

# **Title of Grant: Restoring the Gulf: Leveraging Deepwater Horizon Funds with Impact Investment**

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Timeframe: 2/15/17 to 9/30/19

Grant Number: 69-3A75-17-18

Date of Submission: December 18, 2019

Deliverables Identified in the Grant Agreement:

1. Up to six investment blueprints and associated term sheets and project pipelines that can support private impact investment in a resilient Gulf system by leveraging RESTORE Funds. Additionally, at least 3 case studies will be developed to illustrate how investment terms and project capabilities can be paired in specific places in the RESTORE footprint to implement investment blueprints.
2. A pipeline of specific deal opportunities to execute in cooperation with the RESTORE Council and with other state and federal agencies that would test the investment blueprints and provide further information on replicability.

# **Report on Opportunities for Leveraging Deepwater Horizon Funds with Impact Investment and Other Private Funds**

The Nature Conservancy/NatureVest  
December 2019

This report was supported by a grant from the Conservation Innovation Grant Program of the Natural Resources Conservation Service.

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## Executive Summary

The settlement of legal actions resulting from the Deepwater Horizon Oil Spill in 2010 required BP and other responsible parties to pay more than \$20.8 billion into various dedicated funds for the environmental restoration and economic recovery of the Gulf of Mexico and its surrounding communities. While this may seem like a very large amount of money, it is not nearly sufficient to address the Gulf's full legacy of problems, including the extensive land loss in the Mississippi River Delta. Pursuant to the Resources and Ecosystems Sustainability, Tourist Opportunities, and Revived Economies of the Gulf Coast States (RESTORE) Act passed by Congress in 2012, the RESTORE Council was established to receive a portion of Clean Water Act fines from the spill. From the outset, RESTORE Council staff recognized the importance of trying to leverage RESTORE and other Deepwater Horizon (DWH) funding to accomplish more restoration than could be accomplished with DWH funding alone.

In discussions with The Nature Conservancy (TNC) and its NatureVest program, RESTORE Council staff suggested TNC look at the potential to use RESTORE funding to leverage private capital and thus expand the restoration that could be accomplished with oil-spill money. The Conservation Innovation Grant (CIG) Program of the USDA's Natural Resources Conservation Service subsequently provided TNC with a grant to match this funding to investigate the feasibility of using RESTORE Act money to leverage private capital, and particularly, impact capital, to restore the Gulf's resources. Impact capital is defined as investment capital that seeks a financial return alongside social and environmental impacts.

This project evaluated blueprints for the following potential private capital investment strategies to determine whether they could produce tangible restoration results and provide a sufficient return on investment to private impact investors:

- Blueprint #1: Development of local water management systems
- Blueprint #2: Investment in sustainable agriculture
- Blueprint #3: Forest conservation at a landscape scale
  - Blueprint #3a: Stewardship contracts and agreements on national forests
  - Blueprint #3b: Working Woodlands program
  - Blueprint# 3c: Working forest easements
- Blueprint #4: Coastal restoration
  - Blueprint #4a: Oyster/living shoreline restoration using oyster scaffolds
  - Blueprint #4b: Beneficial use of dredged materials



Overall, we found that using RESTORE Act funding to leverage private capital, including impact capital, to increase the scope of Gulf restoration is more difficult in practice than in theory. However, several opportunities do exist for leveraging RESTORE and other DWH dollars.

Specifically, we found that private capital can be used/leveraged: 1) to develop local water management systems (Blueprint #1); 2) in large landscape forest conservation projects to protect tributaries to the Gulf, including through stewardship contracts and agreements on national forests, through a Working Woodlands Program for private forest lands, and through working forest easements on large private landholdings (Blueprint #3); and, 3) potentially, to restore oyster reefs/living shorelines using oyster scaffolds (Blueprint #4a). We found that there is not an entirely new need for private capital to leverage RESTORE funding to encourage sustainable agriculture in the Gulf of Mexico watershed (Blueprint #2) because U.S. Farm Bill Programs administered by the Natural Resources Conservation Service already achieve substantial environmental benefits by partnering with private agricultural landowners/producers. However, development of a fully structured nutrient trading system in Louisiana, as a model for other states, could increase the profitability (and the attractiveness for investment) of operating large-scale farming in a sustainable way. We found that the use of private capital to enable the beneficial use of dredged materials (Blueprint #4b) is not feasible at this time without changes in the permitting and funding processes for coastal restoration.

This analysis has contributed to potentially viable private investment projects now under discussion including: 1) Implementation of water quality improvements in Milton, Florida, 2) Continuation of stewardship agreements in Apalachicola National Forest, 3) Consideration of the Working Woodlands Program for inclusion in Gulf forest restoration projects, 4) Additional working forest easements to protect water resources in Gulf tributaries, 5) TNC seeking opportunities to pilot the use of oyster scaffolds for oyster restoration in Louisiana. However, none of these projects has yet matured into full-fledged investment opportunities.

## **Introduction**

Given limitations on government funding for conservation and environmental restoration, there has been a longstanding quest for opportunities and methods for private capital to invest in the environment and receive a return on that investment. The idea is that there is vastly more private capital than public funding in the United States, and that if it could be enlisted in environmental restoration, more progress could be made toward building a healthier and more sustainable world than through public spending alone. Such investment, however, is dependent upon activities that provide at least a modest return on that investment.

