RESTORE Act Ecosystem Restoration Project Proposals
for consideration in the Gulf Coast Ecosystem Restoration Council's Comprehensive Plan 2012

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<tr><td colspan="4">Contact Information Margaret Wuerstle, mwuerstle@swfrpc.org</td><td colspan="4">Date of Submittal: January 7, 2013</td></tr>
<tr><td colspan="4">Name of Project: Environmental Services Provided by the Gulf of Mexico</td><td colspan="4">Org and Rank: SWFRPC Rank 2</td></tr>
<tr><td colspan="8">Project Description: Improve knowledge of the economic value of environmental services provided by the Gulf of Mexico (GOM) resources in terms of long-term community sustainability, growth and resilience. This project will identify the range and quantity of ecosystem services provided by existing conservation areas, including marine, estuarine and freshwater wetlands and associated native uplands, and determine how the relative abundance of wetlands and native uplands, their distribution and position in the landscape, and their ecological condition affects the provisioning of ecosystem services within the Charlotte Harbor National Estuary Program study area.
The project will expand upon the assessment methods utilized in the study A Watershed Analysis of Permitted Coastal Wetland Impacts and Mitigation Methods within the Charlotte Harbor National Estuary Program Study Area, linking the derived ecosystem function measurements with a geo-spatially positioned ecosystem services database. This will generate an ecosystem services topography (ECOSERVE layer) that can be combined with other ecosystem services layers for functional analyses by geographic boundary (watershed, municipality, county, etc.) and will generate projected alternate futures of ecosystem services resulting from land use changes, anticipated climate changes, natural and man-made disasters, the implementation of alternative wetland protection and land conservation programs, and null hypothesis futures of build-out landscapes in the current planning and regulatory environment.
Products of the study will include updated valuations of the ecosystem services provided by existing conservation lands in the GOM; an updated conservation lands mapping of the project study area; a documentation and quantification of the ecosystem services provided by each habitat type; multiple GIS ECOSERVE layers/GIS maps for the many ecosystem services provided by the various wetland and upland types; and analyses and quantification of current and alternate future ECOSERVE landscapes, and a basis for estimating existing and post-disaster ecosystem services for damages evaluation in the CHNEP.</td></tr>
<tr><td colspan="8">Project Location: Gulf of Mexico</td></tr>
<tr><td colspan="4">Responsible Party: SWFRPC</td><td colspan="4">Partners:</td></tr>
<tr><td colspan="2">NEP: CHNEP, SBEP, TBEP</td><td colspan="3">Project Cost: $500,000.00</td><td colspan="3">Dollars Needed $500,000.00</td></tr>
<tr><td colspan="4">Start: October 1, 2013</td><td colspan="4">Completion: September 30, 2016</td></tr>
<tr><td colspan="8">Status of Project Design and Permitting: Not yet commenced.</td></tr>
<tr><td colspan="8">What Date or Year could Construction Feasibly Begin: No construction</td></tr>
<tr><td colspan="8">Your Proposed Timing of Funding (given permits, phasing, staging, etc.)</td></tr>
<tr><td>FY</td><td>12/13</td><td>13/14</td><td>14/15</td><td>15/16</td><td>16/17</td><td>17/18</td><td>Total</td></tr>
<tr><td></td><td>0</td><td>$200,000</td><td>$200,000</td><td>$100,000</td><td>0</td><td>0</td><td>$500,000.00</td></tr>
<tr><td colspan="8">Quantify Environmental Results and How to Measure Them:</td></tr>
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The environmental results of the project will be the development of wetland condition assessments of the ecosystem services provided by all wetland types to the GOM. This assessment will be available to local governments for use in developing wetlands planning, restoration and enhancement plans throughout the GOM. This project will identify areas where alternative techniques may be appropriate to preserve wetland functions and will highlight techniques that are compatible with habitat restoration goals. The outputs will inform and advance important outcomes including improved state and tribal wetland management and decision-making capacity, especially in terms of documenting and providing ecosystem services. They will also help state and tribal wetland managers evaluate the effectiveness of wetland restoration and mitigation strategies. The physical products of the project will be the tabulation of ecosystem services by type and location throughout the GOM and methods to forecast future ecosystem services in response to climate change, environmental perturbations and natural and human caused disasters.

Economic Benefits (including ecosystem services): Products of the study will be an updated multi-entity wetland type definition; an updated wetland type GIS mapping of the project study area, a documentation and quantification of the ecosystem services provided by each wetland type, multiple ECOSERVE layers GIS maps for the many ecosystem services provided by the various wetland types; and an analysis and quantification of current and alternate future ECOSERVE landscapes resulting from existing path, projected future landscape change, climate change, and alternate wetland protection programs.

