SCIENCE EVALUATION

Bucket 2 – Council Selected Restoration Component

PROPOSAL TITLE

Recovery and Restoration of Deep-water Coral Habitats in the Gulf of Mexico

LOCATION

Gulf of Mexico continental slope, region southeast of Louisiana Mississippi delta in the vicinity of Deepwater Horizon spill

SPONSOR(S)

Department of the Interior?

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

Implementation

REVIEWED BY:

DATE:

01/10/2015

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?

- ○ YES
- ○ NO
- ◉ NEED MORE INFORMATION

Comments

The rationale behind the overall goals of this study is not supported by literature citations. There needs to be more information and citations supporting the statements made regarding the importance of these environments for ecosystem services (with the exception of one Thurber 2014), and habitat and reproduction for fish species. The linkage between the coral species and the ecosystem services is not made or supported but rather just stated. There are some citations used that are not linked to the deep sea environment but this is not discussed. The statements made regarding the systems (watersheds, marine and estuarine) being linked was not supported by any literature citations. There was a comment made that inferred the study results would help understand the system linkages, however, this is very unclear how this specific study would help advance that understanding. The methods, objectives, and other information was well supported but the overarching basic rationale is missing development and literature support.

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?

- (●) YES
- ( ) NO
- ( ) NEED MORE INFORMATION

Comments

The methods are supported and building off of those that are being currently employed in the Gulf Coast region.

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

- (●) YES
- ( ) NO
- ( ) NEED MORE INFORMATION

Comments

The literature that is provided is accurate and complete. However, there are holes in what was supported (as mentioned above) and when citations were used that were not deep sea related it was not discussed why these were used over others (if they exist).

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

- (●) YES
- ( ) NO
- ( ) NEED MORE INFORMATION

Comments

Although much of the pertinent information is based on current studies that these same researchers are conducting or at least involved in, they did a good job of including other supporting research when possible.

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

- ( ) YES
- ( ) NO
- (●) NEED MORE INFORMATION

Comments

I don't believe they addressed all of the uncertainties and risks that exist in this proposal. Their study design is dependent upon finding two other non-impacted coral sites. How likely is this? What happens if they do not find these sites or they find two and the coral population is too small? What are the parameters necessary for inclusion of sites? They did not discuss this at all in the proposal. They also did not discuss the possibility of having unsuccessful restoration techniques and having negatively impacted the existing coral species (by taking samples). No supported statements were made about the existing population dynamics and robustness of the existing populations. Why is restoration needed? This was not at all discussed

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?)

- ○ YES
- ◉ NO
- ○ NEED MORE INFORMATION

Comments

The proposal doesn't discuss the impacts of unsuccessful restoration techniques and the cost that will be put into taking samples and putting them back on the seafloor and what it would mean if they were unsuccessful. It does not discuss impacts of environmental changes to the information this study will gather. How relevant will the information be in 5 years? Does the bottom habitat shift frequently? On the other hand, this study will collect baseline data that will be useful for the long-term despite environmental changes because it provides a database to compare future conditions. However, it is unclear if this

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?

- ○ YES
- ○ NO
- ◉ NEED MORE INFORMATION

Information Needed:

The methods and objectives are based on peer-reviewed literature and builds off of current studies. However, the basic rationale to conduct this research is lacking and unsupported. It is unclear what this study will provide in the long term. If restoration techniques are successful, what does that mean to the environment? fish populations? ecosystem services? etc. This needs to be developed and supported.

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)?

- ◉ YES
- ○ NO
- ○ NEED MORE INFORMATION

Information Needed:

The methods are strongly supported and will provide baseline information that will be useful in the future.

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?

- ○ YES
- ◉ NO
- ○ NEED MORE INFORMATION

Information Needed:

The section provided in the proposal does not address all of the uncertainties and risks that may exist with this proposal and acquiring this data apart from the nature of the environment.

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)?

No. However, this is a very particular study in a high risk environment. Their restoration techniques do not include a variety of options that may be useful when restoring for the first time. I agree with the researchers sticking with successful techniques in this case. Their experimental design needs more detail and refinement or at least justification. They propose to restore corals in concrete blocks in a way that represents high density. They do not provide information on whether the samples will come

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

No, not to my knowledge.

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)

I did not see this in the proposal apart from their plan to minimize overhead costs for Shiptime.

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

They mentioned having a plan to vary methods and then try again if restoration fails the first year. However, they do not mention any sort of plan if two sites are not found that are required for the sample design.

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

Yes.

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

Yes. However, Objective 1 states that temporal change will be tracked. How will this be occurred when the AUV is only used once? Will the ROV be used for the temporal changes?

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

This proposal is primarily collecting baseline information on coral populations around the Deep Water Horizon. The measures of success are inferred in the successful collection of data. The restoration experiment does not have measures of success discussed (% survival?).

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)

The methods for monitoring existing corals seemed to be well supported and proven successful. However, the restoration experiment and monitoring of success is not well defined.

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

yes. It builds off of current and/or existing projects and data.

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)

Yes. The methods for data collection are proven successful and the basic methodology for the fixing corals to concrete blocks is using existing and proven techniques.

Please summarize any additional information needed below:

There is not a clear study design described in the proposal. How many samples will be taken of coral colonies? How many colonies will be restored? What are the parameters required for the other two sites that will be found with the AUV? There are no statements that describe the status of the coral populations. Are the populations robust enough to handle restoration activities? The restoration experiment may be a bit premature.

Overall, the proposal needs more support for the basic rationale. It also needs a clear study design to adequately determine