The advent of so-called “impact capital” in the last 10 years brought new amounts of investment into the marketplace, reflecting the goal of a subset of wealthy individuals and private foundations to invest in socially and environmentally beneficial projects and enterprises and to receive a financial return in exchange for those social and environmental benefits.

TNC created a subsidiary program, NatureVest, in 2014 to leverage private capital for environmental good. Through TNC field programs, NatureVest has pioneered successful examples of impact investment, such as investing in water rights to rebalance water needs between farmers and the environment and developing stormwater treatment systems in large urban areas.

The settlement of the DWH Oil Spill legal cases in 2015 provided funding through the RESTORE Act and other mechanisms over a 15-year period for Gulf of Mexico restoration. As that money is guaranteed for restoration, it is important to consider how portions of the DWH funding stream could be leveraged with private capital to produce greater restoration benefits.

## **Background**

In April 2010, BP’s DWH Macondo exploratory oil well, located 41 miles off the Louisiana

coast, exploded. The event killed 11 workers and released an unchecked flow of oil from the broken well-head that lasted 87 days and ultimately spilled an estimated 3.19 million barrels of oil into the Gulf of Mexico. The spill did extensive damage to the marine and estuarine resources of the Gulf and also caused severe economic damage to tourism, commercial and recreational fishing and other industries that depend on the Gulf's natural character.

After the well was finally capped in September 2010, the U.S. Justice Department and the Gulf states filed criminal and administrative lawsuits against BP and the other responsible parties under various provisions of Federal law. In addition, Congress passed the RESTORE Act in July 2012; among other things, this law required that 80 percent of any civil fines resulting from the DWH spill be set aside for Gulf restoration.

The suits were resolved in a settlement agreement approved by the Federal District Court in New Orleans in April 2016. The agreement required BP to pay a total of \$20.8 billion over a 15-year period for resolution of criminal and civil penalties and natural resource and economic damages related to the spill. These funds were dedicated to the environmental restoration and economic recovery of the Gulf of Mexico and the communities that surround the Gulf.

While this may seem like a very large amount of money, it is not nearly sufficient to address all of the legacy of the Gulf's problems including the extensive land loss in the Mississippi River Delta. Pursuant to the RESTORE Act passed by Congress in 2012, the RESTORE Council was established to receive a portion of Clean Water Act fines from the spill. From the outset, RESTORE Council staff recognized the importance of trying to leverage RESTORE and other DWH funding to accomplish more restoration than could be accomplished with DWH-related funding alone. In discussions with TNC and its NatureVest Program, Council staff suggested that TNC look specifically at the potential to use RESTORE funding to leverage private capital and thus expand the restoration that could be accomplished with oil spill money.

## **Review of Methods**

TNC/NatureVest staff include professionals drawn from the finance sector. These staff members worked with TNC conservation staff in state chapters and the TNC Gulf of Mexico Program to evaluate investment opportunities using a multi-staged process.

- We consulted with local community partners, investment consultants, technical consultants and RESTORE staff to identify which opportunities for private investment are most feasible, given current programmatic, funding and capital market constraints.
- Based on these investigations, we developed a separate blueprint analysis of

seven potential investment opportunities. These analyses tested the feasibility of each opportunity and spelled out how they could be implemented if they appeared feasible, or, alternatively, explained why they do not appear feasible at this time. The testing process varied from case to case but overall included the following methods:

- Case studies of similar projects and of potential projects
- Analysis of the economics of proposed projects
- Interviews with experts who have undertaken similar projects
- Market studies
- Evaluation of constraints of government programs that are needed to enable or incentivize investment

### **Discussion of Quality Assurance**

As we used different methodologies to evaluate the different investment opportunities, we accomplished quality assurance by asking experts with varying backgrounds to review and comment on the findings for each case. None of the evaluations involved gathering scientific data that would require traditional quality assurance.

### **Findings, Conclusions and Recommendations**

We evaluated seven opportunity blueprints for private investment in Gulf of Mexico restoration. The format of this final report varies for the individual opportunities but includes conclusions and recommendations following the findings for each case.





Admiral Mason Stormwater Park, Pensacola, Florida

## **BLUEPRINT #1: DEVELOPMENT OF LOCAL WATER MANAGEMENT SYSTEMS**

### ***Description of the Opportunity***

Green stormwater infrastructure (GSI) and other water quality improvement projects, including construction of wastewater treatment plants, have the potential to deliver amenities to communities while improving water quality and reducing flood risk. Investment approaches developed in this study aim to maximize the use of existing legal, operational and budgetary structures to deliver more GSI across the Gulf Coast. Private companies can invest in water quality by carrying out water quality improvement projects and providing improved services to municipalities, their residents and businesses. These projects provide environmental and social co-benefits. The work must comply with local city, county or statewide stormwater management regulations. Specific private investment strategies evaluated here include:

- Stormwater fee reduction incentives for private landowners who manage runoff on their property.
- Reverse auction incentive programs soliciting private-sector GSI developers to propose projects to jurisdictions that are seeking stormwater management and treatment capacity. Once projects are approved and built, the GSI developer receives reimbursement on a Pay-for-Success basis. Pay-for-Success contracts allow jurisdictions to pay for services after they are delivered, with the option to finance those payments over time. These projects are typically on private land and delivered through partnerships between landowners and private GSI development companies. Landowners receive

stormwater fee reductions (if they are regionally applicable) or equivalent lease payments from developers. GSI project developers assume the risk of project delivery and may take responsibility for operation and maintenance (O&M).

