SCIENCE EVALUATION

Bucket 2 – Council Selected Restoration Component

Connecting coastal Waters: Restoring Coastal Wetland Hydrology

PROPOSAL TITLE

LOCATION

Multiple Gulf Coastal Counties/Parishes

SPONSOR(S)

Department of Commerce

TYPE OF FUNDING REQUESTED (Planning, Technical Assistance, Implementation)

All three

REVIEWED BY: **DATE: 7 January 2015**

Best Available Science:

These 6 factors/elements help frame the reviewers answers to A, B and C found in next section:

1. Have the proposal objectives, including methods used, been justified using peer reviewed and/or publicly available information?

O YES O NO O NEED MORE INFORMATION

1. Bahia Grande Wetland System Restoration, TX **O YES**
2. San Antonio Bay Marsh Restoration, TX **O YES (on the web)**
3. Maurepas Swamp (West Joyce Wetlands) Restoration **O NO**
4. Hancock County Marshes Coastal Preserve Wetlands Restoration **O NEED MORE INFORMATION**
5. Wolf River Preserve Restoration, MS **O YES**
6. Fish River and Weeks Bay Marsh Restoration **O NEEDS MORE INFORMATION**
7. Oyster Bay Marsh Restoration **O NEED MORE INFORMATION**
8. Meadows Tract Marsh Restoration **O NEEDs MORE INFORMATION**
9. Money Bayou Wetlands Restoration **O YES (on the web)**

10. Tate's Hell Crooked River Basin Restoration **O YES (on the web)**
11. Robinson Preserve Wetlands Restoration **O NEEDS MORE INFORMATION**

Comments

see summary at the end

2. If information supporting the proposal does not directly pertain to the Gulf Coast region, are applicant's methods reasonably supported and adaptable to that geographic area?

O YES O NO **O NEEDS MORE INFORMATION**

Comments

see summary at the end
the information provided is skimpy for all of them, but what is provided generally comes from the GOM literature

3. Are the literature sources used to support the proposal accurately and completely cited?

O YES O NO **O NEED MORE INFORMATION**

Comments
see summary at the end

the information provided is skimpy for all of them; sometimes the appropriate information is in web-based documents specific to the project

4. Are the literature sources represented in a fair and unbiased manner?

O YES O NO O NEED MORE INFORMATION

1. Bahia Grande Wetland System Restoration, TX **O YES**
2. San Antonio Bay Marsh Restoration, TX **O YES**
3. Maurepas Swamp (West Joyce Wetlands) Restoration **O NO**
4. Hancock County Marshes Coastal Preserve Wetlands Restoration **O YES**
5. Wolf River Preserve Restoration, MS **O YES**
6. Fish River and Weeks Bay Marsh Restoration **O YES**
7. Oyster Bay Marsh Restoration **O YES**
8. Meadows Tract Marsh Restoration **O YES**
9. Money Bayou Wetlands Restoration **O YES**
10. Tate's Hell Crooked River Basin Restoration **O YES**
11. Robinson Preserve Wetlands Restoration **O YES**

Comments

see summary at the end

5. Does the proposal evaluate uncertainties and risks in the scientific basis for the proposal, including any identified by the public and Council members?

O YES O NO O NEED MORE INFORMATION

1. Bahia Grande Wetland System Restoration, TX **O NEED MORE INFORMATION**
2. San Antonio Bay Marsh Restoration, TX **O NEED MORE INFORMATION**
3. Maurepas Swamp (West Joyce Wetlands) Restoration **O NO**
4. Hancock County Marshes Coastal Preserve Wetlands Restoration **O NEED MORE INFORMATION**
5. Wolf River Preserve Restoration, MS **O NEED MORE INFORMATION**
6. Fish River and Weeks Bay Marsh Restoration **O NEED MORE INFORMATION**
7. Oyster Bay Marsh Restoration **O NEED MORE INFORMATION**
8. Meadows Tract Marsh Restoration **O NEED MORE INFORMATION**
9. Money Bayou Wetlands Restoration **O NEED MORE INFORMATION**
10. Tate's Hell Crooked River Basin Restoration **O NEED MORE INFORMATION**
11. Robinson Preserve Wetlands Restoration **O NEED MORE INFORMATION**

Comments
see summary at the end

6. Does the proposal evaluate uncertainties and risks in achieving its objectives over time? (e.g., is there an uncertainty or risk that in 5-10 years the project/program will be obsolete or not function as planned given projections of sea level rise?)

