St. Andrew and St. Joseph Bays Estuary program (SASJBEP)
Stressors Assessment Workshop

Date: October 6, 2021
Place: Virtual workshop

Objective of the workshop:

- ✓ Identify and prioritize stressors and management concerns for each proposed potential focus area (Water and sediment quantity and quality, resiliency and natural resources management and species conservation) that will be incorporated into the program's Comprehensive Conservation Management Plan (CCMP).
- ✓ Prioritize the identified stressors and management concerns for the watersheds and bays.
- ✓ Identify locations where prioritized stressors are dominated
- ✓ Identify measurable indicators for each prioritized stressors and management concerns

Participants: 34 people from local and national governmental and non-governmental organizations, University of West Florida, University of Florida and SASJBEP. The list of participants and their affiliation organizations are given in the following Table

List of participants and their affiliations

No	Name	Organization
1.	Jessica Graham	SASJBEP
2.	Rafael Montalvo	FCRC Consensus Center
3.	Hal Beardall	FCRC Consensus Center
4.	Amanda Croteau	University of West Florida
5.	Jane Caffrey	University of West Florida
6.	Tesfay Gebremicael	University of Florida
7.	Matthew Deitch	University of Florida
8.	Greory Johnson	Auburn University
9.	Lawrence Wagner	TNC
10.	Patrice Couch	Former SABRMA-Citizen
11.	Chris Anderson	Auburn University
12.	Rose Driber	FCRC Consensus Center
13.	Mark Hyman	USFWS
14.	Jessica Bibza	National Wildlife Federation

15.	Irvin Clark	FSU
16.	Jim Muller	Bay county
17.	Jon Brucker	FDEP-Aquatic Preserves
18.	Michelle Council	SABRMA Board Member
19.	Darry Boudreau	NWFL Water Management District
20.	Becca Hatchell	FWC
21.	Kennard Watson	Turtle Watch
22.	Katie Koncher	FWC
23.	Andrea Graves	TNC
24.	Cherissa Thacker	Board of Bay Watch RMA and Outreach for Sheraton
25.	Katie Davis	
26.	Phone (7708262020)	Conservation Citizen-Representative on Management Council
27.	Bryan Phillips	FWC
27	Patty Kelly	USFWS
28	Catrina Martin	USFWS
29	Linda Gerstner	
30	M. Mathews	
31	Norman Capra	
32	Christina Cantrell	Bay Watch RMA
33	Mary Walker	
34	Emily Evans	FWC

Welcome Opening: The workshop was opened by Jessica Graham, executive director of SASJBEP by welcoming the participants of the workshop, introducing the primary goal of the estuary program, and explaining the objective of this workshop. Additionally, she introduced the purpose and contribution of UF and UWF team in the workshop and throughout the development of the Comprehensive Conservation and Management Plan (CCMP) of the estuary programs. Finally, she introduced the presenter/workshop facilitator (Amanda Croteau) and handed over the workshop to her.

Introduction: An introduction on the incoming workshop series, purpose and goal of the stressor assessment workshop, word cloud on stressors and management concerns from existing

management plans and the use of Mural application in the workshop was given by Amanda. I brief introduction on the focus areas such as (1) Water and sediment quantity and quality (2) Natural Resource Management and Species Conservation (3) Resiliency and (4) Education and outreach was given with the highlight that the first three focus areas are going to be addressed in the stressor assessment as well as in the coming workshop series. Ground rules and expectations on the use of zoom chat, mural, background noise during the workshop were also disclosed to the participants before the actual exercises.

Mural Tutorial: Next, a tutorial on how to use mural was given to the participants by Amanda. A description and demonstration of how the participants can add and move a sticky note, typing, zoom in and out of sticky note on the mural and overall, how to navigate using the outline, basic Mural functions. The Mural activities including grouping, moving, deleting of redundant sticky notes were facilitated by Amanda and Jane Caffrey, participants who had problems with adding and writing on the sticky notes were sending their ideas to Tesfay Gebremicael in the zoom. Tesfay was monitoring the zoom chat and adding sticky notes in mural for the participants.

