessment funding, Gulf Environment Benefit Fund) spoke about critical roles the reserve has played—providing long-term data to inform restoration design and placement, identifying relevant area stakeholders, hosting meetings, and contributing staff time and equipment to implement and monitor projects once they are installed. The director of the \$20 million Apalachicola Bay System Initiative, which is developing science-informed restoration and ecosystem-based management plans focused on the recovery of oyster reefs and the health of Apalachicola Bay, described the reserve's support as critical. Without the presence of the reserve's long-term monitoring data, logistical support, research, and technical capabilities, many partners noted that important projects (e.g., Franklin 98) would have not received funding or resources.

Accomplishment: The Office for Coastal Management recognizes the Apalachicola Reserve for its fantastic work providing long-term data and place-based expertise, convening area partners, and using their facilities and equipment to inform and support multiple significant investments to restore the Apalachicola Bay ecosystem.

Another example of a critical role played by the reserve since the previous evaluation is the work that went into standing up the Panhandle Estuarine Restoration Team (PERT). Restoration has been a hot topic during recent years given the oil spill and oyster fishery collapse, and the reserve was identified as a reference site and area for research on potential restoration approaches. The reserve tested and demonstrated effective living shoreline projects in Apalachicola Bay and in 2016 convened a Living Shorelines Summit to bring together partners working on similar efforts. During the summit, it was determined that a forum for restoration work in the region was needed and in 2017 PERT was established to facilitate partner-based restoration projects. A 15-member steering committee was established composed of federal, state, local, university, and nongovernmental organization partners in the region, with the reserve's assistant manager serving as the chair of the committee, and the Coastal Training Program coordinator playing key roles on the committee. Due to the key staff support from the reserve, PERT is bringing together restoration practitioners to communicate about and collaborate on regional restoration initiatives. This has been a highly successful effort with numerous action items underway, but it was noted that a dedicated website is needed to better convey the ongoing work of the team.

Another effort, the Franklin 98 restoration project, was discussed multiple times during the evaluation meetings. This project intends to use nature-based restoration to improve coastal habitat and protect a critical transportation artery for local communities and commerce. The reserve was identified as a critical partner in this effort by representatives from the local planning authorities, the Florida Fish and Wildlife Conservation Commission, and other participants. The reserve's knowledge of the area, collaborative expertise, experience with implementing effective living shoreline techniques, and partnerships have helped bring this project to life. With funding support from the Florida Coastal Management Program, the reserve helped guide the analysis of the initial vulnerability assessment and identified the stretch of Highway 98 between Eastpoint and Carrabelle as a high priority for additional protection. The reserve held public meetings and other meetings with stakeholders to further refine the scope of the project and identify suitable project sites, and piloted a demonstration

project within the reserve. Ultimately the project team received funding from the National Fish and Wildlife Foundation in 2020 to carry out the project.

Accomplishment: The Office for Coastal Management applauds the Apalachicola Reserve's commitment to convening strong regional partnerships that have resulted in improved local resilience. Stakeholders reflected on multiple examples including the many living shoreline projects within the reserve, the Franklin 98 project, and the reserve's role in standing up the Panhandle Estuarine Restoration Team (PERT).

The Apalachicola Bay area is experiencing significant climate change impacts and associated ecological and sociocultural transitions. The monitoring, research, outreach, and engagement done by the reserve is both building knowledge about current and projected impacts, and helping resource managers and the local community plan for resilience.

The reserve has deployed an impressive array of surface elevation tables (SETs) to monitor sea level rise-driven change in the marshes; there are 24 SETs throughout the Apalachicola Bay system, with four new SETs installed near the visitor's center to demonstrate to visitors and students how sea level rise is being tracked. Recently, transects have also been established out into the water to monitor changes in critical seagrass habitat. The reserve's long-term and active participation in the Ecological Effects of Sea Level Rise in the Northern Gulf of Mexico project, funded by NOAA's National Centers for Coastal Ocean Science, has helped produce a wealth of data and modeling products; this information is now informing both natural resource management and community resilience planning, as well as future modeling efforts.