- Policies enabling Public-Private Partnership (P3) delivery of GSI programs and projects. These can be based on standard municipal contracts or on a Pay-for-Success basis. The P3 option reduces the capacity burden on jurisdictions and reduces the risk of cost overrun during design and construction. These projects are typically on, but are not necessarily limited to, public lands. P3 partnerships can also place O&M responsibilities on the private partner, further reducing capacity burden for the jurisdiction.
- Local stormwater ordinances that require new and redevelopment projects to manage runoff onsite for both stormwater quality and quantity. Alternative compliance provisions that enhance the effectiveness of stormwater ordinances by allowing developers to utilize offsite mitigation include:
  - Direct offsets allowing permittees to directly build stormwater capacity at another site.
  - In-lieu fees allowing permittees to pay into a centralized fund applied to municipal stormwater projects.
  - Offsite compensatory treatment options allowing developers to buy stormwater management capacity from a third party or “stormwater bank.” Purchases can be either one-off peer-to-peer transactions or facilitated through an open stormwater credit market structure such as the Stormwater Retention Credit market operating in Washington D.C. Stormwater credit markets allow credits to be traded where they are critically needed or where they are more cost effective. A further strategy is for regulators to provide purchase guarantees to private entities bringing stormwater management credits to market, thus reducing the risk for credit suppliers.\*\*

*\*Note: Some jurisdictions already have some of these policies and programs in place. Others may need to develop them to create opportunities for private-sector investment in GSI projects.*

*\*\* Compared with other policies and programs, stormwater credit markets can take significantly more time to develop and implement. Progress can be hampered by slow market uptake, lack of demand for credits and potentially high risk for credit suppliers.*

## **Case Study and Findings**

We used the actual wastewater and stormwater needs of the City of Milton, Florida, as a case study. If RESTORE funding is used to pay part of the cost, it is feasible to use investment of private capital (through an Environmental Service Provider) to expand and accelerate completion of the needed water quality improvements, repaying private funding over a maximum of 20 years. The use of “offsite treatment credits” would provide additional revenue to the City of Milton from the construction of stormwater treatment facilities using natural infrastructure. The model used in Milton could be employed elsewhere in Florida and probably at other Gulf Coast locations.

This analysis is applicable to any local government within the Gulf Coast region eligible for RESTORE ACT funding, if certain enabling conditions are met. These conditions include but are not limited to the existence of local stormwater utilities and stormwater fees, regulations or local ordinances requiring new and redevelopment projects to manage stormwater runoff onsite, allowance for offsite compensatory stormwater treatment trading, and capital improvement programs for stormwater management systems or wastewater treatment plant upgrades, especially those that capture disconnected private septic systems or engage in other activities resulting in water quality improvement.

The scale of replication depends on the availability of capital improvement budgets and utility fees that are earmarked for funding stormwater and wastewater improvement projects. Implementing a case study such as Milton will help provide a “real-world” example that can be used to generate interest and support for similar projects in other Gulf of Mexico communities.

### ***Pipeline Project***

The Milton project is suitable for further implementation and testing of this blueprint, and the analysis contained in the full blueprint has been forwarded to the participants in water quality planning in Milton, Florida.

### ***Conclusions and Recommendations***

We concluded from this evaluation that strategies and techniques which utilize alternative financing approaches for water resource/water quality improvement projects are, in fact, feasible. Some of these techniques involve the use of private capital, and those can be enabled and enhanced through the use of DWH-related funding.