O YES O NO O NEED MORE INFORMATION

1. Bahia Grande Wetland System Restoration, TX **O NEED MORE INFORMATION**
2. San Antonio Bay Marsh Restoration, TX **O NEED MORE INFORMATION**
3. Maurepas Swamp (West Joyce Wetlands) Restoration **O NO**
4. Hancock County Marshes Coastal Preserve Wetlands Restoration **O NEED MORE INFORMATION**
5. Wolf River Preserve Restoration, MS **O NEED MORE INFORMATION**
6. Fish River and Weeks Bay Marsh Restoration **O NEED MORE INFORMATION**
7. Oyster Bay Marsh Restoration **O NEED MORE INFORMATION**
8. Meadows Tract Marsh Restoration **O NEED MORE INFORMATION**
9. Money Bayou Wetlands Restoration **O NEED MORE INFORMATION**
10. Tate's Hell Crooked River Basin Restoration **O NEED MORE INFORMATION**
11. Robinson Preserve Wetlands Restoration **O NEED MORE INFORMATION**

Comments

see summary at the end
All but #3 seem to have the right idea

Based on the answers to the previous 6 questions, and giving deference to the sponsor to provide within reason the use of best available science the following three questions can be answered:

A. Has the applicant made a reasonable determination that the proposal is based on science that uses peer- reviewed and publicly available data?

O YES O NO O NEED MORE INFORMATION

1. Bahia Grande Wetland System Restoration, TX **O NEED MORE INFORMATION**
2. San Antonio Bay Marsh Restoration, TX **O NEED MORE INFORMATION**
3. Maurepas Swamp (West Joyce Wetlands) Restoration **NO**
4. Hancock County Marshes Coastal Preserve Wetlands Restoration **O NEED MORE INFORMATION**
5. Wolf River Preserve Restoration, MS **O NEED MORE INFORMATION**
6. Fish River and Weeks Bay Marsh Restoration **O NEED MORE INFORMATION**
7. Oyster Bay Marsh Restoration **O NEED MORE INFORMATION**
8. Meadows Tract Marsh Restoration **O NEED MORE INFORMATION**
9. Money Bayou Wetlands Restoration **O NEED MORE INFORMATION**
10. Tate's Hell Crooked River Basin Restoration **O NEED MORE INFORMATION**
11. Robinson Preserve Wetlands Restoration **O NEED MORE INFORMATION**

Information Needed:
see summary at the end

some pertinent information is on the web for some projects (see notes), but not noted in the proposal.

B. Has the applicant made a reasonable determination that the proposal is based on science that maximizes the quality, objectivity, and integrity of information (including, as applicable, statistical information)?

O YES O NO O NEED MORE INFORMATION

1. Bahia Grande Wetland System Restoration, TX **O NEED MORE INFORMATION**
2. San Antonio Bay Marsh Restoration, TX **O NEED MORE INFORMATION**
3. Maurepas Swamp (West Joyce Wetlands) Restoration **NO**
4. Hancock County Marshes Coastal Preserve Wetlands Restoration **O NEED MORE INFORMATION**
5. Wolf River Preserve Restoration, MS **O NEED MORE INFORMATION**
6. Fish River and Weeks Bay Marsh Restoration **O NEED MORE INFORMATION**
7. Oyster Bay Marsh Restoration **O NEED MORE INFORMATION**
8. Meadows Tract Marsh Restoration **O NEED MORE INFORMATION**
9. Money Bayou Wetlands Restoration **O NEED MORE INFORMATION**
10. Tate's Hell Crooked River Basin Restoration **O NEED MORE INFORMATION**
11. Robinson Preserve Wetlands Restoration **O NEED MORE INFORMATION**

Information Needed:
see summary at the end
none has metrics of success, none has examples included of prior success (some should be successful, given that they have done this before – see notes)'

C. Has the applicant made a reasonable determination that the proposal is based on science that clearly documents and communicates risks and uncertainties in the scientific basis for such projects?

