

Restoration of Coastal Habitats: An Evaluation of NOAA's Current and Potential Role

**Ecosystem Science and Management Working Group
NOAA Science Advisory Board**

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INTRODUCTION

Coastal restoration¹ activities usually have multiple benefits² (e.g., recreation, preservation, fish production). Support for restoration from stakeholders, constituents, and elected officials is often garnered by touting these multiple benefits that can be provided by restoration projects. There are, however, questions as to how well restoration projects deliver any of these benefits and, if they are being designed to do so, are effectively measured.

Restoration is a significant component of NOAA's work and continues to increase. NOAA has played a central role in thousands of restoration projects. Those projects appear to be increasing in number and scale, both in dollars and acres. NOAA increasingly serves as an advisor on the best use of significant levels restoration funds. NOAA is one of a very small handful of truly global leaders in coastal and marine restoration. The organization is widely regarded for its expertise and involvement in restoration of salt marsh, oyster reef, coral reef, and seagrass habitats³. While NOAA is involved in mangrove restoration, there has been significant leadership provided on the study of this habitat elsewhere around the world (e.g., Vietnam).

With significant help from NOAA's senior leadership and key staff, we collected data on NOAA's direct and indirect restoration projects. We identified direct projects as those where restoration funds pass through NOAA, and are administered by NOAA directly. Indirect projects are those where funds pass through other agencies, but NOAA has a direct and tangible role in guiding how those funds are spent, usually by its presence on the key advisory board.

¹ NOAA (2008) defined restoration as "the process of re-establishing a self-sustaining habitat that closely resembles a natural condition in terms of structure and function." NOAA (National Oceanic and Atmospheric Administration). Habitat Restoration. Silver Spring, MD: NOAA, 2008.

² For the purposes of this paper, the term "benefits" is used in general terms and encompasses a number of potentially beneficial outcomes of a project.

³ See for example:

- McLennen et al. 2013. Draft agenda for action: Conserving and enhancing marine and coastal habitats. *Global Partnership for the Oceans*. USAID.
http://www.globalpartnershipforoceans.org/sites/oceans/files/images/GPO%20HABITAT-WHATS_WORKING_DECEMBER2013.pdf
- Global Restoration Network - <http://www.globalrestorationnetwork.org/ecosystems/coastal/>

Our goal was to understand: (1) where and how restoration is supported within NOAA, (2) the benefits that are discussed and assessed, and (3) how NOAA uses its role in guiding restoration efforts, both directly and indirectly.

METHODS

Our approach was to seek information directly from NOAA in order that we could consider the issue from the agency's perspective. The information obtained was supplemented by our own research involving a restoration program with which we are familiar. No attempt was made to ensure the data collected were all inclusive; however, particularly for direct projects, national level databases were investigated wherever possible. We greatly appreciate NOAA's responsiveness in addressing the key questions that we raised on habitat restoration efforts. NOAA provided substantial background material and answers to our questions. Most of the data collected and used as a basis for this report were accessed during late 2012 and 2013 and as a result, the assessment may not always reflect an up-to-date status of restoration activities.

The following questions were posed to NOAA staff:⁴

NOAA Direct Restoration Leadership

For the following six major NOAA programs⁵ with significant restoration activities (i.e., Restoration Center [RC], National Estuarine Research Reserve System [NERRS], Damage Assessment, Remediation, and Restoration Program [DARRP]; Marine Debris, Coral Reef Conservation Program, Sea Grant Program, Sanctuaries):

- a. What direct (i.e., appropriated) NOAA dollars are spent on restoration activities within your program?
- b. What criteria do you use for project selection (e.g., in RFPs or departmental guidance), including those for ecological goals and socio-economic goals (e.g., ecosystem services, functions, and benefits)?
- c. What criteria do you use for evaluating project performance (e.g., in RFPs or departmental guidance), including those for ecological goals and socio-economic goals (e.g., ecosystem services, functions, and benefits)?
- d. How would we access project performance monitoring information (e.g., project database)?

NOAA Indirect Restoration Leadership

- a. Please characterize amounts (\$) of major (i.e., greater than \$1 million), "external" (e.g., partnership; nonappropriated) restoration activities in which NOAA plays a central role in allocation of funds (e.g., member of small group of advisors or trustees beyond an advisory level but still with a position to influence decisions). Examples of likely major activities include the Coastal Wetland Planning, Protection and Restoration Act (CWPPRA), Pacific Salmon, multiple efforts by the National Resource Damage Assessment (NRDA), Estuaries Restoration Act, RESTORE (actual and expected).

⁴ The questions were developed in discussion with senior NOAA leadership to be clear, specific, and answerable. The ESMWG ultimately developed the final questions to be sent NOAA program leaders.

⁵ These were the major programs identified by NOAA leadership as involving significant restoration activities.

b. Please provide a general description of the criteria for selection and program/project performance.

NOAA DIRECT PROJECTS

Findings

Many of NOAA's RFPs and decision criteria for project identification and funding focus on multiple benefits and ecosystem services, but it appears that there is little focus on measuring these benefits.