The results will be directly applicable throughout southwest Florida and throughout the GOM study area, where coastal wetland permitting and mitigation are regulated by the same agencies in a similar manner. The methodology utilized to develop the ECOSERVE layers should also be applicable elsewhere, where wetland impacts are anticipated and permitted.

Estimated number of Jobs Created or Preserved: In 2003, Florida's direct ocean economy (GSP) was an estimated $13 billion, ranking second in the nation behind California. Florida's total ocean economy that same year (including multipliers) was an estimated $23.2 billion, which contributed 3.2% of Florida employment and 4.5% of Florida GSP in 2003. Employment forecasts project 73% growth with more than 268,000 new jobs by 2015. The Tourism & Recreation was the fastest growing sector GSP in the ocean economy, far surpassing the others with 90% growth between 1990 and 2003. The Marine Transportation Sector GSP grew 82% during the period 1990-2003.

How much Habitat will be restored and conserved?: This is not a habitat restoration or land conservation project.

Quantify pollutant reductions: This is not a pollutant reduction project.

What living coastal/marine resources will be improved and by how much?: All coastal and watershed resources.

- Extensive GIS mapping of the current conservation area wetland and upland extents and types, in the project study area,
- Analyses of ecosystem services provided by those wetlands with identification of techniques and procedures that utilize wetland ecological condition indicators and related data to quantify wetland ecosystem services delivery,
- Development of an Arc View-friendly protocol for statistical and geographic analysis and interpretation can be used with the types of data generated by surveys of wetland ecological condition indicators to quantify ecosystem services generated in a specific geographic area (e.g., watershed, municipality, county),

- An accurate and up to date wetland spatial information necessary to quantitatively measure ecosystem services provided by wetlands,
- A quantification of observed wetland condition data linked to ecosystem services and their contribution to human well-being,
- A quantification of the pollution-prevention or mitigation services (e.g., chemical pollutant removal, sediment removal)provided by wetland ecosystems vs. the cost of providing them through built infrastructure,
- A quantification of the amount of food or fiber produced per unit area in areas well-protected by wetlands vs. that of poorly protected or unprotected areas,
- The economic value of recreational opportunities provided by a specific wetland provision or protection of fishable/swimmable water),
- Construction costs avoided by the presence of wetlands that slow and absorb floodwaters (flow mitigation or flood control) (output of grant tabulation),
- Approaches to statistical and geographic analysis and interpretation that can be used to quantify the relative importance of perturbation stressors (e.g., agriculture, hydrologic alteration, development, climate change) that impact wetlands and the ecological services they provide,
- Useful and practicable indicators for assessing wetland ecosystem services delivery and that present creative and innovative applications of statistical and geographic analysis and interpretation to provide new information on wetland ecosystem services, wetland condition surveys, and
- A tool that can be used to develop regionally relevant ecosystem services measurement and assessment programs and that can be used to assist in implementing efficient and effective decisions-making by local and regional regulatory, mitigation, enforcement programs.

How will community resilience be enhanced? This project will develop and implement a wetland ecosystem services survey and mapping methodology derived from wetland functional analyses which will then be utilized to forecast, evaluate and report trends in wetlands ecosystem services.

Products of the study will be an updated multi-entity wetland type definition; an updated wetland type GIS mapping of the project study area, a documentation and quantification of the ecosystem services provided by each wetland type, multiple ECOSERVE layers GIS maps for the many ecosystem services provided by the various wetland types; and an analysis and quantification of current and alternate future ECOSERVE landscapes resulting from existing path, projected future landscape change, climate change, and alternate wetland protection programs.

The results will be directly applicable throughout Florida and throughout the GOM study area, where coastal wetland permitting and mitigation are regulated by the same agencies in a similar manner. The methodology utilized to develop the ECOSERVE layers should also be applicable elsewhere, where wetland impacts are anticipated and permitted.

Additional Justification: This project is intended to identify the range and quantity of ecosystem services provided by marine, estuarine and freshwater wetlands and native upland habitat and a determine how the relative abundance of the functional types of wetlands and native uplands, their distribution and position in the landscape, and their ecological condition alters the provisioning of ecosystem services within the Charlotte Harbor National Estuary Program study area.

