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## Heritage Monitoring Scouts: Engaging the Public to Monitor Sites at Risk Across Florida

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### ABSTRACT

Along Florida's nearly 13,000 km of shoreline, nearly 4000 archaeological sites and over 600 recorded historic cemeteries are at risk from climate change impacts including coastal erosion and a 2-metre rise in sea level. In 2016, the Florida Public Archaeology Network (FPAN) created the Heritage Monitoring Scouts (HMS Florida) programme to engage the public in monitoring sites at risk. The programme grew quickly during the first year of operation to include 233 volunteers who submitted 312 monitoring forms. The programme exists beyond the singular act of a volunteer reporting site conditions; across Florida, varied combinations of local partnerships present unique opportunities for programmes, for example, the pilot program at the Guana Tolomato Matanzas National Estuarine Research Reserve. Preliminary outcomes from the first year of HMS Florida and the pilot indicate the programme is effective in public engagement and a powerful management tool for tracking change to sites over time.

### KEYWORDS

Public engagement; climate change; citizen science; heritage at risk; monitoring

Just as our resources are becoming recognized as a 'distributed observing network of the past' [and] as multiple libraries of Alexandria rich with data for many disciplines . . . we are realizing the extent and urgency of the threat. Our libraries are on fire right now. (McGovern 2017)

In Florida, as in other places around the world, archaeologists are responding to the global threat of climate change. Threats to cultural resources include rising sea levels, warmer temperatures, thawing permafrost, increased storminess, worsening wildfires, coastal inundation, and erosion (NPS 2016; Anderson et al. 2017; Markham 2017). In addressing heritage at risk, Nimura et al. (2017, 3) challenged archaeologists to 'strive to better integrate public-driven approaches'. Responders would do well to remember that destruction of the archaeological record is not just a library on fire, as McGovern (2017) argues, but a *public* library on fire. As public libraries serve the community and are administered by local government, archaeologists must not only consider how to interpret this problem for the public and offer a wide range of activities for adults and children to increase their scientific literacy, but should also assist local governments that serve as library managers.

The Florida Legislature did not create the Florida Public Archaeology Network (FPAN) in 2005 to address heritage at risk from climate change impacts, but over the course of a

decade, FPAN staff turned their attention to this rising concern. They began with conference participation, which transitioned to developing programmes for the public and increasing partnerships with other conservation-minded organisations. This led to the development of the Heritage Monitoring Scouts (HMS Florida) and subsequent pilot programmes, for example a series of training opportunities conducted in partnership with Guana Tolomato Matanzas National Estuarine Research Reserve (hereafter, Reserve).

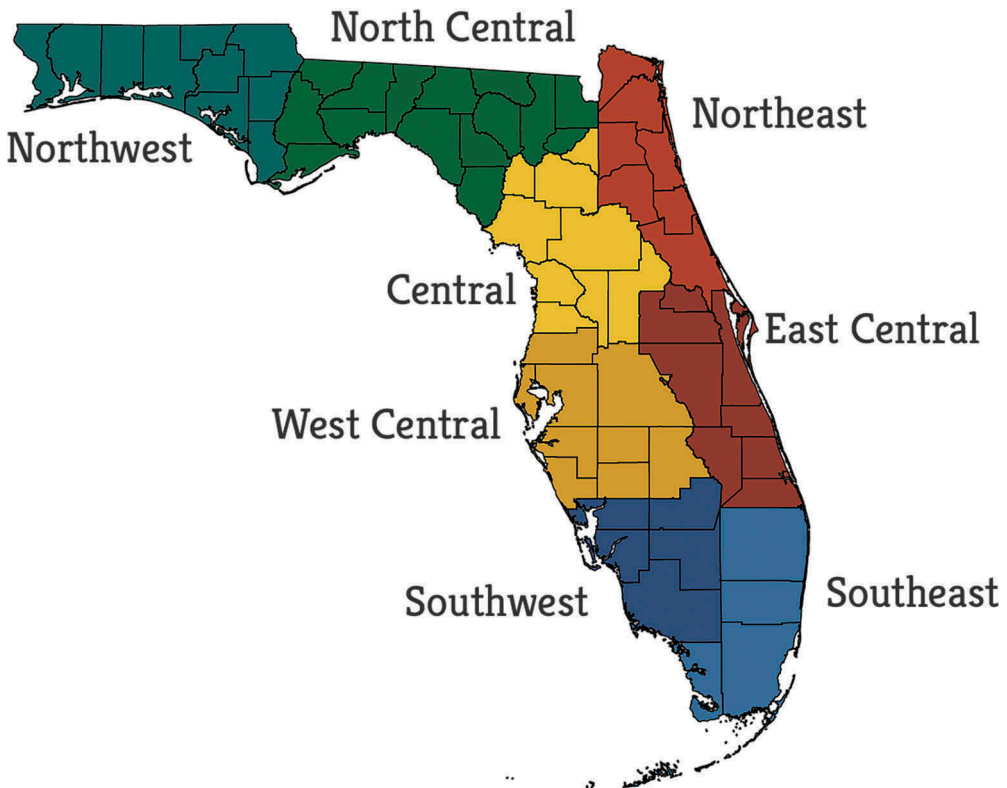
The first section of this paper describes the creation of the HMS Florida programme by Sarah Miller (FPAN Regional Northeast/East Central Director) in close collaboration with Emily Jane Murray (FPAN Northeast) and Kevin Gidusko (formerly FPAN East Central) with contributions by FPAN staff in other regions including Jeff Moates, Sara Ayers-Rigsby, Rebecca O'Sullivan, Rachael Kangas, Mike Thomin, Robbie Boggs, Barbara Clark, Tristan Harrenstein, Nicole Grinnan, Kassie Kemps, Nigel Rudolph, Mallory Fenn, Della Scott-Ireton, and William Lees. The authors conducted all the work described and have first-hand knowledge of reflections shared that contribute to this evaluation from the first year. The second section discusses the HMS Florida pilot programme at the Reserve in detail, led by Emily Jane Murray with contributions by Sarah Miller and Robbie Boggs. As part of the *Burning Libraries* volume, the authors hope to contribute to the growing body of integrated community engagement programmes that lead to improved management strategies and conservation efforts for archaeological sites.

## Launching HMS Florida

### *FPAN and the Rising Seas*

The Florida State Legislature approved funding for the FPAN in 2005 to help stem the rapid deterioration of the state's buried past (Bense 2005). The steering committee established by statute further fleshed out goals to guide the organisation, namely to: (1) provide education and outreach, (2) assist local governments, and (3) assist the Florida Division of Historical Resources. The steering committee also created eight regions across the state hosted by local institutions – currently University of West Florida (UWF), Flagler College, University of South Florida (USF), and Florida Atlantic University (FAU), and staff to carry out the mission (Figure 1). In the beginning, each centre developed unique programming, but over time 'thinking like a network' resulted in several uniform statewide programmes (Lees, Scott-Ireton, and Miller 2016, 100).