We received 12 RFPs from NOAA in our original request for information on restoration projects and support. Six RFPs were clearly focused on fishery goals and benefits. Fisheries considerations figured less prominently, and sometimes not at all, in terms of potential benefits in the other six RFPs. Preferred metrics of success for meeting goals were only specified in four of the RFPs provided to the Ecosystem Sciences and Management Working Group (ESMWG).

NOAA does focus on measuring fisheries benefits.

In our numerous presentations and conversations with NOAA and staff, it was clear that there is a substantial focus on measuring fisheries objectives and benefits. It was often stated that this is because of the clear fisheries mandates associated with the Magnuson-Stevens Fisheries Conservation and Management Reauthorization Act (MSRA).

This focus and imperative have been most clearly reiterated by staff and leadership associated with the RC. In itself, this focus at RC is not surprising, given that the RC is within NOAA Fisheries. Furthermore, the perception that this fisheries focus is the core priority at NOAA in general may partly be driven by the fact that the RC has the most visible role at NOAA of any unit involved in restoration. This visibility has many roots including maintaining a core center of excellence with (often) stable staff at HQ, and in offices across the US. The program has also used relatively modest funding to build a broad constituency for restoration.

What is surprising is that NOAA has many other goals and mandates beyond those reiterated in the MSRA. Even the RC administers entire project areas with very clear nonfisheries mandates. For example, the American Recovery and Reinvestment Act (ARRA) projects, which are some of the largest ever at the RC, had very clear mandates to both create jobs and measure that job creation.

We attempted to analyze what NOAA actually does measure in terms of benefits, but this proved particularly problematic. We analyzed the National Estuaries Restoration Inventory (NERI, <https://neri.noaa.gov/neri/>), which houses information on estuary habitat restoration projects. NERI was designed to track progress towards meeting the goals of the [Estuary Restoration Act](#); these goals were primarily focused on restored acreage. In addition to being possibly the world's largest restoration project database (more than 12,000 projects), NERI contains seemingly detailed data on what was measured in projects, which is uncommon in other restoration databases.

Based on NERI data, we examined NOAA and other agencies (e.g., U.S. Army Corps of Engineers [USACE] and U.S. Fish and Wildlife Service [USFWS]) and found that NOAA reported that it focused more on measurement of fishes, invertebrates, and mixed assemblages than other agencies (Figure 1). However, a review of the data suggests real concerns in data quality that were echoed by NOAA RC staff. For example, the data suggest that NOAA, USACE, and USFWS all monitored birds in 100% of their restoration projects; we know from personal project experience across dozens of NOAA-funded projects and discussion with RC staff that this is incorrect (Table 1). In addition, the only item that USFWS was reported to measure beyond birds was “other.” We also found that NERI had an inconsistent approach in assessing acreages restored, as identified both in our discussions with NOAA staff and through a brief review of projects for which the committee had direct first-hand experience. NERI appears to be quite useful as a catalog of restoration projects, but its value as a source for examining monitoring data is questionable, given the observations described above.

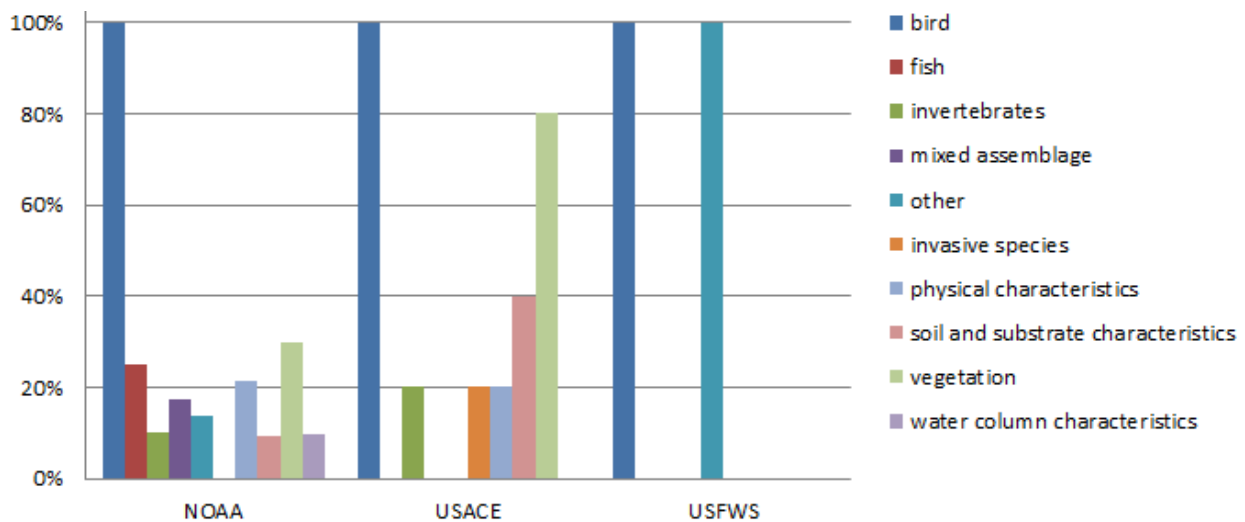


Figure 1: Resources monitored in restoration projects across NOAA, USACE, and USFWS as reported in the NERI database. Data are indicated as a percent of projects reporting that they measured birds, fish and other species, and ecosystem variables.

