



**THE WATER INSTITUTE  
OF THE GULF®**

# Restore the Earth Foundation Cypress Reforestation Social Return on Investment Report

*Pointe-aux-Chenes Wildlife Management Area*

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Produced for and funded by: Restore the Earth Foundation



April 2017





Pointe-aux-Chenes, Louisiana.



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#### ABOUT RESTORE THE EARTH FOUNDATION, INC.

This report was prepared for and funded by Restore the Earth Foundation. Restore the Earth's mission is to restore the Earth's essential forest and wetland ecosystems, employing landscape-scale restoration solutions with environmental, social, and economic returns verified by a leading third-party impact accounting firm. For more information, visit [restoretheearth.org](http://restoretheearth.org).

#### SUGGESTED CITATION

Hemmerling, S.A., Barra, M., and Bienn, H.C. (2017). Restore the Earth Foundation Cypress Reforestation Social Return on Investment Report: Point-aux-Chenes Wildlife Management Area. The Water Institute of the Gulf. Prepared for and funded by the Restore the Earth Foundation. Baton Rouge, LA.

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## Table of Contents

List of Figures .....	2
List of Tables .....	2
1.0 Executive Summary .....	4
1.1. SROI Type and Period .....	5
1.2. Audience .....	6
2.0 SROI Analysis .....	9
2.1. Purpose of the SROI .....	9
2.2. SROI Approach.....	10
2.3. Challenges with applying the SROI methodology to environmental projects .....	12
2.4. Project Approach .....	13
2.5. Who worked on the report?.....	14
3.0 Case Study #1: Pointe-aux-Chenes Wildlife Management Area .....	15
3.1. Background: Pointe-aux-Chenes Wildlife Management Area and Regional Demographics .....	15
3.2. Identifying Stakeholders .....	16
4.0 Research Methodology .....	25
4.1. Advisory meetings and field visits.....	25
4.2. Outreach strategies.....	26
4.3. Focus group meetings and short participant survey .....	26
4.4. One-on-one interviews.....	27
5.0 Inputs.....	27
5.1. Identifying and valuing inputs .....	27
6.0 Analysis of outcomes .....	28
6.1. Outcomes experienced by stakeholders engaged in the qualitative phase of research .....	28
7.0 Theory of Change .....	34
8.0 Discount Factors .....	41
8.1. Counterfactual (Deadweight) [Might this change happen anyway?].....	41
8.2. Attribution [What else might contribute to outcomes?].....	42
8.3. Displacement [What might be displaced by the outcomes?] .....	42
8.4. Drop-off for stakeholder groups .....	42
9.0 Attaching Values to Outcomes .....	43
9.1. Testing outcomes for materiality .....	48
9.2. Unintended or negative outcomes.....	56
10.0 Sensitivity Analysis .....	57
10.1. Sensitivities for stakeholder groups .....	58
10.2. Unexpected environmental events: Hurricanes and saltwater intrusion .....	59
10.3. Regional economic downturns and WMA visitation .....	60
10.4. Integrity of local flood protection structures.....	60
10.5. Limited protection of vulnerable coastal communities.....	60
11.0 Summary of Social Value Created.....	60
11.1. Contributions.....	61
11.2. Statement of risks of overclaiming .....	67
11.3. Considerations and limitations.....	67



12.0	Conclusions and Recommendations .....	68
12.1.	Stakeholder review and verification of results.....	73
12.2.	Recommendations.....	73
	Works Cited.....	75
	Appendix 1 – Stakeholder Engagement Facilitator Guide.....	76
	Appendix 2 – Stakeholder Survey .....	80

## List of Figures

Figure 1.	Mississippi Alluvial Valley and Pointe-aux-Chenes WMA location (Louisiana, USA).....	4
Figure 2.	Pointe-aux-Chenes Wildlife Management Area.....	15
Figure 3:	Volunteers help replant trees at Pointe-aux-Chenes.....	43
Figure 4.	Social value per stakeholder group.....	67

## List of Tables

Table 1.	Social Return on Investment for reforestation in Pointe-aux-Chenes WMA .....	7
Table 2:	Market Return on Investment for reforestation in Pointe-aux-Chenes WMA.....	8
Table 3:	Investment, market value, and social value delineated by IIRC shared value capital for reforestation in Pointe-aux-Chenes WMA.....	8
Table 4.	The SROI framework focuses on answering five key questions .....	11
Table 5.	Regional demographics for the Pointe-aux-Chenes Wildlife Management Area.....	18
Table 6.	Dates of fieldwork activities between September 2016 and December 2016.....	26
Table 7.	Corporate sponsors .....	29
Table 8.	Volunteers involved in replanting.....	29
Table 9.	Government agencies.....	30
Table 10:	Conservation Organizations.....	30
Table 11.	Recreational users .....	31
Table 12.	Those employed directly and indirectly by reforestation project.....	31
Table 13.	Communities surrounding the site that benefit from water and air quality, waste treatment, storm protection, soil stabilization, and biological control .....	32
Table 14.	Communities that benefit from other ecosystem services such as habitat refuge and cultural value.....	33
Table 15.	Restore the Earth Foundation.....	35
Table 16.	Volunteers involved in replanting.....	35
Table 17.	Corporate sponsors.....	36
Table 18.	Government agencies.....	36
Table 19:	Conservation Organizations.....	37
Table 20.	Recreational users .....	37
Table 21.	Those employed directly and indirectly by the reforestation project.....	38
Table 22.	Communities surrounding the site that benefit from water and air quality, waste treatment, storm protection, soil stabilization, and biological control .....	39
Table 23.	Communities that benefit from other ecosystem services such as habitat refuge and cultural value.....	39
Table 24.	Other environmental benefits.....	41
Table 25.	Financial proxies for Pointe-aux-Chenes EcoMetrics Model .....	44
Table 26.	Testing stakeholder outcomes for materiality and significance .....	49



Table 27: Sensitivity overview of factors influencing materiality of results .....	58
Table 28: Social and Market Return on Investment Summary .....	62
Table 29: Social Return on Investment for reforestation in Pointe-aux-Chenes WMA .....	63
Table 30: Market Return on Investment for reforestation in Pointe-aux-Chenes WMA.....	66
Table 31: Social and market return on investment delineated by SVI stakeholder groups for reforestation in Pointe-aux-Chenes WMA.....	69
Table 32: Social return on investment delineated by IIRC shared value capital for reforestation in Pointe-aux-Chenes WMA. ....	71

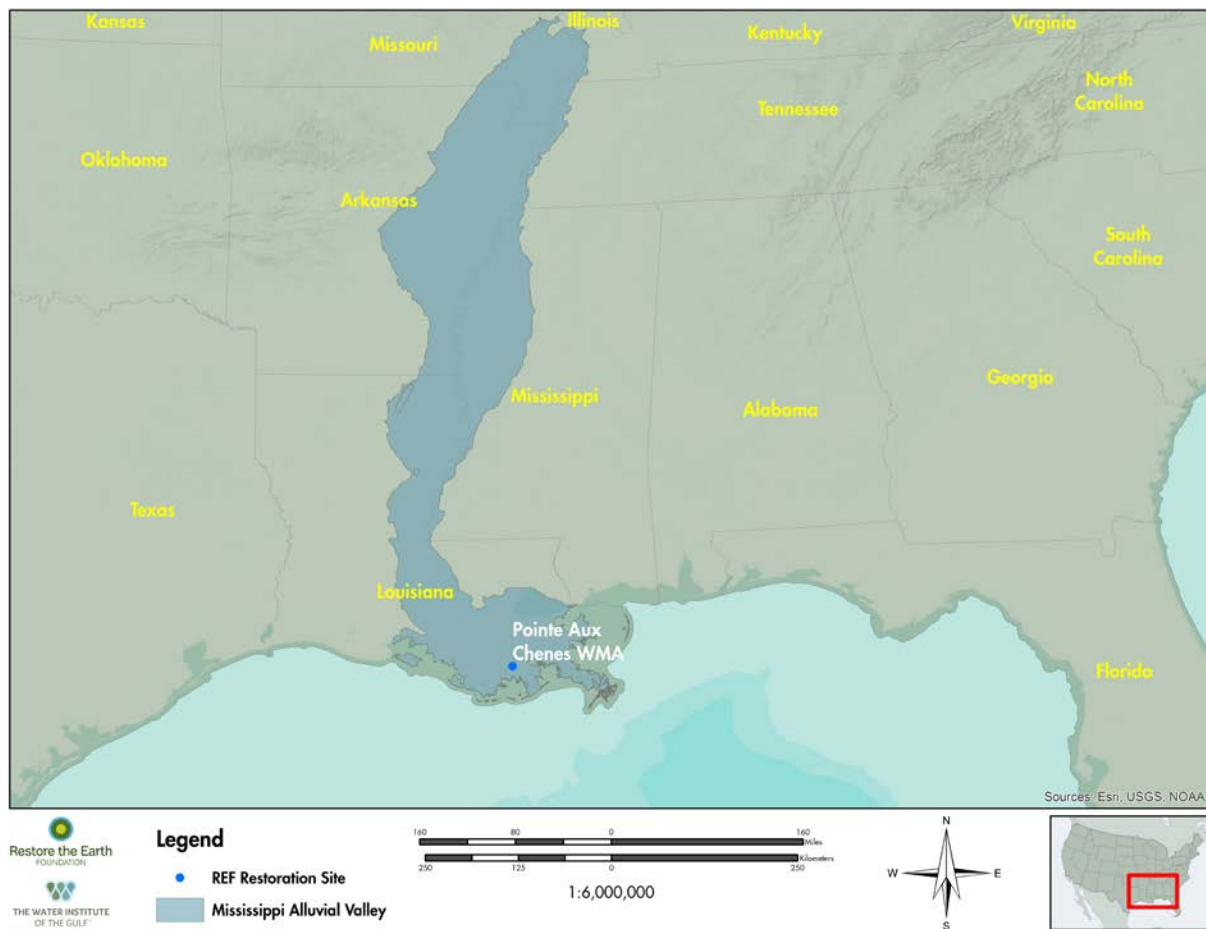




## 1.0 Executive Summary

This report contains a forecast of the economic, social, and environmental outcomes of a reforestation project in coastal Louisiana at the southern tip of the Mississippi Alluvial Valley (MAV). The Social Return on Investment (SROI) was commissioned by Restore the Earth Foundation (Restore the Earth), a non-governmental organization that aims to generate support from corporate donors to fund forest and wetland restoration efforts in the MAV. Restore the Earth has an initial focus on Louisiana coastal environments in the face of the state's ongoing coastal land loss crisis (Couvillon et al 2011). This report looks at its reforestation of 4,000 acres of cypress trees on the Pointe-aux-Chenes Wildlife Management Area (Pointe-aux-Chenes, LA) as part of its future goal of restoring a million acres of the MAV.

**Figure 1. Mississippi Alluvial Valley and Pointe-aux-Chenes WMA location (Louisiana, USA)**



Restore the Earth contracted with The Water Institute of the Gulf to research and complete a Social Return on Investment (SROI) report as means of assessing and valuing the intangible aspects of restoration efforts on a variety of stakeholders impacted by this project. Research methodologies were informed by two goals: 1) collecting data to fulfill the requirements of social return on investment report assurance by Social Value International; and 2) populating Restore the Earth EcoMetrics™ Model, a tool developed by Restore the Earth to collaboratively analyze the social, economic, and environmental



benefits of investing in reforestation efforts. The model combines quantitative and qualitative values across numerous social, economic, and environmental categories to forecast the relative social and economic outcomes for corporations interested in investing in reforestation projects. The EcoMetrics model was built on the guiding principles of Social Value International's (SVI) SROI Methodology and the International Integrated Reporting Council's (IIRC) International Integrated Reporting Framework (IIRF). Stakeholder relationships are of primary importance to both methodologies. The SVI approach concerns an in-depth, evidence-based understanding of change for a full range of community stakeholders with recognition of both positive and negative changes as well as intended and unintended outcomes. Value in this context refers to the relative importance placed by a stakeholder group on one potential outcome over another. Assigning these valuations using SVI principles requires the use of financial proxies, as many of the identified outcomes are difficult to quantify using conventional accounting practices. The IIRC methodology is principally concerned with value creation for funding stakeholders and resources are allocated based on the potential benefit to the corporation and quantified using conventional accounting practices.

This report specifically presents an analysis of the data collected by The Water Institute between September 2016 and February 2017. This review is an opportunity for Restore the Earth to assess the extent to which reforestation can create social, economic, and environmental value in ongoing projects and how stakeholders perceive the project creating diverse forms of social and environmental returns. This report discusses the impacts to stakeholders as they have articulated them while also considering the various limiting factors on the projected social return on reforestation, and assesses the creation of social value for both community stakeholders and funding stakeholders. Both market and non-market social value was generated for various stakeholder groups and the relationship between these stakeholder groups can be quantified through application of the six capitals identified by the IIRC: financial, manufactured, intellectual, human, social, and natural.

### 1.1. SROI TYPE AND PERIOD

- This report contains a forecast of a reforestation project in the Mississippi Alluvial Valley in the state of Louisiana, U.S.A.
- The reforestation is located on public lands (state owned)
- The Pointe-aux-Chenes Wildlife Management Area (WMA) is a 40-year forecast study that examines the perceived impacts of cypress reforestation in southeast coastal Louisiana which broke ground in October 2016
- The Water Institute began research for the SROI of the Pointe-aux-Chenes WMA in September 2016 and finished in February 2017
- The final report was drafted in February and March 2017
- Revisions based on SVI feedback were made in June 2017



## 1.2. AUDIENCE

The audience for this SROI report is Restore the Earth Foundation's management and staff, as well as existing and potential investors. Restore the Earth Foundation will use this study to communicate its impact to potential funders and stakeholders.



### 1.2.1. Social Value Creation

The major stakeholder groups who will benefit from the reforestation project in the MAV include:

- **Restore the Earth Foundation**, which will benefit from the enhancement to its reputation, which will allow it to continue working towards their goal of reforesting 1 million acres of land in the MAV and the carbon, nitrogen, and phosphorus offsets generated by the reforestation project
- **Volunteers involved in replanting** who will benefit from the enhanced sense of accomplishment and wellbeing from working on the reforestation project, and will gain an enhanced awareness of the importance of ecosystem restoration
- **Corporate Sponsors** who will benefit from an enhanced social license to operate in coastal Louisiana, and are assigned the carbon offsets for the project, proportionate to their investment in the project
- **Recreational users, including general recreational users, hunters, fishers, wildlife viewers and birdwatchers** who benefit from the enhanced recreational opportunities reforestation provides
- **Those employed directly by the reforestation project, including state and federal wildlife managers and local business owners** who benefit from the enhanced business opportunities resulting directly from the reforestation project work and indirectly through increasing visitation to the region
- **Communities surrounding the site and downstream/wind of it** who benefit from improved water and air quality, storm protection, and soil stabilization due to the reforestation
- **Communities that benefit from other ecosystem services such as habitat refuge and cultural value including community services and outreach organizations, indigenous communities, and educational users of the site** who benefit from an enhanced sense of community pride, the restoration of historical landscapes that can be used for cultural traditions, and an increase in education programs
- **Government Officials** who will benefit from the enhanced coastal protection and future savings in storm recovery time and cost
- **Conservation Organizations** who benefit from the enhanced ecosystem benefits that the projects provide to the broader ecological region
- **Environmental outcomes** that benefit all stakeholder groups but are not immediately apparent to stakeholders or may not manifest for several years and include the societal benefits of reduced nitrogen and phosphorus and the sequestration of carbon resulting from the reforestation

The SROI analysis of the anticipated outcomes for each stakeholder group shows a significant social return associated with the Pointe-aux-Chenes reforestation. An investment of \$15,467,764 in the 2016 financial year creates approximately \$218,076,777 of net social impact over 40 years, resulting in an indicative SROI ratio of 14.10:1 (Table 1). In other words, the SROI analysis presents evidence that substantiates that for every dollar invested in reforestation in the Points-aux-Chenes WMA by Restore the Earth's corporate sponsors, \$14.10 is returned to community stakeholders in social value. Additionally,



\$25,664,585 in direct market value is returned to Restore the Earth and corporate investors, a direct market return of \$1.66 for every dollar invested (Table 2). In sum, with an initial investment of \$15,467,764 in financial and intellectual capital, the community and funding stakeholders see a return of \$243,741,362 in financial, manufactured, human, social, and natural capital over 40 years (Table 3), for a total return on investment of 15.76:1.