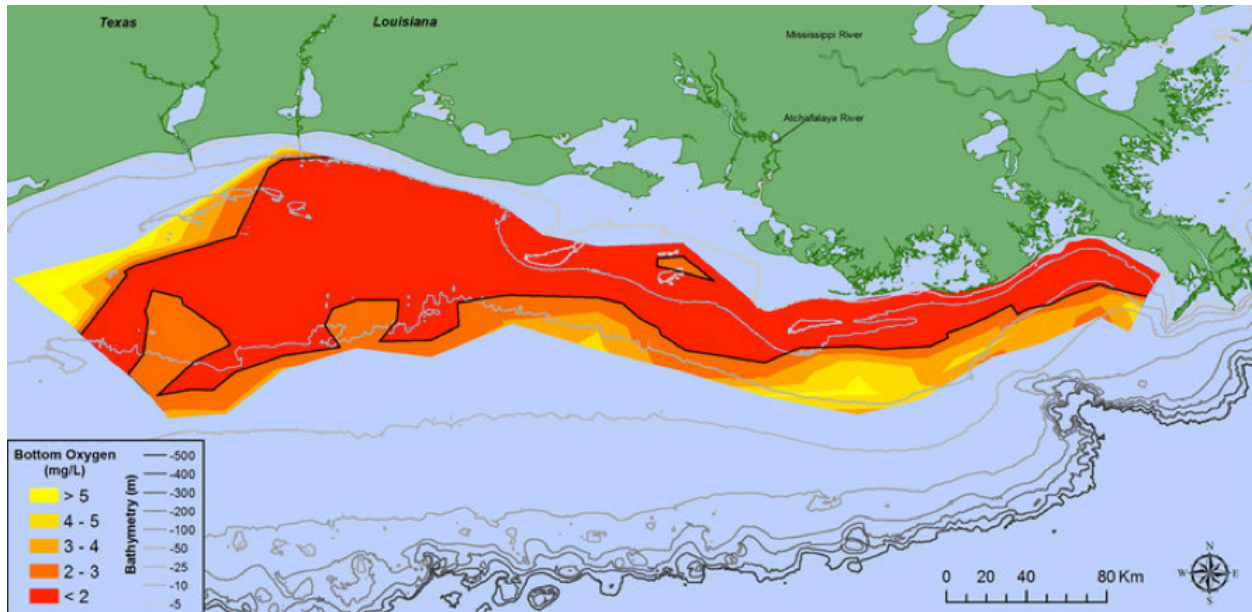
Therefore, we recommend that the full paper on this subject be distributed to stakeholders who are likely to pursue these applications, including counties and other municipal governments in the Gulf region, the RESTORE Council and its members, and organizations of municipal planners, public works directors and the like. TNC should consider sponsoring a telephone discussion of these opportunities.

## **BLUEPRINT #2: INVESTMENT IN SUSTAINABLE AGRICULTURE**

### ***Description of the Opportunity***

Private investment in one or more demonstration farms in Louisiana could reveal the

economics of sustainable farming using Natural Resources Conservation Service programs and water quality trading to enhance farm profitability. At the same time, this investment would reduce environmental impacts, including the creation of a dead zone in the Gulf of Mexico from excess nutrients. We also looked at the potential for supplementing Farm Bill appropriations with RESTORE or other DWH funds to further enhance the effectiveness and targeting of Farm Bill conservation programs.



The Dead Zone in the Gulf of Mexico

## Findings

We did not advance this case beyond the preliminary stage for two reasons:

- Farm Bill programs are working effectively to partner with the private investments of agricultural landowners, and additional appropriations from the 2018 Farm Bill are likely to make them even more effective. We do believe that RESTORE and other DWH funding can be better coordinated with the Farm Bill to achieve success in priority Gulf watersheds. The new Regional Conservation Partnership Program can be particularly useful in accomplishing this coordination.
- As part of this investigation, we examined whether water quality trading legislation in Louisiana offers the opportunity to increase income on farms by obtaining marketable credits for reducing nutrient runoff. Although the new Louisiana water quality trading legislation is clearly a step in the right direction, there are three major issues (discussed below) that prevent Louisiana's water quality trading market from providing viable investment opportunities supporting sustainable agriculture.

## Conclusions and Recommendations

We concluded that there are three deficiencies in the Louisiana nutrient trading system:

- The Louisiana Legislature needs to finalize nutrient trading legislation. To be an attractive opportunity for outside investors, the water quality trading program framework must first be articulated and finalized. At present, basic concepts such as how much a single credit is worth, how many credits a single entity can generate, how location affects price, and how different watersheds might offer potential discounts are not accounted for. Until these parameters are quantified, there is no reliable way for investors to predict a return on investment.
- There is no effective enforcement of nitrogen and phosphorus pollution in Louisiana. This lack of enforcement is tied to the fact that the Environmental Protection Agency has not set Total Maximum Daily Loads for these nutrients. The result is an incomplete market that does not adequately allow credit swapping between point and non-point polluters, drastically shrinking the opportunity for private investors to benefit from nutrient trading.
- Geographic boundaries are limiting the project scope. Decades of development and farm land conversion have drastically reduced the presence of large-scale agriculture within 15 miles of the Gulf Coast. For the water quality trading market to function effectively, the geographic scope of the trading area must increase.

## BLUEPRINT #3: FOREST CONSERVATION AT A LANDSCAPE SCALE

### BLUEPRINT #3A: STEWARDSHIP CONTRACTS AND AGREEMENTS ON NATIONAL FORESTS

#### *Description of the Opportunity*

RESTORE and other Deepwater Horizon-related funding may be leveraged through stewardship agreements as described here:

- Several National Forests are located in the watersheds of important tributaries to the Gulf of Mexico. The condition of these forests affects water quality and quantity flowing to the Gulf.
- The U.S. Forest Service does not have sufficient appropriated funding to restore these forests in ways that achieve water quality and other environmental objectives.



Longleaf pine germination (Photo by David Printiss)

- RESTORE funds could be used to pay the planning, design and procurement costs for soliciting stewardship contracts and agreements for forest tracts within the National Forests. These up-front public investments could then attract private capital to harvest and sell timber to offset the costs of forest restoration.
- The key questions, then, are whether timber revenues derived from environmentally appropriate stewardship contracts and agreements would be sufficient to attract private entities to bid on those contracts and agreements to accomplish the needed forest restoration work, and whether such forest restoration would materially benefit the health of the Gulf of Mexico.