Mural activity: Mural exercises, facilitated by Amanda: Participants were asked to brainstorm stressors and management concerns on water and sediment quantity and quality. A mural format link was shared with the participants to list the stressors or management concerns and Jane was responsible to organize the sticky notes, move and arrange them. Tesfay was there to help participants in adding a sticky note for them and keep an eye on the chat if any assistance is needed by the participants. Based on their urgency and impact, participants were asked to prioritize and recommend six (3 for water and 3 for sediment) stressors. During organizing and grouping of listed stressors and management concerns, participants were asked to elaborate on some of the stressors and their abbreviations. There was a good interaction between the facilitators and the participants. After discussions on the grouping, reorganizing, and deleting of overlapped sticky notes, participants were asked to group sticky notes into spatial categories to provide information on where in the watershed and estuaries the concerns were an issue. Following that activity, participants were asked to prioritize the top three stressors/management concerns per category (water and sediment) from the Water and Sediment Quality and Quantity focus area by considering their impact and urgency of the concern (Figure 1). Next, participants brainstormed a list of indicators for each of the prioritized concerns (Table 1). Information on sources of datasets such

as links to public notice of pollution (Public Notice of Pollution | Florida Department of Environmental Protection), contamination locator map (Florida DEP Cleanup Sites (state.fl.us), electronic document management system (https://depedms.dep.state.fl.us/Oculus) and map gallery to different data (Map Direct Gallery (state.fl.us) were recommended from Patrice for the preparation of the upcoming workshop series.