**Table 1. Social Return on Investment for reforestation in Pointe-aux-Chenes WMA**

Stakeholders	Real outcomes due to Pointe-aux-Chenes reforestation project	Social Value Creation	Social Value per Stakeholder Group
Environment	Social value of carbon sequestered	\$18,811,375.10	\$26,259,939.68
	Improved soil formation and nutrient cycling	\$1,342,049.29	
	Erosion control and sediment retention	\$15,676.22	
	Increased waste treatment capacity,	\$6,090,839.08	
Volunteers involved in replanting	Sense of accomplishment	\$127,035.00	\$127,035.00
Government Agencies	Enhanced coastal protection for adjacent communities	\$30,006,508.50	\$30,006,508.50
Conservation Organizations	Enhanced habitat refuge	\$23,365,326.49	\$23,365,326.49
Recreational users (general recreational users, hunters, fishers, wildlife viewers and birdwatchers)	Enhanced habitats for hunting	\$254,831.74	\$367,433.72
	Enhanced habitats for fishing	\$107,240.72	
	Enhanced habitats for general recreation	\$3,220.83	
	Enhanced habitats for birdwatching	\$2,140.44	
Those employed directly and indirectly by the reforestation project	Direct employment for local nursery and planting services	\$1,758,782.51	\$3,042,834.44
	Enhanced business opportunities	\$1,284,051.93	
	Enhanced habitat refuge	Shared Value with Conservation organizations	
Communities surrounding the site and downstream/wind of it that benefit from water and air quality, waste treatment, storm protection, soil stabilization, biological control	Enhanced Water Quality. Value of Marginal Nitrogen and Phosphorus Mitigation.	\$37,383,790.69	\$134,021,266.95
		\$90,701,489.02	
	Increased atmospheric oxygen and cleaner air	\$5,935,987.24	
	Enhanced storm surge protection	Shared Value with Government agencies	
Communities that benefit from other ecosystem services such as habitat refuge and cultural value	Sense of community pride; community gathering place	\$274,880.07	\$886,431.73
	Enhanced ecosystem that can be used for cultural rituals and traditions	\$604,736.16	
	More educational programs and opportunities	\$6,815.50	
		<b>Total Present Value</b>	<b>\$218,076,776.51</b>
		<b>Total Investment</b>	<b>\$15,467,763.67</b>
		<b>Non-Market Return on Investment (dollar returned per dollar invested)</b>	<b>14.10</b>



**Table 2: Market Return on Investment for reforestation in Pointe-aux-Chenes WMA**

Stakeholders	Real outcomes due to Pointe-aux-Chenes reforestation project	Market Value Creation	Market Value Creation per Stakeholder Group
Restore the Earth Foundation	Enhances Restore the Earth's reputation by planting the first 4,000 acres of 1 million acre goal	\$156,000.00	\$22,700,585.27
	Organization of volunteer labor to offset 10% of the project costs	\$1,546,275.97	
	Market value of carbon sequestered	\$15,186,048.89	
	Market value of nitrogen offset	\$3,955,114.65	
	Market value of phosphorous offset	\$1,857,145.77	
Corporate Sponsors	Social license to operate (effects to reputation; positive impact on communities)	\$2,964,000.00	\$2,964,000.00
		<b>Total Present Value</b>	<b>\$25,664,585.27</b>
		<b>Total Investment</b>	<b>\$15,467,763.67</b>
		<b>Market Return on Investment (dollar returned per dollar invested)</b>	<b>1.66</b>

**Table 3: Investment, market value, and social value delineated by IIRC shared value capital for reforestation in Pointe-aux-Chenes WMA.**

Shared Value Capital	Investment	Market Value	Social Value
<b>Financial</b>	\$12,000,000.00	\$22,700,585.27	\$3,042,834.44
<b>Manufactured</b>			\$30,006,508.50
<b>Intellectual</b>	\$3,462,759.67		
<b>Human</b>	\$5,004.00		\$367,433.72
<b>Social and Relationship</b>		\$2,964,000.00	\$24,378,793.22
<b>Natural</b>			\$160,281,206.63
<b>Total Investment</b>	<b>\$15,467,763.67</b>		
<b>Total Present Value</b>		<b>\$25,664,585.27</b>	<b>\$218,076,776.51</b>
<b>Market and Non-Market Return on Investment (dollar returned per dollar invested)</b>		<b>1.66</b>	<b>14.10</b>

The SROI, however, provides more than the estimated social value per dollar invested. The report has been a concrete way to test theories about stakeholders' understanding of the way environmental reforestation projects impact their lives and livelihoods. To that end, it is important to recognize that



while this case study on face represent before and after scenarios, it speaks solely to the reforestation of this specific area of the MAV and the unique uses of this WMA. Furthermore, the coastal location of this reforestation is a highly variable environment within the MAV, making the success of the reforestation contingent upon the extent the environment remains stable enough for the trees to mature. One reason that this location was selected was that it is protected by the Morganza to the Gulf levee system, which reduces some of the risk to the site. Nevertheless, coastal Louisiana is a highly dynamic environment, and it is difficult to predict the frequency or severity of weather events that might impact the reforestation project. These uncertainties, to a certain extent, shape how stakeholders view the long-term impacts, successes, or failures of this reforestation. The funding stakeholder, Restore the Earth, has considered these uncertainties and has taken steps to circumvent unexpected damages to the reforestation. It has, for example, invested in a proprietary system for growing its cypress trees - EKOgrown® trees - which delivers higher survivability and faster growth to maturity (Restore the Earth Foundation). Such factors are key to the success of the reforestation as cypress trees can better withstand saltwater inundation the more mature they are. Finally, this research utilizes three forecast scenarios that bound the environmental uncertainty to some degree: conservative, realistic, and aggressive. The focus of this analysis is on the realistic scenario, which uses a discount rate of 5% for climate change mitigating investments.

## 2.0 SROI Analysis

### 2.1. PURPOSE OF THE SROI

This report presents a Social Return on Investment (SROI) analysis of a reforestation program in the Mississippi Alluvial Valley (MAV) of Louisiana, USA conducted for Restore the Earth Foundation, a 501(c)(3) non-profit dedicated to restoring forest and wetland ecosystems. Restore the Earth Foundation works closely with public agencies and local experts to identify critical restoration projects in need of funding and utilizes its EcoMetrics model to develop the business case for each restoration project based on its benefits and returns (environmental, social and economic). Using this business case, Restore the Earth assesses its existing network of partners as well as a consortium of potential project stakeholders including business, industry, government, local and regional communities to determine interested parties with vested interests. Using aligned interests, paired with the business case, Restore the Earth works to "unlock" funding in the form of financial or in-kind support. This report is built based on the





respective interest of each potential investor – i.e. carbon offsets, community resilience, storm protection, ecosystem restoration, job creation, sustainable sourcing of raw materials, etc.

This report contains a forecast SROI analysis of a cypress reforestation project located in the Pointe-aux-Chenes Wildlife Management Area (WMA), located in Louisiana’s coastal zone in Terrebonne and Lafourche Parishes. It covers the actual tree planting reforestation activities from years 1-10 and the long-term growth and maintenance of the project and its environmental outcomes through year 40.

This report is not an analysis of the operations of Restore the Earth Foundation or an assessment of the business model. This report does not focus on the sustainability of the operations of Restore the Earth Foundation, but rather focuses on understanding the impact that the activities undertaken by Restore the Earth will have on stakeholders. The objectives of this project were to use the SROI methodology to:

- Identify and engage key stakeholders affected significantly by reforestation – Understand what each stakeholder wants changed (objectives), what they contribute (inputs), what activities they do (outputs) and what changes for them (outcomes, intended or unintended) as a result of their involvement;
- Measure and value the social impacts of reforestation – Understand the value created as a result of the changes experienced by each stakeholder group by using indicators to measure the outcomes and financial proxies to value the outcomes; and
- Create a forecast analysis to measure and evaluate the impacts of reforestation – Articulate the key drivers of social value and identify what data are needed to best measure and evaluate the impacts of activities.

To fully measure and evaluate the impacts of reforestation, this research incorporates scientific data on the objective impacts of environmental degradation and the mitigating effects of forest restoration into the SROI evaluation. These data are directly tied to the outcomes defined by the key stakeholders and used to quantify the social value of environmental change. The SROI methodology presents these social values in terms of financial equivalents, which allows stakeholders across the board to evaluate the cost/benefit favorability or unfavorability of proposed environmental interventions. Such valuation of outcomes will allow Restore the Earth and its corporate funders to understand the internalized financial benefits and externalized societal benefits of making investments in so-called “green infrastructure” or natural capital.

This report provides a brief overview of the SROI methodology, project approach, the objectives and activities of the reforestation and afforestation projects, and the key findings and assumptions made when completing the analysis. Finally, this report includes a discussion of the SROI results and recommendations. The audience for this SROI report is Restore the Earth Foundation’s management and staff, as well as existing and potential investors. Restore the Earth Foundation will use this study to communicate the impact to potential funders and stakeholders.

## 2.2. SROI APPROACH

SROI is a framework for measuring and accounting for the broad concept of social value, a measure of change that is relevant to people and organizations that experience it. This concept of value goes beyond what can be captured in pure, market-based financial terms, seeking to reduce inequality and environmental degradation and improve wellbeing by incorporating social, environmental, and economic costs and benefits into project valuation (SROI Network, 2012). For analytical purposes, SROI converts



non-financial values into their financial equivalents, using both subjective and objective research to estimate those values. Restore the Earth believes that is what makes SROI different from other forms of social-impact analysis, and therefore more valuable to corporate funders and governmental agencies that have fiduciary responsibility to the public.

There are two types of SROI analysis:

- Evaluative, which is conducted retrospectively to validate a forecast or baseline SROI to understand if the impact sought was achieved
- Forecast, which is designed to understand and predict the desired impact and outcomes of a program or activity for significant stakeholders

Forecast SROIs are especially useful in the planning stages of an activity. They can help show how investment can maximize social impact and are also useful for identifying what should be measured once the project is implemented (SROI Network, 2012).

SROI was developed from social accounting and cost-benefit analysis and is based on seven principles of social value (SROI Network, 2012):

1. Involve stakeholders – Inform what gets measured and how this is measured by involving stakeholders;
2. Understand what changes – Articulate how change is created and evaluate this through evidence gathered, recognizing positive and negative changes as well as those that are intended and unintended;
3. Value things that matter – Use financial proxies in order that the value of all outcomes can be recognized including those that are not traded in markets but are affected by activities;
4. Only include that which is material – Determine what information and evidence must be included in the accounts to give a true and fair picture, such that stakeholders can draw reasonable conclusions about impact;
5. Do not over-claim – Only claim the value that organizations are responsible for creating;
6. Be transparent – Demonstrate the basis on which the analysis may be considered accurate and honest, and show that it will be reported to and discussed with stakeholders; and
7. Verify the result – Ensure appropriate independent assurance.

The SROI process works by developing an understanding of the program being analyzed, how it meets its objectives, and how it works with its stakeholders. The SROI framework accounts for a broad concept of value and focuses on answering five key questions:

**Table 4. The SROI framework focuses on answering five key questions**

Question	Definition
Who changes?	Taking account of all the people, organizations, and environments affected significantly
How do they change?	Focusing on all the important positive and negative changes that take place, not just what was intended
How do you know?	Gathering evidence to go beyond individual opinion
How much is you?	Taking account of all the other influences that might have changed things for the better (or worse)
How important are the changes?	Understanding the relative value of the outcomes to all the people, organizations, and environments affected





SROI puts a value on the amount of change (impact) that takes place as a result of the program and looks at the returns to those who contribute to creating the change. It estimates a value for this change and compares this value to the investment required to achieve that impact, resulting in an SROI ratio. It takes standard measures of economic return a step further by placing a monetary value on social returns (Social Ventures Australia Consulting, 2011). Critical to the process is the development of an impact map demonstrating the impact value chain for each stakeholder group. It links stakeholders' objectives to inputs (e.g. what has been invested), to outputs (e.g. number of trees planted), through to the outcomes (e.g. increase in income through employment). The process then involves identifying indicators for the outcomes, so that we can measure if the outcome has been achieved. The next step is to use financial proxies to value the outcome.

It is then necessary to establish the amount of impact each outcome has had. Impact is defined in the SROI as an estimate of how much of the outcome would have happened without the project and the proportion of the outcome that can be isolated as being added by the activities being analyzed. A number of filters are utilized in the analysis to render additional validity and stability to the conversion of non-market values into their financial equivalents. SROI uses four filters applied to each outcome to establish the impact of the activities:

- Deadweight – what would have happened anyway?
- Displacement – were other outcomes displaced to create the outcome?
- Attribution – who else contributed to the outcome?
- Drop-off – how much does the outcome drop-off each year?

Establishing impact is important as it reduces the risk of over-claiming and may also help identify any important stakeholders that may not have been included in the analysis.

### 2.3. CHALLENGES WITH APPLYING THE SROI METHODOLOGY TO ENVIRONMENTAL PROJECTS

Restoration and reforestation projects mitigate carbon emissions through sequestration of carbon and by eliminating nitrogen and phosphorus runoff from sediment loss. This process restores and rebalances ecosystems and establishes healthy natural capital buffers. Married with the direct environmental impacts, the indirect co-benefits created include improved air and water quality and quantity, job training and creation of jobs, lessening of extreme weather patterns, storm protection, pest control, increased recreation and tourism through bird watching, hunting, and fishing, and the creation of new technology. Many of these outcomes have multiple benefits to multiple stakeholders.

Applying the SROI methodology to environmental projects such as ecological restoration and reforestation projects, however, poses unique challenges. The SROI methodology has historically been used by community organizations focused on social welfare programs which have a clearly defined period of investment and an associated commensurate period of benefits (Social Ventures Australia Consulting, 2011). With restoration projects, many of the benefits are often not readily or immediately apparent to stakeholders. For example, the assignment of carbon, nitrogen, and phosphorus offset credits provide direct benefits to Restore the Earth and its partners. However, the environmental value of carbon, nitrogen, and phosphorus for other stakeholders and society at large are generally not identified as outcomes through stakeholder engagement. To account for these more intangible assets, the environment is considered as a stakeholder, as though it were a person or an organization. The specific outcomes



associated with the environment were derived from the scientific literature and research contracted by Restore the Earth. The results of this research can be considered outcomes that will accrue to various stakeholder groups in the future.

## 2.4. PROJECT APPROACH

The comprehensive benefits of these reforestation projects – which include social, economic, and environmental outcomes – were tracked, measured, and reported on through Restore the Earth Foundation EcoMetrics Model that is based on the guiding principles of Social Value International’s SROI Methodology. The Pointe-aux-Chenes project was analyzed using the 2016 financial year investment and assessing the benefits over a 40-year time horizon with a 5% discount rate.



The forecast SROI analysis for Restore the Earth Foundation was undertaken in six stages. The activities in these six stages include:

1. Establishing scope and identifying stakeholders
  - a. define boundaries and time scale for analysis
  - b. define stakeholders
2. Mapping outcomes
  - a. engage with stakeholders to develop an impact map which shows the relationship between objectives, inputs, outputs and outcomes
3. Evidence outcomes and giving them a value
  - a. synthesize data from stakeholder interviews into an impact map
  - b. identify relevant indicators and financial proxies to monetize the social outcomes, where possible
  - c. define the investment, both direct cash investments and pro bono contributions from the various stakeholders
  - d. conduct follow up interviews to verify evidence where required
  - e. test assumptions with other Water Institute of the Gulf and Restore the Earth Foundation staff
4. Establish impact
  - a. determine those aspects of change that would have happened anyway or area result of other factors
5. Calculate the SROI
  - a. populate and use the EcoMetrics model to add up all the benefits, subtract any negatives and compare the result to the investment. This is also where the sensitivity of the results is tested.
6. Reporting, using and embedding
  - a. write a detailed report which describes the methodology, assumptions made, results and recommendations



- b. complete summaries of the SROI analysis
- c. report to stakeholders, communicate and use the results, and embed the SROI process in the organization

In addition, the SROI analysis will be used to provide a baseline indicator of whether social value created by the Pointe-aux-Chenes reforestation project. The primary purpose of the baseline SROI is to identify outcomes, guide forward planning and establish what needs to be monitored and measured to demonstrate success.

## 2.5. WHO WORKED ON THE REPORT?

This SROI analysis and measurement and evaluation framework had input from the following individuals and organizations:

- Scott A. Hemmerling, the lead author from the Water Institute of the Gulf, spent approximately 60 days conducting the analysis and compiling the report and assumed overall responsibility for the analysis
- Monica Barra, co-author and research associate from the Water Institute of the Gulf, spent approximately 90 days conducting stakeholder engagement, conducting the analysis and compiling the report
- Harris Bienn, co-author and research assistant from the Water Institute of the Gulf, spent approximately 30 days conducting stakeholder engagement, conducting the analysis and compiling the report
- Richard Landry from Restore the Earth Foundation contributed approximately 20 days reviewing the analysis and assuring consistency with the EcoMetrics model
- Ben Carpenter from Social Value International contributed approximately 5 days reviewing the analysis and assuring consistency with SVI report assurance criteria

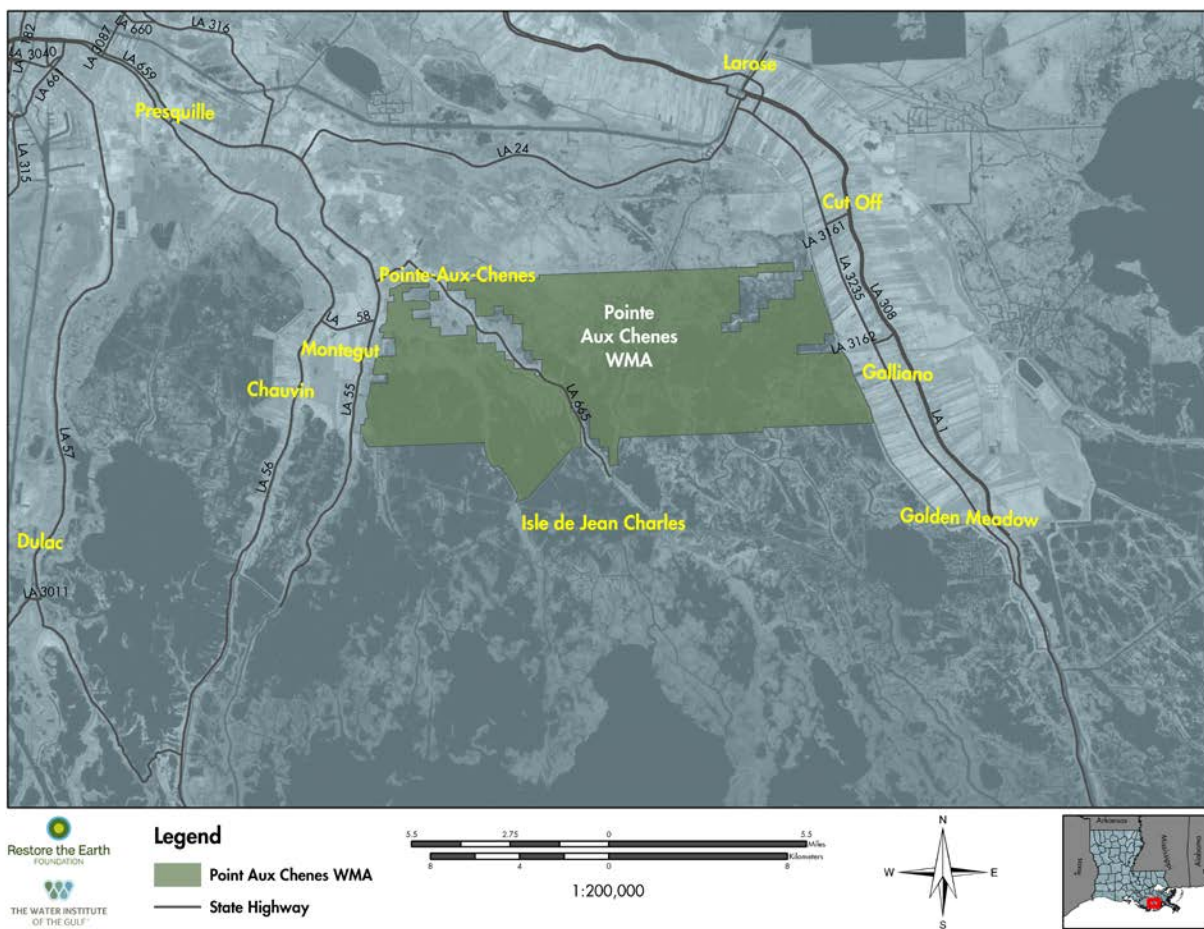


## 3.0 Case Study #1: Pointe-aux-Chenes Wildlife Management Area

### 3.1. BACKGROUND: POINTE-AUX-CHENES WILDLIFE MANAGEMENT AREA AND REGIONAL DEMOGRAPHICS

The Pointe-aux-Chenes Wildlife Management Area (WMA) is a state-owned wildlife management area that encompasses 33,488 acres of intermediate/brackish marsh and bottomland hardwood forest. It is located in Louisiana's coastal zone in two parishes (counties) - Terrebonne Parish and Lafourche Parish - which have a total population of 208,178 as of 2010. The WMA was established in the 1970s through the donation of land and marsh by regional landowners. It is staffed by Louisiana Department of Wildlife and Fisheries staff. Today, the area is primarily accessible by boat and is a popular fishing and waterfowling destination for people across the state and gulf coastal region. The area is also adjacent to several state recognized Native American tribes whose ancestors have lived in the region for multiple generations. There are a number of small communities that surround the Point-aux-Chenes Wildlife Management area. Restore the Earth project site is located closest to Montegut, LA, on the west end of the WMA.