### ***Case Study and Findings***

Interviews with TNC Staff in Florida. We used the stewardship agreement on Apalachicola National Forest in Florida as a case study, to determine the feasibility of other such projects. We interviewed David Printiss, North Florida program manager, and Jana Mott, North Florida stewardship projects coordinator for TNC, who are administering the agreement, and reviewed documents from this project. This agreement, which was signed on September 20, 2018, covers timber harvesting, longleaf pine planting, brush mowing, drum chopping, groundcover restoration, herbicide treatment, prescribed burning, and road reconstruction and maintenance. The activities covered by the stewardship agreement are now 90 percent complete. The value of the timber removed under the agreement has, in fact, covered the cost of its removal and the cost of the other activities specified under the agreement, except for a small contribution from the Forest Service and an in-kind matching contribution from TNC.

Interviews with TNC Staff in Oregon. We interviewed Mark Stern, director of forest conservation for the Oregon Chapter of TNC, about two longstanding forest stewardship agreements: The Rogue Forest Partners Initiative and the Ashland Forest Resilience Project. These projects are successfully meeting their restoration and financial goals.

Review of USDA Forest Service Stewardship Contracting and Agreements. In 2017, TNC land protection associate Emily Clegg did a careful analysis of stewardship contracting and agreement procedures and wrote a “Guidance and Best Practices for Agreements with The Nature Conservancy” document. This document explains how to negotiate and implement stewardship agreements. It is relevant to this evaluation because it shows in a step-by-step fashion that stewardship contracts and agreements are feasible not just for TNC but also for other organizations undertaking such activities. While the procedures are somewhat complicated, they are by no means a barrier to this approach to forest restoration.

Discussions about a Watershed Forest Restoration Project. TNC participated in dis-

cussions in 2019 among state foresters in Mississippi, Alabama, and Florida; the USDA Forest Service; the Natural Resources Conservation Service; the American Forest Foundation; and the National Fish and Wildlife Foundation to develop a proposal for RESTORE funding. The proposal sought to provide assistance to private and public owners and managers of forest land in the watersheds of rivers that are important to the health of Gulf of Mexico estuaries. This group received input from U.S. Forest Service and U.S. Geological Survey research staff who described the impact of forest management on the water quality (and quantity) of the region's rivers.

### ***Pipeline Project***

An additional stewardship project between TNC and the Apalachicola National Forest is suitable for a pipeline project and should be included in future requests to the RESTORE Council or other Deepwater Horizon-related funding sources.

### ***Conclusions and Recommendations***

Based on our analysis of case studies in Florida and Oregon, stewardship contracts and agreements are a viable approach to accomplishing forest restoration in the National Forests. The health of these forests is important to maintaining water quality, water quantity and habitat integrity in tributaries to Gulf estuaries.

Two kinds of RESTORE or other DWH-funded investments can be useful in facilitating stewardship contracts and agreements on National Forests in the Gulf region:

- Investments in the up-front costs of National Forests to do the planning, timber surveys, environmental assessments and other activities needed to proceed with requests for proposals for stewardship contracts and agreements.
- Investments in loans to potential nonprofit participants in stewardship agreements to pay the up-front costs of timber harvests (such as improved road access and cutting designs), with these funds being repaid from the proceeds of those harvests.

Private sector investment comes in the form of expenditures by nonprofit or commercial forestry entities for timber harvesting and other restoration activities, to be offset by the sale of the timber harvested and sold for industrial purposes.

Based on this evaluation, the U.S. Forest Service should consider a strategy that involves surveying all National Forest lands that directly impact Gulf watersheds, identifying the potential for stewardship contracts and agreements to accomplish forest restoration in those areas, conducting a single NEPA review of proposed actions at those sites, and issuing a coordinated series of requests for proposals (or a single one) for stewardship

activities over those lands. An accompanying RESTORE or other DWH funding source project could then be developed to facilitate such a project by paying up-front USFS costs and by creating a loan fund to assist prospective nonprofit bidders on stewardship work. It is clear from the Apalachicola National Forest Stewardship Agreement now being concluded by TNC that additional agreements of this type are feasible.

## **BLUEPRINT #3B: WORKING WOODLANDS PROGRAM**

### ***Description of the Opportunity***

The Working Woodlands program utilizes sustainable forest management practices to create multiple benefits for forests and communities, including carbon storage and sequestration, enhanced water quality and quantity, biodiversity, job creation, and community safety. Launched in 2009 by TNC's Pennsylvania Chapter, Working Woodlands provides free technical assistance to landowners for long-term forest planning, for obtaining forest certification (thus opening new wood markets), for marketing forest carbon and for potential sale of conservation easements. This assistance has enabled landowners to retain their land in forest uses for decades to come. The opportunity explored here is whether the Working Woodlands program can be effective in protecting forest land in Gulf watersheds.

### ***Case Study and Findings***

The Working Woodlands program has successfully protected forest lands in other parts of the U.S., but as the program continues to grow and expand to new regions like the Southeast, it is outgrowing the available philanthropic support. RESTORE funding could be paired with private capital investments to finance continued growth of the program and increase the scale and pace at which Working Woodlands projects are implemented. By providing a portion of the project development costs as a grant, RESTORE and other Deepwater Horizon funding can substantially reduce the risk of these projects for investors, making projects viable at lower carbon prices. We evaluated a case study for a Working Woodlands tract in Alabama to test the viability of this option.