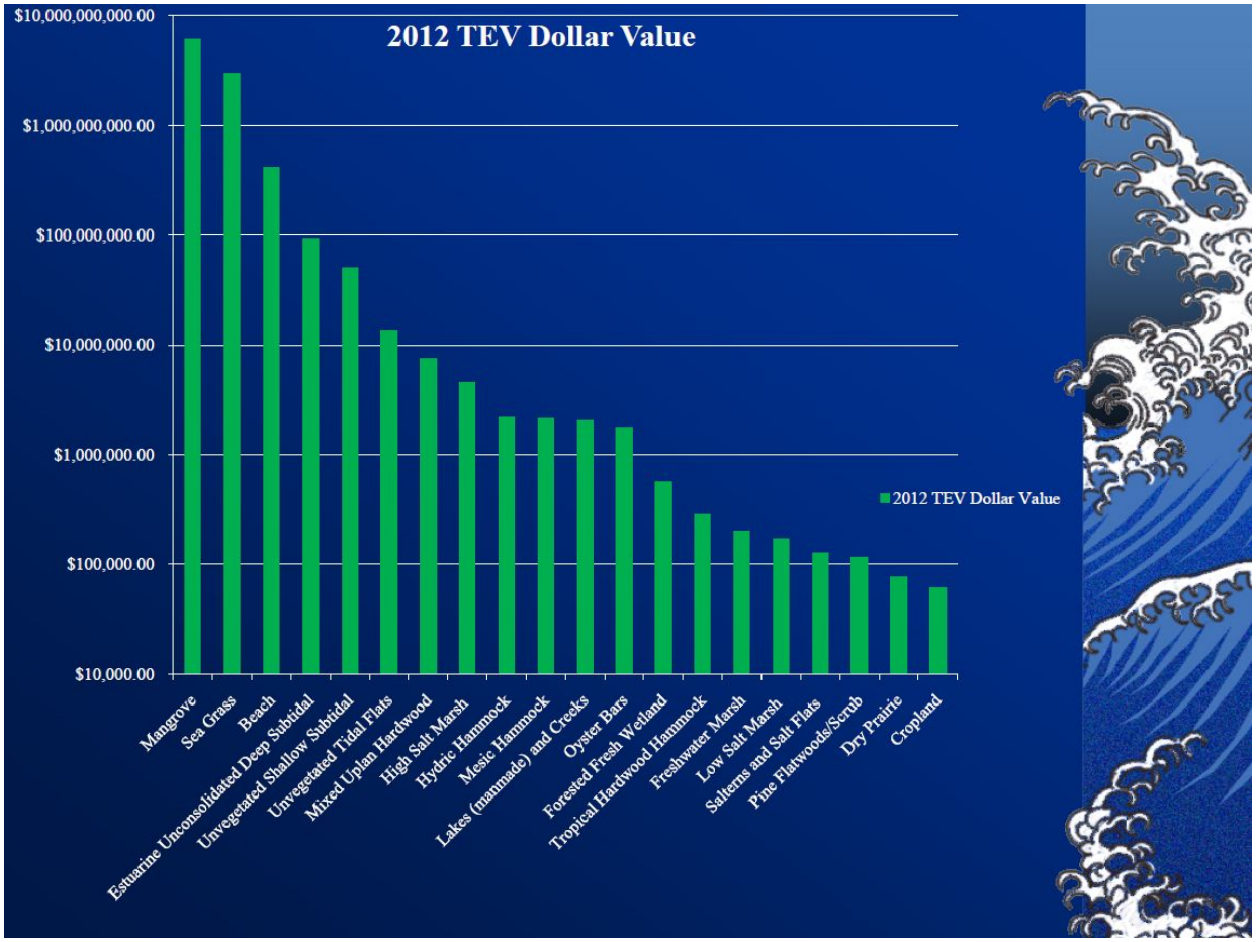
Experts currently recognize four categories of ecosystem services: provisioning, regulating, supporting, and cultural. This project will require establishing the acreage of all the various habitat types,

identification of the ecosystems services provided by each habitat type; definition of the relative abundance of each habitat type; identification of the distribution and position of these habitats in the southwest Florida landscape; identification of the ecological condition of these habitats; and quantification of how these factors alter the provisioning of the ecosystems services that these habitats provide in their existing and potentially restored status.