We were, upon request, received reliable information about recently funded projects on project size and variables monitored from the NOAA RC (Tables 1 and 2). Table 1 indicates that jobs were the most frequently measured variable; this was legislatively mandated.

Table 1: Monitoring of the 50 Recovery Act NOAA restoration projects. Values shown are the percent of projects that monitored each variable.

<i>Fish</i>	<i>Coral & shellfish</i>	<i>Additional species</i>	<i>Physical processes</i>	<i>Water quality</i>	<i>Coastal defense</i>	<i>Jobs</i>	<i>Recreational benefits</i>	<i>Other benefits</i>
80%	24%	72%	78%	60%	36%	100%	12%	18%

At the scale of most restoration projects, the benefits to fisheries productivity are likely to be low (or nonexistent) or at the very least, extremely difficult to measure; a few more local fish does indicate increased fisheries productivity.

The NERI database did not provide reliable data on the scale of restoration projects in terms of acreage. Table 2 provides an estimate of the recent size of projects supported by the NOAA RC, which is in the order of tens to hundreds of acres. Other programs can have somewhat larger projects such as NOAA CWPPRA; in the last five years, NOAA CWPPRA projects have ranged from approximately 350-590 acres and from \$2-45 million for engineering through construction, with the average at \$33 million⁶.

Table 2: Size of projects funded competitively by NOAA RC from 2010-2013.

Per project	Non-Recovery Act projects (2010-2013)	Recovery Act projects
Average acres restored	47	346
Average stream miles opened	11	28
Average NOAA contribution	\$89,123	\$1,939,796
Max NOAA contribution	\$3,137,550	\$12,796,006

At the scale of tens to hundreds of acres, it is unlikely that these projects can have impacts at the scale of fisheries. Some local studies of specific habitat enhancements have demonstrated increased densities of fishery species, and indications of improvements in food resources, may influence the occurrence of feeding behavior on those resources.⁷ One example where fishery benefits of a restoration project have been demonstrated is the Great South Bay, NY. Large-scale fishery benefits are being developed from approximately \$6 million⁷ worth of restoration projects.⁸

Small-scale restoration projects undoubtedly have a role in coastal habitat enhancement. However, the goals and expectations set for those projects need to be appropriate for their scale. If such goals are met and the directional change in habitat extent or quality is extended through additional restoration, then some fisheries improvement may ultimately result.

Indeed, it is possible that many small-scale fishery enhancement projects could collectively have significant large-scale fishery influence. There is, however, little evidence to point to these large-scale impacts, and achieving them would likely require a very long-term, consistent, strategic focus on particular taxa and locations, which is difficult for even a large federal agency. In such cases, fishery improvements should only be seen as a collective goal and at a system scale, rather than at a project scale. Furthermore, specific system-scale monitoring of these

⁶ Summer Morlock, pers comm., Dec., 2013.

⁷ Toft, J.D., Ogston, A.S., Heerhartz, S.M., Cordell, J.R., and E.E. Flemer. 2013. Ecological response and physical stability of habitat enhancements along an urban armored shoreline, *Ecological Engineering*, 57, 97-108.

⁸ Lobue, C. and M. Bortman. 2011. Hard clams, hard lessons: The shellfish renaissance. *Solutions*. 2(1), 82-88. <http://thesolutionsjournal.com/node/849>

projects would be required to identify the resulting benefits. Generalizing local studies to the system scale is fraught with difficulty. Citing salmon habitats as an example, Diefenderfer et al. (2011)⁹ note: “The inferential problems of demonstrating the cumulative effects of habitat restoration on salmon returns are not wholly dissimilar from trying to prove or disprove the ‘greenhouse’ effect on global warming. A single definitive, indisputable experiment does not exist, nor will it ever exist.”

NOAA’s projects are likely to actually deliver many additional benefits apart from fisheries, including job creation, shoreline access, recreational opportunities and hazard mitigation—even at the current scale of numerous projects—and many projects are chosen for these benefits.