In addition to leveraging private capital from carbon offset investors, a RESTORE grant could potentially catalyze corporate investment in the program from the forest products and consumer products industries. Many consumer products companies want to use packaging that is produced from sustainable, certified forests. This demand is driving forest products companies to seek more certified wood from landowners. State foresters in Mississippi, Alabama and Florida met recently to develop a RESTORE proposal that would assist private landowners in the watersheds of important Gulf estuaries to improve



management of their land to benefit water quality and quantity. The Working Woodlands program was mentioned in these discussions as a way of further leveraging RESTORE and other Deepwater Horizon money by providing access for landowners to carbon markets.

### ***Pipeline Project***

A Working Woodlands pilot is being discussed with State Foresters and other participants of the group proposing a RESTORE project to restore privately owned forests in watersheds of Gulf estuaries. This could be a separate RESTORE proposal or be funded from other Deepwater Horizon sources in one of the target watersheds.

### ***Conclusions and Recommendations***

The Working Woodlands approach can be used to supplement other forest conservation incentives in the watersheds of tributaries to the Gulf of Mexico. RESTORE or other DWH funding could pay the up-front costs of reaching out to forest landowners and enrolling them, including outreach, forest surveys, the costs of securing Forest Stewardship Council Certification and the costs of implementing plans and restrictions necessary to sell carbon credits. This work would then leverage private capital from the carbon market to secure land in forest management to protect water resources for 10 to 20 years, or longer in the case of permanent easements.

Four factors affect whether Working Woodlands can be used to achieve Gulf of Mexico water resource objectives:

- Projects must be grouped along or at the headwaters of tributary rivers to Gulf estuaries that are significant for restoration of oysters, crabs, shrimp and finfish species. Unless a critical mass of forest land is protected, the results will not be measurable.
- Bottomland hardwood tracts are the most likely forest type for successful Working Woodlands projects because they produce large amounts of carbon under natural conditions. Agreeing to lower intensity harvests of bottomland hardwoods can produce carbon increments that can be sold on both the compliance and voluntary markets.
- Extending rotations on intensively managed upland pine plantations can work for the voluntary carbon market, but it may not be successful for the compliance market, due to species diversity requirements and mandatory project time frames.
- Conversion of forest plantations to longleaf pine is unlikely to lead to successful forest carbon projects in either the voluntary or compliance markets unless longleaf is grown in denser than natural stands. Even then, if existing forest plantations are harvested to make room for longleaf, there may not be net carbon benefits from the project.

Given these findings, we recommend that Working Woodlands be considered for inclu-

sion in forested watershed restoration project(s). This program or one like it could extend the impact of RESTORE and other Deepwater Horizon funds that are allocated to assist private landowners in retaining and managing forests in important Gulf watersheds.

### How the Program Works: Project Timeline and Activities

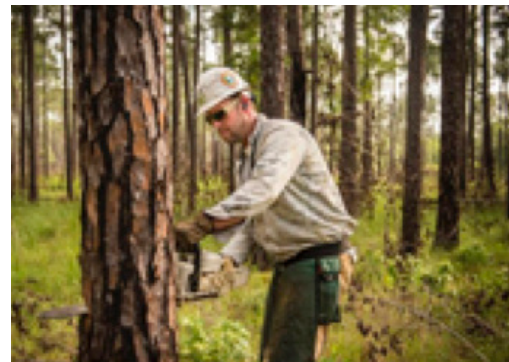


Based on past Working Woodlands projects, we estimated that it would cost \$70,000 to enroll a minimum 2,000-acre parcel in the program. However, the average parcel in the Gulf region is larger, around 3,000 acres in size. Thus, \$5 million in RESTORE or other DWH funds would be needed to complete about 50 3,000-acre projects to conserve 150,000 acres. This approach would be a cost-effective means of conserving significant amounts of timberland in Gulf watersheds.

## BLUEPRINT #3C: WORKING FOREST EASEMENTS

### Description of the Opportunity

We evaluated whether, given current economic and market conditions, it is feasible to expand the use of RESTORE and other DWH funds to purchase working forest easements from institutional and individual landowners to conserve the environmental values of timberland within the watersheds of the Gulf of Mexico. Such easements represent a long-term relationship with private investors for the ownership and management of private forest lands with important environmental values, particularly for the protection of water quality and quantity.



## ***Case Study and Findings***

We used a recent working forest easement transaction in the Suwannee basin of Florida, owned by the Lyme Timber Company, as our case study. The Lyme Timber Company is a Timber Investment Management Organization (TIMO) headquartered in Lyme, New Hampshire, that has completed numerous conservation land transactions nationwide since its founding in 1976. Beginning in 2013–2014, Lyme purchased 95,000 acres of working forest land in the Big Bend/Suwannee region of Florida. In March 2016, Florida’s Governor and Cabinet approved the state’s purchase of an 8,138-acre conservation easement over a portion of the Lyme Land. As of 2019, Lyme is in the process of completing the sale of a working forest easement on 19,225 acres adjacent to the Suwannee River to the Florida Department of Environmental Protection. The easement would protect water quality and habitat values on the land (and thus water quality downstream, in the Big Bend estuary of Florida) at a cost about 50 percent lower than if the property were purchased outright. In addition, using an easement means that the private owner remains responsible for management of the lands, whereas an outright purchase would incur the cost of public land management.