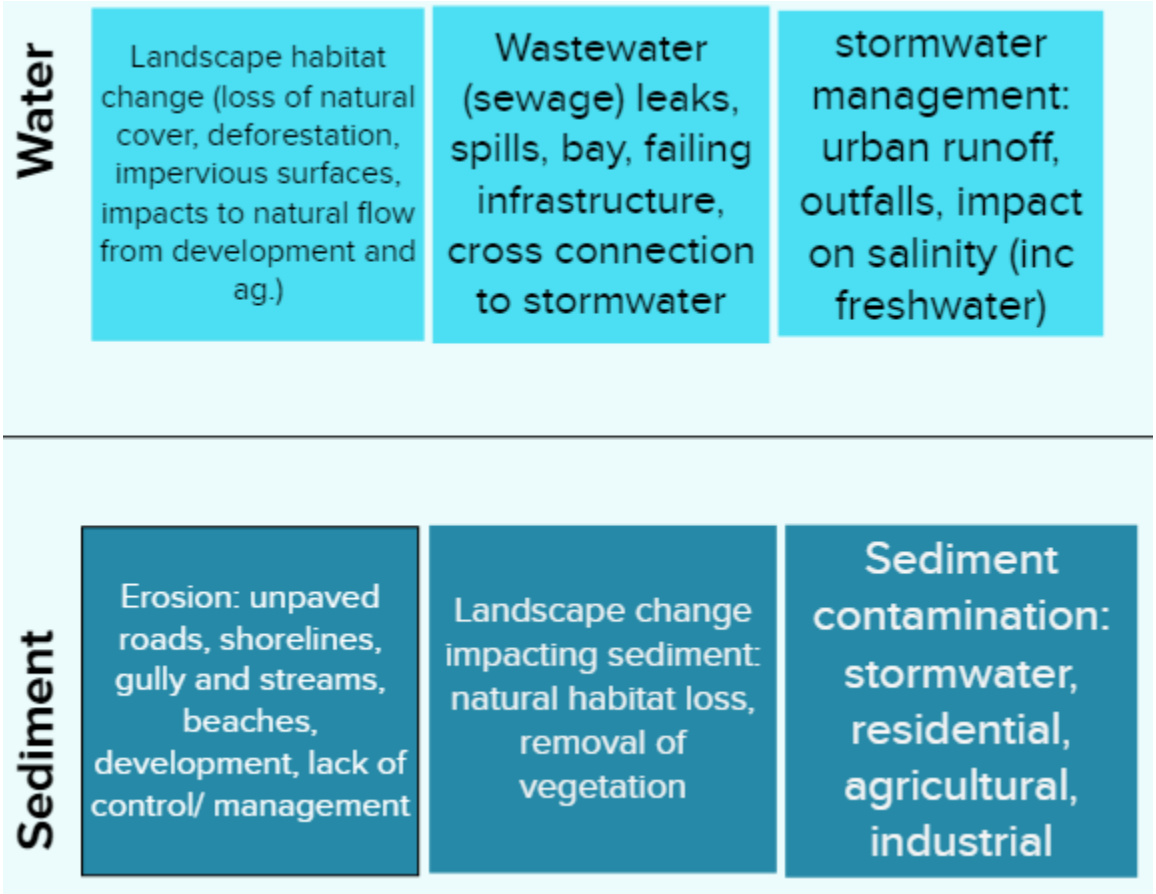

Figure 1: Prioritized stressors for the Water and Sediment Quality and Quantity focus area

Table 1. Identified indicators for the Water and Sediment Quality and Quantity focus area prioritized stressors

Stressor/Management Concern	Indicators
Landscape habitat change (loss of natural cover, deforestation, impervious surfaces, impacts to natural flow from development and ag.)	Loss of sea grasses, monitor locations Water quality FNAI cover classification - changes over time LIDAR Clip data - landuse and % change over time Dredge-and-fill permits Studies on how certain classes of urban development and agriculture quantitatively affect water flows and water quality. Water testing of retention ponds Hydrological surveys Some developers/ developments use pervious asphalt. Can we keep track of where this is happening? Aerial data showing LU/LC Document changes via historical aerial imagery Natural landcover in the floodplain metric Test water in drainage points for contaminants
Wastewater (sewage) leaks, spills, bay, failing infrastructure, cross connection to stormwater	DOH data records (change over time & location of leaks/spills) WQ including bacteria sampling Permit requests for new or replacement? Approx age of septic tanks based on neighborhood age/house age? Nitrate/ nutrient concentrations; bacteria counts in surface water and groundwater Municipal - County Utilities Inventory/Reports FDEP Pollution - Spill Reports/Database Watershed level wastewater infrastructure New wastewater plans and number of septic users
Stormwater management: urban runoff, outfalls, impact on salinity (increasing freshwater)	Management of stormwater ponds (neighborhood HOA or county and actions of maintenance) City planning audits, especially for new developments Nitrate/ nutrient concentrations; bacteria counts in surface water and groundwater NWFWMD SWIM Plans Turbidity monitoring Nutrient monitoring WQ monitoring Permits for stormwater Data mining - state agencies, WIN/Storet

Table 1 cont. Identified indicators for the Water and Sediment Quality and Quantity focus area prioritized stressors

Stressor/Management Concern	Indicators
Erosion: unpaved roads, shorelines, gully and streams, beaches, development, lack of control/ management	Routine mapping and surveying Shoreline vegetation community change Shoreline change WQ Sampling Data SARP barrier database and USFWS/FWC conceptual designs map route of runoff from unpaved roadways to estuary / calculate quantity of sediment load Suspended Sediment load , bedload measurement during storms Sediment deposition in streams, estuary deposits over time DEP Beaches - beach profiles, renourishment projects, beach management
Landscape change impacting sediment: natural habitat loss, removal of vegetation	Visual--too many acres and acres of grassy lawns Visual--to many people plant crape myrtles which lack use by native bugs, birds--one example FNAI cover classification - changes over time Land use permits for development Routine habitat mapping Updated aerials show loss of habitat
Sediment contamination: stormwater, residential, agricultural, industrial	Sediment study / analysis of cores Bay Watch data and report on sediment and previous BEST data Aerial imagery / hydrological assessment NWFWMD SWIM plans Sedimentation and water quality studies

Next, participants were asked to brainstorm and do the same procedure to identify stressors and management concerns on natural resources management and species conservation. After listing the possible stressors and management concerns, there was discussion and clarification of the identified stressors (e.g., concerns about local Redfish population by fishermen and guides). Based on their urgency and impact, participants were asked to prioritize and recommend six (3 for habitat and 3 for species) stressors (Figure 2). Next, participants brainstormed a list of indicators for each of the prioritized concerns (Table 2).