NOAA has a number of projects that are clearly delivering measureable, nonfisheries benefits. For example, NOAA’s ARRA projects were required to focus on jobs and job creation benefits. These 50 projects carried out by numerous partners had strong and clear reporting requirements. More importantly, they were shown to clearly deliver jobs creation (Figure 2). “These habitat restoration projects created, on average, 17 jobs per million dollars spent which is similar to other conservation industries such as parks and land conservation, and much higher than other traditional industries including coal, gas, and nuclear energy generation.”¹⁰ However, the “economic benefit” of jobs is not always straightforward. For instance, some people may benefit from job creation programs, such as avoiding unemployment spells, etc., while in other cases the benefits may be limited as people simply transfer from one region or occupation to another. In an more fully employed economy creating jobs may not result in what economists consider to be project benefits.¹¹

Return on Investment analyses of NOAA’s restoration projects are rare, but the few examples show that other services and benefits can outweigh fishery benefits. Kroeger and Guannel (in press)¹² reviewed two NOAA oyster restoration projects and found that the benefits associated with erosion reduction and coastal defense can be greater than the fishery benefits. They measured fisheries production across a wide range of finfish, shrimp, crabs, and oysters, primarily using data and approaches from Scyphers et al. (2011) and Grabowski and Petersen

⁹ Diefenderfer, H.L., Thom, R.M., Johnson, G.E., Skalski, J.R., Vogt, K.A., Ebberts, B.D., Roegner, G.C., and E.M. Dawley. 2011. A levels-of-evidence approach for assessing cumulative ecosystem response to estuary and river restoration programs. *Ecological Rest.* 29, 111-132.

¹⁰ Edwards, P., Sutton-Grier, A.E., and G. Coyle. 2013. Investing in nature: restoring coastal habitat blue infrastructure and green job creation. *Marine Policy*, 38, 65-71. <http://dx.doi.org/10.1016/j.marpol.2012.05.020>.

¹¹ For additional discussion of the issue of economic benefit of job creation see:

Timothy J. Bartik, 2012. Including jobs in benefit-cost analysis. *Annual Review of Resource Economics, Annual Reviews*, Vol. 4(1), pp. 55-73

Pendleton, L. 2010. Measuring and monitoring the economic effects of habitat restoration: A summary of a NOAA Blue Ribbon Panel.

http://www.era.noaa.gov/pdfs/NOAA%20RAE%20BRP%20Estuary%20Economics_FINAL.pdf

Pendleton, L. 2008. The economic and market value of coasts and estuaries: What’s at stake? *Restore America’s Estuaries*. Arlington, VA. <https://www.estuaries.org/images/stories/docs/policy-legislation/final-econ-with-cover-5-20-2008.pdf>

¹² Kroeger, T. and G. Guannel. (in press). Fishery enhancement, coastal protection and water quality services provided by two restored Gulf of Mexico oyster reefs. In K. Ninan (ed.), *Valuing Ecosystem Services-Methodological Issues and Case Studies*. Edward Elgar.

(2007).¹³ They considered the potential fishery production contributions to regional recreational and commercial fisheries. For coastal defense they only considered the avoided replacement costs of hardening shorelines behind the restored reefs. Their results are consistent with other reviews of ecosystem services, which often find that the greatest ecosystem benefits for coastal and marine habitats and their restoration are associated with coastal defense or tourism (e.g., Laurens et al., 2013.¹⁴) Edwards et al. also identified other potential benefits from NOAA ARRA restoration projects, noting that “one of the ARRA funded projects demonstrated that restoring Muskegon Lake, on the east shore of Lake Michigan, will generate more than \$66 million in economic benefits for its \$10 million investment, including a \$12 million increase in property values, up to \$600,000 in new tax revenues annually, and over \$1 million in new recreational spending annually.”¹⁵

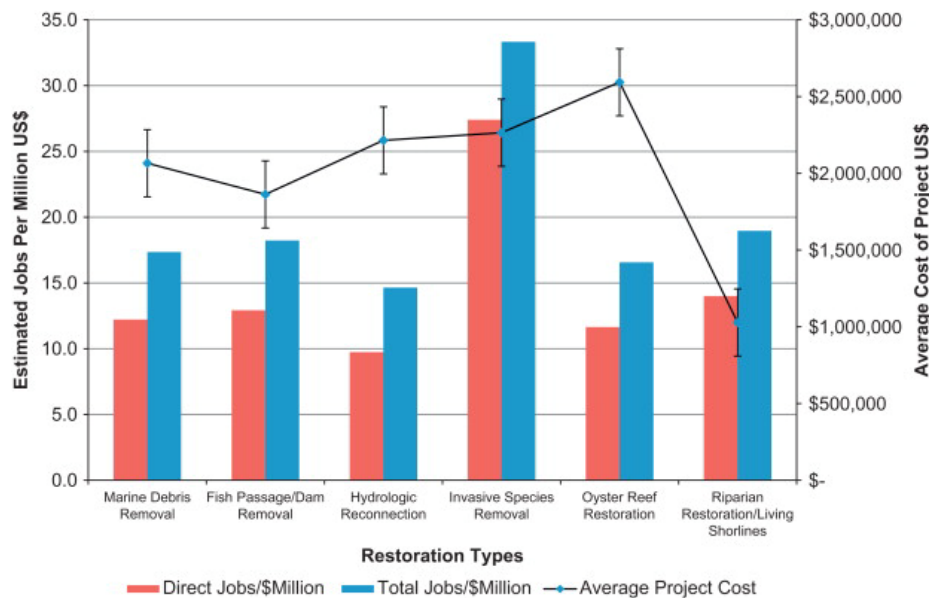


Figure 2: Average jobs generated per million expenditure and average project cost per restoration type. From Edwards et al. (2013).