The stewardship coordinator at the reserve has led an effort to monitor the emergence and spread of two species of mangroves in the area, a clear indicator of tropicalization driven by climate change. A recently published paper by the stewardship coordinator on this work is an important contribution to the literature, informing resource managers across the country who are working to plan for habitat transitions. Additionally, the reserve research coordinator has been working to connect water quality information with biological information, and has initiated a new zooplankton monitoring effort. These efforts provide critical insights into climate-driven changes, for example, by showing how increased salinities in the bay when water flows are low result in changes to the biota.

In addition to all this work on the ecological side, the reserve has been initiating and supporting conversations and workshops about the resilience of the built environment. By sharing information on topics such as sea level rise projections, mitigation actions that can reduce flood insurance premiums, and strategies for protecting historic structures, the reserve is helping the City of Apalachicola understand future risks and move toward resilience actions. This project has identified ten potential projects in the city's historic district to improve the resilience of the community to future hazards. The reserve has brought in experts and helped secure grants to work on these efforts.

Stakeholders discussed new approaches for handling uncertainty of sea level rise data and stated that the reserve is the first place to be able to operationalize this new approach. Climate change research questions that the reserve could address include a continuation of

biogeophysical research on sea level rise, marsh model validation, mangrove expansion, and social science focused on sea level rise and resilience.

There is opportunity to further explore the connections between social science, sea level rise, and tropicalization. In addition, long-term environmental data could inform interdisciplinary efforts and explore connections to ecosystem services valuation and education.

Accomplishment: The Office for Coastal Management recognizes the reserve's exceptional leadership in understanding climate change impacts and associated transitions affecting the Apalachicola Bay ecosystem through foundational research and long-term data. The reserve has fostered conversation and actions to further community resilience and support the social and ecological resilience of the region.

Stakeholders noted that the reserve has been supportive of the Conservation Corps of the Forgotten Coast since the youth corps was established in 2014. This is an important partnership because of the assistance the reserve receives with resource management responsibilities through volunteer hours provided by the corps youth. In turn, staff are very supportive of the corps, provide mentoring and guidance, and have been instrumental in providing professional training. The corps would not be able to do the work they do without the partnership with the reserve. Conversely, some of the restoration projects such as the Franklin 98 living shoreline project would not be as successful without involvement from the Conservation Corps through the added manpower capacity they provide.

The corps helps with other living shoreline projects, exotics control, primitive trail maintenance, and prescribed burns by providing the labor needed to carry out this work, and while the corps youth are working on these efforts they are learning skills that can be used in the future. The reserve staff have helped several corps members secure jobs with area resource management agencies, including one person who joined the reserve staff. The corps decided to locate their headquarters across the street from the reserve, which will facilitate even greater collaboration. Future corps projects focus on launching an oyster shell recycling program, and helping with the demonstration of oyster aquaculture lease projects in the bay.

Accomplishment: The Office for Coastal Management commends the Apalachicola Reserve for developing a strong partnership with the Conservation Corps of the Forgotten Coast to implement on-the-ground stewardship activities and priorities of the reserve, while raising the capacity of corps youth.

The new memorandum of agreement between Florida State University and the reserve presents opportunities for both the reserve and the university's Coastal and Marine Laboratory. Under this memorandum, six of the eight reserve staff positions currently employed under the Florida Department of Environmental Protection's Other Personnel Services mechanism will transition to being employees of the university. For the university, this agreement will result in expanded engagement with reserve staff in the Apalachicola area, access to data, and access for students to the natural resources and reserve facilities and equipment. For the reserve, this agreement means staff will receive benefits, which can help increase staff satisfaction and prevent turnover. The potential for greater collaboration with the marine lab is also a benefit

for the reserve, as the lab is an important player in regional natural resource management initiatives such as the Apalachicola Bay System Initiative. This new agreement allows new paths to expand the mission of the university's lab through more exchange of staff between the lab and reserve. Monthly meetings with reserve staff will facilitate interactions between the reserve and the lab.

Accomplishment: The Apalachicola Reserve and Florida Department of Environmental Protection are commended for entering into a memorandum of agreement with Florida State University. Through this agreement, multiple Other Personal Services staff will transition to Florida State University contract employees through a purchase agreement. This approach replicates similar personnel actions by the other Florida research reserves, and will provide significant benefits to both the reserve and the Florida State University Coastal and Marine Lab.