O YES O NO O NEED MORE INFORMATION

O NEEDS MORE INFORMATION:
1. Bahia Grande Wetland System Restoration, TX
2. San Antonio Bay Marsh Restoration, TX
4. Hancock County Marshes Coastal Preserve Wetlands Restoration
5. Wolf River Preserve Restoration, MS
6. Fish River and Weeks Bay Marsh Restoration
7. Oyster Bay Marsh Restoration
8. Meadows Tract Marsh Restoration
9. Money Bayou Wetlands Restoration
10. Tate's Hell Crooked River Basin Restoration
11. Robinson Preserve Wetlands Restoration

3. Maurepas Swamp (West Joyce Wetlands) Restoration **O NO**

Information Needed:

see summary at the end - do not fund this project

Science Context Evaluation

A. Have other methods been discussed and reasons provided to why the method is being selected (e.g., scientifically sound; cost-effectiveness)?

1. Bahia Grande Wetland System Restoration, TX **O NEED MORE INFORMATION**
2. San Antonio Bay Marsh Restoration, TX **O NEED MORE INFORMATION**
3. Maurepas Swamp (West Joyce Wetlands) Restoration **NO**
4. Hancock County Marshes Coastal Preserve Wetlands Restoration **O NEED MORE INFORMATION**
5. Wolf River Preserve Restoration, MS **O NEED MORE INFORMATION**
6. Fish River and Weeks Bay Marsh Restoration **O NEED MORE INFORMATION**
7. Oyster Bay Marsh Restoration **O NEED MORE INFORMATION**
8. Meadows Tract Marsh Restoration **O NEED MORE INFORMATION**
9. Money Bayou Wetlands Restoration **O NEED MORE INFORMATION**
10. Tate's Hell Crooked River Basin Restoration **O NEED MORE INFORMATION**
11. Robinson Preserve Wetlands Restoration **O NEED MORE INFORMATION**

see summary at the end
they have not discussed alternatives;, but 10 of the 11 have made a reasonable decision.

B. Has your agency/vendor/project manager conducted a project/program like the one proposed?

1. Bahia Grande Wetland System Restoration, TX **Yes**
2. San Antonio Bay Marsh Restoration, TX **Yes**
3. Maurepas Swamp (West Joyce Wetlands) Restoration **NO**
4. Hancock County Marshes Coastal Preserve Wetlands Restoration **Yes**
5. Wolf River Preserve Restoration, MS **Yes**
6. Fish River and Weeks Bay Marsh Restoration **Yes**
7. Oyster Bay Marsh Restoration **Yes**
8. Meadows Tract Marsh Restoration **Yes**
9. Money Bayou Wetlands Restoration **Yes**
10. Tate's Hell Crooked River Basin Restoration **Yes**
11. Robinson Preserve Wetlands Restoration **Yes**

see summary at the end

My agency does not do this, but I have experience with the methods if it has a 'yes'

C. Is there a risk mitigation plan in place for project objectives? (captures risk measures as defined under best available science by the Comprehensive Plan and Act)

NO None of them have this

see summary at the end

D. Does the project/program consider consequences with implementation? (captures risk measures as defined under best available science by the Comprehensive Plan and Act)

NO None of them have this

see summary at the end

E. Does the project/program have clearly defined goals?

Yes, but there are no metrics for success for any of these projects

see summary at the end

F. Does the project/program have clearly defined objectives?

O NEED MORE INFORMATION' for all of these

'see summary at the end

G. Does the project/program have measures of success? (captures statistical information requirement as defined by the Comprehensive Plan and Act)