FPAN's turn to sites at risk due to climate change began in 2012 when Adrienne Burke, a city planner for Fernandina Beach, contacted FPAN's Northeast Regional Center with concerns about potential impacts from rising sea level at a city-owned historic cemetery. Mutual concern for the cemetery grew into a larger apprehension about the future of cultural resources in general, which became the focus of the Cultural Resources and Sea Level Rise panel at the 2013 Florida Trust for Historic Preservation conference in St. Augustine (Miller 2013). FPAN presented on potential impacts of sea level rise on archaeological sites in Florida and included a map of Florida by Vincent Birdsong (2012). The map, a predictive model based on elevations reported on Florida Master Site File (FMSF) listings, gave archaeologists and preservationists the first rough estimates of cultural resources to be impacted by sea level rise: 1-metre rise resulting in 16,015 resources affected and 2-metre rise resulting in 34,786 resources affected (Figure 2). At

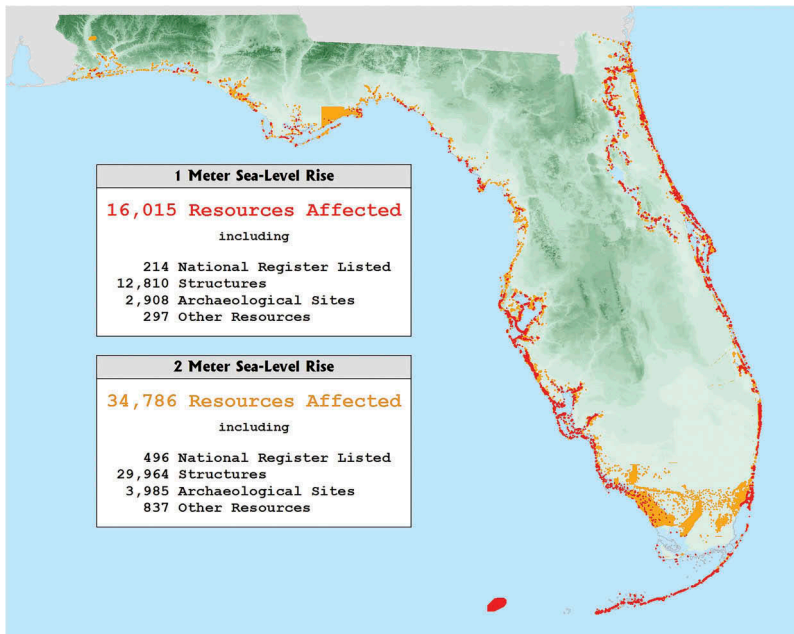


**Figure 1.** Regional centers of the Florida public archaeology network. Source: Florida Public Archaeology Network 2018.

the same time, climate change was – and still is – a politically taboo topic in state government. However, most agree that we ‘already have a stressed coastal situation without the spectre of a significant increase in the rate of sea level rise’ (Hine 2016, 32).

Realising the enormous scale of the problem, FPAN set out to first educate themselves and then turned to educating the public. Ultimately, staff developed a Sea Level Rise (SLR) workshop based on a template used with success for previous FPAN workshops: (1) Heritage Awareness Dividing Seminar for dive instructors, (2) Submerged Sites Education and Archaeological Stewardship for sport divers, and (3) Cemetery Resource Protection Training (CRPT) for cemetery stewards (Scott-Ireton 2011, 2014; Miller 2015). These FPAN programmes all deliver formal instruction in a classroom followed by a hands-on component in the field to put lessons learned from the classroom into practice. All workshops provide a binder of information for participants to take back to their community as a shared resource.

With background information and a fleshed-out template in hand, staff facilitated three SLR workshops in 2015. The first offering took place in Marineland along Florida’s northeast coast in partnership with the Reserve’s southern component along the Matanzas River – not to be confused with the Reserve’s northern component along the Tolomato and Guana River estuaries featured in the second half of this paper – and nearby Washington Oaks State Park. Ninety miles north, the City of Fernandina Beach and Fort



**Figure 2.** Known cultural resources in Florida potentially affected by sea level rise. Source: reproduced with permission from Vincent Birdsong 2012.

Clinch State Park partnered with FPAN for the second workshop. The third training on Merritt Island, located 177 km south of Marineland midway down the eastern shore of the state, presented an opportunity to partner with the Environmental Endangered Lands (EEL) programme at the historic Sams House site owned by Brevard County.

While the SLR workshops showed good effort, they failed to realise the stewardship goals met by the other programmes. The workshop succeeded in informing the public about predictive models, identifying environmental threats to archaeological sites, and discussing resiliency strategies. A fixed hands-on activity to suit all the locations, however, never came to fruition. At the first SLR workshop, FPAN staff led participants to a coastal site identified after Hurricane Isaac scoured the shore. Participants then travelled to Washington Oaks further up the coast to observe resiliency strategies in place at the park. Neither activity allowed participants to visualise the resource the training aimed to protect. On the beach, sand again covered the scoured site. At the park, a seawall installed as a protective strategy now covered any evidence of the site to be monitored and conditions observed at low tide did not stir the hoped-for sense of urgency. At the second SLR workshop, planner Adrienne Burke facilitated the Game of Floods (County of Marin 2015). The game proved effective at encouraging participants to deliberate over resiliency strategies, but discussion turned away from managing cultural resources to panic over homes and access to essential services. At the third training, EEL staff used wooden stakes to show where the land surrounding Sams House – the oldest standing structure in the county – would meet the rising waters from the Intracoastal Waterway at a 1- and 2-metre rise in sea level. The stakes helped generate discussion but did not create an activity volunteers could replicate elsewhere.

The binder also proved problematic. Given the topic of heritage at risk due to climate change, printing off hundreds of pages for binders ran contrary to the conservation efforts of the programme. In the end, staff transitioned the resource binder for SLR resources into a shared folder on Dropbox and reusable thumb drives as funding allowed.

### ***Shoreline Monitoring and Stewardship***

A turning point came after the 2016 Society for American Archaeology (SAA) annual meeting in Orlando that led to awareness of a new paradigm in site stewardship, a plan to launch a similar site stewardship programme in Florida, and partnership building. First, FPAN staff knew of the Scottish Coastal Archaeology and the Problem of Erosion (SCAPE) organisation and their Scotland Coastal Heritage at Risk Project (SCHARP) programme, but the SAAs provided an opportunity to meet SCAPE founders Tom Dawson and Joanna Hambly to talk at greater length about their unique approach in engaging the public to monitor sites at risk. SCAPE, based at St. Andrews University, released the location of coastal sites identified from coastal zone surveys to their ShoreUPDATE app, which allowed the public to download site descriptions and upload condition reports (Hambly 2017; Hamby and Dawson 2017). After local volunteers monitored 940 prioritised sites, SCAPE led subsequent excavation of 14 sites, again with community volunteers. The SCHARP programme exceeded SCAPE's expectations. In total, 486 community volunteers submitted 1074 surveys of previously recorded sites and contributed 400 new sites using the ShoreUPDATE app.

After the SAAs, Tom Dawson and Joanna Hambly travelled by invitation to Flagler College in St. Augustine with a request to meet with FPAN and learn more about CRPT, their novel approach to community engagement in historic cemeteries. While the visit did not outright solve the afternoon field component problem of the SLR workshops, it helped FPAN staff to realise the solution lay in their community engagement roots and strength as a statewide organisation to reach scores of communities. The relationship with SCAPE continues with reciprocal visits to Scotland and Florida to observe shoreline monitoring in action.

A second significant step after the SAAs involved a partner meeting in Tallahassee. The partner meeting, initiated by FPAN staff and hosted by the Florida Bureau of Archaeological Research (BAR), included representatives from Florida State University, University of Florida, National Park Service (NPS) Southeastern Archaeological Center, FMSF, and the Tallahassee chapter of the Florida Anthropological Society (FAS). There, FPAN proposed HMS Florida and presented the framework for how the programme would operate. The assembled representatives gave vital feedback and a consensus to move forward. FPAN staff then went to work addressing stated concerns and fleshing out guiding documents for the programme.