**Figure 2. Pointe-aux-Chenes Wildlife Management Area**





This area of coastal Louisiana is directly impacted by the state's ongoing coastal land loss crisis and has seen much of the native forested wetlands gradually turn into marsh and open water since the early 20th century (Couvillon et al. 2011). This is largely due to human activities in the region, particularly the construction of a vast network of access canals, predominately for oil and gas companies, which cut into coastal wetlands, facilitating the intrusion of saltwater and degradation of native ecosystems, especially freshwater cypress forest. This particular area, and all of coastal Louisiana, is included with the state's 2017 Master Plan for Coastal Restoration and Protection, which identifies sites and projects for coastal restoration throughout the coastal zone.

Restore the Earth aims to restore 4,000 acres of cypress forest in several sections of the WMA site over the next 40 years. This includes 10 years of planting cypress directly with volunteers and hired labor and continued site maintenance by Wildlife Management Area staff. The Pointe-aux-Chenes cypress reforestation project was initiated by Restore the Earth with its partners, using its proprietary EKOgrown® plant methodology (see Appendix 6) to help ensure the survival and longevity of the restoration. The analysis presented in this report is a 40-year forecast of the reforestation project that calculates return on investment measured predominately in terms of tree growth (with the exception of volunteer and wage labor) beginning with the first year of planting in 2016. Reforestation (planting) activities will take place from years 1-10 and calculations of environmental benefits of reforested areas occur over a 40-year time span. Over this time period, provided continued maintenance as the site matures, environmental benefits will continue to accrue to each of the stakeholder groups. Some benefits, such as enhanced storm protection, wildlife habitat, and educational usage, will reach their maximum levels in 10 years while others, such as increased biomass, carbon sequestration, and nutrient cycling, will continue to increase over the full 40-year period.

### 3.2. IDENTIFYING STAKEHOLDERS

To begin the research for the Social Return on Investment (SROI) analysis, Restore the Earth provided a list of initial stakeholder categories to The Water Institute that attempted to capture the range of stakeholders likely to experience material social, economic, environmental, and cultural impacts and outcomes associated with reforestation practices as part of Restore the Earth Foundation EcoMetrics™ Model. The Water Institute used this preliminary set of stakeholder categories to reach out to



individuals within potentially impacted communities surrounding the reforestation sites. Stakeholders were invited to participate in the study based on their membership in one or more of these stakeholder categories and their availability and willingness to participate. The Water Institute relied on contacts from Restore the Earth as well as their own personal contacts to develop a primary list of stakeholders. Recommendations were solicited from this initial group in order to reach a range of stakeholders and refine the broad stakeholder categories. The goal was to talk with at least 2 representative perspectives for each stakeholder category that could guide the calculation of social return on investment.



The stakeholder categories capture a diverse population potentially impacted by Restore the Earth reforestation project. According to the 2010 U.S. Census, approximately 208,178 people live in Terrebonne and Lafourche Parishes (counties) where the project is located. Over the last decade, the population, employment, and income levels in these parishes have been growing faster than the Louisiana statewide average (Table 5). These populations are accounted for within the stakeholder categories that encompass The Public at Large (affected by climate change), Communities surrounding the site and downstream of the site, and Communities that Benefit from Other Ecosystem Services. Current visitation to the Pointe-aux-Chenes WMA for recreational uses (including hunting, fishing, general recreation, birdwatching, and education) totals 666 users per year (LDWF Visitation for Pointe-aux-Chenes WMA 2011-2013). The local per capita income of Terrebonne and Lafourche Parishes is \$45,829 per year, predominately from jobs related to the 'working coast' in commercial and recreational fisheries and oil and gas activities.



**Workshop facilitators from The Water Institute of the Gulf, lay out the evening's agenda during a meeting in Chauvin, Louisiana.**



**Table 5. Regional demographics for the Pointe-aux-Chenes Wildlife Management Area**

Parish	Population			Employment			Per Capita Income		
	2000	2010	Percent change 2000-2010	2000	2010	Percent change 2000-2010	2000	2010	Percent change 2000-2010
<b>Lafourche LA</b>	89,974	96,318	7.1%	37,207	42,698	14.8%	15,809	22,898	44.8%
<b>Terrebonne LA</b>	104,503	111,860	7.0%	41,406	49,171	18.8%	16,051	22,931	42.9%
<b>Area Total</b>	<b>194,477</b>	<b>208,178</b>	<b>7.0%</b>	<b>78,613</b>	<b>91,869</b>	<b>16.9%</b>	<b>31,860</b>	<b>45,829</b>	<b>43.8%</b>
<b>Louisiana</b>	4,468,976	4,533,372	1%	1,831,057	1,952,818	6.65%	\$16,912	\$23,094	36.55%
<b>United States</b>	281,709,873	308,745,538	10%	128,279,228	141,833,331	10.57%	\$21,587	\$27,334	26.62%



After consulting with Restore the Earth on the relevant background of the Pointe-aux-Chenes reforestation project, The Water Institute began recruiting stakeholder participants for the qualitative portion of the SROI analysis. This was achieved through a 'snowball' methodology, wherein stakeholders recommended to The Water Institute were asked to suggest additional stakeholders to reach out to. Phone, email, and in-person contact was attempted with approximately 45 individuals representing 9 stakeholder groups and 6 subgroups. Subgroups were identified through the process of classifying materially different outcomes from gathered qualitative data and representative stakeholders engaged by The Water Institute. Methodologies are described in detail in the next section of the report.

**Number of attendees for focus group: 17 total**

**Stakeholder groups and subgroups represented in focus group:** Volunteers involved with replanting, government agencies, conservation organizations, those employed directly by reforestation, local business, state and federal wildlife managers, communities surrounding the site and downstream/wind of the restoration that benefit from ecosystem services such as water and air quality, storm protection, and soil stabilization, community services and outreach, indigenous communities, education and research.

**Number of participants for one-on-one interviews: 12** (note, 3 of the interviewees participated in the focus groups as well)

**Stakeholder groups and subgroups represented in one-on-one interviews:** Restore the Earth Foundation, corporate sponsors, volunteers involved with replanting, government agencies, those employed directly by reforestation, local business, state and federal wildlife managers, communities surrounding the site and downstream/wind of the restoration that benefit from ecosystem services such as water and air quality, storm protection, and soil stabilization, community services and outreach, indigenous communities, education and research.

It should be noted that the stakeholder groups from coastal areas - every group except Restore the Earth, corporate sponsors, and volunteers - live in small, sparsely populated communities. For example, Montegut, the town directly adjacent to the restoration project, had a total population of approximately 1,500 people in 2010. It is important to keep this kind of figure in mind when considering the number of individuals directly engaged in the SROI research.

### 3.2.1. Description of stakeholder groups

In total, The Water Institute conducted meetings, focus groups and one-on-one interviews with 26 individuals for the PAC study. The only group The Water Institute did not directly engage was "former landowners." They were deemed 'not applicable' because land acquired for the reforestation project was already owned by the state of Louisiana and thus was not purchased and/or taken out of the local tax base. As a historical context, the land on which the current Pointe-aux-Chenes WMA is currently situated was given to the state of Louisiana in the 1970s by several oil and gas companies that were previous landowners.

Numerous individuals represented multiple stakeholder positions in this case study. As a result, data was coded and sorted to reflect input on particular impacts to stakeholder groups a participant was a member of. For example, an individual could be a recreational user, local resident, and a member of a Native American group. As such, their responses were coded and organized in accordance to their input on a





particular stakeholder experience or impact. That is to say, responses from a participant who is Native American were sorted according to which stakeholder impact they were speaking to at a particular point in time during the research, whether that be specific to Native American groups or to other stakeholder experiences. This enabled us to maximize the breadth and depth of the data collected from individuals.

#### *Restore the Earth Foundation*

As the principal organization providing and organizing financial and intellectual capital to develop the Pointe-aux-Chenes reforestation project, Restore the Earth Foundation is a major beneficiary likely to experience significant outcomes through the development of the project and the ability to initiate additional innovative coastal restoration projects. The foundation is a 501(c)(3) non-profit that works alongside federal and state agencies, private, philanthropic, and community organizations to restore essential forest and wetland ecosystems along the U.S. Gulf Coast. Since 2008, the foundation has secured funding to reforest 45,000 acres in the region. The 4,000 acre cypress reforestation project in the Pointe-aux-Chenes Wildlife Management Area represents the beginning of a much larger goal for Restore the Earth to restore 1 million acres of forest in the Mississippi Alluvial Valley. As part of its business model, Restore the Earth solicits donations from corporate sponsors and deploys that money to build restoration projects. Restore the Earth then registers carbon and water offsets, which it assigns to the corporate sponsors. To track the effectiveness of its projects in creating environmental, social, and financial value, Restore the Earth developed the EcoMetrics Digital Platform, based on a social return on investment model.

***Number of stakeholders directly engaged: 3***

***Method of engagement: 3 stakeholders participated in regular meetings with the Water Institute over the course of 6 months.***

#### *Corporate sponsors*

To implement projects like the Pointe-aux-Chenes reforestation, Restore the Earth Foundation leverages private funding through partnerships with corporate sponsors. By providing financial and natural capital investments for the reforestation, these corporate sponsors directly support local and regional environmental sustainability, enabling them to build upon their corporate reputation in the area effected as well as to provide their employees with an opportunity to connect to the environment. These corporate sponsors are beneficiaries, experiencing outcomes such as enhanced social license to operate, wherein a company is seen by a community as a good neighbor, the activities of that company are often legitimized and therefore able to continue with the consent of those affected by the activity. These sponsors will also potentially receive market benefits in the form of carbon and water offsets assigned by Restore the Earth.

***Number of stakeholders directly engaged: 2***

***Method of engagement: 2 stakeholders were engaged through one-on-one interviews***

#### *Volunteers involved in replanting*

The Pointe-aux-Chenes project will utilize teams of volunteers from several regional and national corporations to assist in reforestation activities. These volunteers are major beneficiaries who are likely to experience significant outcomes from volunteering their time to the project. In 2016,



volunteers participated in three cypress planting activities in the Pointe-aux-Chenes site. The majority of these volunteers worked for corporate sponsors of the project and resided in nearby urban areas. For many, this was their first opportunity to directly interact with the coastal environment and to see the impacts of coastal land loss personally. As expressed in interviews, the majority of the volunteers experienced a sense of accomplishment and wellbeing during these events. Through these reforestation activities, many of these volunteers developed a more personal connection toward environmental sustainability.

***Number of stakeholders directly engaged: 3***

***Method of engagement: 3 stakeholders were engaged through one-on-one interviews.***



#### *Government agencies*

State and regional (parish) government officials represent the interests of their constituencies, the majority of whom may reside some distance away from the Pointe-aux-Chenes reforestation project. These regional stakeholders are beneficiaries who are likely to experience protection-related outcomes if the reforestation project is successful. These impacts would include the interactive effects of this reforestation project with other ecological restoration and coastal protection projects existing at the state and regional level constructed throughout Louisiana's coastal zone, which could potentially reduce storm impacts for communities far inland of the project.

***Number of stakeholders directly engaged: 2***

***Method of engagement: 2 stakeholders were engaged in a focus group; 1 was engaged in a one-on-one interview.***

#### *Conservation organizations*

Conservation organizations represent the interests of constituencies that often reside far afield of the Pointe-aux-Chenes reforestation project. These conservation organizations include regional and national non-profit groups that work through local chapters to support environmental enhancement and restoration projects for at-risk habitats and wildlife. They often work closely with state and



regional government officials on environmental projects that have wider ecological impacts. The organizational mission of many of these organizations is to create and sustain programs beneficial to both their membership and the general public. Members of conservation organizations generally differ from direct users of the site in that their outcomes are often experienced at broad ecosystem scale.

***Number of stakeholders directly engaged: 1***

***Method of engagement: 1 stakeholder participated in a focus group.***

#### *Recreational users*

Recreational users of the Pointe-aux-Chenes Wildlife Management Area are major beneficiaries of the reforestation project who are likely to experience significant outcomes if the project is successful. One of the prevailing outcomes of reforestation is the enhancement of wildlife habitat associated with this cypress ecosystem. As the Wildlife Management Area is already one of the more popular recreational areas in the state, many participants from the recreational users stakeholder groups noted that visitation would likely increase as a result of the reforestation. Recreational activities include hunting, fishing, non-consumptive uses (boating, kayaking, nature study), and birding. This is linked to the fact that the cypress forest enhances habitat for wildlife, which improves hunting, fishing, birdwatching, and general recreation.

***Number of stakeholders directly engaged: 15***

***Method of engagement: 11 stakeholders were involved in a focus group; 4 stakeholders were involved in one-on-one interviews.***

#### *Those employed directly and indirectly by the reforestation project*

The reforestation of the Pointe-aux-Chenes Wildlife Management Area is expected to have direct and indirect impacts on local businesses both throughout the actual period of reforestation and over the long term. Those employed directly and indirectly by the reforestation project are major beneficiaries of the reforestation project who are likely to experience significant outcomes if the project is successful and the reforested areas are sustainable. The stakeholder engagement process revealed that there were several distinct subgroups of stakeholders that would be expected to experience employment-related outcomes of the reforestation project; those employed directly to perform the reforestation, state and federal wildlife managers responsible for maintaining the





reforested land, and local businesses that would be expected to see an increase in visitation if the project is successful.

*Those employed directly by the reforestation*

Local workers are beneficiaries who are likely to experience significant outcomes during the reforestation process. The Pointe-aux-Chenes reforestation project will utilize local nurseries and employees to grow plant material for use in the project. In addition, the project is expected to hire several local employees to plant the reforested areas and maintain them. These direct jobs created by the reforestation project will provide a tangible outcome in terms of the number of full time jobs created. In addition to these direct jobs created, the presence of work crews, funders, project support staff and management, and other administrative staff travelling to the work site during reforestation is expected to create a number of induced jobs in the surrounding communities. An induced job is a job that is created when employees of both direct employers and indirect employers of the reforestation project spend money in the local economy. In the case of both direct and induced employment, the bulk of this employment is anticipated to occur during the initial phase of reforestation.

***Number of stakeholders directly engaged: 1***

***Method of engagement: 1 stakeholder was involved in a one-on-one interview.***

*Local business*

Local and regional businesses and workers are beneficiaries who would be likely to experience significant outcomes following successful reforestation of the Pointe-aux-Chenes Wildlife Management Area. Local business owners, according to stakeholder interviews, anticipate that the reforestation will bring more visitors to the area. These visitors will frequent local stores, restaurants, and hotels during their visit, potentially increasing revenue and creating new employment opportunities within local communities. This, a number of permanent indirect jobs could be produced in communities surrounding the site with enhanced usage of the WMA.

***Number of stakeholders directly engaged: 3***

***Method of engagement: 1 stakeholder participated in a focus group; 2 stakeholders participated in one-on-one interviews.***

*State and federal wildlife managers*

One final subgroup of workers employed directly and indirectly by the reforestation project include the current staff of the Pointe-aux-Chenes Wildlife Management Area, who will be directly impacted by changes to their workload and routines. A total of seven biologists, technicians, and wildlife managers from the Coastal Operations and Marsh Management section of the Louisiana Department of Wildlife and Fisheries currently operate and manage Pointe-aux-Chenes. With the implementation of the reforestation project, the wildlife managers expect that they and their staff will need to spend additional hours maintaining and monitoring the site, according to stakeholder interviews.



***Number of stakeholders directly engaged: 2***

***Method of engagement: 2 stakeholders participated in one-on-one interviews.***

*Communities surrounding the site and downstream/wind of the restoration that benefit from ecosystem services such as water and air quality, storm protection, and soil stabilization*

Communities such as Montegut and Pointe-aux-Chenes are located immediately adjacent to the Pointe-aux-Chenes Wildlife Management Area. These communities are part of the Houma-Bayou Cane-Thibodaux Metropolitan Statistical Area, although they are considerably smaller and more rural than the other communities that make up this area. These “down the bayou” communities are located on narrow threads of land that are increasingly threatened by coastal land loss and tropical storm events. As previously noted, coastal restoration projects such as the Pointe-aux-Chenes reforestation present a wide range of outcomes experienced at multiple scales, from local to global. Residents of Montegut and Pointe-aux-Chenes could potentially experience a number of local-scale primary impacts of the project, such as improved air and water quality, lowered costs of waste treatment, storm protection and water infrastructure maintenance, and changed or lowered cost of biological control.

***Number of stakeholders directly engaged: 24***

***Method of engagement: 17 stakeholders participated in a focus group; 4 stakeholders participated in one-on-one interviews; 3 stakeholders participated in both the focus group and the interview.***

*Communities that benefit from other ecosystem services*

Several local nonprofit community service organizations operate in the vicinity of the Pointe-aux-Chenes Wildlife Management Area. The focus of many of these organizations is to promote sustainable local communities and environments. Many provide social and educational opportunities for a wide range of residents in need, including children, adults, and the elderly. As expressed in interviews, stakeholders involved in conducting outreach and providing services to these residents in need identified several quality of life benefits that could be achieved by the reforestation project, including an increase in community morale. This increase in morale would be due in part to a desire to experience those historical landscape features that have been lost over the course of a generation.