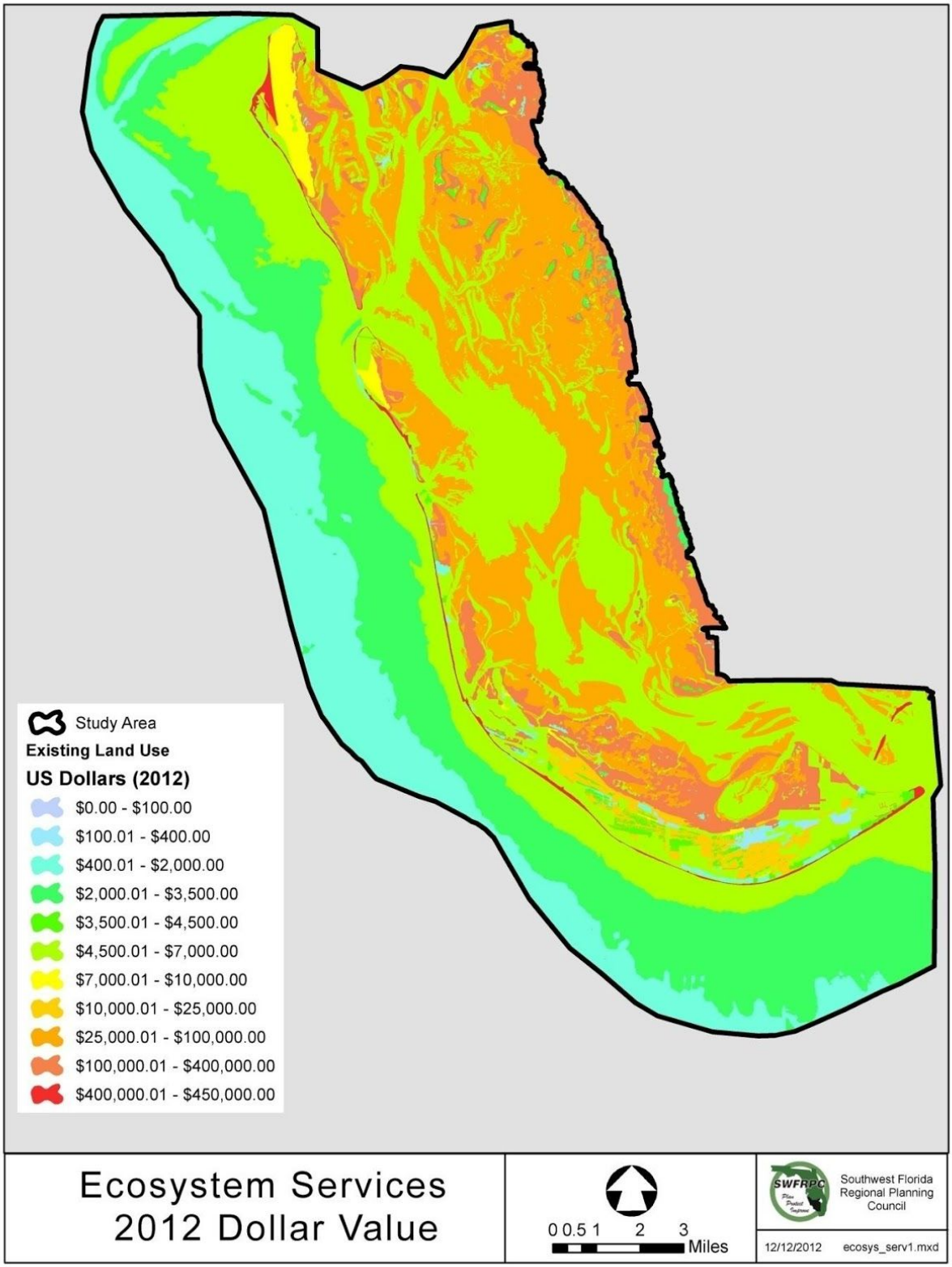
The output of this project will be the development of wetland condition assessments of the ecosystem services provided by all wetland types to the CHNEP Study Area. This assessment will be available to local governments for use in developing wetlands planning, restoration and enhancement plans throughout the GOM study area.

In addition, this project will generate an ecosystem services topography (ECOSERVE layer) that can be combined with other ecosystem services layers for functional analyses by geographic boundary (watershed, municipality, county, etc.) and will generate projected alternate futures of ecosystem services resulting from land use changes, anticipated climate changes, natural and man-made disasters, the implementation of alternative wetland protection and land conservation programs, and null hypothesis futures of build-out landscapes in the current planning and regulatory environment. Utilization of the ECOSERVE layer will allow permit reviewers to evaluate the impact of mining and restoration on the ecosystem services attributable to the wetlands types being impacted the types proposed post-restoration.

Add any photos or maps that explain project:



Example of ecosystem services calculations for Pine Island Sound ecosystem, Lee County, Florida.



Ecosystem Services 2012 Dollar Value

0 0.5 1 2 3 Miles

Southwest Florida Regional Planning Council

12/12/2012 ecosys_serv1.mxd

Example of a ECOSERVE map for the Pine Island Sound Ecosystem, Lee County, Florida