After receiving a green light from the partners assembled, the former SLR workshop model shifted from an in-person workshop like CRPT to a more organic citizen-science programme accessible by internet to anyone with a computer or cell phone. Online presence for the programme started with the creation of a landing page ([www.fpan.us/hmsflorida](http://www.fpan.us/hmsflorida)) (Figure 3). FPAN needed to recruit volunteers for the programme who demonstrated sensitivity to cultural resources; therefore, staff researched and created an application form requiring a pledge to abide by the FAS's code of ethics (Appendix 1).



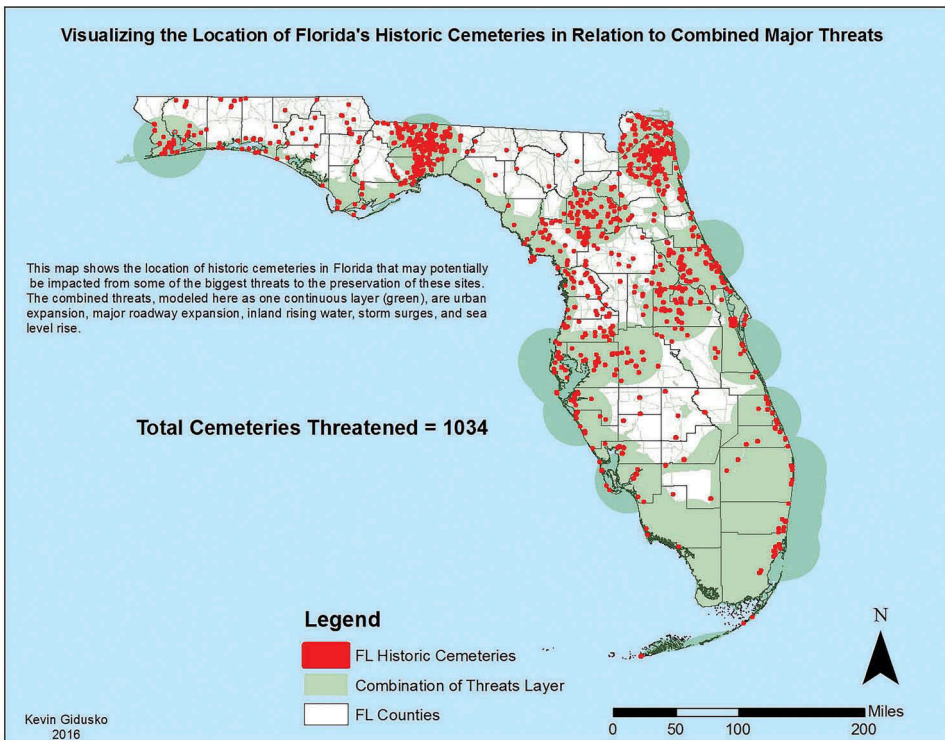


**Figure 3.** Landing page for HMS Florida (beta version 2016–2018). Source: Florida Public Archaeology Network 2018.

Staff then turned to standardisation of information the volunteers would collect and ostensibly submit via smartphone (Appendix 1). Research for the monitoring form included compiling and comparing information from successful site stewardship programmes, such as TVA’s Thousand Eyes (Pritchard 2015), California (Newland 2014), SCAPE (Dawson 2016), and existing monitoring forms provided by Florida State Parks (FSP) and BAR. Over time, programme managers posted more resources and how-to links as needed.

FPAN staff anticipated trepidation over release of site location information and discovered several creative workarounds. SCAPE’s model assumes site locations are

public information and leans heavily on Scotland's Land Reform Act of 2003 (commonly known as 'freedom to roam', see <https://www.scotways.com/faq/law-on-statutory-access-rights>). In the United States, however, archaeological site information is not public and site access depends on property ownership and trespassing laws. In some cases, rather than releasing site locations on the website, staff sent approved volunteers site information directly to monitor targeted locations. This works well in the case of FSP, which manages 2536 archaeological sites and 580 historic structures on public land (William Stanton, personal communication 9 June 2017). In other cases, staff appealed to scouts to visit archaeological sites already interpreted and open to public visitation to resolve some of the site protection issues. Historic cemeteries, considered public record in Florida, provided another 1200 sites where volunteers could initiate monitoring activities. In fact, historic cemeteries represent one of the largest and most threatened site types across the state (Figure 4). Locations of historic structures, like historic cemeteries, are also public information. Whereas SCAPE does not include structures in SCHARP assessments, the debate over inclusion of historic structures for HMS Florida remains ongoing with a pilot study in Fernandina Beach underway. Since public interest drives the programme, FPAN staff decided no cultural resource should be off the table if the public demonstrated willingness to monitor the site.



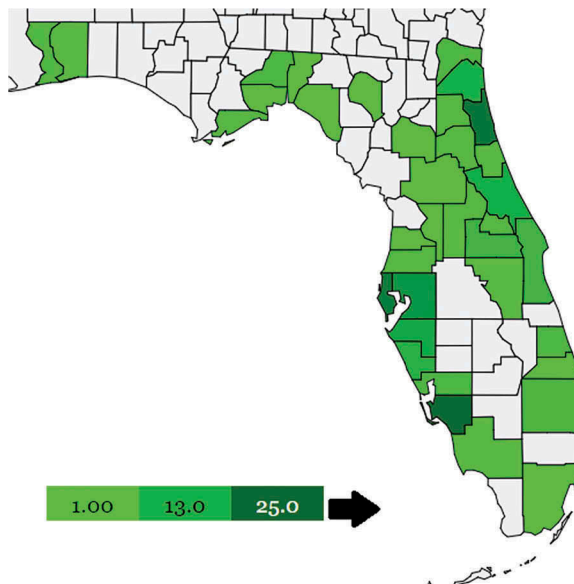
**Figure 4.** Threats at recorded historic cemeteries across the state. Adapted from and reproduced with permission, Kevin Gidusko 2016.



### **Launch of HMS Florida and Preliminary Outcomes of the First Year**

Starting in August 2016, participation in the programme grew to 46 out of 67 possible counties based on where scouts monitor, where scouts live, where programme partners are located, and where training activities take place (Figure 5) (Miller 2017). During the first year of HMS Florida, 233 volunteers applied for the programme. The volunteers reside in 36 different counties representing 87 communities throughout Florida and 3 live out of state. In a year, volunteers submitted 312 monitoring forms. In addition to the monitored sites, they reported 19 sites not previously listed on the FMSF. Not all scouts who applied to the HMS Florida programme are active. Of the 233 people who applied, only 76 submitted a monitoring form or multiple forms for several sites, for example, 13 of the 76 scouts submitted 10 or more monitoring forms. Some of the scouts monitor in groups, which may account for the lower rate of active volunteers. Additionally, scouts do not necessarily monitor where they live. One of HMS Florida's most active volunteers, for example, monitors sites in adjacent Jefferson County, leaving no sites monitored in the volunteer's county of residence.

As a public engagement programme, FPAN evaluates volunteer participation by categories defined by Rosenblatt's (2010) engagement pyramid model. Since the launch in August 2016, just over 15,000 people are observing and following the programme measured by members of the EnvArch Facebook page (<https://www.facebook.com/groups/EnvArch/>) and page views on the HMS Florida landing page or associated blog posts. A total of 233 people endorsed the programme by signing up. Seventy-six scouts are contributing to the programme by submitting monitoring forms, and of these, 13 are demonstrating ownership by submitting more than 10 forms. Six scouts, currently FPAN staff, are leading the programme by conducting outreach and training.



**Figure 5.** Sites monitored by county during first year (August 2016– July 2017) of pilot programme. Source: Sarah Miller 2017.