NO there are no metrics for success for any of these projects

see summary at the end

H. Is a monitoring program in place to determine project goals, success and help adaptive management (if applicable)? (captures statistical information requirement as defined by the Comprehensive Plan and Act)

1. Bahia Grande Wetland System Restoration, TX **O YES**
2. San Antonio Bay Marsh Restoration, TX **O YES**
3. Maurepas Swamp (West Joyce Wetlands) Restoration **O NO**
4. Hancock County Marshes Coastal Preserve Wetlands Restoration **O NO**
5. Wolf River Preserve Restoration, MS **O YES**
6. Fish River and Weeks Bay Marsh Restoration **O YES**
7. Oyster Bay Marsh Restoration **O NEEDS MORE INFORMATION**
8. Meadows Tract Marsh Restoration **O NEEDS MORE INFORMATION**
9. Money Bayou Wetlands Restoration **O YES**
10. Tate's Hell Crooked River Basin Restoration **O NEEDS MORE INFORMATION**
11. Robinson Preserve Wetlands Restoration **O NEEDS MORE INFORMATION**

see summary at the end

I. Does the project/program consider recent and/or relevant information? (captures statistical information requirement as defined by the Comprehensive Plan and Act)

O NEED MORE INFORMATION for all of them.

see summary at the end

the descriptions about this are either non-existent, not cited, or undeveloped.

J. Has the project/program evaluated past successes and failures of similar efforts? (captures the communication of risks and uncertainties in the scientific basis for such projects as defined by the Comprehensive Plan and Act)

1. Bahia Grande Wetland System Restoration, TX **O YES**
2. San Antonio Bay Marsh Restoration, TX **O NEEDS MORE INFORMATION**
3. Maurepas Swamp (West Joyce Wetlands) Restoration **O NO**
4. Hancock County Marshes Coastal Preserve Wetlands Restoration **O NO**
5. Wolf River Preserve Restoration, MS **O NEEDS MORE INFORMATION**
6. Fish River and Weeks Bay Marsh Restoration **O NEEDS MORE INFORMATION**
7. Oyster Bay Marsh Restoration **O NEEDS MORE INFORMATION**
8. Meadows Tract Marsh Restoration **O NEEDS MORE INFORMATION**
9. Money Bayou Wetlands Restoration **O Yes**
10. Tate's Hell Crooked River Basin Restoration **O Yes**
11. Robinson Preserve Wetlands Restoration **O Yes**

see summary at the end

the review of success, if it is done, is limited to the site, and not a general review of the pros and cons.

Please summarize any additional information needed below:

This proposal is a set of 11 individual projects that are not linked together. They need to be evaluated separately. The bundled proposal has merit, with the exception of one of them (#3), but they have strengths and weaknesses in each. Some of them could have been made stronger with the addition of information that is on the web – simply by adding the website address. I've provided some of this below.

The #3 Maurepas Swamp project is the lemon in the group and should not be funded.

1. Bahia Grande Wetland System Restoration, TX
26.083726°
-97.303797°
$1,140,000; 800 acres
Public

The hydrologic isolation by the Brownville Ship Channel seems like it would be less important than from Highway 100 and a parallel road, Pennsylvania Avenue, located about a half mile to the south. The State Highway 48 effectively sealed off the southern source of freshwater, too.

There is no indication on the google earth images that suggests a culvert under either Highway 100 or Pennsylvania Avenue; they may be there, or not. If they are there, then it may be necessary to enlarge them – right?

It would have been good to reference the Bahia Grande Restoration project (e.g., http://www.co.cameron.tx.us/commissioner_pct3/docs/bahiagrande2.pdf; and, http://www.habitat.noaa.gov/toolkits/tidal_hydro/portfolio_resources/tidalhydro_bg_11_2009_masterplanoverview.pdf) which substantiates the infrastructure supporting the larger restoration scheme, including the hydrologic framework and some monitoring.

There is official State-Federal-NGO partnership in place (e.g., Bahia Grande Restoration Partnership; Laguna Atascosca National Wildlife Refuge).