There are a number of NOAA small-scale restoration projects that do deliver recreational benefits for fishermen (e.g., oyster restoration projects led by the North Carolina Department of Natural Resources and the San Francisco Bay Rod and Gun club), which are clearly different from delivering fishery production benefits. It is well-established in the literature that even small

¹³ Scyphers, S.B., S.P. Powers, K.L. Heck Jr. and D. Byron. (2011). Oyster reefs as natural breakwaters mitigate shoreline loss and facilitate fisheries. *PLoS ONE*, 6(8), e22396.

Grabowski, J.H. and C.H. Petersen. (2007). Restoring oyster reefs to recover ecosystem services. In Cuddington, K., J.E. Byers, W.G. Wilson and A. Hastings (eds.), *Ecosystem Engineers: Concepts, Theory and Applications*, Amsterdam: Elsevier-Academic Press, 281-298.

¹⁴ Laurens, Y., Pascal, N., Binet, T., Brander, L. Clua, E., David, G., Rojat, D., and A. Seidi.. 2013. Economic valuation of ecosystem services from coral reefs in the South Pacific: Taking stock of recent experience. *Journal of Environmental Management*, 116, 135-144.

¹⁵ See also http://www.glc.org/announce/11/pdf/Muskegon-Lake-ARRA-econ-fact-sheet_Final_May2011.pdf ftp://geoportal.wri.gvsu.edu/awri_website/final%20socio%20economic%202.pdf.

structures can serve as fish aggregating devices with benefits from fish attraction. The evidence for actual fishery production benefits from artificial structures is rare. Indeed, there are reasonable arguments that suggest fish attraction can have negative effects on fisheries by aggregating species and making it easier to overfish them with less effort. Of course, fish attraction may not be a problem if the fishery is being managed sustainably overall.

Given these findings, we make the following recommendations:

Recommendation 1

NOAA should track and make available information regarding its existing measures in the Restoration Atlas or the NERI database, ensuring consistency and accuracy in the data.

There appears to be quite a bit of effort and investment in measures undertaken by NOAA and grantees, yet it is exceptionally difficult to gather even basic information on these measures. We found it was generally not possible to reliably summarize anything on even the key variables measured in past projects, and not possible to gather any information on values.

Better tracking of these measures is essential to assessing success and for building constituencies of support. These monitoring data can be critical for expanding restoration. The data that NOAA collected and published on jobs for the ARRA projects could influence NOAA's future restoration projects and those of many other agencies and organizations.

Furthermore, improved monitoring could open alternative mechanisms for funding restoration projects. For example, sufficient monitoring data to describe the relationship between abundance of oysters and denitrification and water quality could inform and enhance nutrient trading schemes and lead to more oyster restoration.

Recommendation 2

NOAA should more clearly recognize that its restoration mandates extend well beyond fisheries.

NOAA's mission and mandates cover aspects of management from the coastal zone to the high seas. NOAA responsibilities include those covered from NRDA to the Coastal Zone Management Act (CZMA) to Magnuson-Stevens. NOAA is the chief coastal and marine steward in its overall mission and it serves this role well.

We have found it surprising how fisheries-focused restoration efforts are *perceived* at NOAA. We find significant amounts of evidence indicating that NOAA's restoration efforts and measurements often extend well beyond fisheries, and NOAA has strong expertise in nonfisheries measures. Restoration staff also has a clear understanding of nonfisheries mandates. For example, much of the RC projects are in state waters and the regional staff work well and very closely with state agencies.

It is possible that these nonfishery restoration indicators, or measures, may lack focus; we believe that this issue is one of perception, which could also be addressed with some further leadership in identifying a clear Measures (i.e., indicators) Framework across NOAA programs. In the first instance, more detailed and defined guidance on the key categories of measures and

benefits that NOAA will track would be useful (e.g., jobs, fish production, water purification [WQ], coastal defense, recreation).

Recommendation 3

NOAA should undertake a Return on Investment analysis on a small, random subsample of projects that cover multiple objectives.

The approach to these Return on Investment studies is well defined.¹⁶ NOAA and its partners have conducted Return on Investments studies for restoration projects that have been used, for example, in congressional briefings.¹⁷ NOAA could likely interest some outside Fellows to assist in such an analysis.

Recommendation 4

NOAA should scale its restoration projects to more clearly fit the desired objectives.

For example, if NOAA intends to deliver measurable fisheries production benefits from restoration projects, then it likely needs to undertake fewer, and larger, projects. Many of the current projects do not appear to be significant enough to deliver measurable fisheries benefits and will likely need to be several orders of magnitude larger to deliver production benefits. There is likely a minimum scale below which the projects ecologically are too small to provide production benefits, and such scales need to be identified before projects are undertaken. Where benefits are expected to be cumulative across a number of projects, or where the effects are spatially diffused in later life history stages, must be clearly stated and the benefits quantified at the scale or location where these benefits are expected to occur.