Three statewide initiatives in conjunction with HMS Florida furthered the programme's success, specifically the Tidally United Summit, Cemetery Dash, and Florida Heritage at Risk travelling exhibit. The summit planning started before HMS Florida existed when FPAN Executive Director William Lees tasked the Northeast Regional Center to organise a meeting of archaeologists working across the state to come together and share their work. Given the impending launch of HMS Florida, however, the summit's audience shifted from purely academic to a more community-based approach. FPAN issued invitations to participate in the summit to archaeologists, preservationists, local governments, and volunteers. The 'Tidally United: Cultural Resources Shoreline Monitoring and Public Engagement Summit' hosted by Flagler College in St. Augustine focused on: (1) impacts to archaeological sites; (2) impacts to buildings and structures; (3) interpretation of the problem for the public; and (4) advocacy. The second day of the summit provided tours of sites at risk and field opportunities to monitor select sites in the area.

Advocacy became a major theme for the summit. Dr Judith Bense, former president of UWF, delivered the keynote address on the advocacy efforts which led to the development of FPAN. Lisa Craig of City of Annapolis, and founder of the Keeping History above Water conference and Weather It Together programme, spoke about increasing partnerships and funding opportunities. During breakout sessions, participants shared their own advocacy experiences and discussed how to build momentum in Florida. The summit took advocacy as far as mailing out a group picture to elected officials in order to communicate the group's shared concern for the impacts of climate change on cultural resources (Figure 6). Presenters and partners for the summit came from other FPAN hosting institutions (UWF, FAU, and USF), the Florida Trust for Historic Preservation, NPS, the City of St. Augustine, and private consulting firms. The summit



**Figure 6.** Advocacy postcard produced after the 2016 tidally united summit.

Source: Florida Public Archaeology Network 2016.

drew 100 registrants for the formal sessions on Friday and 42 participants for the informal tours and workshops on Saturday.

Cemetery Dash, the second major statewide initiative to support HMS Florida, issued a challenge to HMS Florida volunteers to monitor a historic cemetery during the month of October. Fall is a perfect time of year in Florida to be outside and Halloween at the end of the month means an increased threat of vandalism for cemeteries. During a CRPT workshop in October, Rachael Kangas in FPAN's Southwest Region integrated Cemetery Dash – or monitoring a cemetery using the HMS Florida form during the time of the challenge – in the afternoon portion of the training. This act brought the two programmes together and ever since HMS Florida has been a standard component of CRPT workshops. Kangas (2017) also presented preliminary results from the first year of Cemetery Dash during the Cemetery Resource Protection Training Conference. She reported that scouts monitored 32 cemeteries in October and 67 in total by the end of 2016.

The third major initiative, a travelling heritage at risk exhibit, came just in time for Florida Archaeology Month 2017. FPAN staff from multiple regions worked together to interpret how climate change impacts will affect Florida's cultural resources and issued a call to action for the public to help on two portable banners. Four panels illustrating current HMS case studies in various FPAN regions reinforced themes delineated on the banners. Artefacts on display featured those commonly encountered by scouts during monitoring activities. A mounted iPad linked to the HMS reporting form allowed visitors to monitor a 3D image of the Shell Bluff Landing site in St. Johns County, the site at the centre of the case study described in the next section. The exhibit opened at the Destination Archaeology Resource Center at the FPAN Coordinating Center in Pensacola and subsequently travelled to multiple conference venues and public libraries.

### ***HMS Florida as a Tool for Land Management and Disaster Response***

HMS Florida is not only a community engagement programme, but also a tool for land managers. Data from the first year show that a majority of the 312 sites monitored rest on state-owned lands (45%), followed by private (22%), city (6%), county (5%), and federal (3%) (Miller 2017). Most of the sites monitored as of July 2017 are prehistoric (74%) followed by historic (19%), shipwrecks now on land (4%), and submerged shipwrecks (2%). HMS Florida volunteers monitored predominantly archaeological sites ( $n = 180$ ), but also a significant number of historic cemeteries ( $n = 104$ ), historic structures ( $n = 18$ ), historical landscapes such as plantations ( $n = 7$ ), and unidentified site types ( $n = 5$ ). One of the most important features to land managers is confirmation of site location. Data from HMS Florida indicate sites monitored are generally mapped in the correct location (93%) with 4% not found and 3% found at a different location requiring a FMSF update.

Overall, HMS Florida volunteers report sites are in good condition, facing medium to low threats (Figure 7). FPAN recommends the small number of sites in good condition facing a high threat level to be further tested and resiliency strategies discussed. Unless the local community argues otherwise, sites in poor condition facing high to low threat levels are resources to consider abandoning in place. More data are needed to test the accuracy of condition and threat levels assessed, and gain a greater sample size approaching the estimates of cultural resources affected by sea level rise.



**Figure 7.** Threat level by overall site condition from sites monitored during the first-year HMS Florida. Source: Sarah Miller 2017.

HMS Florida launched just as the 2016 Atlantic hurricane season swung into full force and quickly proved to be a powerful disaster response tool. Major storms generated coastal flooding and inundation of areas that shocked many communities, especially St. Augustine in the aftermath of Hurricane Matthew; Cedar Key and the Gulf Coast after Hurricane Hermine; and the Middle Keys after Hurricane Irma. As illustrated in the following case study, HMS Florida reporting procedures proved useful in measuring the impact of major storm events on cultural resources, in some cases documenting erosion of the sites for the first time. While monitoring sites after the storms proved valuable, FPAN staff now realise the need to mobilise volunteers to monitor sites prior to and – when safe – immediately after storm events.

HMS Florida exists in many different forms across Florida. Considering the many partners involved during just the first year, programmes tied to HMS Florida are co-created several times over to deliver a wide range of case studies and best practices (Table 1) (Bollwerk, Connolly, and McDavid 2015). To illustrate HMS Florida as a tool for land managers and disaster responders, the case study on the pilot programme with the Reserve highlights the partnership between organisations, the dedication of volunteers, and lessons to consider as HMS Florida moved into its second year of operation.

## **Case Study: Guana Tolomato Matanzas National Estuarine Research Reserve (Reserve)**

### ***HMS Florida Pilot Programme Overview***

After the launch of HMS Florida in August 2016, FPAN staff initiated a pilot programme with the Reserve to offer volunteers hands-on training through classroom presentations and monitoring at archaeological sites. The Reserve is 1 of 29 National Estuarine Research Reserves around the country with a shared mission to conduct research,