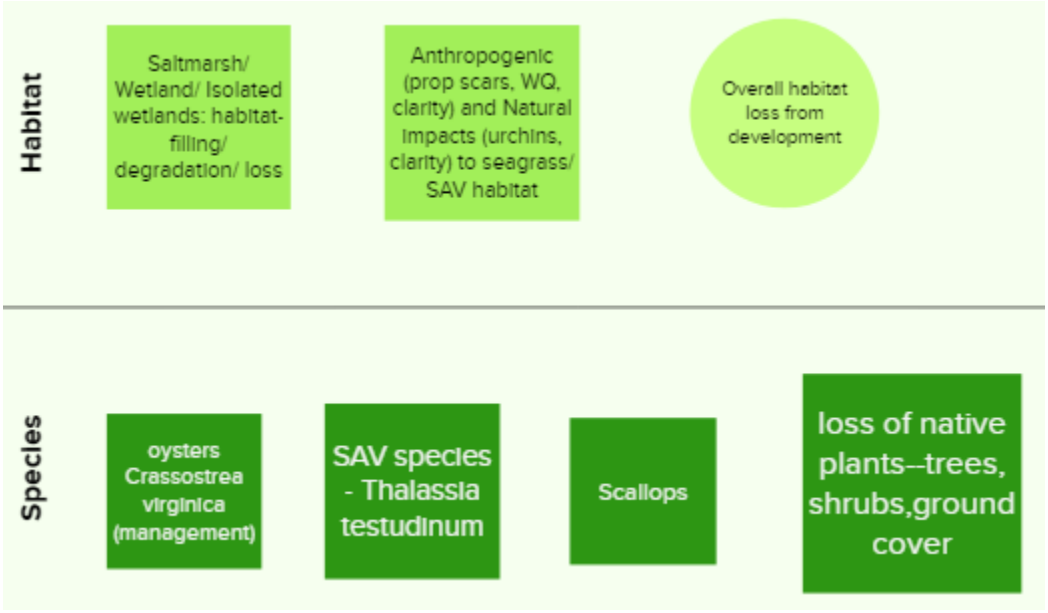

Figure 2: Prioritized stressors for the Natural Resource and Species Conservation focus area

Table 2. Identified indicators for the Natural Resource and Species Conservation focus area prioritized stressors

Stressor/Management Concern	Indicators
Saltmarsh/ Wetland/ Isolated wetlands: habitat-filling/ degradation/ loss	FNAI and FWC mapping-CLIP may have it. Development planning for future projections FDEP Map Direct Fathom data for flood plain info ($$$) or EPA floodplains Routine habitat mapping
Anthropogenic (prop scars, WQ, clarity) and Natural impacts (urchins, clarity) to seagrass/ SAV habitat	Urchin information? Not sure if it exists but would be important to know carrying capacity etc. Monitoring (existing data & identify data gaps) Mapping (existing data & identify data gaps) DEP/FWC seagrass mapping and monitoring DEP/FWC seagrass restoration
Overall habitat loss from development	GIS folks can filter landcover data files Analysis of trends in permitting - metrics for wetlands acres filled Planning for future development....ex: margaritaville, west bay?? Routine habitat mapping
Oysters Crassostrea virginica (management)	DEP/FWC oyster restoration Commercial harvest quantification/change over time Mapping Habitat suitability modeling DEP/FWC oyster monitoring Previous oyster distribution compared to current Acres of approved and conditionally approved harvesting areas - trends Acres of habitat closed from harvesting (i.e., sanctuary sites) Navy hard bottom mapping?
Scallops	Annual scallop reports from Steve Geiger - FWRI FWC/FWRI Scallop monitoring and restoration Seagrant Scallop monitoring?
SAV species - Thalassia testudinum	Areas of previous habitat to investigate restoration potential DEP/FWC/SABRMA (Baywatch) seagrass monitoring There are 4 species of seagrass in the bay system
Loss of native plants--trees, shrubs,ground cover	Driving by assessments, also tied to analysis of development expansion Routine habitat mapping Chris Anderson group's work on projections etc. Christmas Bird Count?

Finally, stressors and management concerns for the resiliency focus area were discussed and prioritized the top six in the list (Figure 3). Among the listed stressors, deforestation, and land use, nature-based solution, relocation of potential pollution sources, climate change, sea-level-rise and room for wetland migration came out as the top six stressors and management concerns that need to be addressed in the CCMP. Indicators for each prioritized stressors/management concern were also listed and discussed (Table 3).