*Community services and outreach*

Several local nonprofit community service organizations operate in the vicinity of the Pointe-aux-Chenes WMA. The focus of many of these organizations is to promote sustainable local communities and environments. Many provide social and educational opportunities for a wide range of residents in need, including children, adults, and the elderly. As expressed in interviews, stakeholders involved in conducting outreach and providing services to these residents in need identified several quality of life benefits that could be achieved by the reforestation project, including an increase community morale. This increase in morale would be due in part to a desire to experience those historical landscape features that have been lost over the course of a generation.



***Number of stakeholders directly engaged: 3***

***Method of engagement: 2 stakeholders participated in a focus group; 1 stakeholder participated in a one-on-one interview.***

*Indigenous communities*

South Terrebonne Parish, where the Pointe-aux-Chenes Wildlife Management Area is located, is home to several Native American tribes, including the Pointe-au-Chien, Biloxi-Chitimacha-Choctaw, and Houma. Like the Cajun populations residing in the bayou communities, the Native American residents of the region have strong cultural and historical ties to the cypress forests. Even as changes in climate and sea level rise has forced many Native American residents from their homes, many Native American tribe members have noted that their quality of life would be improved by the restoration of the cypress forests. Representative of various tribes noted that the restoration of this historical landscape would allow them to once again experience their cultural traditions and practices.

***Number of stakeholders directly engaged: 4***

***Method of engagement: 3 stakeholders participated in a focus group; 1 stakeholder participated in a one-on-one interview***

*Education and research*

One stakeholder group that tended to cross-cut many other stakeholder groups, including both the community services and indigenous communities subgroups, consists of educators and researchers. Teachers from primary and secondary schools, as well as regional colleges and universities, have used the wildlife management area as a teaching tool to educate students in environmental and ecological issues. This stakeholder group lists outcomes specific to the educational opportunities that reforestation can present for local communities, public schools, and universities. With the implementation of the reforestation project, these educators and researchers would likely experience significant outcomes in the form of enhanced educational opportunities for both teachers and students as they are able to directly engage with ongoing coastal restoration projects. For researchers, the reforestation project will provide a valuable “before and after” case study of cypress reforestation.

***Number of stakeholders directly engaged: 5***

***Method of engagement: 3 stakeholders participated in a focus group; 2 stakeholders participated in one-on-one interviews.***

## 4.0 Research Methodology

### 4.1. ADVISORY MEETINGS AND FIELD VISITS

In September and October 2016, The Water Institute had several advisory meetings and field visits regarding the Pointe-aux-Chenes case study. These meetings were used to delve deeper into the logistics of the project and relevant background of Restore the Earth's activities in Pointe-aux-Chenes. During this



time, The Water Institute met with Louisiana Department of Wildlife and Fisheries (LDWF) managers working on the Pointe-aux-Chenes reforestation site and local businesses directly employed by the reforestation project (Table 6). In these meetings, The Water Institute inquired into: collected data on visitor use to the Pointe-aux-Chenes Wildlife Management Area; the environmental footprint of the reforestation project; the amount of jobs reforestation might bring to the area; how the project fits into an existing landscape of environmental management and coastal protection; and recommendations on potential stakeholders to speak with.

**Table 6. Dates of fieldwork activities between September 2016 and December 2016**

Date	Meeting Type	Location	Parties Present
9/28/16	Advisory meeting and field visit	Pointe-aux-Chenes/Chauvin, LA	Restore the Earth, TWI, LDWF, Community stakeholders and local business owners
10/27/16	Field visit	Pointe-aux-Chenes, LA	Restore the Earth, TWI, Various stakeholders
11/7/16	Focus Group	Pointe-aux-Chenes/Chauvin, LA	Restore the Earth, TWI, Various stakeholders

#### 4.2. OUTREACH STRATEGIES



After initial meetings and collection of stakeholder names and organizations, The Water Institute compiled a list of potential stakeholders, individuals and organizations to contact for participation in either a focus group or one-one-one phone or in-person interview. Through phone calls and emails, The Water Institute attempted to get in touch with 45 stakeholders pertaining to the Pointe-aux-Chenes reforestation. Individuals who were contacted were invited to attend one of the focus group sessions and to conduct a one-on-one interview.

#### 4.3. FOCUS GROUP MEETINGS AND SHORT PARTICIPANT SURVEY

The Water Institute conducted one focus group session for Pointe-aux-Chenes. The Water Institute decided to use focus groups in order to create an opportunity to reach several stakeholders at the same time. Another motivation is also to foster general discussion amongst participants about the meeting topics, which often enhances and expands the extent and detail of their responses to questions. In addition to meeting notes and transcripts, each participant completed a short informational survey that gave us a more direct sense of how each stakeholder used the Pointe-aux-Chenes WMA.

The Water Institute and Restore the Earth worked with a local non-profit community service organization to host the two-hour focus group meeting and dinner. The meeting was structured in a way to maximize



the amount of time for gathering stakeholder input on the values and uses of the Pointe-aux-Chenes WMA as well as perceived outcomes, both positive and negative, of reforestation. With a total of 17 attendees, The Water Institute staff facilitated three small group discussions organized around a facilitation guide (see Appendix A1) that covered the topics of: economic value, recreational value, educational value, ecological value, and coastal protection value of Pointe-aux-Chenes before and after reforestation. Facilitators spoke with stakeholders specifically about their uses and intended uses of the WMA, with and without the project, in order to anticipate changes that might occur regardless of the reforestation. These questions allowed researchers to determine what other factors might contribute to the forecasted changes (i.e. deadweight and attribution). Discussion also included questions about changing use of the Pointe-aux-Chenes area and unintended negative outcomes of the reforestation project. Each small group session had a note taker in addition to being audio recorded. Collected audio was transcribed in November and December 2016. All notes and responses were recorded by The Water Institute and coded using MAXQDA qualitative coding software.

#### 4.4. ONE-ON-ONE INTERVIEWS

The Water Institute, in consultation with Restore the Earth, created a long-form interview guide (Appendix A2) for the Pointe-aux-Chenes case study that was used for one-on-one phone and in-person conversations with stakeholders. The interview guide has 5 sections and approximately 50 questions. Interviews covered the following: background and use of Pointe-aux-Chenes WMA; Quantitative attribution of economic, recreation, education, cultural, ecological, and flood protection value of Pointe-aux-Chenes WMA; Quantitative attribution of economic, recreation, education, cultural, ecological, and flood protection value of Pointe-aux-Chenes after reforestation; assessing monetary value of reforestation; and drop-off, deadweight, and displacement of outcomes (unintended negative outcomes). Using this interview guide, The Water Institute mixed qualitative and quantitative questions to be able to measure perceptions of change and outcomes of reforestation projects as well as describe what those numerical attributions meant to each participant and their relative stakeholder groups.

## 5.0 Inputs

### 5.1. IDENTIFYING AND VALUING INPUTS

Inputs of the Pointe-aux-Chenes reforestation project were encompassed by Restore the Earth Foundation and volunteers involved in the replanting efforts in the amount of \$15,467,763.67. Restore the Earth Foundation invested approximately \$3,462,759.67 in intellectual capital to assure that the impacts of the reforestation project can be effectively monitored and sustained. This includes the development of the EcoMetrics model, a tool that assesses long-term social and ecological change resulting from the reforestation, and investment in EKOgrown plant methodology, a proprietary system for growing the cypress trees used which delivers higher survivability and faster growth. The total inputs of groups for labor, time, land, research, and money are accounted for within the \$15,462,759.67 for Restore the Earth and the labor value for 30 volunteers to work in two 5-hour shifts is \$5,004.00. The inputs of other stakeholder categories are considered not relevant because when funders, volunteers, state land managers, and local businesses provide input to the project, it is Restore the Earth that distributes those funds and runs the reforestation. Therefore, the total input of capital, labor, time, and land is valued (in currency) within the \$15,462,759.67 that Restore the Earth contributes.





## 6.0 Analysis of outcomes

The Water Institute's qualitative research was an attempt to 'ground test' the anticipated social change that accompanies the Pointe-aux-Chenes restoration project through qualitative and quantitative research among stakeholders. The following paragraphs describe changes experienced by stakeholders as they were described to The Water Institute through focus groups, meetings, and one-on-one interviews.

### 6.1. OUTCOMES EXPERIENCED BY STAKEHOLDERS ENGAGED IN THE QUALITATIVE PHASE OF RESEARCH

#### 6.1.1. The Environment

The most direct and documented benefits of cypress restoration are ecological. These are predominately associated with the Environment stakeholder group and are associated with the enhancement of environmental functions, such as water quality, air quality, soil stabilization, enhanced ecosystem functions, and the creation and maintenance of wildlife habitats. Beyond this, carbon sequestration, phosphorous and nitrogen capture are several of the outcomes of the project that are beneficial to the Environment. These environmental impacts are those that are recognized by the scientific community although the benefits may not be immediately recognized by local stakeholders. In some



cases, these benefits may not manifest in ways identifiable by community residents until some point in the future. As the only stakeholder group that cannot speak for itself, the Environment is unique in that its outcomes were predominately articulated by scientific research contracted by Restore the Earth, as well as secondary literature. With this in mind, it should be noted that all environmental outcomes were described by Restore the Earth first and foremost and, where needed, the Water Institute provided expert review of proposed outcomes among those working directly with Restore the Earth as well as colleagues from the ecological sciences that work at the Water Institute. Finally, it is important to note that environmental benefits are global in nature in terms of their impacts on society. The various kinds of ecological functions reforestation provide, creates a clearer, healthier environment for generations to come. Much of the non-market social returns on investment are contained within the outcomes for this stakeholder group.

#### 6.1.2. Restore the Earth

Restore the Earth, like the environment, also stands to receive several environmental-based outcomes as a key stakeholder in their projects. Carbon offsets, nitrogen offset credits, and phosphorous offsets are some of the primary returns they will receive through their partnerships with corporate sponsors and the state of Louisiana for the reforestation in Pointe-aux-Chenes WMA. With the successful completion of the first 4,000 acres of their 1 million acres of reforested land goal, it also receives the added benefit of an enhanced reputation in the corporate world as well as within local communities, with which Restore the Earth coordinates with throughout the reforestation project. Through the maintenance of these local and



corporate relationships Restore the Earth stands to gain enhanced community trust and a reputation for "getting projects on the ground," as one member of local government in Terrebonne Parish told the Water Institute (Pointe-aux-Chenes interview 11/2016) and providing successful opportunities for corporate investors to create positive environmental change.

**Table 7. Corporate sponsors**

Outcomes	Statements from Stakeholder Affirming Outcomes
<ul style="list-style-type: none"> <li>• Social license to operate (effects to reputation; positive impact on communities)</li> </ul>	<p>"For us and all our environmental support, conservation and rehabilitation, we require a volunteer and community component. Our direct benefit is involving our employees and their families and friends and community members (like schools) so that we have a direct relationship and learn more about the consequences of environmental degradation. It's about education and creating a connection to our environment."</p>

For corporate sponsors, stakeholders identified participation in Restore the Earth's reforestation project as creating a sense of accomplishment and personal connection to fostering environmental sustainability as one of the primary outcomes they experienced (Pointe-aux-Chenes interview 12/2016). The reforestation also provides an opportunity to contribute volunteers and monetary support to these environmental sustainability projects, enabling them to build upon their corporate reputation in the area affected as well as to provide their employees with an opportunity to connect to the environment (Pointe-aux-Chenes interview 12/2016). When a company is seen by a community as a good neighbor, the activities of that company are often legitimized and therefore able to continue with the consent of those affected by the activity. This outcome can be understood as granting corporations a social license to operate by local stakeholders and communities, and fostering connections between employees and the environment.

**Table 8. Volunteers involved in replanting**

Outcomes	Statements from Stakeholder Affirming Outcomes
<ul style="list-style-type: none"> <li>• Sense of accomplishment</li> </ul>	<p>"The thing I like about planting is the permanence of it. That 50-100 years from now it will still be there. When you plant a tree. I love the idea of doing something and years from now it's so much more. A lasting impact. Something for living the right way. Let's me feel like I've made an effort that can last."</p>

During 2016, volunteers from the Entergy Corporation, Royal Dutch Shell, and The Timberland Company participated in three cypress planting activities in the Pointe-aux-Chenes site. The Water Institute spoke with several volunteers who participated in this event as well as other volunteer activities with their companies. In one-on-one interviews, volunteers stated that they experienced a sense of accomplishment and well-being during these events, cultivating a more personal connection to long-term environmental sustainability (Pointe-aux-Chenes interview 12/2016). This was largely framed in terms of a sense of accomplishment that emerges from being a part of something bigger than themselves that will last for many generations to come. This is a unique outcome and one that is difficult to capture through financial proxies. Interviews made clear that these feelings motivate employees to continue volunteering on environmental projects in south Louisiana and elsewhere. One way to think about this is that projects



like the Pointe-aux-Chenes reforestation cultivate a 'culture of volunteerism' among corporate volunteers, which motivates them to continuously look for volunteering opportunities beyond a singular experience.

**Table 9. Government agencies**

Outcomes	Statements from Stakeholder Affirming Outcomes
<ul style="list-style-type: none"> <li>• Creates cost savings on coastal protection and potential damage from storm surge for local, state, and federal government</li> </ul>	<p>"When hurricanes come in this is so important. This land is so important to stop the storm surge from getting into those bits of the community. So the more we can build up on the outside and inside of the levee to shore that up, the better that will be."</p>

For stakeholders representing government agencies, the most frequently identified outcomes of the reforestation project were its capacity to enhance existing coastal and storm surge protection projects (Pointe-aux-Chenes focus group 11/2016). This encompasses building one part of what is regionally called a 'multiple lines of defense' protection system that includes home elevation, levee protection, and restoration of degraded environments such as coastal marshes and forests. The cypress reforestation directly impacts the latter, which in turn protects other lines of defense (i.e. levees and home) that can produce significant cost savings for local, state, and federal government in the event of severe weather (Pointe-aux-Chenes focus group 11/2016). Cypress, in particular, also helps sequester water and provides a buffer against storm surge, which translates into savings from storm surge damage (Pointe-aux-Chenes focus group 11/2016).

**Table 10: Conservation Organizations**

Outcomes	Statements from Stakeholder Affirming Outcomes
<ul style="list-style-type: none"> <li>• Supports their wildlife conservation mission</li> </ul>	<p>"To bring forested wetlands back is huge for migratory bird species. They need sustainable and viable forests."</p>

Regional and national conservation organizations are also invested in aspects of coastal protection and restoration, but with a particular focus on environmental restoration (i.e. rebuilding coastal marshes). As stakeholders at the focus group noted, the cypress reforestation would enhance projects conservation groups have initiated in the area, working to strengthen and expand the footprint of vegetation that creates coastal protection and, in turn, re-establishes native ecosystems that are vital to the general public and their specific wildlife and ecological conservation commitments (Pointe-aux-Chenes focus group 11/2016). In particular, conservation groups see the return of the cypress forests as a way to enhance the ecological health of the entire Mississippi Alluvial Valley flyway, creating a valuable wintering space for many species of migratory bird.



**Table 11. Recreational users**

Outcomes	Statements from Stakeholder Affirming Outcomes
<ul style="list-style-type: none"> <li>• Creates increased opportunities for hunting, fishing, wildlife viewing, general recreation, and birdwatching</li> </ul>	<p>"It will bring in more people. More recreation, especially hunting with all the wildlife that is in there. Camping, hiking, might come up as well."</p> <p>"Of course better hunting and fishing, but just boating too. Lots of folks just like going out there gliding through the cypress swamps."</p>

The Pointe-aux-Chenes WMA is already one of the most popular public recreational areas in south Louisiana, particularly for waterfowling and fishing activities. As such, many of the participants the Water Institute spoke with identified the importance of this area as a space for recreational activities. This outdoor culture is shared by recreational users living adjacent to the site as well as those that drive long distances to spend time there fishing and hunting. To these stakeholders, the reforestation of parts of the WMA would provide increased spaces and opportunities for engaging in all recreational activities (Pointe-aux-Chenes focus group 11/2016). This is because the re-establishment of the native cypress ecosystem impacts the diversity of wildlife and landscape within the WMA that is key to the cultural benefits of recreational use.

**Table 12. Those employed directly and indirectly by reforestation project**

Outcomes	Statements from Stakeholder Affirming Outcomes
<p><b>Those employed directly by the reforestation project</b></p> <ul style="list-style-type: none"> <li>• Direct employment for local nursery and planting services</li> </ul>	<p>"It [the reforestation] will give me work and help the locals - I hired 4 or 5 locals to help with the plantings. That will be for 4 or 5 years."</p>
<p><b>Those indirectly employed by the reforestation project:</b></p> <p><b>Local business</b></p> <ul style="list-style-type: none"> <li>• Creates the potential of more visitors frequenting local businesses</li> </ul>	<p>"Those marshes come in good, now you put people to work. You bring in green jobs [...] you are putting people back to work and out of the oil fields. "</p>
<p><b>Those indirectly employed by the reforestation project:</b></p> <p><b>State and federal wildlife managers</b></p> <ul style="list-style-type: none"> <li>• Creates new areas for LDWF management and monitoring</li> </ul>	<p>"We have 7 of us working at this WMA [...] [reforestation] would re-work priorities for management."</p>

Several stakeholders in both focus groups and one-on-one interviews discussed the potential impacts of reforestation to the local economy. These comments are broken down below to reflect the groups and kinds of income that reforestation is perceived to be related to by stakeholders.

*Those employed directly by the reforestation project*

The Pointe-aux-Chenes reforestation is expected to directly provide additional resources regionally to create business and jobs for local nurseries and individuals who will be employed by the project for up to 5 years. According to local businesses owners who are already contracted by Restore the Earth to provide the trees for the reforestation, the project will create 4-5 full-time jobs in the immediate future for planting activities and site maintenance (Pointe-aux-Chenes interview 12/2016).



*Those employed indirectly by the reforestation project: Local businesses*

During focus groups and interviews, other local business owners noted how improvement to the WMA that attracted more visitors to the region are expected to bring more business to local hotels, restaurants, gas stations, and other businesses (Pointe-aux-Chenes focus group 11/2016). Third party literature corroborates these expectations, noting that for every \$1 million invested in reforestation projects, it will produce at least 18 jobs with an annual average salary of \$28,080 (Garrett-Peltier 2009).