We do not necessarily recommend this approach; in fact, we think there should be a broader focus on the benefits beyond fisheries, but NOAA should be precise on how scaling projects will take place to deliver desired benefits.

Recommendation 5

There should be center(s) of excellence in restoration at NOAA that focus on fisheries and nonfisheries benefits.

The RC plays a central role for NOAA in restoration. For a variety of reasons—both real and perceived—related to its budget and mandates, it often takes a fisheries-centric approach. But this viewpoint and mandate do not encompass NOAA's restoration mandate and there likely needs to be either: (a) an equally robust center elsewhere in NOAA. or (b) the RC needs to

¹⁶ Pendleton. 2010. Measuring and monitoring the economic effects of habitat restoration: A summary of a NOAA Blue Ribbon Panel.

http://www.era.noaa.gov/pdfs/NOAA%20RAE%20BRP%20Estuary%20Economics_FINAL.pdf

Pendleton. 2008. The Economic and Market Value of Coasts and Estuaries: What's At Stake? Restore America's Estuaries. Arlington, VA. <https://www.estuaries.org/images/stories/docs/policy-legislation/final-econ-with-cover-5-20-2008.pdf>

¹⁷ See Edwards et al. 2013. Kroeger and Guannel (in press).

http://www.habitat.noaa.gov/pdf/RAE_Restoration_Jobs.pdf;

http://www.habitat.noaa.gov/pdf/Investing_in_Nature_TNC.pdf

expand beyond its fishery objectives and have a much clearer focus on nonfisheries objectives. All things being equal, we believe (b) is the best approach, but we also recognize that there is a degree of history and inertia that will make this difficult. If NOAA were to choose (a), we do not necessarily think staff would need to be added, although we did not assess staff numbers, but we suspect that four or five other restoration programs might be able to coalesce some staff. A “capacity assessment” may be required to clarify existing capabilities.

Recommendation 6

NOAA restoration efforts should more clearly measure additional benefits beyond fisheries.

In fact, many RFPS and projects identify numerous benefits that could, or should, arise from projects and, as a result, should be measured. We are simply calling for greater clarity and focus for these efforts and recognition that these represent some of NOAA’s most clearly measured projects (e.g., water quality). These clear and timely measures and efforts offer real marketability to decision makers such as the Office of Management and Budget (OMB). Defining broader goals and measures is likely to engage a more diverse group of stakeholders, which should make it easier to make a viable case to OMB or Congress on the benefits of restoration.

Recommendation 7

More of the NERI and NOAA Restoration Atlas’ data should be made public.

There were significant data in NERI and the Restoration Atlas that could have been highly informative to many stakeholders, from restoration practitioners to funders. This information was usually only accessible by viewing projects individually and copying or recording the data elsewhere. The underlying data were, however, clearly well organized in a type of tabular format. Only limited amounts of these data could be accessed by arcane search engines with limited analysis capabilities. The alternative was to ask NOAA staff to analyze their databases for us on a case-by-case basis, which was clearly not an efficient use of participants’ time. If the database was more accessible, then outside scientists or research fellows (e.g., funded by Smith or NSF [National Science Foundation]) could help analyze and sort these data.

NOAA INDIRECT PROJECTS

Findings

NOAA is a key advisor for hundreds of millions of dollars of habitat restoration investments by other federal and state agencies.

Over the past five years, NOAA has administered significant restoration program funds associated particularly with the Pacific Coastal Salmon Recovery Fund and the ARRA projects. The indirect funds for which they serve as an advisor are at this same scale of magnitude. When Restore Act funds and potential NRDA funds associated with the Deepwater Horizon are considered, these numbers for indirect projects are potentially greater by an order of magnitude than the funds for direct projects.

Table 3a: Direct appropriations for NOAA restoration efforts.

	NOAA Organization	Appropriations FY08-FY12 (millions)	Account
Estuary Restoration Program	NOS/Office of Response and Restoration	\$8.0	ORF
	NMFS/Office of Habitat Conservation	\$0.5	ORF
Community-based Restoration Program	NMFS/Office of Habitat Conservation	\$83.5	ORF
Chesapeake Bay Oyster Restoration	NMFS/Office of Habitat Conservation	\$5.2	ORF
Open Rivers Initiative	NMFS/Office of Habitat Conservation	\$15.6	ORF
Great Lakes Habitat Restoration Program	NMFS/Office of Habitat Conservation	\$3.0	ORF
Pacific Coastal Salmon Recovery Fund (PCSRF)	NMFS/Northwest Regional Office - Protected Species	\$371.8	Other
American Reinvestment and Recovery Act (ARRA)		\$167	Other

Table 3b: Restoration funds for which NOAA is a key or principle advisor but which are not directly appropriated to NOAA. Note that RESTORE Act funds for restoration have yet to be determined but are expected to be in the hundreds of millions of dollars.