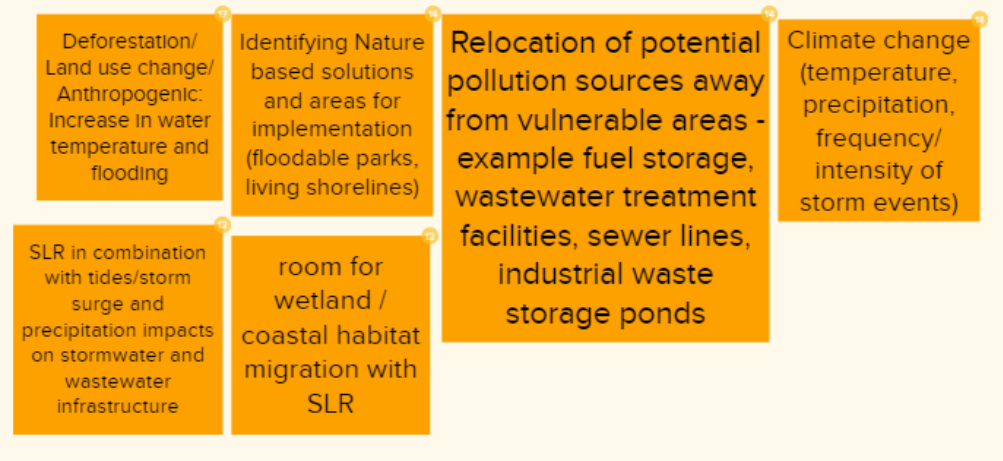

Figure 3: Prioritized stressors for the Resiliency focus area

Table 3. Identified indicators for the Resiliency focus area prioritized stressors

Stressor/Management Concern	Indicators
Identifying Nature based solutions and areas for implementation (floodable parks, living shorelines)	FWS can identify areas needed for protection of PC crayfish habitat has multiple functions- water retention, species recovery, recreational value Panhandle Estuarine Restoration Team (PERT) - there are also other ERTs around the State. Living shoreline habitat suitability modeling TNC's Scaling Up Nature Based Solutions project Amount of shoreline with nature based solution or natural features Envision planning for Panama City Implementation with St. Andrew Bay Watch Living Shorelines Acres set aside or restored
Deforestation/ Land use change/ Anthropogenic: Increase in water temperature and flooding	FNAI clip mapping and WQ monitoring (Bay Watch) Flood stage measurements/ USGS gauge data EPA floodplain to inform loads Temperature data from continuous monitoring stations FEMA flood zones and changes Mapped extent of flooding under events of varying magnitude DEP WQ and nutrient monitoring
SLR in combination with tides/storm surge and precipitation impacts on stormwater and wastewater infrastructure	Frequency of surge tides/stormwater and wastewater overflows Review SLAMM results for area and protect migration space. Vulnerability assessment for ST. Andrew and St. Joe bays together
Room for wetland / coastal habitat migration with SLR	FDEP's Coastal Resilience Program Wetland habitat suitability modeling Infrastructure planning or master plan for all municipalities
Climate change (temperature, precipitation, frequency/ intensity of storm events)	WQ and meteorological monitoring IPCC NOAA for storm information
Relocation of potential pollution sources away from vulnerable areas - example fuel storage, wastewater treatment facilities, sewer lines, industrial waste storage ponds	SB 1954 Vulnerability Assessment Identify permitted coastal facilities - create inventory of those within flood prone areas - coordinate with FDEP to identify - secure grant funds to assist process FDEP Clean Marina Use water quality data to support grant proposals - leverage funds to accomplish FDEP Coastal Resilience Program FDEP Walk the WBID

Amanda, Jessica and Hal Beardall gave final remarks on the workshop. Jessica and Hal Beardall showed gratitude to the UWF and UF team for their hard work in preparing and facilitating the workshop. They also send a message to the participants to contact the team if they have any questions and information including data and materials that can be used as input for the next workshop series. Amanda concluded the session with the message that the team will be engaged in the preparation of the upcoming workshop series.