*Those employed indirectly by the reforestation: State and federal wildlife managers*

State and federal wildlife managers understanding of outcomes has been included in this category because reforestation will ultimately be a long-term project maintained by their staff. While the project does not provide additional funds to the WMA to hire more staff, the successful implementation of the project could lead the WMA towards being able to leverage for future increases to staff and resources for managing the WMA (Pointe-aux-Chenes focus group 11/2016). This calculated through the financial proxy of the value of acres of restored habitat because allocated resources to manage the Pointe-aux-Chenes WMA are related to recreational usage which, if the reforestation is successful, is assumed to increase the number of visitors, thus create the potential need for addition wildlife management staff.

**Table 13. Communities surrounding the site that benefit from water and air quality, waste treatment, storm protection, soil stabilization, and biological control**

Outcomes	Statements from Stakeholder Affirming Outcomes
<ul style="list-style-type: none"> <li>Increased water quality for communities</li> </ul>	"[I think] Water quality and air quality would improve."
<ul style="list-style-type: none"> <li>Creates savings on storm surge protection for communities</li> </ul>	"Coastal protection - that is the southeastern portion of the parish. It is the most rapidly disappearing part of the parish. The cypress planting is right on the edge of wonder lake. Wonder lake is a problem. So anything they can do for reforestation to slow down storm surge is extremely important."

Many of the communities surrounding the project site live just inside or outside local levee systems that are the only thing standing between their homes and open water. As such, participants emphasized how the loss of protective marsh and cypress forest has contributed to degrading environmental quality, such as air and water quality, in their communities as well as increased exposure to hurricanes and seasonal flooding. With these experiences in mind, stakeholders discussed how reforestation could offset these vulnerabilities through creating enhanced water quality and storm surge protection. According to third party literature, these savings can be up to \$619 per acre/year in reduced damages in coastal Louisiana (Barnes et al 2015). This was particularly salient when discussing the savings on storm clean-up and potentially flood insurance if the reforested areas reach maturity and are maintained over time (Pointe-aux-Chenes interview 12/2016). While these savings are most immediately financial, they are also emotional, as clean-up from storms is an expensive and stressful endeavor. For the purposes of understanding social return on investment, these outcomes are measured through cost savings and benefits of enhanced water quality.



**Table 14. Communities that benefit from other ecosystem services such as habitat refuge and cultural value**

Outcomes	Statements from Stakeholder Affirming Outcomes
<b>Community services and outreach</b> <ul style="list-style-type: none"> <li>• Increased sense of community pride</li> </ul>	"People would start to feel more pride and sense of value for the land that that had a lot of love for. It could lift people out of depression. I think if it were reforested it would bring back life to the community."
<b>Indigenous communities</b> <ul style="list-style-type: none"> <li>• Use of reforested areas for cultural rituals and traditions</li> </ul>	"We had this huge discussion with anthropologists about cypress trees, and I have cypress baskets from my grandfather that are over 100 years old. I know how to make cypress baskets but we don't have cypress like we use to have [...] I would be so excited to be able to work with them to get our trees for our baskets. That is so important. We have baskets in all kinds of museums all over the country - there are so few."
<b>Education and research</b> <ul style="list-style-type: none"> <li>• Sustained or increased opportunities for educational and research programs for k-12 and university students and environmental researchers</li> </ul>	"To me this is a great area to educate people and that is more of what we need to do. Education is so important not only on a local level but so many people in this world don't know what is going on down here [land loss]."

Stakeholders within this category reflect the diverse cultural values that reforestation can provide. The focus of many of these organizations is to promote sustainable local communities and environments. As expressed in interviews, stakeholders involved in conducting outreach and providing services to these residents in need identified several quality of life benefits that could be achieved by the reforestation project, including an increase in community morale. This increase in morale would be due in part to a desire to experience those historical landscape features that have been lost over the course of a generation.

*Community services and outreach*

For stakeholders working in local community service organizations, an increased sense of community pride was described as one of the most important yet somewhat intangible benefits of reforestation. This was described during interviews with the Water Institute as particularly important to the small communities surrounding the WMA that have suffered setbacks in community morale as a result of repeated environmental devastation (Pointe-aux-Chenes interview 12/2016). To measure this value, the Water Institute looks at the amenity value of reforested areas, which can reflect the general social value that reforestation can provide to local communities.

*Indigenous communities*

Unique to the project site, there are several Indigenous communities living adjacent to the Pointe-aux-Chenes WMA that see the outcomes of the reforestation as particularly positive in terms of their tribal culture and historical practices. During focus groups and interviews, several leaders from different communities noted that the restoration of cypress forest holds particular significance for the sharing of inter-generation memories of subsistence hunting and fishing as well as cultural practices such as cypress basket weaving which have been on the decline with the degradation of these ecosystems in south Louisiana (Pointe-aux-Chenes interviews 12/2016). Because of these direct connections to cultural practices, these outcomes were measured in terms of the cultural value of reforestation per acre reforested.



### *Education and research*

Also within this category, education and research stakeholders are included because of the many uses the reforested area provides for K-12, university, and wider public education about the culture and history of coastal Louisiana and its changing environment. Many stakeholders from these groups noted that any reforestation attempt, successful or not, would provide a useful opportunity to educate youth and adults alike about the pressing cultural and environmental impacts of land loss and coastal restoration (Pointe-aux-Chenes focus group 11/2016). The connections between culture and education are significant to note, as this project would not only be an experiment geared solely towards environmental education. As one educator noted, environmental restoration and 'bayou culture' go hand-in-hand (Pointe-aux-Chenes interview 12/2016). As such, these outcomes are measured in terms of educational value within the broader category of the cultural benefits to communities.

## 7.0 Theory of Change

A theory of change describes and summarizes the objectives, inputs, outputs, and outcomes of programs and activities on different stakeholder groups (Social Ventures Australia Consulting, 2011). It is additionally a pathway linking the activities of these programs and activities to short-term, medium-term, and long-term outcomes experienced by these stakeholder groups (Ireland, 2013). The theory of change described here delineates how varying stakeholder groups experience and perceive material change resulting from the inputs of Restore the Earth's cypress reforestation project.

Collected data was carefully analyzed to determine the changes experienced by stakeholder groups and their interrelations. As previously described, the input costs for labor, time, land, and money are accounted for within the inputs provided by Restore the Earth. This input culminates in the central input of the project: 4,000 acres of restored cypress forest. As such, the theory of change for each stakeholder group other than Restore the Earth is derived from the relationship between the planting of these 4,000 acres of cypress forest and the respective outcome for each stakeholder group.

The results of the qualitative portion of this research revealed that there were differences in the ways that groups of people potentially impacted by the reforestation project were able to engage with the project site. The development of the theory of change highlights these differences and identifies those outcomes unique to each stakeholder group. Based on observation, past experience, and initial data gathering, eight general groups of relevant stakeholder groups were identified.



**Table 15. Restore the Earth Foundation**

Objectives	Inputs	Outputs	Outcomes
<ul style="list-style-type: none"> <li>• Successful restoration of cypress forests</li> </ul>	<ul style="list-style-type: none"> <li>• Restoration costs</li> </ul>	<ul style="list-style-type: none"> <li>• 4,000 acres of land acquired to restore</li> </ul>	<ul style="list-style-type: none"> <li>• Enhances Restore the Earth's reputation by planting the first 4,000 of 1million acre goal</li> </ul>
<ul style="list-style-type: none"> <li>• Ability to leverage future project funding from corporate sponsors</li> </ul>	<ul style="list-style-type: none"> <li>• Initial verification costs</li> </ul>		<ul style="list-style-type: none"> <li>• Use of volunteers offset 10% of the project costs</li> </ul>
	<ul style="list-style-type: none"> <li>• Monitoring costs</li> </ul>		
	<ul style="list-style-type: none"> <li>• Recruiting and organizing volunteers for to assist with reforestation</li> </ul>		

Restore the Earth is a 501(c)(3) non-profit that works alongside federal and state agencies, private, philanthropic, and community organizations to initiate landscape scale restoration along the coast of U.S. Gulf of Mexico. It utilizes a cross-sector funding mechanism that combines government and private dollars to make large-scale ecosystem restoration activity financially feasible for both parties. The 4,000 acre cypress reforestation project in the Pointe-aux-Chenes Wildlife Management Area represents the beginning of a much larger goal for Restore the Earth of restoring 1 million acres of forest in the Mississippi Alluvial Valley. To work towards this outcome, Restore the Earth invests the time and money needed to conduct the reforestation. This includes monitoring and upkeep costs, as well as the cost involved in coordinating volunteer activities for the project. This volunteer component results in a 10% reduction in project costs. While obtaining carbon, nitrogen, and phosphorus offsets is important, the primary outcome of this project for Restore the Earth is the enhanced reputation the foundation will receive from a successful project. This will allow Restore the Earth to continue to make progress towards their ultimate goal of restoring 1 million acres of forest in the Mississippi Alluvial Valley.

**Table 16. Volunteers involved in replanting**

Objectives	Inputs	Outputs	Outcomes
<ul style="list-style-type: none"> <li>• Sense of accomplishment</li> </ul>	<ul style="list-style-type: none"> <li>• Time and labor (approximately 30 volunteers per year)</li> </ul>	<ul style="list-style-type: none"> <li>• 4,000 acres of forest planted</li> </ul>	<ul style="list-style-type: none"> <li>• Enhanced sense of wellbeing</li> </ul>
<ul style="list-style-type: none"> <li>• Being a part of long term environmental change</li> </ul>			
<ul style="list-style-type: none"> <li>• Opportunity for community service</li> </ul>			

During 2016, volunteers from the Entergy Corporation, Royal Dutch Shell, and The Timberland Company participated in three cypress planting activities in the Pointe-aux-Chenes site. By giving of





their time and labor, they were instrumental in completing the first phase of the project, the planting of 4,000 acres of cypress trees. While their work represented a tangible financial savings outcome for Restore the Earth, the volunteers themselves experienced a sense of accomplishment and wellbeing during these events (Pointe-aux-Chenes interview 12/2016). Many of these volunteers were from the city of New Orleans and had never seen the coastal wetland before. Through these reforestation activities, many these urban volunteers developed a more personal connection toward environmental sustainability (Pointe-aux-Chenes interview 12/2016).

**Table 17. Corporate sponsors**

Objectives	Inputs	Outputs	Outcomes
<ul style="list-style-type: none"> <li>• Corporate responsibility and community service</li> </ul>	<ul style="list-style-type: none"> <li>• Financial donation</li> </ul>	<ul style="list-style-type: none"> <li>• 4,000 acres of reforested land</li> </ul>	<ul style="list-style-type: none"> <li>• Social license to operate</li> </ul>
<ul style="list-style-type: none"> <li>• Builds company reputation</li> </ul>			
<ul style="list-style-type: none"> <li>• Positive environmental impacts</li> </ul>			

For corporate sponsors, as with volunteers, participation in Restore the Earth's reforestation project created a sense of accomplishment and personal connection to fostering environmental sustainability (Pointe-aux-Chenes interview 12/2016). For Corporate Sponsors, in particular, the reforestation provides an opportunity to contribute volunteers and monetary support to these environmental sustainability projects, enabling them to build upon their corporate reputation in the area effected as well as to provide their employees with an opportunity to connect to the environment (Pointe-aux-Chenes interview 12/2016). The primary outcome for corporate sponsors, however, is the granting of a social license to operate by local stakeholders and communities. When a company is seen by a community as a good neighbor, the activities of that company are often legitimized and therefore able to continue with the consent of those affected by the activity. By investing in community projects such as the Pointe-aux-Chenes reforestation, the corporate sponsors are anticipated to experience increased social acceptance as an outcome. Additionally, corporate sponsors are assigned environmental offset credits registered by Restore the Earth, resulting in a market return on investment for these stakeholders.

**Table 18. Government agencies**

Objectives	Inputs	Outputs	Outcomes
<ul style="list-style-type: none"> <li>• Contribute to coast-wide restoration efforts</li> </ul>	<ul style="list-style-type: none"> <li>• 4,000 acres of public land</li> </ul>	<ul style="list-style-type: none"> <li>• Coastal protection systems</li> </ul>	<ul style="list-style-type: none"> <li>• Enhanced coastal protection for surrounding communities</li> </ul>
<ul style="list-style-type: none"> <li>• Enhance regional restoration and protection projects</li> </ul>		<ul style="list-style-type: none"> <li>• Partially restored ecosystem</li> </ul>	<ul style="list-style-type: none"> <li>• Savings on storm protection</li> </ul>



For stakeholders representing government agencies and their constituencies, the most frequently identified outcomes of the reforestation project were its capacity to enhanced existing coastal and storm surge protection projects (Pointe-aux-Chenes focus group 11/2016). This encompasses building one part of what is regionally called a 'multiple line of defense' protection system that includes home elevation, levee protection, and restoration of degraded environments such as coastal marshes and forests. The cypress reforestation directly impacts the latter, which in turn protects other lines of defense (i.e. levees and home) that can produce significant cost savings for local, state, and federal government in the event of severe weather (Pointe-aux-Chenes focus group 11/2016).

**Table 19: Conservation Organizations**

Objectives	Inputs	Outputs	Outcomes
<ul style="list-style-type: none"> <li>Restore coastal ecosystems</li> </ul>	<ul style="list-style-type: none"> <li>4,000 acres of public land</li> </ul>	<ul style="list-style-type: none"> <li>Partially restored ecosystem</li> </ul>	<ul style="list-style-type: none"> <li>Enhanced habitat for bird species throughout the broader Mississippi Alluvial Valley Flyway</li> </ul>

As stakeholders at the focus group noted, the cypress reforestation would enhance projects conservation groups have initiated in the area, working to strengthen and expand the footprint of vegetation that creates coastal protection and, in turn, re-establishes native ecosystems that are vital to the general public and their specific wildlife and ecological conservation commitments (Pointe-aux-Chenes focus group 11/2016).

**Table 20. Recreational users**

Objectives	Inputs	Outputs	Outcomes
<ul style="list-style-type: none"> <li>Enhancement of biodiversity and wildlife for hunting, fishing, and trapping</li> </ul>	<ul style="list-style-type: none"> <li>These stakeholders are not directly involved in providing inputs into the project. They utilize the outcomes of the reforestation project, spending time using the site after it is completed</li> </ul>	<ul style="list-style-type: none"> <li>Enhanced habitat for recreational activity</li> </ul>	<ul style="list-style-type: none"> <li>New areas available for hunting</li> </ul>
<ul style="list-style-type: none"> <li>Increased opportunities for recreation</li> </ul>			<ul style="list-style-type: none"> <li>New areas available for fishing</li> </ul>
			<ul style="list-style-type: none"> <li>New areas available for general recreation</li> </ul>
			<ul style="list-style-type: none"> <li>New areas and species available for birdwatching</li> </ul>

One of the prevailing outcomes of creating 4,000 acres of cypress forest is the enhancement of wildlife habitat associated with this forest ecosystem in the region. As the Pointe-aux-Chenes WMA is already one of the more popular recreational areas in the state, many participants from the Recreational Users stakeholder groups noted that visitation would not drop-off but most likely increase as a result of the reforestation (Pointe-aux-Chenes focus group 11/2016). This is linked to the fact that the cypress forest enhances habitat for wildlife, which improves hunting, fishing, birdwatching, and general recreation.



While most recreation users of the WMA are hunters and fishers, many noted that the return of the cypress forests would encourage more general recreation users to begin to utilize the site, whether for kayaking and paddling, or hiking and camping (Pointe-aux-Chenes focus group 11/2016). The restoration of cypress habitat would also be expected to draw new bird species to the area, which would increase the usage of the site by birdwatchers.

**Table 21. Those employed directly and indirectly by the reforestation project**

Objectives	Inputs	Outputs	Outcomes
<b>Those employed directly by the reforestation</b> • Gain of temporary or permanent employment	• Time and labor	• Partially restored ecosystem	• Enhanced business and employment opportunities
<b>Those indirectly employed by the reforestation: Local business</b> • Enhanced local business due to potential increasing visitation to the WMA			• Enhanced business opportunities
<b>Those indirectly employed by the reforestation: State and federal wildlife managers</b> • Increase in visitation to the WMA	• Site maintenance	• Potential for future additional forests created	• Increased acreage of WMA

The Pointe-aux-Chenes cypress reforestation project is expected to directly provide additional resources regionally to create business and jobs for local nurseries and individuals who will be employed by the project for up to 5 years (Pointe-aux-Chenes interview 12/2016). In some cases, the reforestation will lead to the direct employment of workers who will be employed to work on the reforestation and continued maintenance of the site.

In addition, through anticipated increased visitation, the reforestation will bring more visitors to the area that frequent local stores, restaurants, and hotels during they visit, potentially increasing revenue within the local economy (Pointe-aux-Chenes focus group 11/2016). Third party literature suggests that for every \$1 million invested in reforestation projects, it will produce at least 18 jobs with an annual average salary of \$28,080 (Garrett-Peltier 2009).

Finally, biologists and wildlife managers currently employed in the Pointe-aux-Chenes WMA expect that they will need to spend additional hours maintaining the reforestation site and assuring that pests such as nutria are controlled. While this does not lead to additional income, it does potential provide wildlife managers with the capacity to leverage for additional staff or funding if the project is successful (Pointe-aux-Chenes interview 11/2016). This additional time and labor needed to maintain the ecological integrity of the site will lead to a healthy ecosystem necessary to assure the continued viability of the site’s wildlife habitat.



**Table 22. Communities surrounding the site that benefit from water and air quality, waste treatment, storm protection, soil stabilization, and biological control**

Objectives	Inputs	Outputs	Outcomes
<ul style="list-style-type: none"> <li>• Improve water quality</li> </ul>	<ul style="list-style-type: none"> <li>• These stakeholders are not directly involved in providing inputs into the project. They utilize the outcomes of the reforestation project, using the natural capital the cypress forests provide</li> </ul>	<ul style="list-style-type: none"> <li>• Partially restored ecosystem</li> </ul>	<ul style="list-style-type: none"> <li>• Enhanced water quality</li> </ul>
<ul style="list-style-type: none"> <li>• Enhance storm protection and water infrastructure maintenance</li> </ul>			<ul style="list-style-type: none"> <li>• Savings on storm surge protection</li> </ul>

Residents living in communities surrounding the reforestation site see the greatest outcomes of the project as the enhanced storm surge protection that would be provided by an intact cypress forest landscape. Participants from communities such as Montegut and Lower Pointe-aux-Chenes, located above and behind the project site, emphasized that this project could provide direct protection to their communities and provide savings on storm protection and reduce the cost of flood clean up and flood insurance for homeowners. These residents also highlighted the fact that the reforestation project would enhance both local air and water quality.