During the evaluation meetings we learned about some opportunities to provide additional training or enhanced onboarding, and to reorganize existing positions to better support areas of need. The incoming interns could be required to do pre-field work training to make them more prepared to contribute to different opportunities to help at the reserve during their limited time there. Boating certifications and other skills-based trainings could be organized so these interns can participate in various management activities. Additionally, the reserve may want to discuss increasing the number of interns that the Friends of the Reserve can support to increase capacity.

The Stewardship Program at the reserve has expanded its scope since 2014, and much of it directly contributes to the resilience of the reserve. As resilience work across the state expands and additional funding is made available to do this work, the reserve should consider creating a resilience coordinator position within the Stewardship Program. Due to the increased visitors to the reserve and new residents coming to the area, now may also be a good time to initiate a citizen science program at the reserve to supplement some areas of the research portfolio that need additional capacity. Additional monitoring and maintenance of the various access points for the reserve, including the Marshall House and Little St. George Island, were mentioned as a growing need, and there may be potential for expanding camp hosts at the reserve who have traditionally provided volunteer hours for the education programs. The existing Park Service positions at the reserve were discussed as potentially being reorganized to better fit some of these expanding needs of the reserve.

Recommendation: The Office for Coastal Management encourages the Apalachicola Reserve to explore opportunities to strategically reorganize existing positions and expand collaborations with partners vested in complementary efforts to increase capacity focused on resilience and recovery of Apalachicola Bay. The reserve is reaching its capacity to support the research and stewardship needs of the bay.

Since the oyster fishery collapse, the reserve has been engaged with the fishing industry and research community to work on understanding the issues that caused the collapse. The reserve will continue to play a critical role in supporting the Apalachicola Bay System Initiative by providing historical data, collecting new data, convening meetings, and strategically connecting

people within the research community. Some participants suggested that a good role for the reserve may be to pilot an oyster monitoring program that could be expanded to the rest of the state. Meanwhile, it can't be overstated how much the livelihoods for many people in the area are affected by the collapse and, because the fishing heritage of the community is generations old, how much that heritage is an important and prominent part of the area's identity. While many hope that oysters can be successfully restored in Apalachicola Bay, it will take time. Several multi-million-dollar projects are adding shell material and limestone into historically productive areas, but there are currently limited amounts of oyster shells available for this. Therefore, the reserve's consideration of an oyster shell recycling program with area restaurants and other partners could help to address some of the factors limiting the restoration of oyster habitat in the bay.

As restoration efforts continue, area communities are also considering the potential for oyster aquaculture as a way to sustain and even grow the seafood economy. The reserve is positioned to monitor the ecological and economic impacts of oyster aquaculture leasing in the bay. The reserve has the science and education staff needed to create education and outreach programming to show how oyster aquaculture works and explain it to the visiting public. This could improve visibility for aquaculture for the future of the bay, and with careful messaging, may increase acceptance and support because it comes from a trusted entity such as the reserve. In addition, the reserve can provide continued outreach at area events such as the Seafood Festival and Estuaries Day to help both residents and visitors understand the ecology and the culture, and to lead people to minimize their impacts and do their part to protect the health of the ecosystem.

Recommendation: The Office for Coastal Management encourages the Apalachicola Reserve to continue pursuing opportunities to restore a sustainable oyster fishery, maintain the local seafood culture, and work with local communities and visitors to engage them in stewardship and develop their appreciation of the Apalachicola Bay ecosystem.

Evaluation Metrics

Beginning in 2012, reserves began tracking their success in addressing three evaluation metrics specific to their programs. The evaluation metrics include a five-year target and provide a quantitative reference for each program about how well it is meeting the goals and objectives it has identified as important to the program. In 2017, reserves began a new five-year period and set targets specific to their programs based on measures from existing National Estuarine Research Reserve System performance measures.

Evaluation Metrics: 2012-2017

Goals and objectives for the following metrics are from the Apalachicola National Estuarine Research Reserve (ANERR) Management Plan 2012–2017.

METRIC 1

Goal: An informed public that is aware of environmental issues and has a sense of stewardship for resources within ANERR (Goal 1.1 in management plan).

Objective: By 2017, increase public awareness of opportunities to access and enjoy reserve-managed lands and waters (Objective 1.1.1 in management plan).