**Table 1.** Statewide HMS Florida partners by county.

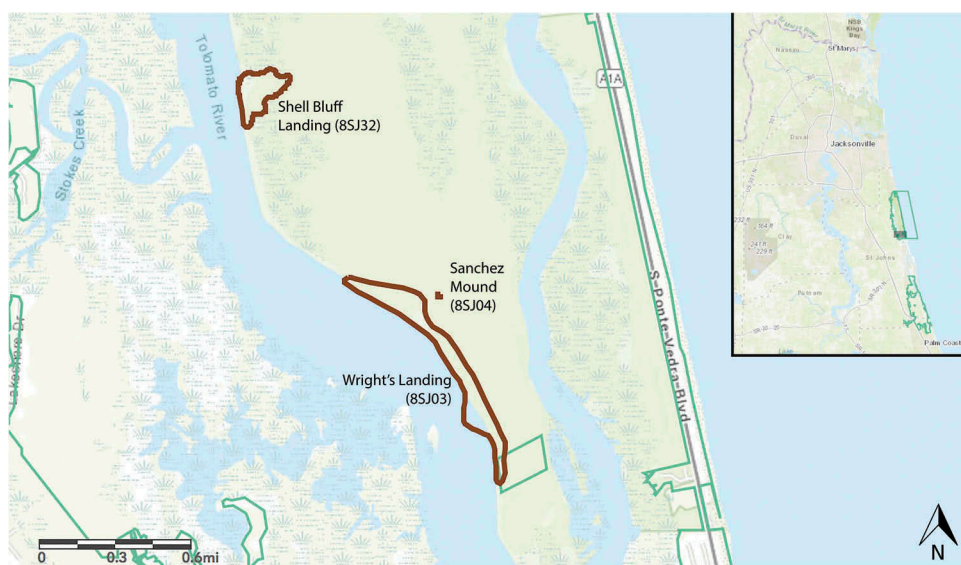
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|                     |   |
|---------------------|---|
| BREVARD:            | Florida solar energy center, Sams house at pine island preserve, Space Coast science education alliance   |
| BROWARD:            | Native learning center  |
| CHARLOTTE:          | Charlotte history center  |
| CITRUS:             | Gulf Archaeology Research institute   |
| CLAY:               | Clay county archives  |
| COLLIER:            | Rookery bay NERR  |
| DADE:               | Florida international university  |
| DUVAL:              | University of North Florida   |
| ESCAMBIA:           | Destination archaeology resource center, Goat lips chew and brewhouse, University of West Florida   |
| FLAGLER:            | Bings landing county park, Marineland dolphin adventures  |
| FRANKLIN:           | Apalachicola national estuary research reserve  |
| HENDRY:             | Ah-Tah-Thi-Ki Seminole INDIAN museum, Seminole Tribe of Florida tribal historic Preservation office   |
| HILLSBOROUGH:       | University of South Florida   |
| LAKE:               | Trout lake nature preserve  |
| LEE:                | Randell research center, Cape coral library, Koreshan state historic site, South county regional library  |
| NASSAU:             | Amelia island museum of history, City of Fernandina beach, FORT clinch state park   |
| ORANGE:             | University of Central Florida, Department of anthropology   |
| PALM BEACH:         | Florida Atlantic University   |
| PINELLAS:           | Central gulf coast archaeological society, Weeden island preserve cultural and natural history center   |
| PUTNAM:             | Log cabin winery  |
| SARASOTA:           | New college   |
| ST. JOHNS:          | Flagler college, Flagler college archaeology club, GTM research reserve, Guana river wildlife management area, historic tours of America, north-east Florida aquatic preserves, St. Augustine archaeological association, St Johns county environmental division, St. Johns county public library |
| ST. LUCIE:          | Richard E. Becker preserve, St. Lucie parks and recreation  |
| VOLUSIA:            | New Smyrna museum of history, Town of ponce inlet   |
| STATEWIDE/NATIONAL: | Environmental remediation and recovery, Inc., Florida archaeological council, Florida coastal office, Florida department of historical resources, Florida Trust for historic preservation, National park service  |
| MANATEE:            | Emerson point preserve, Manatee county parks and recreation, Time sifters archaeological society  |

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education, and stewardship. The Reserve encompasses approximately 74,000 acres of coastal conservation lands in north-east Florida from Ponte Vedra Beach to Palm Coast (Figure 8). A network of agencies – including the NPS, FSP, St. Johns Water Management District, and Flagler County – work together to manage the Reserve. In addition to the conservation of lands and wildlife, the Reserve boundaries encompass 115 recorded cultural resources which include shell middens, burial mounds, historic structures, and historic cemeteries (DEP 2008). The Reserve already supervises ongoing monitoring programmes for environmental resources and maintains a firm commitment to citizen science. Over 150 volunteers regularly contribute to monitoring, research, education, stewardship, and administrative tasks. In some cases, volunteers lead Reserve monitoring and research projects (personal communication, Kaitlyn Dietz, 10 April 2017).

The HMS Florida pilot programme at the Reserve aimed to aid staff in managing archaeological resources by training a force of volunteers to monitor sites and record threats, impacts, and changes. FPAN and Reserve staff hosted four training sessions during a 6-month period from October 2016 to March 2017 (Figure 9). Each training intended to prepare volunteers to monitor sites by providing a brief background on archaeology, discussing the importance of monitoring sites, and instructing volunteers to fill out the forms properly. The trainings featured a classroom portion with presentations and hands-on guidance on identifying artefacts and archaeological features. Scouts learned about the most common artefacts in north-east Florida, including historic and prehistoric ceramics, glass, shells, and faunal remains. After the brief classroom portion, participants visited an archaeological site to practice monitoring skills, such as photographing site conditions, defining site boundaries, identifying threats, and mapping.



**Figure 8.** Location of the GTM research reserve and sites monitored during pilot programme.  
Source: Emily Jane Murray 2018.

While volunteers could opt to attend a single training, FPAN staff encouraged volunteers to attend multiple sessions to gain a better understanding of archaeology and take advantage of practicing monitoring skills under supervised conditions.

During the training days, volunteers visited one of three different sites to monitor a variety of site types and conditions. They visited: (1) Shell Bluff Landing (8SJ32), a multicomponent shell midden located along the Intracoastal Waterway; (2) Wright's Landing (8SJ3), a large multicomponent site that includes miles of prehistoric shell middens and historic wharf structures; and (3) Sanchez Mound (8SJ4), a prehistoric burial mound. Shell Bluff Landing, described in detail in the next section, became a focal point for HMS Florida statewide. Wrights Landing provided an opportunity for volunteers to observe a living shoreline restoration project initiated by the Reserve. Volunteers also observed the boundary fence around Sanchez Mound to keep visitors and animals from impacting the site (Figure 10). Conditions ranged from fair to poor with a variety of threats observed through the series of site visits.

### ***Shell Bluff Landing Overview***

Located in the northern component of the Reserve on a peninsula of land, Shell Bluff Landing lies above a high-energy zone on the eastern shore of the Intracoastal Waterway known as the Tolomato River. A popular hiking trail terminates at the bluff with interpretive signs on the history of the area and information on select sites. Shell Bluff Landing is listed on the National Register of Historic Places and contains evidence of around 6000 years of human occupation. The dense marine shell midden contains artefacts from the Late Archaic Period, Florida's Mississippian-era St. Johns Period, and the missions of Florida's First Spanish Period from 1565 to 1763. The presence of the Spanish artefacts



**Figure 9.** Flier for HMS Florida workshops during pilot programme.  
Source: Florida Public Archaeology Network.



**Figure 10.** Scouts monitoring Sanchez Mound (8SJ4) during training workshop.  
Source: Sarah Miller 2017.

suggests the Nuestra Señora de Guadalupe de Tolomato Mission may be in the vicinity. During Florida’s British Period from 1763 to 1783, the first British Governor James Grant owned and operated much of the Guana Peninsula as a large indigo and rice plantation.