**Table 23. Communities that benefit from other ecosystem services such as habitat refuge and cultural value**

Objectives	Inputs	Outputs	Outcomes
<p><b>Community services and outreach:</b></p> <ul style="list-style-type: none"> <li>• Contribute to community efforts to promote sustainable local communities and environments</li> </ul>	<ul style="list-style-type: none"> <li>• These stakeholders are not directly involved in providing inputs into the project. They utilize the outcomes of the reforestation project, using the natural capital the cypress forests provide</li> </ul>	<ul style="list-style-type: none"> <li>• Partially restored ecosystem</li> <li>• Increased frequency of use of the WMA</li> </ul>	<ul style="list-style-type: none"> <li>• Community gathering place</li> <li>• Sense of community pride</li> </ul>
<p><b>Indigenous communities:</b></p> <ul style="list-style-type: none"> <li>• Help facilitate indigenous rituals and practices associated with this ecosystem</li> </ul>		<ul style="list-style-type: none"> <li>• Increased frequency of cultural use of the WMA</li> </ul>	<ul style="list-style-type: none"> <li>• Enhanced ecosystem that can be used for cultural rituals and traditions</li> </ul>
<p><b>Education and research:</b></p> <ul style="list-style-type: none"> <li>• Presents educational opportunities for students to engage with ongoing coastal restoration projects</li> <li>• Allow researchers to analyze a 'before and after' case study of cypress reforestation</li> </ul>		<ul style="list-style-type: none"> <li>• Increased frequency of educational and research use of the WMA</li> </ul>	<ul style="list-style-type: none"> <li>• More educational programs and opportunities</li> </ul>



The restored cypress forest is expected to provide significant cultural value to stakeholders, especially those from indigenous communities.

#### *Community services and outreach*

Stakeholders representing community services and outreach groups also noted the positive community benefits of having a restored cypress forest. As of today, much of the landscape in the area contains what are colloquially called 'ghost trees,' the dried-out shells of old oak and cypress trees. These stand as monuments to land loss, and saddens many residents who have seen this landscape slowly be lost over the past 100 years. With reforestation, however, there is an opportunity to boost community morale and pride of place with a restored ecosystem (Pointe-aux-Chenes interview 12/2016). As expressed in interviews, stakeholders involved in conducting outreach and providing services to these residents in need identified several quality of life benefits that could be achieved by the reforestation project, including an increase in community morale. This increase in morale would be due in part to a desire to experience those historical landscape features that have been lost over the course of a generation.

#### *Indigenous communities*

The Indigenous residents of the region have strong cultural and historical ties to the cypress forests. Even as changes in climate and sea level rise has forced many Indigenous residents from their homes, many Indigenous tribe members have noted that their quality of life would be improved by the restoration of the cypress forests. This ecosystem has historically been associated with cultural traditions (subsistence fishing and hunting) and cultural practices (basket weaving) which have largely been lost in the area due to saltwater intrusion and land loss. According to Indigenous tribal stakeholders, the successful return of the cypress forests would allow tribal members to once again use this landscape for these cultural traditions and practices (Pointe-aux-Chenes interviews 12/2016).

#### *Education and research*

Having a restored ecosystem, and in particular being able to see the system mature over time, also provides a valuable learning experience to researchers and educators in the region. The site becomes a living experiment wherein groups can have opportunities over time to study and witness the evolution of the restoration project (Pointe-aux-Chenes focus group 11/2016). This is an educational opportunity they would not have if the project was not initiated. With the implementation of the reforestation project, educators and researchers would likely experience significant outcomes in the form of enhanced educational opportunities for both teachers and students as they are able to directly engage with ongoing coastal restoration projects. For researchers, the reforestation project will provide a valuable “before and after” case study of cypress reforestation.



**Table 24. Other environmental benefits**

Objectives	Inputs	Outputs	Outcomes
• More trees	• 4,000 acres of reforested land	• Carbon sequestration	• Improved air quality
• Increased biomass		• Increased Oxygen/Cleaner Air	• Reduced levels of greenhouse gasses
• Reduce the impacts of climate change		• Improved soil formation and nutrient cycling	• Increased waste treatment capacity
		• Erosion control and sediment retention	• Reduced occurrences of eutrophication and hypoxia
		• Breakdown and recovery of excess nutrients and compounds	

With restoration projects such as the cypress reforestation at Pointe-aux-Chenes, many of the social benefits of the project are not immediately apparent to stakeholders and others may not manifest for several years. For example, the environmental value of carbon, nitrogen, and phosphorus for other stakeholders and society at large are generally not identified as outcomes through stakeholder engagement. To account for these more intangible assets, the environment is considered as a stakeholder, as though it were a person or an organization. These environmental outcomes were therefore derived from the scientific literature. For every acre restored, valuable ecosystem functions are achieved, such as carbon sequestration, nitrogen and phosphate storage, erosion mitigation, and enhanced air and water quality. These biophysical functions are the result of reforestation effects and will be sustained long after the project is complete. Furthermore, these ecological functions are vital to off-setting carbon emissions and, especially the case of coastal Louisiana, restoring parts of the deteriorating coastline through soil stabilization and sediment capture. In short, investing in reforestation produces a diverse array of environmental benefits. Furthermore, these benefits not only persist over time, but are widely shared amongst stakeholder groups.

## 8.0 Discount Factors

### 8.1. COUNTERFACTUAL (DEADWEIGHT) [MIGHT THIS CHANGE HAPPEN ANYWAY?]

In the case off all stakeholder categories, none of the outcomes identified by the stakeholders will happen if the reforestation project does not happen. Deadweight numbers for recreational users were calculated using the most recent data from Louisiana Department of Wildlife and Fisheries (LDWF) reflecting recreational visitation trends (fishing, hunting, birding, general recreation, and educational users) between 2013-2016. It is important to note that is it difficult for state wildlife managers to know exactly how many people use the over 33,000-acre site from day to day. Deadweight calculations were made based upon WMA user category, reflecting how LDWF organizes their data, and calculating averages of change over



the three years of data LDWF provided to the Water Institute. Deadweight for hunters was calculated at -30%; the deadweight for fishers 36%; deadweight for general recreational users 55%; deadweight for birders -50%; deadweight for educational users -6%. These numbers reflect the data collected by state wildlife managers between 2013-2016 from 'self-clearing permits,' and therefore self-reported by visitors. They are, however, the most up-to-date information on recreational use that the state could provide and were thus used to calculate this particular discount factor and calculate the 40-year forecast.

The Water Institute, through their qualitative research with stakeholders and through reviews of third party material, found that other stakeholder groups would not be expected to alter their usage of the site without the reforestation action. As there are no other anticipated cypress reforestation projects in the area, stakeholders would not be able to shift the anticipated outcomes to other sites. Thus, levels of deadweight for non-recreational and non-educational stakeholder group outcomes are 0%.

## 8.2. ATTRIBUTION [WHAT ELSE MIGHT CONTRIBUTE TO OUTCOMES?]

Without the reforestation project, none of the outcomes for any of the stakeholder groups would be possible. The Water Institute, through their qualitative research with stakeholders and through reviews of third party material, did not find any other anticipated reforestation projects for the area. This kind of project would be the only other factor that might create the outcomes identified by stakeholder groups. Thus, **the attribution rate for all stakeholder group outcomes is 0%.**

## 8.3. DISPLACEMENT [WHAT MIGHT BE DISPLACED BY THE OUTCOMES?]

The outcomes identified by stakeholders in the qualitative phase of the research conducted by The Water Institute were not directly correlated to displacing any specific phenomena. As several stakeholders noted, reforestation in this area does not displace groups such as local fishermen (the area is inside state-protected land/water, thus cannot be commercially fished) or local landowners (the area is on state owned property). Prior to reforestation, there was no specific human activity on the project site. The main entity on the site is a levee, which the project does not displace. Restore the Earth, echoing third party literature on coastal land loss in Louisiana, noted that if the project is not completed the land in the area would continue to degrade into open water. This is affirmed in Louisiana's most recent predictions of coastal land loss (Coastal Restoration and Protection Authority 2017). Other third-party literature consulted did not identify any types of displacements specifically to reforesting land on state-owned sites similar to the one in Pointe-aux-Chenes. Thus, **the displacement rate for all stakeholder group outcomes is 0%.**

## 8.4. DROP-OFF FOR STAKEHOLDER GROUPS

Across all stakeholder groups in qualitative research conducted by The Water Institute there was no anticipated drop-off in use of the Pointe-aux-Chenes project area indicated as a result of reforestation. In interviews, focus group conversations, and other meetings conducted with 26 individuals from stakeholder groups associated with the Pointe-aux-Chenes reforestation, only 2 stakeholders indicated any anticipated drop-off in use as a result of the reforestation (elaborated on below). In order to assess the levels of drop-off for outcomes during the qualitative portion of the research, stakeholders were asked if they anticipated a drop-off in use or the outcome of the reforestation project for their particular stakeholder group. The only group to identify a drop-off was the volunteer group. The reason for volunteers drop-off in use of the area is because the project would be complete, therefore there would be no further need to volunteer and thus visit the area. However, because their duration is shorter than other



groups (1), this was not calculated within the drop-off discount factors. The drop-off level for volunteers is anticipated to be 100% after the project is complete (10 years into the future, or 2026). **The drop-off level for all other stakeholder group outcomes is 0%.**

## 9.0 Attaching Values to Outcomes

For attaching values to outcomes, our goal was to find the most up to date peer-reviewed materials to use for the calculation of financial proxies across outcomes. Where possible, we looked for the most regionally specific calculations beginning from coastal Louisiana, to the Mississippi Alluvial Valley, to the southeast US region and, where there was no regionally specific information, to the US national level. Peer-reviewed figures from federal and state agencies were prioritized, depending on dates they were produced. Where other third-party peer reviewed figures were more recently produced or updated, those figures were used. In this case, recent research conducted by the RAND corporation on the social-economics impacts of coastal restoration have provided many of the formulas and financial proxies for non-monetary outcomes (Barnes et al. 2015). Where these criteria could not be met for peer-reviewed proxies, recent international reports were used to make calculations, particularly for some of the more intangible values of well-being and sense of accomplishment tied to volunteerism. Those values were adjusted by The Water Institute to reflect the circumstances of Restore the Earth reforestation project.

**Figure 3: Volunteers help replant trees at Pointe-aux-Chenes**







**Table 25. Financial proxies for Pointe-aux-Chenes EcoMetrics Model**

Stakeholders	Stakeholder Subgroup (if applicable)	Outcomes	Financial Proxy	Duration	Value per Unit	Quantity	Total Value	Justification
Environment		Social value of carbon sequestered	Social cost of carbon (\$/acre/year)	40	\$43.61 to \$427.60/acre/year	4000 acres	\$18,811,375.10	Citation [1] from Assumption tab
		Improved soil formation and nutrient cycling	Soil Formation (\$/acre/year)	40	\$26.00/acre/year	4000 acres	\$1,342,049.29	Citation [1] from Assumption tab
		Erosion control and sediment retention	Soil Stabilization (\$/acre/year)	40	\$0.42/acre/year	4000 acres	\$15,676.22	Citation [1] from Assumption tab
		Increased waste treatment capacity,	Waste Treatment (\$/acre/year)	40	\$118.00/acre/year	4000 acres	\$6,090,839.08	Assumptions tab, Row 79
Restore the Earth		Enhances Restore the Earth's reputation by planting the first 4,000 acres of 1million acre goal	26% of the \$600,000 invested in the project will be returned to the organization by way of increased donations due to increased reputation	40	\$600,000.00	0.26	\$156,000.00	Meetings with REF; Citation [20] from Assumption tab
		Organization of volunteer labor to offset 10% of the project costs	Volunteer labor saves 10% of total project costs; Citations [1], [17], and [18] from Assumptions tab	1	\$15,462,759.67	0.10	\$1,546,275.97	Surveys and interviews; citation [1] from Assumption tab
		Market value of carbon sequestered	Value of carbon reduction (\$/acre/year)	40	\$15.00 to \$475.20/acre/year	4000 acres	\$15,186,048.89	Carbon Sequestration Tab
		Market value of nitrogen offset	Nitrogen Offset Credit (\$/kg N)	40	\$2.52/kg N	89,872.73 kg NO3-N	\$3,955,114.65	Assumptions tab, Row 53



						annual denitrification		
		Market value of phosphorous offset	Phosphorus Offset Credit (\$/kg P)	40	\$6.51/kg P	18,809.83 kg P annual retention	\$1,857,145.77	Assumptions tab, Row 56
Volunteers involved in replanting		Sense of accomplishment; positive reputation for organization	\$/volunteer/year Value adjusted to reflect volunteering on a quarterly basis	10	\$4,234.50 /per volunteer/year	30 volunteers	\$127,035.00	Surveys and interviews; citation [19] from Assumption tab
Corporate Sponsors		Social license to operate (effects to reputation; positive impact on communities)	26% of the \$11,400,000 invested in the project is returned to the corporation due to increased reputation	10	\$11,400,000.00	0.26	\$2,964,000.00	Surveys and interviews; secondary source materials; Citation [20] from Assumption tab
Government Agencies		Enhances coastal protection for adjacent communities	Savings on storm protection (\$/acre/year)	10	\$619.00/acre/year	4000 acres	\$30,006,508.50	Surveys, interviews, focus groups, and meetings; citation [17] from Assumptions tab
Conservation Organizations		Enhances habitat refuge	Refuge habitat (\$/acre/year)	10	\$482.00/acre/year	4000 acres	\$23,365,326.49	\$/acre/year Refuge Habitat Non-Use Value
Recreational users (general recreational users, hunters, fishers, wildlife viewers and birdwatchers)	Hunters	Enhanced habitats for hunting	Hunting consumer surplus (\$/person/day)	10	\$42.53/person/day	358 annual hunting visitors	\$196,477.82	Surveys, interviews, focus groups, and meetings; citation [17] from Assumptions tab
	Fishers	Enhanced habitats for fishing	Fishing consumer surplus (\$/person/day)	10	\$56.36/person/day	230 annual fishing visitors	\$167,276.12	Surveys, interviews, focus groups, and meetings; citation [17] from Assumptions tab
	General recreation	Enhanced habitats for	General recreation consumer surplus (\$/person/day)	10	\$42.77/person/day	13 annual general	\$7,174.93	Surveys, interviews, focus groups, and meetings;



		general recreation				recreation visitors		citations [3], [4], [5], [6] from Assumptions tab
	Bird watchers	Enhanced habitats for birdwatching	Birdwatching consumer surplus (\$/person/day)	10	\$36.86/person/day	3 annual birdwatching visitors	\$1,426.96	Surveys, interviews, focus groups, and meetings; citation [17] from Assumptions tab
Those employed directly and indirectly by the reforestation project	Those employed directly by the reforestation project	Direct employment for local nursery and planting services	Direct and induced jobs created * average wage (\$/year)	3	\$28,080.00/year	23 jobs created	\$1,758,782.51	Surveys, interviews, focus groups, and meetings; citation [16] from Assumptions tab
	Local Business	Enhanced business opportunities	Indirect jobs created * average wage (\$/year)	10	\$28,080.00/year	26 jobs created	\$1,284,051.93	Surveys, interviews, focus groups, and meetings; citation [16] from Assumptions tab
	State and federal wildlife managers	Enhanced habitat refuge	Refuge habitat (\$/acre/year)		Shared Value with Conservation Organizations			Surveys, interviews, focus groups, and meetings.
Communities surrounding the site and downstream/wind of it that benefit from water and air quality, waste treatment, storm protection, soil stabilization, biological control		Enhanced Water Quality. Value of Marginal Nitrogen and Phosphorus Mitigation. Reduced occurrences of eutrophication and hypoxia.	Value of marginal nitrogen mitigation (\$/kg N)	40	\$25.27/kg N	89,872.73 kg NO3-N annual denitrification	\$37,383,790.69	Citation [1] from Assumption tab
			Phosphorus retention social value (\$/kg P)	40	\$338.95/kg P	18,809.83 kg P annual retention	\$90,701,489.02	Citation [1] from Assumption tab
		Increased atmospheric oxygen and cleaner air	Air quality (\$/acre/year)	40	\$115/acre/year	4000 acres	\$5,935,987.24	Citation [1] from Assumption tab
		Enhanced storm surge protection	Savings on storm protection (\$/acre/year)			Shared value with Public at Large		Citation [1] from Assumption tab



Communities that benefit from other ecosystem services such as habitat refuge and cultural value	Community services and outreach	Sense of community pride; community gathering place	Amenity value (\$/acre/year)	10	\$5.00/acre/year	4000 acres	\$274,880.07	Surveys, interviews, focus groups, and meetings; citation [17] from Assumptions tab
	Indigenous Community	Enhanced ecosystem that can be used for cultural rituals and traditions	Cultural value (\$/acre/year)	10	\$11.00/acre/year	4000 acres	\$604,736.16	Surveys, interviews, focus groups, and meetings; citations from [2] and [13] in Assumptions tab
	Educational users of the site	More educational programs and opportunities	Educational value (\$/person/year)	10	\$7.33/person/year	62 annual education visitors	\$6,446.75	Surveys, interviews, focus groups, and meeting; Citation [18] from Assumptions tab.



### 9.1. TESTING OUTCOMES FOR MATERIALITY

Outcomes of Restore the Earth's reforestation project were determined by first analyzing collected material from the qualitative phase of research (see description in section 3 "Research Methodologies"). Collected data was coded with MAXQDA data analysis software to determine frequencies, differences, and similarities of outcomes identified by participants across stakeholder categories. Only outcomes identified by stakeholder groups during the qualitative research phase were included. Once outcomes were identified by stakeholder group, third party (secondary source) literatures were consulted to validate research findings within broader third-party literature and other relevant studies. Quantities for the Environmental stakeholder were based on the 4,000 acres for the reforestation project. Quantities for Recreational users and subgroups as well as Education and Research were derived from data provided by Louisiana Department of Wildlife and Fisheries based on recreational usage between 2013 and 2016. Quantities for all other stakeholder groups were derived from third party literature. Duration was provided by Restore the Earth, consistent with its EcoMetrics model. Third party literature was consulted to determine the value of outcomes (discussed in Section 9).