Strategy: ANERR will establish and maintain trail systems with interpretive signage within the reserve's boundaries to allow the public to learn more about the habitats and species that are commonly found along the Gulf coast. Nature trails would be used for self-guided tours and for lectures/classes offered by the reserve. The initial trail will be established at the new ANERR facility which is situated on approximately 26 acres of prime coastal uplands along Apalachicola Bay. While the property consists of several fragmented, modified areas, it also exhibits common natural communities found along Florida's Gulf coast. An array of wildlife utilizes the property, including several species of birds, most notably a pair of bald eagles. The shoreline of the property is susceptible to erosion and through mitigation projects, two living shoreline projects have been established to help with stabilization. A trail system at the facility would allow the public to learn more about the habitats and species that are commonly found along the Gulf coast. They would be able to learn about restoration efforts including living shorelines and prescribed burning. Other demonstration areas could be integrated into the trail system such as xeric gardening, butterfly gardening and green building practices. This strategy is discussed in more detail in the Apalachicola NERR Management Plan Draft on pages 76 and 82.

Performance Measure: Number of linear feet of nature trails with interpretive signs established on reserve-managed lands.

Target: 2,500 linear feet of nature trails with interpretive signs established on reserve-managed lands.

Results:

Year 1 - Year 2: 1,600 linear feet of nature trails

Year 3 - Year 5: 30,080 linear feet of nature trails

Total: 31,680 feet

Discussion: During the implementation period for this metric, the reserve completed 1,600 feet of Americans with Disabilities Act (ADA) compliant boardwalk during the first two years that included a telescope mounted at the end of the boardwalk for viewing the bay, upland habitats, and a nearby eagle nest. An additional 30,080 feet of nature trails were completed on reserve-managed land over the remaining three years. The reserve has far exceeded its target of 2,500 feet by 2017 and is commended for the additional trails provided at the reserve.

METRIC 2

Goal: Identify potential effects of climate change (increased temperature, sea level rise, ocean acidification) on the resources of ANERR (Goal 5.1 in Management Plan).

Objective: By 2017, the reserve will identify the potential impacts of climate change on natural resources within ANERR (Objective 5.1.2 in Management Plan).

Strategy: The reserve has already begun the process of becoming an established sentinel site for climate change. Establishing sentinel sites for climate change is a priority for the n as well as NOAA, and ANERR is part of the Northern Gulf of Mexico Sentinel Site Cooperative. In late 2011, three locations within the lower river marshes of the Apalachicola River were identified as sites for more intensive monitoring. These sites are located where the freshwater tidal marsh meets the floodplain forest, an area which is susceptible to changes in riverflow, flooding frequency, and sea level rise. Two transects at each site will cross these two habitat types. Regular sampling of quadrats along these transects will provide information about the species composition of vegetation and how it changes relative to several factors. Surface Elevation Tables (SETs) were installed at the sites to measure rates of erosion and accretion in these two natural communities. The ANERR water quality monitoring sites, dune erosion profile sites and SETs were surveyed to benchmarks. The vegetation transects will be surveyed annually after they are established. Regular monitoring will be integrated into the reserve's current monitoring program per NERR vegetation monitoring guidelines. Data produced will be public and made available to modelers to determine the potential impacts of coastal inundation. Performance will be based on the reserve's ability to maintain monitoring at specific locations at regular intervals as well as geodetic control of all sampling locations.

Performance Measure: Number of emergent vegetation transects established and monitored.

Target: Six emergent vegetation transects established and monitored.

Results:

Year 1: 3 emergent vegetation transects established.

Year 2: 3 emergent vegetation transects established.

Year 3: 6 emergent vegetation transects established in years 1 and 2 are monitored.

Year 4: 6 emergent vegetation transects continue to be monitored.

Year 5: 6 emergent vegetation transects continue to be monitored.

Total: 6 number of emergent vegetation transects established and monitored.

Discussion: The target for this metric was met successfully after the installation of six vegetation transects in 2012-2014. These new transects were monitored semiannually starting in year 3 for the remainder of the evaluation period and the QA/QCed data were submitted to the Centralized Data Management Office. The reserve quickly met the target that was set and has been processing and providing the data regularly since the vegetation transects were established.

METRIC 3

Goal: Maintain biodiversity, abundance and productivity within ANERR (Goal 2.1 in management plan).