The metrics of success are not identified.

This project, potentially at least, has all the elements of becoming a successful project.

2. San Antonio Bay Marsh Restoration, TX
28.157958°
-96.785087°
$802,500; 170 acres
Public

This place is a mess; the roads need to be hydrologically punctuated and the levees should come down. There is a master plan developed as a joint program with the USFWS and Aransas National Wildlife Refuge. There is much more to the infrastructure than the proposal indicates or reveals. Some examples are: http://www.cbbep.org/publications/publication1224.pdf, http://www.cbbep.org/publications/virtuallibrary/74.pdf, http://sabaypartnership.org/pptpdffiles/SABPProject04092010.pdf;

The metrics of success are not identified.

3. Maurepas Swamp (West Joyce Wetlands) Restoration
30.401576°
-90.423041°
$3,495,000; 15,000 acres
Mostly private property on the map (Williams Land Co.), but also a way to reduce water treatment costs for the City of Hammond.

Congress enacted the Clean Water Act "to restore and maintain the chemical, physical, and biological integrity of the Nation's waters," (CWA section 101(a). (The current FWPCA is codified at 33 U.S.C. §§ 1251-1387). This project appears to be in violation of the spirit, if not the law of the CWA. It is not restoring 'severely degraded' wetlands; the history of the project is that it causes the conversion of wetlands to open water. This should not be funded, ever. The City of Hammond should start over.

Constructed wetlands are the industry norm for sewage treatment, but this is not a constructed wetland; it is a re-distribution of partially treated sewage into the natural environment. A review of constructed systems is in Vymazal (2011; Environ. Sci. Tech. 45: 61-69.). "The growing knowledge about wetland functions and values have caused a radical change of attitude toward wetlands since the 1950s and the use of natural wetlands for wastewater disposal decreased in some parts of the world. Unfortunately, in some parts of the world the deterioration of wetlands with wastewater still occurs." The Bible of wetland wastewater treatment, by Kadlec and Knight 1996) says the same thing (Kadlec, R. H. and R. L. Knight. 1996. Treatment wetlands. Lewis Publishers, New York).

The expansion of the free-flowing dispersal of sewage treatment water into a wetland adjoining the Joyce Wildlife Management Area (see GoogleMap) restored nothing – it caused the demise of the wetland there. It did not restore a system that did not need restoring - rather, the wetland turned to open water. The trees on the pipeline levee that were before it started are now dead; the planted cypress trees in the water distribution path are dead; the claims of nutria causing these results are not just disputed, but has no science foundation; eutrophication leads to other problems, including pathogen enhancement for people and wildlife (see, for example, Johnson et al. 2010 Linking environmental nutrient enrichment and disease emergence in humans and wildlife. ECOLOGICAL APPLICATIONS 20: 16-29); the City could spend the money on systems that work – it has already wasted at least $2 million.

There is no evidence of severely damaged forest in the GoogleEarth photos. The damage is from the sewage water introduced to the Joyce WMA. The GoogleEarth images show this clearly (see the timeline feature in GoogleEarth, starting in 2007).

The claim that "saltwater intrusion has killed vast areas of cypress-tupelo swamp forests" is unsubstantiated. There is no sign of saltwater vegetation in the photos. The apparent damage in the proposed expansion area is from being heavily logged – logging trails are running east – west in GoogleEarth. This is not saltwater intrusion issue. Further, the very I-55 levee they claim is the problem would keep salt water out of the area. The possible source of salt water is 9 miles to Lake Pontchartrain – which is a few ppt at the most, and there is forest shrub all the way – freshwater vegetation.

Proper wastewater treatment may be expensive but that the destruction and restoration of wetlands is also costly. It is very difficult to restore wetlands once they have been lost.

A letter from the Mayor of Hammond says that $2KK has already been spent (another source says it is $6 million), and is asking for $3 million (this project) more to fix it. The letters of recommendation are from the consultants who were/are involved in the $2 million failed project. The consultants are basically recommending their own project, and asking for a bailout that they would, presumably, be paid to do. This is an unacceptable way of endorsing Restore projects.