Depending on the stakeholder group, causality between the outcomes was determined based on stakeholder involvement and/or relevant third-party literature. All outcomes are directly linked to the reforestation project, as no other factors or inputs were determined to have caused any of the outcomes identified by stakeholder groups and third-party literature (see Section 10 Sensitivity Analysis for a discussion of sensitives and Section 8 for discount factors for all stakeholder groups). In short, the first event in the chain of events is the reforestation, to which all identified outcomes are directly linked. That is, through the establishment of a cypress forest and ecosystem, the various outcomes are achieved specific to different stakeholder groups. Relevance was determined by the materiality of the outcome, that is, if it was a material outcome articulated by a member of a stakeholder group during the qualitative phase of the research. For the Environment stakeholder, the only group that cannot speak for itself, relevance was determined by third-party literature as well as suggestions by Restore the Earth.



**Table 26. Testing stakeholder outcomes for materiality and significance**

Stakeholder	Stakeholder Subgroup (if applicable)	Outcome	Indicator	Outcome identified by stakeholder during qualitative phase of research	Outcome confirmed by third party materials	Significance			Relevance
						Value	Materiality	Causality	
Environment		Social value of carbon sequestered	EPA Social Cost of Carbon	No	Yes	\$18,811,375.10	Yes	Social Cost of Carbon [Carbon Sequestration Tab, Row 30 Column C, Actual Values Tab Row 46] * Total carbon sequestered over the first 5 years of the project [Carbon Sequestration Tab, Row 21 Column D]	Relevant
		Improved soil formation and nutrient cycling	Soil composition	No	Yes	\$1,342,049.29	Yes	Citation [13] from Assumptions tab, Row 73	Relevant
		Erosion control and sediment retention	Acreage, # of trees planted	No	Yes	\$15,676.22	Yes	Max. estimate of soil stabilized [Stabilization Tab, Row 17, Actual Values Tab Row 58] * soil stabilization value [Stabilization Tab, Row 16, Actual Values Tab Row 57]	Relevant
		Increased waste treatment capacity	Water composition	No	Yes	\$6,090,839.08	Yes	Midpoint of \$11-\$225 [Assumptions Tab Row 74]	Relevant
REF		Enhances Restore the Earth's reputation by planting the first	Dollar value of enhanced reputation	Yes	Yes	\$600,000.00	Yes	Meetings; Citation [1] from Assumptions tab	Relevant



		4,000 acres of 1-million-acre goal							
		Organization of volunteer labor to offset 10% of the project costs	10% of annual project cost (Value to Recipients)	Yes	Yes	\$15,462,759.67	Yes	Surveys and interviews; Citation [1] from Assumptions tab	Relevant
		Market value of carbon sequestered	Carbon Price Forecast (\$/t CO2-e) Medium Case and Average Sequestered (t CO2-e/acre/year)	Yes	Yes	\$15,186,048.89	No	Carbon Price Forecast [Carbon Sequestration Tab, Row 18 Column D, Actual Values Tab Row 44] * Total carbon sequestered over the first 5 years of the project [Carbon Sequestration Tab, Row 21 Column D]	Relevant
		Market value of nitrogen offset	Value of the nitrogen offset portion of a water quality credit that includes both N and P offsets.	Yes	Yes	\$3,955,114.65	No	Value of nitrogen offset credit [Nitrogen Mitigation Tab, Row 22, Actual Values Tab Row 51] * Net Base Case Nitrate Loss [Nitrogen Mitigation Tab, Row 20] * hectare/acre conversion	Relevant
		Market value of phosphorous offset	Value of the phosphorus offset portion of a water quality credit that includes both N and P offsets.	Yes	Yes	\$1,857,145.77	No	Phosphorus Offset Credit Price [Phosphorus Retention Tab, Row 17, Actual Values Tab Row 54] * Max. Phosphorus Retention in Natural Wetlands [Phosphorus Retention Tab, Row 19] * hectare/acre conversion	Relevant
Volunteers involved in replanting		Sense of accomplishment; positive reputation for organization	Monetary equivalent of the wellbeing benefit derived from	Yes	Yes	\$127,035.00	Yes	Surveys and interviews; Citation [1] from Assumptions tab	Relevant



			volunteering (Value to Participants)						
Corporate Sponsors		Social license to operate (effects to reputation; positive impact on communities)	Value of social license to operate	Yes	Yes	\$11,400,000.00	Yes	Surveys and interviews; Citation [1] from Assumptions tab	Relevant
Government Agencies		Enhances coastal protection for adjacent communities	Acres of land reforested Savings on storm protection (\$/acre/year)	Yes	Yes	\$30,006,508.50	Yes	Surveys, interviews, focus groups, and meetings; citation [14] from Assumption tab	Relevant
Conservation Organizations		Enhances habitat refuge	\$/acre/year Refuge Habitat Non-Use Value	Yes	Yes	\$23,365,326.49	Yes	Surveys, interviews, focus groups, and meetings; citation [14] from Assumption tab	Relevant
Recreational users (general recreational users, hunters, fishers, wildlife viewers and birdwatchers)	Hunters	Enhanced habitats for hunting	Wildlife Management Area usage; Waterfowl Hunting (consumer surplus) (\$/person/day)	Yes	Yes	\$196,477.82	Yes	Surveys, interviews, focus groups, and meetings; citation [14] from Assumption tab	Relevant
	Fishers	Enhanced habitats for fishing	Wildlife Management Area usage; Saltwater Fishing (consumer surplus) (\$/person/day)	Yes	Yes	\$167,276.12	Yes	Surveys, interviews, focus groups, and meetings; citation [14] from Assumption tab	Relevant





	General recreation	Enhanced habitats for general recreation	Wildlife Management Area usage; General recreation (consumer surplus) (\$/person/day)	Yes	Yes	\$7,174.93	Yes	Surveys, interviews, focus groups, and meetings; citation [14] from Assumption tab	Relevant
	Bird watchers	Enhanced habitats for birdwatching	Wildlife Management Area usage; Birdwatching (consumer surplus) (\$/person/day)	Yes	Yes	\$1,426.96	Yes	Surveys, interviews, focus groups, and meetings; citation [14] from Assumption tab	Relevant
Those employed directly and indirectly by the reforestation project	Those employed directly by the reforestation project	Direct employment for local nursery and planting services	Jobs created (direct and induced); number of working hours per year; wages	Yes	Yes	\$1,758,782.51	Yes	Surveys, interviews, focus groups, and meetings; citation [14] from Assumption tab	Relevant
	Local Business	Enhanced business opportunities	Jobs created (indirect) (# of jobs / \$ million invested); number of working hours per year; wages	Yes	Yes	\$1,284,051.93	Yes	Surveys, interviews, focus groups, and meetings; citation [14] from Assumption tab	Relevant



	State and federal wildlife managers	Increased and more diversified user activity. Increased habitat refuge value might result in other users coming in..	\$/acre/year Refuge Habitat Non-Use Value	Yes	Yes	Shared Value with Conservation Organizations	Yes	Surveys, interviews, focus groups, and meetings.	Relevant
Communities surrounding the site and downstream/wind of it that benefit from water and air quality, waste treatment, storm protection, soil stabilization, biological control		Enhanced Water Quality. Value of Marginal Nitrogen and Phosphorus Mitigation. Reduced occurrences of eutrophication and hypoxia.	Water quality, nitrogen content, other scientific measures per advisors.	No	Yes	\$37,383,790.69	Yes	Value of marginal nitrogen mitigation [Nitrogen Mitigation Tab, Row 21, Actual Values Tab Row 50] * Net Base Case Nitrate Loss [Nitrogen Mitigation Tab, Row 20] * hectare/acre conversion	Relevant
			Water quality, phosphorus content, other scientific measures per advisors.	No	Yes	\$90,701,489.02	No	Phosphorus Retention Social Value [Phosphorus Retention Tab, Row 17, Actual Values Tab Row 54] * Max. Phosphorus Retention in Natural Wetlands [Phosphorus Retention Tab, Row 19] * hectare/acre conversion	Relevant
		Increased atmospheric oxygen and cleaner air	Atmospheric oxygen concentration, air quality	No	Yes	\$5,935,987.24	Yes	Citation [13] from Assumptions tab, Row 72	Relevant
		Enhanced storm surge protection	Savings on storm protection	Yes	Yes	Shared Value with Government Officials	Yes	Surveys, interviews, focus groups, and meetings; citation [14] from Assumption tab	Relevant
Communities that benefit from other ecosystem	Community services and outreach	Sense of community pride;	Acres of land reforested Amenity value	Yes	Yes	\$274,880.07	Yes	Surveys, interviews, focus groups, and meetings.	Relevant



services such as habitat refuge and cultural value		community gathering place	for local residents (\$/acre/year)						
	Indigenous Community	Enhanced ecosystem that can be used for cultural rituals and traditions	Acres of land reforested; Cultural value for local residents (\$/acre/year)	Yes	Yes	\$604,736.16	Yes	Surveys, interviews, focus groups, and meetings; citations from [2] and [13] in Assumptions tab	Relevant
	Educational users of the site	More educational programs and opportunities	Wildlife Management Area usage; Visiting an environmental education center (Consumer Surplus) (\$/person/day)	Yes	Yes	\$6,446.75	Yes	Surveys, interviews, focus groups, and meetings.	Relevant



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- 19) Daniel Fujiwara, Paul Oroyemi and Ewen McKinnon, "Wellbeing and civil society: Estimating the value of volunteering using subjective wellbeing data," UK Department for Work and Pensions and the Cabinet Office, (2013)
- 20) Simon Cole, "The Impact of Reputation on Market Value," *World Economics*, Volume 13, Number 3 (2012)



## 9.2. UNINTENDED OR NEGATIVE OUTCOMES

Methodologies were designed to capture unintended consequences or negative outcomes of past and future restoration projects and what would happen without the project. Both the facilitation guide for the focus group and the interview guide asked the following questions to account for unintended or negative outcomes:

- What is the likelihood that you will use the WMA less often as a result of reforestation?
- Why would this decrease occur?
- What recreational uses of the WMA might reforestation negatively impact?
- What other unexpected or unanticipated factors might result in a drop-off of use for the WMA after reforestation?

In the Pointe-aux-Chenes case, negative outcomes were framed primarily in the perceived future success of the project in the face of environmental changes (storms and saltwater inundation) as well as the extent to which the location site would provide protection for adjacent communities.

In terms of assessing any negative outcomes for the project, one stakeholder summed it up best perhaps with the following statement: "the only negative would be if it doesn't work. But that is not really a negative impact, that is just a no net gain. I don't anticipate that happening. We'll have some level of success" (Pointe-aux-Chenes Transcript 11/2016). This description captures the unique nature of an SROI of this environmental restoration project: Whether it succeeds or is lost, there is the general understanding that it causes no direct harm to many of the stakeholder groups. The exception to this would be for Corporate Sponsors, who stated that the project is deemed a waste of spending if the project does not grow and take hold. The harm, in this case, is framed in terms of a bad investment, saying that "if the trees are not alive in 5 years the project cost too much" (Pointe-aux-Chenes Interview 12/2016). Along the lines of investment, some stakeholders from the focus group noted that if the project fails, it would compromise the possibility of funds for similar kinds of reforestation projects in coastal areas in the future: "Failure is not just failure in one stage. It also greatly impedes your ability to get additional funds to do it again" (Pointe-aux-Chenes Transcript 11/2016). Most stakeholders, however, framed their understanding of potential 'failure' - if the trees die over time - of the reforested as linked to uncontrollable environmental factors, such as hurricanes and floods. Saltwater intrusion and inundation were, as would happen with either of the aforementioned scenarios, identified numerous times at the focus groups as a unique limiting factor to cypress forest specifically, and thus to the success of the project. As one stakeholder noted, "I've done work in cypress swamps before, they are very sensitive to salinity [...] I'm just saying that salinity has to inform where you are choosing to put the trees [...] cypress is amazingly persistent but it is also one of the most fragile and sensitive systems" (Pointe-aux-Chenes Transcript 11/2016). In this regard, members of both the Education and Research groups as well as State Wildlife Managers noted the need to "impound" the trees with freshwater through the maintenance of local levee and flood control (pumping) systems was identified as crucial to the success of the project over time.

Education and research stakeholders noted that even if the reforestation does not survive as projected, it would still be an educational benefit to their groups (Pointe-aux-Chenes focus group 11/2016). This is because it would become a case study of either a successful or failed reforestation. Either way this is considered an educationally valuable, something stakeholders can learn from and teach about.



In addition to ecological questions, several local residents, members of the Communities Benefitting from Ecosystem and Other Services as well as Communities Living Downstream (and Upstream) and Indigenous Communities questioned the extent to which cypress reforestation could provide tangible flood protection for their communities. One Native American tribe that lives in proximity to the project but outside the levees and the areas it might protect noted that, while having more cypress would be aesthetically pleasing and a tangible ecological connection to tribal traditions (such as cypress basket weaving) that their communities would not benefit from any flood protection it might provide in the future. As a tribal member noted, "planting way over here [upstream from their community] what benefit is that when you are sacrificing the people over here? You saving a few birds for some people? When you can protect the whole community? Makes more sense to me [to protect the entire community]" (Pointe-aux-Chenes Transcript 11/2016). As another stakeholder emphasized, "Who benefits to the amount of money and time you spend to do that, when you have a whole community that is at risk right here?" (Pointe-aux-Chenes Transcript 11/2016). These comments point to the concern of local residents, and Indigenous communities in particular, about the decision process through which sites are chosen for reforestation.

## 10.0 Sensitivity Analysis

The outcomes and assumptions used to calculate the final SROI values are subject to various risks and environmental uncertainties due to the impacts of climate change on coastal environments and communities in Louisiana. Actual results could therefore differ materially from those expressed or implied in the forward-looking outcome information. The EcoMetrics model uses three scenarios to assess a range of possible values, and help surface sensitivity to specific value drivers. This is necessary given that the confidence levels of each of the items in the model vary and exact levels are not always known due to a lack of comprehensive research into specific outcomes in coastal Louisiana. The scenario planning feature of the EcoMetrics model was used to test how much a given line item value would need to be at variance from the projection to change a stakeholder's decision as a way of evaluating risks and decisions.

Three scenarios were run to assess the potential range of values resulting from the Pointe-aux-Chenes reforestation project; conservative, realistic, and aggressive. Each scenario includes a sensitivity overview of the factors that could cause actual results to differ materially (Table 27). The conservative scenario assumes higher costs, low survivability rates of the trees, and low market and nonmarket value generation, reflecting the risk that social benefits aren't created as planned. Conversely, the aggressive scenario assumes that costs will be much lower than anticipated, that the need for replanting will be low, and that the market and nonmarket values that will be generated will be high. Use of this aggressive scenario would potentially raise ethical issues about the value of avoided problems that future stakeholders would have to pay to correct. This SROI assessment utilizes a more realistic scenario that assumes moderate costs and moderate value generation rates.



**Table 27: Sensitivity overview of factors influencing materiality of results**

Description	Conservative	Realistic	Aggressive	Unit	Sensitivity
<b>General and Specific to Operations</b>					
<b>Discount Rate</b>	10%	5%	0%	%	±5% range
<b>Land Cost to Acquire</b>	\$-	\$-	\$-	\$/acre	±25%
<b>Restoration Cost</b>	\$3,750	\$3,000	\$2,250	\$/acre	±25%
<b>Sale of Land</b>	\$-	\$-	\$-	\$/acre	±25%
<b>WRP Payment</b>	\$-	\$-	\$-	\$/acre	±25%
<b>Need for Replanting Trees</b>	30%	10%	5%	%	5-30% range
<b>Nitrogen Mitigation</b>					
<b>Value of the marginal Nitrogen mitigation</b>	\$0.99	\$25.27	\$140.85	\$/kg N	\$2.2 - \$313/lb N
<b>Value of Nitrogen Offset Credit</b>	\$0.54	\$2.52	\$4.50	\$/kg N	\$1.21-\$10/lb N
<b>Phosphorus Retention</b>					
<b>Phosphorus Offset Credit Price</b>	\$1.69	\$6.51	\$11.32	\$/kg P	\$3.76-\$25.16/lb P
<b>Phosphorus Retention Social Value</b>	\$2.90	\$338.95	\$675.00	\$/kg P	\$6.45-\$1500/lb N
<b>Max. Phosphorus Retention in Natural Wetlands</b>	1.4	18.7	36	kg P/ha	1.4 - 36 kg P/ha
<b>Other</b>					
<b>Refuge Habitat</b>	\$482.00	<b>\$482.00</b>	\$485.92	\$/acre/year	\$203.63-\$485.92 range
<b>Savings on Storm protection</b>	\$464	<b>\$619</b>	\$774	\$/acre/year	±25%
<b>Air Quality</b>	\$57.5	<b>\$115</b>	\$173	\$/acre/year	±50%
<b>Waste Treatment</b>	\$11	<b>\$118</b>	\$225	\$/acre/year	\$11-225 range

### 10.1. SENSITIVITIES FOR STAKEHOLDER GROUPS

Ideally, if the reforestation takes hold and is successful with trees continuing to grow and the ecosystem becoming healthier, the outcomes for all stakeholder groups will be supported. This reflects the particular benefits of a restored ecosystem to each stakeholder group. However, the sensitivity analysis asks us to account for the 'unexpected' factors that might limit the success of the outcomes of the project for various stakeholders. These are distinct from calculations of deadweight, attribution, displacement and drop-off due to the fact that they are unexpected and therefore cannot be quantified as a discount factor to the project's overall social return on investment.

During the qualitative research conducted by The Water Institute with stakeholders in Pointe-aux-Chenes, specific questions were asked about stakeholder's perspectives on the potential negative impacts of the project, limiting factors of the project's success, and if any other unexpected factors came to mind that would de-rail the anticipated outcomes of the reforestation (a portion of this is covered in Section 5).