Objective: By 2017, use monitoring data and peer-reviewed literature to support science-based decision-making and promote best management practices (BMPs) within communities in the region (Objective 2.1.1 in management plan).

Strategy: Water quantity is perhaps the largest issue impacting the health and productivity of Apalachicola Bay. Currently the reserve provides expertise on the impacts to resources in the bay due to water allocation changes within the Apalachicola-Chattahoochee-Flint watershed. The reserve will continue to collect and provide these data. The reserve will also provide information based on research data on water quality, nutrient concentrations, species distribution and abundance within the reserve. Through educational and training programs, the reserve will continue to use these monitoring data and information from peer-reviewed literature on best management practices to engage local and regional stakeholders and decision-makers so that they are aware of the condition of the resources of the reserve, specific impacts on the resources, and means of mitigating these impacts. Participants in BMP training will complete evaluations to indicate whether they have increased their knowledge of BMPs.

Performance Measure: The percent of regional and local decision-makers attending ANERR best management practices training per year who show an increased knowledge of science-based BMPs that support biodiversity in the ANERR.

Target: 90% of regional and local decision-makers attending ANERR best management practices training per year show an increased knowledge of science-based BMPs that support biodiversity in the ANERR.

Results:

Year 1: 99.6% of regional and local decision-makers show increased knowledge

Year 2: 100% of regional and local decision-makers show increased knowledge.

Year 3: 100% of regional and local decision-makers show increased knowledge.

Year 4: 99.6% of regional and local decision-makers show increased knowledge.

Year 5: 99.6% of regional and local decision-makers show increased knowledge.

Total: 99.7% of regional and local decision-makers show increased knowledge

Discussion: The reserve surpassed the target set for this metric of 90% of decision-makers attending best management practice trainings who reported increased knowledge, and nearly achieved 100% for all years. Clearly these trainings are effective at increasing knowledge for the target audience of decision-makers in the area—well done!

Evaluation Metrics 2017-2022

The goals and objectives for the following metrics are from the Apalachicola National Estuarine Research Reserve (ANERR) Management Plan (2015-2020).

METRIC 1

Goal: Facilitate the use of sustainable land use planning strategies and best management practices for areas adjacent to ANERR

Objective: Provide information on best management practices to direct residential and commercial development projects in the watershed.

Strategies:

- Produce short videos (work with Northwest Florida Aquatic Preserves) less than 2 minutes in length
- Produce brochures that increase stewardship within the reserve boundaries on living shorelines, bay friendly living, and low impact development
- Work with Department of Environmental Protection's Regulatory office and Water Management District on streamlining living shoreline permitting process
- Hold regional Living shoreline summit. Encourage the creation of statewide living shoreline brochure and technical webpage
- Increase ANERR staff capacity to train on living shorelines
- Utilize existing Living Shorelines as demonstration locations
- Engage the public/volunteers in implementation of new Living Shorelines (ex. Marshall House/Little St. George Island)

Performance Measure: From 2017-2022, the number of Coastal Training Program workshops related to the use and monitoring of living shorelines.

Target: From 2017-2022, the reserve will implement 15 Coastal Training Program workshops related to the use and monitoring of living shorelines.

Results:

Year 1: 6 Coastal Training Program workshops related to living shorelines

Year 2: 3 Coastal Training Program workshops related to living shorelines

Year 3: 5 Coastal Training Program workshops related to living shorelines

Year 4: 0 Coastal Training Program workshops related to living shorelines

Year 5:

Total to date: 14 Coastal Training Program workshops related to living shorelines

Discussion: Despite the impacts of the COVID-19 pandemic, the reserve has been able to offer 14 trainings focused on living shorelines between 2017 and 2020. The target of 15 trainings by June 2022 is well within reach. The reserve has provided virtual trainings and only needs to focus one more on living shorelines by June 2022 to satisfy the target. Given the broader reach of virtual formats, the reserve should consider continuing this type of training opportunity in the future.

METRIC 2

Goal: Increase capacity and support for the reserve through opportunities that engage community members and students directly in reserve activities.

Objective: Increase public awareness of the reserve’s natural and cultural resources.