There is significant opposition to the existing project. Some examples: 1) The Louisiana Wildlife Federation urges caution, if not avoidance (http://www.lawildlifefed.org/resolutions_detail.cfm?id=8); 2) there was a workshop sponsored by the Lake Pontchartrain Basin Foundation that was a forum for the consultants and opponents of the existing project – hardly a unanimous evaluation of 'success'. 3) The Gulf Restoration Network and the Louisiana Environmental Action Network (LEAN) have some very pointed comments on sewage plant violations, project success (e.g., "the South Slough Wetlands Assimilation Site can only be characterized as a failure"; http://biotech.law.lsu.edu/blog/Hammond-GRN-comments.pdf). That comment quotes the Mayor (presumably acting on the advice of the consultants) as saying about the present project "[t]here will be no harmful effects on the environment." That is obviously was not the case.

The "supporting" letters are from consulting companies! Comite Resources (Day), Wetland Resources (Shaffer), Tierra Resources (Mack) who will get business, or already have a business with the project. Prof. Shaffer (writing on Wetland Resources LLC consultancy letterhead) says that "this project has the highest probability of success" in the region. This is not a believable assessment. He also says that the project "allows for periods of drawdown in both outfall areas." Drawdown is only possible if there is a containment levee. There is no way that $3 million can build a containment levee around 15,000 acres. That would not be restoration, but impoundment which clearly would have a negative effect on swamp forest.

Disproportionate benefits: The project is supposed to 'restore' 15,000 acres of 'severely degraded forest' (?).This is am extravagant claim. The same amount of sewage water was

supposed to restore a few hundred acres on Joyce (and caused wetland loss), but 30 times more land is 'restored' if the sewage load is doubled?

The metrics of restoration success are not identified and the damage already done at the Joyce WMA marshes is not mentioned.

Summary

This project does not belong in this portfolio of projects from NOAA. It is based on a failed concept, the public support is not there, and the justification represents what appears to be hype, not science.

An acceptable restoration project might be building an expanded treatment plant (conventional) run by the City of Hammond, or a wetland treatment plant (constructed wetland) that is also run by the City. It appears that eight more of these constructed wetlands could be built for the $3 million asked for here, and handle all of the wastewater issues, and with greater control and lower concentrations of nutrients in the outflow channel (e.g., see the capitalization cost and performance of the NW Hammond wetland treatment site http://www.wastewaterengineering.org/nwhammond-la.html)

4. Hancock County Marshes Coastal Preserve Wetlands Restoration

30.219596°
-89.491964°
$3,862,500; 450 acres
Public

This projects appears to address the presumed consequences of the CCC mosquito ditch dredging results from the 1930s. A design and engineering plan is proposed as part of the project, and so the costs are not substantiated by groundwork.

This project is half-baked and not as highly ranked as the others because of the scarcity of infrastructure planning. It looks good, but the 'if, maybe, and perhaps' qualifiers suggest that this is a good idea, but without much forethought.

There is a moderate level of infrastructure for doing the work, however, e.g., http://www.dmr.ms.gov/index.php/mississippi-gems/217-hancock-county-marshes; There are neighboring restoration efforts and NGO interests (e.g., http://www.gulfmex.org/archive/crp/5008.html).

Not clear why re-vegetation is necessary – volunteer plants usually arrive on their own.

The metrics of success are not identified.

5. Wolf River Preserve Restoration, MS
30.369940°
-89.284684°
$451,500; 400 acres
Public

This project has 5 culvert locations on the map.

The infrastructure is in cooperation with the Mississippi Department of Marine Resources, and the Wolf River is a State Scenic Stream. There are two restoration plans for the proposed site that were developed some time ago, which includes modeling of the hydrologic changes. This appears to be a site with low risk of failure and an in-place program to support it.

Filling the mosquito ditches must be accompanied by the removal of the ditched channel levee.

The metrics of success are not identified.