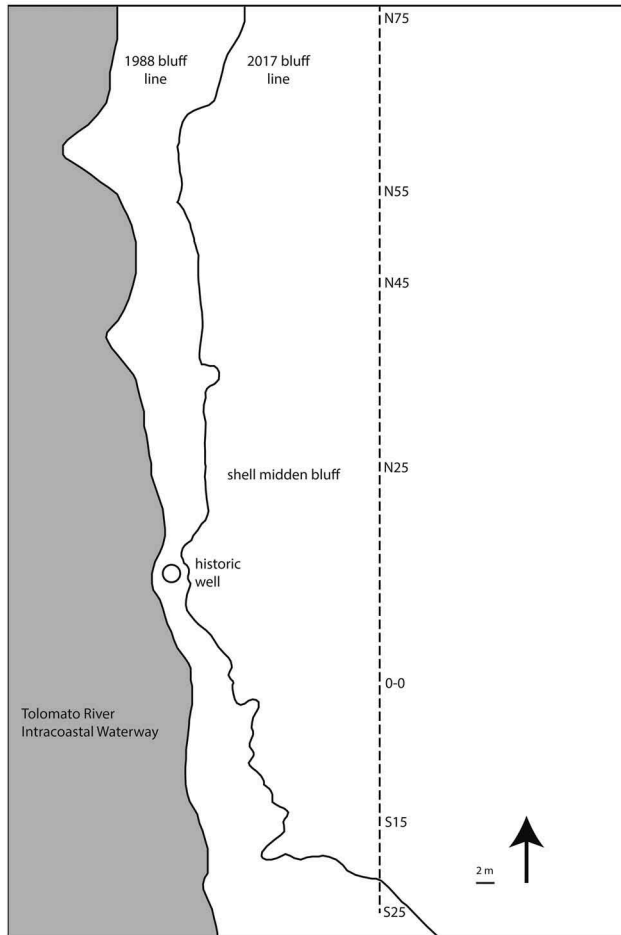
During the Second Spanish Period, 1784–1821, a Minorcan man named Juan Andreu held a Spanish land grant of around 160 acres at Shell Bluff Landing, then named ‘Ostional Banco’ or ‘White Shell’ (Baker 1988a; Weisman, Newman, and Mattick 1991). Spanish documents reveal ‘a good house with a chimney’, a freestanding kitchen, several storage buildings, and cabins for enslaved people once stood on the site. At present, however, only a well constructed from local coquina stone blocks remains from this period.

Erosion of the shoreline, exacerbated by boat wake action, remains the site’s leading threat. The US Army Corps of Engineers maintains the Tolomato River as part of the Intracoastal Waterway and has altered the river to aid navigation (Frazel 2009). As motorised boats increase in number and speed, their impact on the shoreline grows as well. The increased wake action at higher intensities results in more erosion throughout the channel margins (Price 2005). While the western edge of the site erodes, however, inland areas of the 10.3-acre site remain in good condition.

John Goggin first documented erosion at Shell Bluff Landing when he recorded it in the early 1950s. In fact, Goggin (1952) accurately characterised the site without excavation based solely on artefacts observed on the beach that had eroded from the bluff. BAR staff first attempted to track and quantify the erosion using aerial photography in a 1988 study (Baker 1988b). The study found the bluff lost an estimated 12 metres in a 44-year period between 1942 and 1986 (Figure 11). Current estimates using similar techniques put the total loss over 30 metres in the area close to the well and up to 60 metres in the adjacent areas north and south.

By the mid-1980s when the state acquired the property to become Guana State Park, the bluff’s edge stood within 2 metres of the well and the state took action. The Florida Division of Recreation and Parks constructed a bulkhead around the well as a temporary way to stabilise the shoreline until further action could be taken (Figure 12) (Baker 1988b). In 1990, the state removed the bulkhead and added fill to the shoreline to create a protective slope, much of which washed away within 3 months (Newman 1990a, 1990b). In 1992, the state added riprap, geowebbing, and filter cloth to help hold sediment in place and protect it from the waves. An estimated 75% of this material washed away in a storm shortly after its placement (DHR 2004). The state soon replaced the materials and continues to refresh the riprap, but has not done so in at least 10 years (personal communication, Joe Burgess, 2017). The issues with the stabilisation materials themselves illustrate just how much energy is bearing down on the edge of the bluff. The difference in shoreline loss between these areas could be an inadvertent impact of the erosion control techniques employed at the bluff near the well.

In the *Archaeological Stabilization Guide* (DHR 2004, 17) published by the state, recommendations for the site included continued monitoring and ‘the preparation for a long-term plan for site management to address salvage and site testing as well as other strategies for reducing the effects of erosion’. While some inconsistent monitoring occurred, as evidenced from the random selection of site updates in the FMSF, neither BAR nor the Reserve staff put a formal monitoring strategy in place before HMS Florida. Additionally, the state had not conducted formal data recovery at the site since 1990.

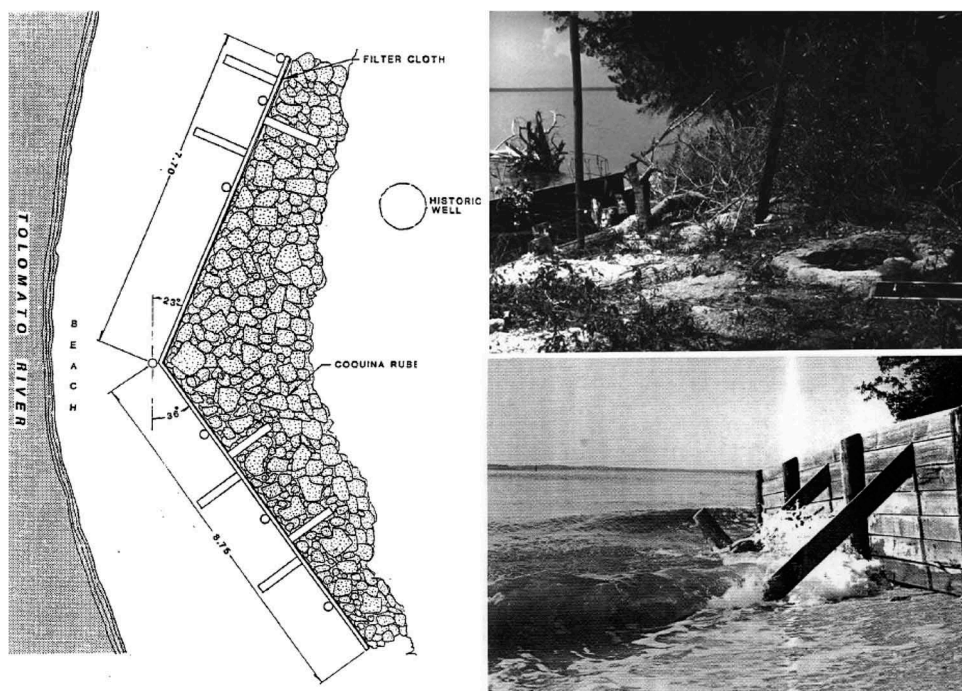
Erosion at Shell Bluff Landing (8SJ32) Bluff Line,  
1988-2017

**Figure 11.** Erosion at Shell Bluff Landing 1988–2018. Source: Emily Jane Murray on behalf of the Florida Bureau of Archaeological Research 2018.

### **Monitoring at Shell Bluff Landing**

Through HMS Florida, FPAN staff and volunteers documented changes at Shell Bluff Landing over the course of a year. Unlike previous attempts, HMS Florida provided a framework to collect standardised information about the site to store in one location. Monitoring began on 28 September 2016, in anticipation of the first training session in late October. Since then staff, scouts, and other volunteers have filed 11 reports on the site. Staff continue to photograph the site from similar angles as the first visit to demonstrate change to the site over time.

Unbeknownst to FPAN staff at the onset, through the course of the pilot programme, they would document the impacts of two hurricanes on Shell Bluff Landing in less than a year (Figure 13). On 7 October 2016, Hurricane Matthew brushed past the north-east coast of Florida with sustained winds of over 160 km per hour, creating a nearly 2-metre storm surge and cutting dune lines back 9–12 metres in Ponte Vedra Beach, just east of the site (Stewart



**Figure 12.** Temporary bulkhead installed to control erosion at Shell Bluff Landing from 1984–1990. Adapted from and reproduced with permission, Henry Baker 1988b.



**Figure 13.** Monitoring photos of Shell Bluff Landings throughout pilot programme. Source: Emily Jane Murray 2018.





**Figure 14.** Archaeologists from Florida BAR map stratigraphy exposed after erosion.  
Source: Emily Jane Murray 2017.

2017). Less than a year later on 10 September 2017, Hurricane Irma moved northwards just off the west coast of Florida with tropical storm force winds extending outward up to more than 600 km from the centre. Again, north-east Florida experienced similar storm surge and coastal erosion as with Matthew with final assessments from Irma still pending (NWS 2017).