Other Restoration Investments - non-appropriated Funding (millions)		
	NOAA Organization	Appropriations FY08-FY12 (millions)
Great Lakes Restoration Initiative (Habitat Restoration)	OAR/Great Lakes Environmental Research Lab & NMFS/Office of Habitat Conservation	\$21.4
Coastal Wetlands Planning Protection and Restoration Act Program	NMFS/Office of Habitat Conservation	\$280*
Damage Assessment, Remediation and Restoration Program	NOS/Office of Response and Restoration & NMFS/Office of Habitat Conservation	\$160**

*CWPRRA—\$145million directly from a total of about \$425 million across agencies on the Task Force
 **DARPA—\$160 million active in the past five years, sitting on 75 other panels. \$160 million in active projects.

NOAA has an opportunity to guide these investments towards “good” projects and specific restoration benefits.

While the role of NOAA varies among these restoration programs, NOAA’s role as a trustee under NRDA and as a Task Force member for the Coastal Wetlands Planning Protection and Restoration Act (CWPRRA), provides the agency with key roles in the allocation of funds to restoration, even when the monies are not federally appropriated through NOAA. NOAA’s DARRP guides assessment and restoration of natural resources negatively impacted by the release of oil and hazardous substances, as well as by physical impacts, such as vessel groundings in National Marine Sanctuaries. At waste sites or after an oil spill, the Assessment and Restoration Division conducts an NRDA. The NRDA process determines the extent of damage to natural resources, the use of these resources, and the appropriate type and amount of environmental restoration required to compensate the American public for those impacts.

Within CWPPRA, NOAA sits for the Department of Commerce of the Task Force which is charged by the Act with making final decisions concerning issues, policies, and procedures necessary to execute the Program and its projects. NOAA also sits on the CWPPRA Technical Committee which established by the Task Force to provide advice and recommendations for execution of the Program and projects from a number of technical perspectives, which include engineering, environmental, economic, real estate, construction, operation and maintenance, and monitoring. CWPPRA projects vary from shoreline protection to barrier island restoration to hydrologic restoration and marsh creation using dredged materials. With its role in the CWPPRA decision-making framework, NOAA can influence the allocation of approximately \$50 million annually towards coastal restoration in Louisiana.

The RESTORE Act funds are slightly different. Figure 3 shows that many of the Section 1603 funds are allocated for restoration through the Council, Gulf coast states, or through a formula related to impact. The Department of Commerce is represented on the Council. Section 1604 of the RESTORE Act, however, authorizes NOAA, in consultation with USFWS, to establish and administer the Gulf Coast Ecosystem Restoration Science, Observation, Monitoring, and Technology Program. The program is commonly known as the NOAA RESTORE Act Science Program. The indirect influence of the science program, on restoration decision making under RESTORE, is yet to be determined

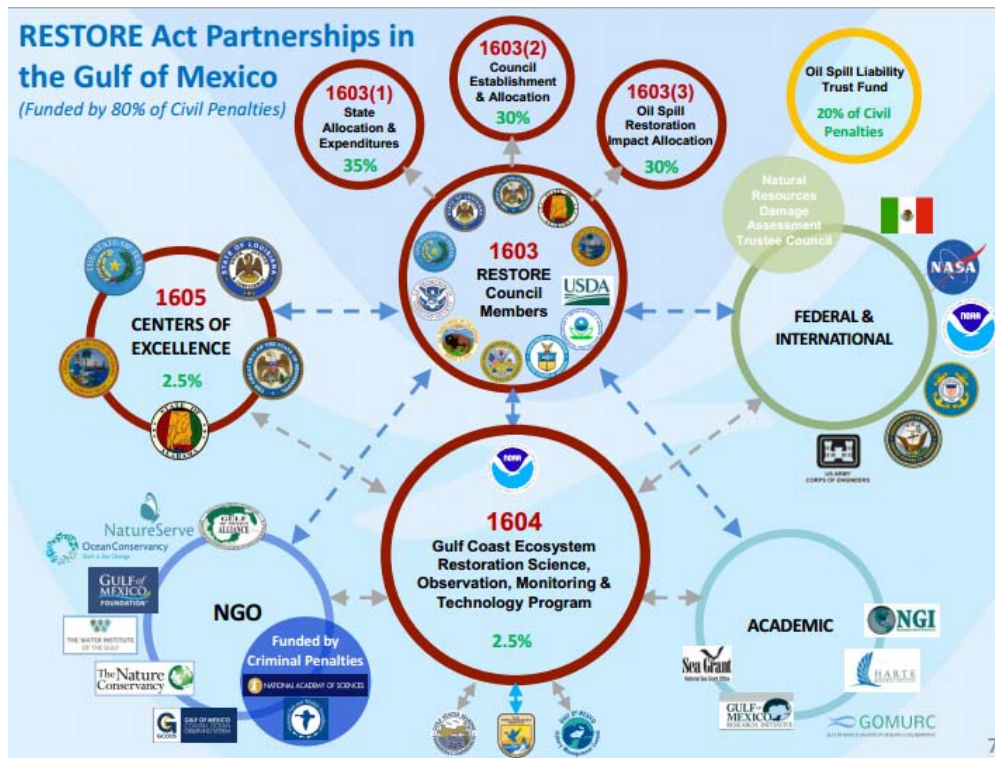


Figure 3: NOAA RESTORE Act Science Program Partnerships in the Gulf of Mexico. From <http://www.nationalacademies.org/gulf/SWalker%20AG%20DC%20Mtg%208-29-13.pdf>

NOAA does not appear to clearly track and account for their largest opportunities to guide restoration funding.