We investigated forest land ownership patterns in three important watersheds in Florida to determine whether working forest easements from TIMOs is a strategy that can be applied more broadly across the Gulf. Our analysis revealed that along the Apalachicola, Perdido and Suwannee Rivers, which are all important to the health of critical Gulf of Mexico estuaries, highly strategic lands are owned by TIMOs or other large landowners who are likely to be willing to sell conservation easements. Similar ownership patterns appear to exist across the watersheds of the northern Gulf.

## ***Pipeline Projects***

TNC drafted a forested watershed restoration concept paper for consideration by state and federal agencies developing RESTORE round three proposals. Our project proposed acquisition of working forest easements from TIMOs in the Apalachicola, Perdido, and Wolf River watersheds. While not accepted in the RESTORE proposal now being advanced by USDA, a separate land/easement project is being considered by the State of Florida.

## ***Conclusions and Recommendations***

We conclude that purchasing working forest easements on forest lands in the watersheds of Gulf estuaries can encourage and enable private investment in the ownership and management of such lands and can protect environmental values far more cost-effectively than outright public ownership. This approach also maintains forest harvesting, which produces jobs and supports the local wood-based economy.



We recommend that various sources of DWH funding be used to purchase working forest easements on land where general public access is not needed and where careful forest harvesting will not damage water resource and other environmental values. State agencies should identify specific watersheds and parcels of land within those watersheds where conservation will have the most significant positive impact on water quality and quantity in tributaries to Gulf estuaries, and prioritize them for conservation easements.

## **BLUEPRINT #4: COASTAL RESTORATION**

### **BLUEPRINT #4A: OYSTER/LIVING SHORELINE RESTORATION USING OYSTER SCAFFOLDS**

#### ***Description of the Opportunity***

We evaluated the feasibility of an oyster restoration program based on installing pre-populated oyster scaffolds to address the Gulf-wide loss of functional oyster habitat, to replenish coastal oyster populations and to restore the environmental and economic benefits of oysters to the Gulf of Mexico. Oyster scaffolds are modular concrete structures to which young oysters can attach and grow, and their presence accelerates the process of reef formation. Pre-populated oyster scaffolds are seeded with oysters and tended in oyster nurseries, then moved to living shoreline sites when the oysters are larger to create “instant reefs.” The nursery sites might also include oyster aquaculture operations. We explored whether and how private capital can help to achieve this by:

- Providing equity investments in the oyster scaffold company.
- Financing a pilot-scale Environmental Impact Bond (EIB) Pay-for-Success model to enable a pilot-scale oyster restoration project.
- Following evaluation of the pilot scale project, financing an estuary/regional-scale EIB or bonds.

- Generating additional revenue by creating sustainable oyster harvest programs or creating and selling credits from increased carbon and nutrient sequestration.

## **Findings**

We first addressed whether there is a market for the construction of living shorelines in the Gulf region. Regional plans indicate an increasing need for coastal resilience infrastructure, including natural infrastructure such as oyster reefs and living shorelines; these approaches are mentioned in Louisiana’s Coastal Master Plan, the Mississippi Coastal Improvements Plan, the developing Texas Coastal Study, Superstorm Sandy Recovery, and national funding initiatives such as Housing and Urban Development’s one-billion-dollar National Disaster Resilience Competition. Funding for coastal resilience is dominated by government spending. In the Gulf of Mexico, \$163 million is allocated for oyster restoration through Natural Resource Damage funds from the DWH settlement. Additional money for oyster restoration is likely available from the Council-Selected category of RESTORE funding. So there appears to be a market for effective oyster reef/living shoreline construction, and government funds are available to advance such projects.

Second, we evaluated whether the oyster scaffold approach described here can produce living shorelines at a lower cost than conventional construction. Utilizing oyster scaffolds as living shoreline units can be an applicable solution for medium and large projects. Modular, three-dimensional scaffolds are “planted” in prime oyster-growing waters (that are either bare of oysters or “seeded” with larvae). As oysters need approximately 12–18 months to settle and grow to adult size, we estimate that it will take about three years for oyster scaffolds to mature, after which they may be sold and relocated to living shoreline projects. The cost of this approach compared with the cost of building living shorelines conventionally reveals that the oyster scaffold approach is about 13–15 percent less expensive for an initial pilot project, with costs decreasing further as oyster scaffold nurseries increase in scale to serve larger projects. This cost reduction could enable the oyster scaffold approach to secure living shoreline contracts and could provide sufficient profit to attract private investment (particularly impact investment) to the basic enterprise.