FPAN staff visited Shell Bluff Landing a few days after Hurricane Matthew on 12 October 2017. While the site normally erodes at a slow and steady pace, Matthew caused sudden and drastic changes to the site in a single day. The storm removed huge sections of the shell midden, in some places over 1 metre, and shifted the bluff back to expose around 1 metre of the well. Post-Irma FPAN and Reserve staff visited the site on 15 September 2017, and documented further damage. Some of the midden material washed up over the bluff edge and was redeposited further inland. After Hurricane Irma, north-east Florida experienced a number of storms in short succession, including Hurricane Jose which passed by offshore and several nor'easters, which resulted in extreme high tides. FPAN staff returned on 20 September at high tide to document the effect of the tides on the site. These tides inundated parts of the site that normally remained dry, even at high tide, and continued to erode the newly exposed areas of the site. The undercut areas worsened due to these conditions. Since September 2016, FPAN staff estimates up to 2.5 metres of site loss along the bluff. The bluff line retreated east to reveal just over 1 metre of the well on all sides, where only several centimetres were exposed at the beginning of the pilot programme.

As the site lost ground, archaeologists broadened their knowledge about Shell Bluff Landing through the year of monitoring. Scouts and FPAN staff photographed many artefacts *in situ*, adding to the known artefact assemblage of the site. When Reserve staff were present, they selectively collected some of the materials after photographing. FPAN staff learned more about the midden itself. Hurricane Matthew revealed a dense lens of scallop shells previously undocumented. The occurrence of scallops provides insight into the environmental changes that occurred during the site's long occupation. Scouts also noted a layer of crushed coquina close to the well, possibly related to construction activities during the historic period. Unfortunately, Irma removed these portions before the damage could be thoroughly documented.

While photography helps document changes at the site, FPAN staff are looking for other ways to quantify change. The installation of rebar baselines could help measure shoreline loss at high-risk sites, such as the University of Florida recently implemented at the Pineland Complex in south-west Florida (personal communication, Rachael Kangas 2017). Rebar was installed at Shell Bluff Landing in 1987 (Baker 1988b), and for a time BAR recorded several sets of measurements a few months apart. The study did not continue, however, despite continued excavation at the site in 1990 (Baker 1988b; Newman 1990a; personal communication, Christine Newman, December 2016).

Recently, FPAN staff relocated the lost rebar at Shell Bluff Landing and immediately used it to record new measurements of the bluff (Figure 13). The change in shoreline from the original measurements in 1988 averages 8.3 metres along the western edge of the site. As noted in the preliminary study using aerial photography, the northern and southern ends of the site where riprap is not present experienced more erosion. The bluff lost 12.63 metres of shoreline at the northernmost baseline point and 20.8 metres at the southernmost baseline point. In fact, the bluff shifted to expose the rebar at the southernmost baseline, leaving only tree roots grown around the bar to hold it in place. As mentioned previously, these areas not only suffer from the lack of protection, but also could be experiencing increased erosion because of the shoreline armament near the well. Shoreline armouring structures appear to be causing higher rates of erosion at adjacent properties (O'Connell 2010).

### ***Preliminary Results of HMS Florida Pilot at the Reserve***

The HMS Florida pilot programme at the Reserve proved successful and will continue to aid in managing cultural resources at the Reserve and providing training opportunities for scouts. During the pilot, staff trained 30 individual participants, many of who attended multiple sessions. These scouts completed 14 reports for 3 sites at the Reserve. Participants explored different types of sites, skills, and materials they could encounter when monitoring in north-east Florida. Comments on evaluations show participants becoming more confident in monitoring on their own, especially for the repeat participants. Several volunteers requested organised group monitoring days to hone their skills. The pilot programme also helped build a base of scouts in the north-east region. Five of the scouts who attended trainings at the Reserve went on to submit 33 monitoring forms on their own. Amazingly, one volunteer organised monitoring days with local college students to aid staff with cultural resources at an FSP.

HMS Florida proved a useful tool for the Reserve in managing and building awareness of cultural resources. In addition to long-term tracking of changes, the programme helped with identifying and solving smaller management issues. For instance, scouts notified staff about a break in the fence at Sanchez Mound after Hurricane Matthew. Scouts then came back to monitor Reserve installation of replacement fence posts and helped in the repair efforts. FPAN staff helped with disaster response after the two major hurricanes. They assessed and documented impacts to cultural resources, leaving Reserve staff free to deal with greater infrastructure and storm damage concerns.

The usefulness of monitoring data, however, goes beyond simple management of the archaeological sites. Reserve staff found the data can inform overall conservation efforts and aid in future research and restoration projects. 'Site condition information



can inform decisions on issues like placement of shoreline restoration projects, visitor access and interpretation, or grant applications' (personal communication, Kaitlyn Dietz, 28 November 2017). The structure of HMS Florida also gives the various land managing agencies and partners throughout the Reserve a framework for discussing and making long-term, widespread management decisions.

The basic documentation of drastic site loss through HMS Florida inspired more study of Shell Bluff Landing. FPAN staff and HMS Florida volunteers teamed up with BAR archaeologists to map newly exposed shoreline stratigraphy, take column samples of the shell midden, and better delineate the eastern portion of the site by excavating shovel tests (Figure 14). This project could lead to a standard response plan for sites severely affected by storms that includes systematic mapping and select sampling at the most at risk sites.

Overall, the first HMS Florida pilot programme succeeded as a partnership to train volunteers and inspired similar partnerships across the state. The partnership with the Reserve continues and has expanded to include other land-managing agencies within the Reserve network, including Florida Fish and Wildlife Conservation Commission and FSP. As HMS Florida grows, the partners hope to document more fragile coastal sites and gather data before the sites disappear.

## Conclusion and Future Directions

The public libraries along Florida's coasts are on fire. With every storm, more data wash away and erase part of the catalogue accessible to researchers and the public. In response to the depletion of cultural resources by effects of climate change, FPAN created the HMS Florida programme that launched in St. Augustine during the summer of 2016 and quickly spread to every region. The public demonstrated a strong commitment to help and monitored 312 sites in the first year.

HMS Florida is a co-created programme with a myriad of partners and publics served. In the case study presented above, FPAN partnered with the Reserve over the course of a year to hold four half-day trainings to improve HMS Florida volunteer literacy on heritage at risk and build their monitoring skill set. Topics ranged from identifying different artefact types to conducting threat assessments, defining site boundaries, mapping, and photographing site impacts. The volunteers applied these skills at a shell midden, burial mound, and historic shipping site. The pilot also contributed to the management of Reserve cultural resources. Volunteers helped document damage from two hurricanes and a nor'easter during the pilot study. Information gained from the monitoring programme helped guide Reserve conservation efforts and led to a follow-up study by BAR.

Lessons learned from the pilot and other HMS Florida programmes in progress are preliminary but encouraging to other states considering implementation of a similar monitoring programme. The programme developed over a short period of time, from the partner meeting in May to the launch in August and did not require any funding outside of FPAN's regular operating budget. It is essential to work closely with the State Historic Preservation Office and State Archaeologist office. It helped that Florida already had a short annual site assessment form for land managers that remained as the core of the HMS monitoring form after additions inspired from other programmes such as SCAPE's SCHARP. Other states considering implementation of HMS should vet the forms across as many land managing entities as possible to reduce changes that may

confuse volunteers or alter the structure of their database once established. Include affirmation of an existing code of ethics in volunteer application forms, as HMS Florida requires scouts to adhere to the FAS code of ethics. FPAN staff approved all volunteers who applied and reported no violations of the ethical agreement to date.