6. Fish River and Weeks Bay Marsh Restoration
30.420116°
-87.825676°
$1,520,000; 70 acres

This is embedded, apparently, in the Weeks Bay NEER. It has the infrastructure and local knowledge to improve the chances of success. Filling the dredged channels in must be accompanied by the removal of the ditched channel levee, esp. where tallow trees might be located.

The metrics of success are not identified.

7. Oyster Bay Marsh Restoration
30.282431°
-87.725478°
$666,500; 150 acres

GoogleEarth photos reveal what appear to be signs of stress on the upland side of 29th Ave, on western end of property.

It should work and is a meritorious idea, but no design plan exists. It is hard to endorse a budget without something with some meat in it.

There is a much more expensive project with the same name listed at http://www.alabamacoastalrestoration.org/ProjectPrint.aspx. The cost is $8,021,180.

(http://www.alabamacoastalrestoration.org/ProjectView.aspx?projectID=85). The area described appears to be the same property. The natural areas nearby (e.g., bon Secour NWR) is a plus.

It is not just the Intracoastal Waterway that affects the hydrology. A closer restraining factor is Highway 4, running east – west across the bottom of the property. This needs to be part of the project.

The metrics of success are not identified.

8. Meadows Tract Marsh Restoration
30.393078°
-87.875623°
$522,000; 250 acres. Public and private ownership

The general principle of restoring the hydrology is fine. But the wetlands "on the east side of Highway 98" doesn't match the GoogeEarth map. East of Highway 98 is off the wetland map shown in the second project map, and north of Weeks Bay.

I'd agree with the idea of replacing/installing culverts – if I could find them. The breakwater walls of Mobile Bay for the property to the west of 98 may create a problem for culvert path – if that is the intended area.

The design plan doesn't exist, so how is the cost justified? The size of the culverts, etc. estimated?

The metrics of success are not identified.

9. Money Bayou Wetlands Restoration
29.697584°
-85.279249°
41,003,563; 1000 acres
PUBLIC

It is a systematic repair job.

Part of the St. Joseph Bay State Buffer Preserve. This is a State program and there is a 'friends' group (http://www.stjosephbaypreserves.org/). A management plan exists (http://www.dep.state.fl.us/coastal/sites/stjoseph_buffer/pub/St_Joseph_Bay_Buffer_Preserve_DRAFT_Management_Plan_2012.pdf). The St. Joseph Bay Friends group has funded some hydrologic restoration already (culverts, fire roads, etc.) and so they have experience with the technical aspects, including funding needs.

The metrics of success are not identified.

10. Tate's Hell Crooked River Basin Restoration
29.886451°
-84.662992°
$1,450,000; 3,500 acres
Public

The description is skimpy, but in the right direction. There is a restoration plan for the general area (http://nwfwmdwetlands.com/nwfwmd/pdfs/Tates_Hydro_Vol_2_081310a.pdf). This restoration plan is fairly detailed and was created/funded by the Florida Department of Forestry. They have done some of this work already, and so they have experience with the technical aspects. Unit costs are included (one of the only ones)

The metrics of success are not identified.

11. Robinson Preserve Wetlands Restoration
27.509126°
-82.670470°
$785,000; 140 acres
Public

Great place to try out restoring agricultural land – near coast, too. It was agricultural land in a 1994 photo on GoogleEarth.

no design plan prepared – so how is the cost justified?

There are a few web sites that say the hydrologic success is completed (https://www.mymanatee.org/home/government/departments/parks-and-recreation/natural-resources/preserves/robinson-preserve.html; http://www.mymanatee.org/home/government/departments/parks-and-recreation/natural-resources/preserves/robinson-preserve/robinson-gallery.html; http://www.robinsonpreserve.com/Robinson_Preserve_info.html; http://baysoundings.com/legacy-archives/sum06/robinsonpreserve.php;

The existing restoration demonstrates a commitment to the site, a rare agricultural restoration to wetlands, and experience with the methods. Putting 10 acres into educational center and recreational facilities is a plus.

The metrics of success are not identified.