Third, we examined whether the oyster scaffold approach can be made more attractive to private investment if the grow-out sites could, in effect, do double duty by growing oysters for market. This method could have dual benefits by more fully utilizing the leased grow-out sites and by producing spat (some diploid oysters would be utilized in the aquaculture enterprise) to help populate the scaffolds. An oyster marketing consultant who conducted interviews and surveys found that, assuming they were high in quality, oysters produced from such facilities should command as high a price as other

branded aquaculture-raised oysters, and potentially could produce additional revenue through a customer donation option.

Finally, we looked at whether EIBs and Pay-for-Success methods further enhance the potential profitability of the oyster scaffold approach to attract private capital to this kind of project. While there is limited experience with these financing strategies, it appears that the reduced cost, multiple benefits and potential sale of oysters might someday facilitate Pay-for-Success methods. However, when Pay-for-Success is combined with a new technology like the use of pre-populated oyster scaffolds, investors are concerned about the financial risks of the Pay-for-Success approach.

### ***Pipeline Project***

TNC has worked actively with ORA Estuaries to pilot an oyster scaffold project that would test the concepts set out in this blueprint.

### ***Conclusions and Recommendations***

We concluded from this analysis that there is an opportunity to attract private investment to the creation of living shorelines in the Gulf using the oyster scaffold/grow-out approach described here, but that a pilot-scale project must be implemented to test this approach before private investment can be attracted for larger scale applications.

Toward that end, we recommend that a request for proposals be developed for RESTORE or Natural Resource Damage funding to construct living shorelines in an estuary suitable for oyster growth and production. The project would be structured to attract both nonprofit and for-profit entities to use the oyster scaffold grow-out approach as well as conventional construction. A performance/evaluation timeline for this proposal should allow for the startup of an oyster nursery as well as for conventional placement of oyster substrate. This would enable the feasibility and financial analysis needed to test the oyster castle/grow-out concept.

## BLUEPRINT 4B: BENEFICIAL USE OF DREDGED MATERIALS

### *Description of the Opportunity*

We evaluated the potential use of materials from the dredging of navigational channels for the restoration or new construction of coastal features designed to make shorelines more resilient to storms and to enhance natural habitat. Restoration projects that reuse dredged materials may have reduced costs and faster implementation, but funding for these projects may not be available in time



Pierce Marsh conveyance pipeline

to accomplish these objectives in tandem with nearby navigational dredging. In that case, the dredged materials are disposed of “in the least-cost environmentally acceptable manner” and the potential cost savings from coordination with navigational dredging are lost.

Our proposed model had the following elements:

- Private capital would be used to establish a “dredged materials” revolving fund or bank.
- Loans would be made available to local and state agencies and authorities and non-profit organizations in order to pay the differential between “the least-cost environmentally acceptable” method of disposal and the cost for beneficial reuse of the dredged materials in a nearby project.
- The loans could then be repaid from funds supporting the restoration project, because the use of the dredged materials would reduce the project’s overall costs by saving the costs of sourcing sediment independently.
- Funds repaid to the bank could then be loaned to other projects with similar characteristics. If beneficial use and restoration projects were matched properly, the cost savings would also allow payment of a 2–3 percent rate of interest to the investors.

### *Case Studies and Findings*

Evaluation of three case studies revealed that there are cost savings for restoration projects that use dredged materials, but that these savings are not necessarily sufficient to offset other costs or other timing and logistical factors in overall project implementation. Thus, the hypothesis that a beneficial use bank could expedite projects by providing the non-federal sponsor with financial “savings” by loaning funds was not

confirmed by the case studies. In each of the three case studies, the non-federal sponsor did not proceed independently to obtain dredged material but timed the project to take advantage of dredged materials. If a loan program could be implemented by a beneficial use bank, additional federal dredged material could be used beneficially, and environmental restoration projects could be completed more quickly, but given current conditions, the savings would likely be in time rather than in money. As a consequence, a beneficial use bank does not appear to be feasible at this time.

### ***Conclusions and Recommendations***

The case studies revealed that that a beneficial use bank could have merit, in selected instances, in facilitating environmental restoration projects that use dredged material. However, the analysis found several impediments to the beneficial use of dredged material that must first be addressed and resolved before the full potential of a beneficial use bank can be realized. These impediments include:

- Project scheduling challenges associated with the time difference between the availability of dredged material and the need for that material in a restoration project
- The suitability of the dredged material, both in terms of its composition and the distance between the dredging and restoration locations
- The ability of project sponsors (i.e., federal, non-federal) to assume the costs associated with planning and designing the beneficial use site
- The current and potential availability of other sources of funding to offset beneficial use costs that could then make loans for this purpose unnecessary
- The potential difficulty that a state or municipality (or other non-federal sponsor) would face in managing a conventional loan, given project uncertainties about the timing and cost of the feasibility study, permitting, and construction components of an environmental restoration project

We concluded that a beneficial use bank should not be created until these impediments are resolved sufficiently to make a bank financially feasible.

In the interim, the beneficial use of federal dredged material can be promoted by such actions as assisting non-federal sponsors with the preparation of Project Cooperation Agreements (PCAs) and feasibility studies (including permit applications and environmental assessments), advocating for state and federal policy and legislative changes that reduce or eliminate impediments to the beneficial use of dredged material for restoration purposes, and operationalizing the dredging/beneficial use tool being developed by the U.S. Army Corps of Engineers.