Aside from the forms and initial set-up, FPAN staff learned to move away from classroom-based models for training to on-site monitoring experiences. The Reserve workshops allowed for teaching a new skill in the education centre but always moved outside to apply the new skill through monitoring a site. In this way, HMS Florida met the needs of the land managers to have sites monitored and to build the knowledge base of the volunteers. A formal assessment of the HMS Florida programme is currently underway by Dr Laura Clark at UWF. While her findings are preliminary, evaluations from the volunteers show they are motivated to carry out their work when provided a knowledge base, autonomy to do the activity, and find the activity fun to do. FPAN staff continue to build on lessons learned with each programme and plan to publish results as the programme matures.

Future steps for HMS Florida include increasing monitoring of submerged resources, 3D scanning of select eroding sites, directed trainings for state land managers, and ensuring the programme is active in all 67 Florida counties. Another major improvement currently underway is updating the HMS Florida database to enhance access to site information by approved volunteers and make uploaded monitoring data viewable to other users. FPAN continues to learn about and reach out to other heritage at risk programmes driven by community engagement beyond SCAPE, including England's Coastal and Intertidal Zone Archaeological Network (CITIZAN); Climate Heritage & Environments of Reefs, Islands and Headlands (CHERISH) in parts of Ireland and Wales; France's Archeologie, Littoral et Rechauffement Terrestre (ALeRT); Greenland's Research and Management of Archaeological sites IN a changing environment and Society (REMAINS); and Community Observation, Assessment and Salvage of Threatened Archaeological Legacy (COASTAL) in Nova Scotia. In the United States, there is no countrywide monitoring programme in place but several states have established site stewardship programmes – such as California, Nevada, Montana, and Colorado to name a few – as well as those mentioned in the Shoreline Monitoring and Stewardship section.

The case study presented is only a single example of how FPAN applied the HMS Florida programme in partnership with a governmental agency and environmental volunteers. Other pilots in the works include monitoring plantations, shipwrecks, cemeteries, and historic structures. FPAN facilitated the Tidally United summit again in Ft. Lauderdale in August 2017 and Tampa in 2018. The Cemetery Dash continues each fall, as do pre- and post-storm assessment of sites during hurricane season. In this way, FPAN continues to keep the library of Florida's endangered cultural resources open and accessible for the public and the communities they serve.

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**Appendix 1. HMS monitoring form 1****Site Monitoring Form**

Master Scout ID:

Site Name:

Site Number (if known, i.e. 8SJ405):

Time:

Date:

Site Location

- Mission location verified
- Site found but in different location (note corrected location in comment field below)
- Site could not be found

Visit

- Initial
- Follow up

Overall Site Condition

- Good = Stable (structural stability, no obvious or predicted deterioration)
- Fair = Declining (discernible decline, wholeness or physical integrity threatened by normal wear)
- Poor = Unstable (palpable, accelerating decline, physical integrity is being compromised quickly)

Threats Observed (check all that apply: link to illustrative examples forthcoming)

- Active erosion
- Storm surge
- Wind
- Flooding
- Wave action
- Vegetation growth
- Animal disturbance
- Visitor traffic
- Vehicle damage
- Development
- Other:

Priority - include justification in comments section below

- High - threats pose immediate risk, recommend urgent follow up
- Medium - threats pose a moderate risk, continue to monitor after storm events or on annual basis
- Low - site at minimal risk, monitor after storm events or every 5 years

Comments on site impacts:

Artifacts visible (photograph in place, do not move)

- Prehistoric pottery
- Lithics
- Shell tool
- Historic ceramics
- Glass
- Architectural (nails, wire, bricks)
- Other:

Recommendation (repeat visit, defense, FMSF update, other comments):

### Supplementary reporting

Please enter the information on this form into the online reporting system found at [FPAN.us/HMSFlorida](http://FPAN.us/HMSFlorida) and then send select/representative pictures of site conditions and any other documentation or questions to [HMSflorida@fpan.us](mailto:HMSflorida@fpan.us).

(continued).



**Appendix 2. Scout application 1**



**Scout Application**

Thanks for your interest in becoming a Heritage Monitoring Scout! Please fill out this application to be added to our monitoring roster. We will send out emails when we have scouting opportunities available. Please contact us at HMSFlorida@fpan.us if you would rather submit your information via email or have any questions.

**Personal Information**

Name \_\_\_\_\_

Street Address: \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_

Phone: \_\_\_\_\_ Email: \_\_\_\_\_

**Please let us know a little about your education and occupation:** \_\_\_\_\_

\_\_\_\_\_  
 \_\_\_\_\_

**Please let us know about any relevant experience:** \_\_\_\_\_

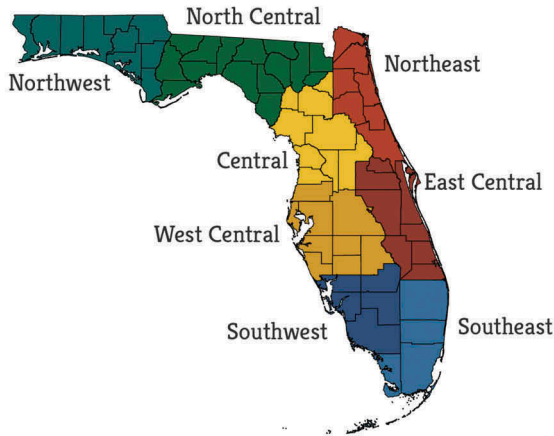
\_\_\_\_\_  
 \_\_\_\_\_

**Why are you interested in becoming a Heritage Monitoring Scout?** \_\_\_\_\_

\_\_\_\_\_  
 \_\_\_\_\_

**Interests:** Prehistoric \_\_\_ Historic \_\_\_ Cemeteries \_\_\_ Underwater \_\_\_ Other \_\_\_\_\_

**Which region(s) are you interested in monitoring sites in?**



*Check all that apply.*

- |                                    |  |                                    |                                       |
|------------------------------------|--|------------------------------------|---------------------------------------|
| <input type="checkbox"/> Northwest | <input type="checkbox"/> North Central | <input type="checkbox"/> Northeast | <input type="checkbox"/> East Central |
| <input type="checkbox"/> Central   | <input type="checkbox"/> West Central  | <input type="checkbox"/> Southwest | <input type="checkbox"/> Southeast    |

**Heritage Monitoring Scouts Code of Ethics and Program Agreement**

1. I have read, comprehend, and affirm that I will abide by the code of ethics outlined by the Florida Anthropological Society: [http://fasweb.org/wp-content/uploads/2016/04/FAS\\_Ethics.pdf](http://fasweb.org/wp-content/uploads/2016/04/FAS_Ethics.pdf).
2. I understand the potentially confidential nature of assisting in providing archaeological site updates. I will keep archaeological site information confidential and will not disclose or discuss the location of these sites with the general public.
3. I deem it my responsibility to practice and demonstrate excellent stewardship of these archaeological sites. I will not willfully cause harm or loss to these sites.
4. I understand that information I generate belongs to the State of Florida and the managers of the HMS Florida program, the Florida Public Archaeology Network.
5. I agree to take on all risk associated with site stewardship and hold only myself accountable for my well-being and safety.
6. I understand that failure to comply with this agreement or the referenced codes of ethics at any time will result in a discontinuation of my involvement with the HMS Florida program.

I have read and will abide by the HMS Florida Code of Ethics and Program Agreement.

(continued).