In our requests to NOAA on project funding, we were able to quickly gather clear information on the yearly budgets for the *direct* restoration funding that NOAA administers. Initially, we were not able to obtain any information on *indirect* projects, yet these are clearly significant programs where NOAA serves as one of just a few key advisors. In our second request, we were able to gather limited information, which was usually not as well organized as the direct projects information. The data generally were not arranged by year and often represented “guesstimates” as opposed to defined data. We did not seek further clarification as we were not convinced we could acquire more acceptable results without substantial effort and for this review, these estimates might suffice. While there may not be a mandate for NOAA to track such funding in

detail, the potential contributions these funds can make to NOAA's restoration mission would appear to justify the effort.

NOAA may not greatly factor its role as a key advisor on restoration into its strategic priorities.

The Next Generation Strategic Plan (NGSP) states:

“NOAA and its partners will use rigorous assessments of habitat quantity, quality, and integrity to prioritize marine, coastal, and riverine habitats that support Federal trust species (that is, threatened or endangered species, interjurisdictional fish, marine mammals, and other species of concern) for conservation actions.”

The NGSP includes a discussion of the importance of partnerships and the acknowledgement that partnerships are crucial to implementing restoration. The five-year goals of the NGSP include: “Increased use of partnerships, scientifically sound conservation measures, coastal and marine spatial planning, and regional ecosystem conservation approaches to protect and restore priority habitats.” However, the NGSP lacks a clear statement regarding the leveraging of partner funds toward shared goals, including restoration.

Similarly, the Habitat Blueprint broadly discusses the concept of engaging partners and collaborative work to increase efficiencies, stating: “we plan to work together with our partners on common actions in priority areas and improve delivery of habitat science to encourage complementary habitat conservation actions along our nation's coastline and for our marine environments.” However, it provides little in the way of specifics or operational details. While we do not expect such operational details to be found in Strategic Plans, we could not locate them elsewhere and believe that such implementation guidance is critical.

If these findings are correct, then it is possible, even likely, that NOAA is missing an important opportunity to lend its expertise to guide the nation's restoration investments, as well as failing to leverage funding from other sources with more general restoration goals towards the conservation and enhancement of coastal fisheries and their habitats. And if this is the case, what are the opportunities to adjust NOAA's role to better guide future restoration investments?

Given these findings, we make the following recommendations:

Recommendation 8

NOAA's strategic plan and associated implementation plans must have a greater focus leveraging the restoration funds of others to achieve multiple benefits, including those to coastal fisheries.

Given the current fiscal climate, it is clear to the ESMWG that the importance of coastal habitats to NOAA's fishery mission, and both legacy and ongoing threats to natural coastal systems, demonstrates the need to work in partnerships with others to achieve systemic restoration. Individual NOAA staff may work with others to develop and guide restoration projects, but as an agency, guidance that empowers and encourages such partnerships seems to be lacking.

Recommendation 9

NOAA should formally recognize that its expertise in coastal habitat restoration, developed as part of its core mission, can provide added value to coastal habitats through advising and directing the use of nonappropriated funds.

While collaboration among federal agencies is often challenged by the budget process and differences in agency missions, within coastal systems there are many arenas where NOAA works hand in hand with other agencies to determine how restoration dollars will be allocated. NOAA has substantial expertise in the restoration of coastal habitats and formally recognizing a role for NOAA's experts as advisors (not only as part of consultations under the Ecological Society of America [ESA], Magnuson-Stevens Fishery Conservation and Management Reauthorization Act [MSRA], or the Marine Mammal Protection Act [MMPA]), even if restoration funds are not appropriated through NOAA, can lead to increased cooperation and, ultimately, improve coastal habitat restoration outcomes and their benefits for fisheries.

Recommendation 10

NOAA should highlight the role it plays in working with its agency partners on projects, illustrating the separate skill sets that its staff and those of other agencies bring to the table to ensure the success of complex restoration projects.

Should NOAA more formally recognize its expertise in coastal habitat restoration and how it relates to the expertise of other agencies (e.g., USACE for construction, the Environmental Protection Agency [EPA] for water quality), its role as a leader will be more widely recognized and appropriately credited. Providing more prominence to this advisory role as part of its accountability framework will enable NOAA staff to gain more credit for their work and will likely result in positive feedback, both for professional development and restoration outcomes. While such benefits may be less tangible than the support for directly funded projects, the recognition of a value-added role for NOAA may enable further engagement and partnership, thus leveraging funds towards NOAA's restoration goals.