Strategies:

- Develop annual communications plan
- Continue targeted lectures and events
- Produce at least three exhibits in transitional space at the Nature Center per year
- Continue diversity of exhibits including art
- Diversity of workshops (art and science)
- Have volunteers capture data on visitors and how they found us
- Have staff capture data on use of Multipurpose Room/Facility
- Targeted advertising strategies based on visitor feedback
- Develop new video for the reserve
- Develop various videos that tell “our story” – YouTube channel- share links on website, etc.

The baseline attendance for “Number of walk-in visitors at NERRS education/visitor center” + “Number of people reached through public/outreach activities” + “Conservation action education programs” from July 2016-June 2017 is 30,013.

Performance Measures: From 2017-2022, the percentage increase in number of visitors to the nature center, number of people reached through public/outreach activities, and conservation action education program participants.

Target: From 2017-2022 a 10% increase in number of visitors to the nature center, number of people reached through public/outreach activities, and conservation action education program participants. (By 2022, 33,146 visitors to the nature center, number of people reached through public/outreach activities, and conservation action education program participants)

Results:

Year 1: 30,274 visitors or participants in activities or conservation action education programs.

Year 2: 23,131 visitors or participants in activities or conservation action education programs.

Year 3: 19,401 visitors or participants in activities or conservation action education programs.

Year 4: 5,347 visitors or participants in activities or conservation action education programs.

Year 5:

Total to date: There has not been a percentage increase in number of visitors or participants in activities or conservation action education programs.

Discussion: According to data available since 2017, the reserve has had fewer visitors each year than the baseline, indicating a need for sustained efforts to promote visitation and increase outreach activities. The COVID-19 pandemic certainly impacted visitation and programming in 2020 and 2021, so a decrease in numbers is no surprise. However, based on the discussions during the evaluation about the popularity of the reserve's programming, once the pandemic is over, the programs and visitors to the nature center will likely resume to pre-pandemic levels and the reserve may once again engage in its efforts to increase the numbers to the desired goal.

METRIC 3

Goal: Increase capacity and support for the reserve through opportunities that engage community members and students directly in reserve activities

Objective: Build partnerships with volunteer organizations, researchers, stakeholders and others that ensure community involvement in accomplishing reserve activities.

Strategies:

- Develop plans for each group: volunteers, interns, conservation corps groups
- Solicit new groups/individuals underrepresented (stakeholders)
- Identify specific short-term projects for each group
- Develop fellowship program to assist sea turtle nest monitoring personnel
- Identify incentives for participants: housing, course credit
- Develop capacity (Nature Center or website) to match potential volunteers with appropriate projects.

The baseline for July 2016-June 2017 is 4,763 volunteer hours

Performance Measure: From 2017-2022, the percent increase in the number of volunteer hours as measured by the NERRS Volunteer Index.

Target: From 2017-2022, a 50% increase in the number of volunteer hours as measured by the NERRS Volunteer Index. (By 2022, 7,145 volunteer hours)

Results:

Year 1: 11,364 hours -- 239% increase

Year 2: 16,640 hours -- 349% increase

Year 3: 13,544 hours -- 284% increase

Year 4: 22,369 hours -- 470% increase

Year 5:

Total to date: The reserve has met its target every year.

Discussion:

The reserve has far exceeded the target it set for a 50% increase in the number of volunteer hours between 2017 and 2022. The amount of volunteer hours has increased significantly from the 2016-2017 baseline and has been sustained over time. The successful partnership between the reserve and the Conservation Corps of the Forgotten Coast established during this period is responsible for a significant portion of the increased hours. Continue the great work!

Conclusion

For the reasons stated herein, I find that the Florida Department of Environmental Protection is adhering to the programmatic requirements of the Coastal Zone Management Act and its implementing regulations in the operation of its approved Apalachicola National Estuarine Research Reserve.

These evaluation findings contain six recommendations. Recommendations must be considered before the next regularly scheduled program evaluation but are not mandatory at this time. Recommendations that must be repeated in subsequent evaluations may be elevated to necessary actions.

This is a programmatic evaluation of the Apalachicola National Estuarine Research Reserve that may have implications regarding the state's financial assistance awards. However, it does not make any judgment about or replace any financial audits.



1/14/2022

Jeffrey L. Payne, PhD
Director
NOAA Office for Coastal Management

Date