## 10.2. UNEXPECTED ENVIRONMENTAL EVENTS: HURRICANES AND SALTWATER INTRUSION

For stakeholder groups benefitting from the ecological outcomes - specifically the Environment, Restore the Earth, Public at Large, Conservation Organizations, Recreational Users (all subgroups), State Wildlife Managers, Communities benefitting from ecosystem services, Community Services and Outreach, and Indigenous Communities - whose outcomes are associated with the enhancement of environmental functions, such as water quality, air quality, soil stabilization, ecosystem



enhancement, and the creation and maintenance of wildlife habitats, several factors were mentioned as potential limiting factors to outcomes. Overall, stakeholders identified unexpected changes to the local environment such as increased salinity levels in the project area (which can limit and potentially eliminate the growth of cypress trees) as a result of hurricanes, the failure of local levee structures, and strong south winds which can move saline water into the freshwater environment the cypress trees need (Pointe-aux-Chenes focus group 11/2016). The impact of salinity levels on cypress tree growth is documented in scientific literature, and saltwater intrusion in many ways is facilitated by hurricanes and strong tropical storms that frequent the region. It is very difficult to account for these events. Because all outcomes are predicated on the assumption that the reforested areas will survive and reach maturity, if a hurricane introduces enough wind or saltwater damage to the project area, all outcomes can be potentially lost. However, the older the trees become, the more tolerate they are to environmental disturbances. As such, the first 5 years are most likely the time when the project will be most environmentally vulnerable.

Restore the Earth, conscientious of these ecological circumstances, aimed to put the project footprint within existing levee protection systems that can, ideally, control salinity levels. Restore the Earth has also invested in a proprietary system for growing their cypress trees - EKOgrown® trees - which delivers higher survivability and faster growth to maturity (Restore the Earth Foundation). These factors are key as cypress trees can better withstand saltwater inundation the more mature they are. While these steps attempt to circumvent unexpected damages to the reforestation, coastal Louisiana is a highly dynamic environment, and it is difficult to predict the frequency or severity of weather events that might impact the reforestation project. Volunteers and corporate sponsor stakeholder groups also noted that if the project did not take hold due to environmental reasons (i.e. hurricanes), that project might be a net fiscal loss for them on their investment, particularly if the trees are not alive after 5 years. Again, Restore the Earth has taken steps to try to address these uncertainties, however it is difficult to account for these unexpected events.





### 10.3. REGIONAL ECONOMIC DOWNTURNS AND WMA VISITATION

For those employed directly by the restoration project or local businesses that stand to potentially benefit from increased visitation to the area because of reforestation, unexpected economic downturns might offset the relative benefits of the reforestation project for local economies. While direct jobs may be provided by Restore the Earth during the project timeframe, ancillary economies are subject to changes beyond the control of Restore the Earth. Along the lines of fluctuating economies, several stakeholders from the Government Officials subgroup and State Wildlife Managers noted that changes to local, state, and federal budgets can impact the array of resources - such as levee maintenance and state wildlife manager staff - that provide long-term maintenance and monitoring of the reforested areas (Pointe-aux-Chenes focus group 11/2016). To the extent that the reforestation takes hold, it is still difficult to predict with great accuracy if this project specifically will increase recreational visitation to the area. This is first and foremost because of the limited capacities of the Pointe-aux-Chenes WMA staff to accurately track the activities of users across the WMA (Pointe-aux-Chenes interview 12/2016). Secondly, the Pointe-aux-Chenes WMA is a predominately water-based area, meaning visitors usually need boats in order to enjoy the full range of what the area can offer. The location of the reforestation is, at the time, in an area with limited road access. In response, however, Restore the Earth is actively investing in building a boardwalk and educational materials in tandem with this reforested area in order to help encourage visitation to the restored cypress forest (Restore the Earth Foundation).

### 10.4. INTEGRITY OF LOCAL FLOOD PROTECTION STRUCTURES

The functions of the local levee system as well as other state and local funded resources ensure the longevity of the reforestation. Without the maintenance of these structures and programs and their continued fiscal support the long-term sustainability and outcomes of the project for all stakeholder groups would be compromised (Pointe-aux-Chenes interview 12/2016). This is not something Restore the Earth can directly change, although reforested areas can help to protect current flood protection structures already in place (Pointe-aux-Chenes focus group 11/2106).

### 10.5. LIMITED PROTECTION OF VULNERABLE COASTAL COMMUNITIES

Finally, several stakeholders from the Indigenous Communities group voiced concern that that, while cypress is of cultural value to several local tribes, they found the geography of the project (its location) to be of little value to them in terms of storm protection (Pointe-aux-Chenes focus group 11/2016). This stakeholder group was particularly sensitive to this matter, noting that the cultural and aesthetic value is appreciated, but that for them - as communities living on the edge of coastal Louisiana's land loss crisis - the location of the project was not ideal for protecting their communities. Restore the Earth can perhaps work to address this unexpected concern through the planning of future reforestation in the Pointe-aux-Chenes area that might provide more direct storm protection to Indigenous Communities.

## 11.0 Summary of Social Value Created

To calculate the net present value (NPV) of the Pointe-aux-Chenes reforestation project, the costs and benefits incurred or generated at different time periods need to be summed (Social Ventures Australia Consulting, 2011). For these costs and benefits to be comparable, a discount rate was used for the NPV calculations. This research examined three forecast scenarios that bound the environmental uncertainty to some degree: conservative, realistic, and aggressive. This analysis describes the "realistic" scenario,



which incorporates a discount rate of 5% to accurately account for the impacts of climate change mitigating investments. Under the realistic scenario, an investment of \$15,467,764 in the 2016 financial year creates approximately \$218,076,777 of net social impact over 40 years, resulting in an indicative SROI ratio of 14.10:1. In other words, the SROI analysis presents evidence that substantiates that for every dollar invested in reforestation in the Points-aux-Chenes WMA by Restore the Earth and corporate sponsors, \$14.10 is returned to community stakeholders in social value. Additionally, \$25,664,585 in direct market value is returned to Restore the Earth and corporate investors, a direct market return of \$1.66 for every dollar invested.

## 11.1. CONTRIBUTIONS

The overall impact of planting 4,000 acres of cypress forest on the Pointe-aux-Chenes WMA would be a large step towards helping to restore a part of Louisiana's subsiding and eroding coastline. As part of Restore the Earth's larger 1 million acres of reforested lands in the Mississippi Alluvial Valley goal, this project has the opportunity to set an example of how public-private partnerships can be utilized to provide the necessary resources to contribute to large-scale environmental sustainability. Stakeholder research has shown that significant market and non-market benefits will accrue to various stakeholder groups. The SROI analysis focuses on the non-market benefits for community stakeholders while an analysis of market returns focuses on the economic returns for funding stakeholders.

### 11.1.1. Social Return on Investment

This SROI analysis demonstrates that cypress reforestation in the Pointe-aux-Chenes WMA will provide significant social benefits at both the local and regional level. The greatest social benefits accrue to communities surrounding the Pointe-aux-Chenes cypress reforestation site, which accounts for approximately 54 percent of the SROI. The greatest social return to these communities comes in the form of reduced phosphorus and nitrogen levels which, in excess, cause diverse environmental problems that directly affect human health and wellbeing, including air pollution, acid rain, marine and freshwater eutrophication, biodiversity loss, and the stimulation of some invasive species (Townsend et al., 2012).



**Table 28: Social and Market Return on Investment Summary**

Description	Value
Net Social Impact	\$218,076,777
PV of Total Investment	\$15,467,764
Social Return on Investment	14.10
Social Internal Rate of Return	36.82%
PV of Total Market Value	\$25,664,585
Market Return on Investment	1.66
Market Internal Rate of Return	8.88%
PV Social + Market Value	\$243,741,362

Environmental outcomes generating the most social value identified by stakeholders are related to (in order of SROI value):

- Water quality (value of marginal nitrogen and phosphorus mitigation): \$128,085,280
- Savings on storm protection: \$30,006,509
- Enhanced wildlife habitat: \$23,365,326
- Erosion control: \$15,676

These outcomes all represent tangible outcomes identified by several stakeholder groups, both locally and regionally. These outcomes are directly related to the flood protection benefits - water retention, storm surge reduction - that reforestation provides as well as the restored wildlife habitat it creates, which in effect adds 4,000 acres of cypress ecosystem to the Pointe-aux-Chenes WMA.

The following social returns, while lower in financial value, were nevertheless some of the most consistently mentioned outcomes by stakeholders engaged by the Water Institute. While they are listed separately here in terms of their SROI calculation, it should be noted that in coastal Louisiana, the economy and local culture are heavily tied to the consumptive and recreational use of coastal ecosystems. As such, these categories are very much intersecting values in terms of everyday life for coastal residents.

Value of recreational impacts:

- Increased value of hunting: \$196,478
- Increased value of fishing: \$167,276
- Increased value of general recreation: \$7,175
- Increased value of birding: \$1,427

Value of reforestation to the local economy:



- Value of direct and induced jobs produced: \$1,758,783
- Value to local business: \$1,284,052

Community, cultural, and educational value of reforestation:

- Amenity value: \$274,880
- Cultural value: \$604,736
- Educational value: \$6,447

Finally, research conducted by Restore the Earth revealed that certain outcomes would be anticipated to accrue to communities in the future. Many of these outcomes are intangible and thus not identified by community stakeholders interviewed as part of this research. Outcomes recognized by the scientific community but not by local stakeholders accrue to the environment and represent future benefits to community stakeholders. For example, forests are also an important carbon sink, removing more carbon from the atmosphere than they are emitting. Increasing the number of trees may therefore slow the accumulation of atmospheric carbon, which is a major contributor to global warming. These effects of these environmental outcomes may take several years to manifest at the local stakeholder level. As a result, these types of broad, long-term benefits of reforestation were generally not considered by local stakeholders, who tended to focus more on the immediate impacts of the project, such as economic growth, recreational benefits, and storm protection. Long-term environmental benefits can therefore be considered to accrue to each of the other stakeholder groups engaged in this research. The SROI values of these environmental benefits are:

- Social value of carbon sequestered: \$18,811,375
- Improved soil formation and nutrient cycling: \$1,342,049
- Erosion control and sediment retention: \$15,676
- Increased waste treatment capacity: \$6,090,839

**Table 29: Social Return on Investment for reforestation in Pointe-aux-Chenes WMA**

Stakeholders	Real outcomes due to Pointe-aux-Chenes reforestation project	Social Value Creation	Social Value per Stakeholder Group
Environment	Social value of carbon sequestered	\$18,811,375.10	\$26,259,939.68
	Improved soil formation and nutrient cycling	\$1,342,049.29	
	Erosion control and sediment retention	\$15,676.22	
	Increased waste treatment capacity,	\$6,090,839.08	
Volunteers involved in replanting	Sense of accomplishment	\$127,035.00	\$127,035.00
Government agencies	Enhanced coastal protection for adjacent communities	\$30,006,508.50	\$53,371,834.99



Conservation organizations	Enhanced habitat refuge	\$23,365,326.49	
Recreational users (general recreational users, hunters, fishers, wildlife viewers and birdwatchers)	Enhanced habitats for hunting	\$254,831.74	\$367,433.72
	Enhanced habitats for fishing	\$107,240.72	
	Enhanced habitats for general recreation	\$3,220.83	
	Enhanced habitats for birdwatching	\$2,140.44	
Those employed directly and indirectly by the reforestation project	Direct employment for local nursery and planting services	\$1,758,782.51	\$3,042,834.44
	Enhanced business opportunities	\$1,284,051.93	
	Enhanced habitat refuge	Shared value with Conservation organizations	
Communities surrounding the site and downstream/wind of it that benefit from water and air quality, waste treatment, storm protection, soil stabilization, biological control	Enhanced Water Quality. Value of Marginal Nitrogen and Phosphorus Mitigation.	\$37,383,790.69	\$134,021,266.95
		\$90,701,489.02	
	Increased atmospheric oxygen and cleaner air	\$5,935,987.24	
	Enhanced storm surge protection	Shared value with Government agencies	
Communities that benefit from other ecosystem services such as habitat refuge and cultural value	Sense of community pride; community gathering place	\$274,880.07	\$886,431.73
	Enhanced ecosystem that can be used for cultural rituals and traditions	\$604,736.16	
	More educational programs and opportunities	\$6,815.50	
		<b>Total Present Value</b>	<b>\$218,076,776.51</b>
		<b>Total Investment</b>	<b>\$15,467,763.67</b>
		<b>Non-Market Return on Investment (dollar returned per dollar invested)</b>	<b>14.10</b>



### 11.1.2. Market Return on Investment

Certain outcomes of the reforestation project represent economic value internalized by Restore the Earth and project sponsors. Such market values were identified by funding stakeholders as important outcomes for their organizations. Market returns on investment were calculated separately from social returns and thus were not included as part of the SROI calculations. Two stakeholder groups identified in this research garner additional market benefits from the success of the Pointe-aux-Chenes cypress reforestation project; Restore the Earth and its corporate sponsors. Each of these stakeholder groups have provided direct financial and social capital to support the reforestation project and are anticipated to experience several unique outcomes relative to their inputs. The largest outcome for stakeholders from Restore the Earth and corporate sponsors of the program come an enhanced reputation (Restore the Earth) and social license to operate (Corporate sponsors) with in local communities. This will not only allow corporate sponsors of the project to continue to operate in nearby communities, but, in the case of Restore the Earth, the successful completion of the Pointe-aux-Chenes reforestation project will allow the organization to build off of this success and conduct additional reforestation projects. The enhanced reputation and social license to operate that these funding stakeholders receive by conducting this reforestation project will result in two different outcomes, one for Restore the Earth and the other for corporate funders:

- Social license for corporate entities to continue to operate in coastal Louisiana: \$2,964,000
- Enhanced funding opportunities for Restore the Earth to conduct additional reforestation projects in coastal Louisiana: \$156,000

Additionally, the reforestation project will allow Restore the Earth Foundation to accumulate credits to offset an emission made elsewhere. Offsets generating the most social value for Restore the Earth include (in order of SROI value):

- Carbon offsets: \$15,186,049
- Nitrogen offsets: \$3,955,115
- Phosphorus offsets: \$1,857,146

Finally, the organization and training of volunteers to work on the reforestation creates a significant outcome for Restore the Earth in the form of financial savings on the project, as the use of volunteer labor offsets 10% of the total project costs. The use of volunteers in the reforestation project also provides a social return for the volunteers themselves, who derive a sense of accomplishment and wellbeing from being involved in the Pointe-aux-Chenes project. The time spent volunteering and the value of that time is measured as an input into the social value assessment. The value of this input, however, results in positive outcomes that accrue to both the recipient of that labor (Restore the Earth) and to the volunteers themselves:

- Savings in project costs (Market Return for Funding Stakeholders): \$1,546,276
- Wellbeing benefit derived from volunteering (Social Return for Volunteers): \$127,035

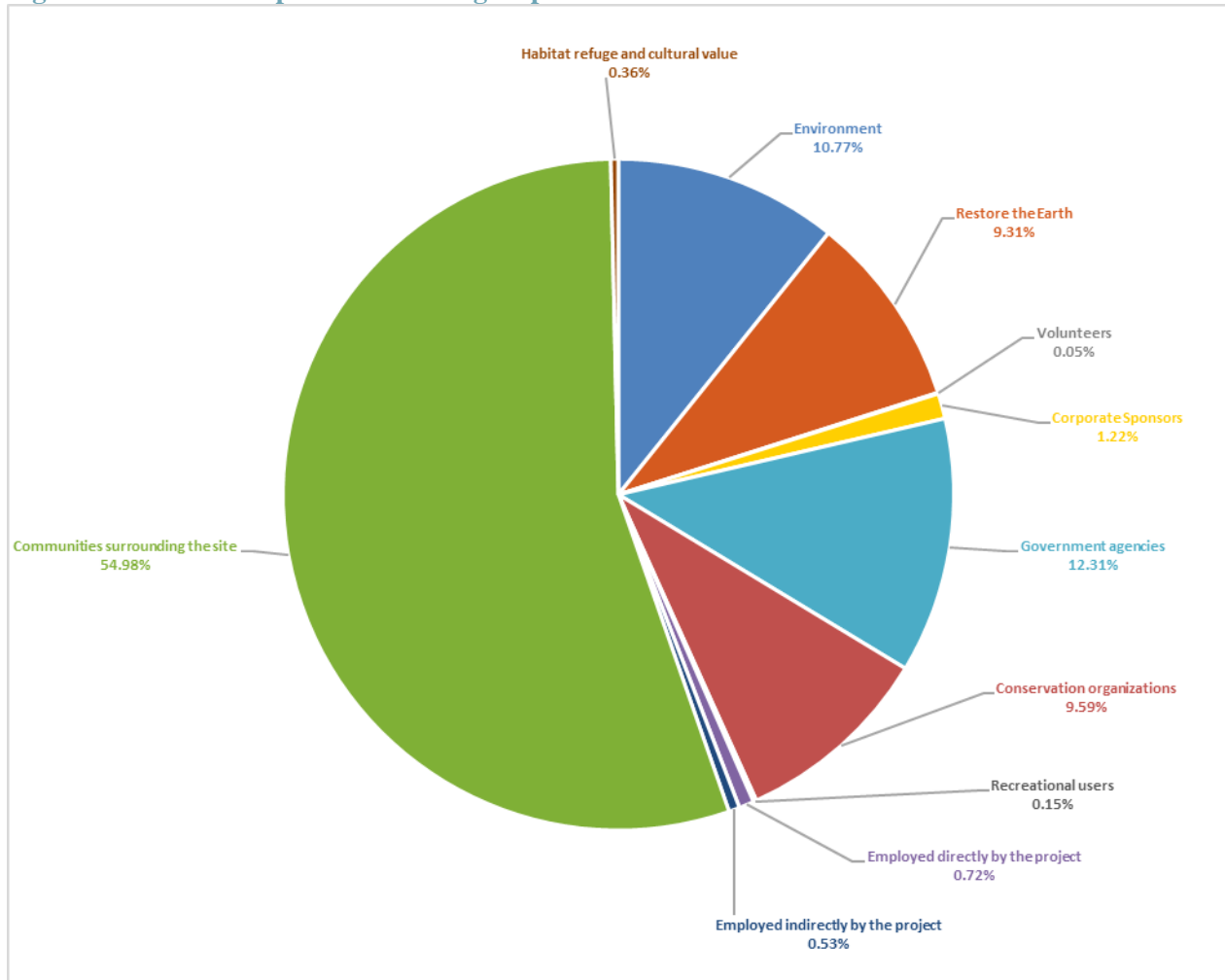


**Table 30: Market Return on Investment for reforestation in Pointe-aux-Chenes WMA**

Stakeholders	Real outcomes due to Pointe-aux-Chenes reforestation project	Market Value Creation	Market Value Creation per Stakeholder Group
Restore the Earth	Enhances Restore the Earth's reputation by planting the first 4,000 acres of 1million acre goal	\$156,000.00	\$22,700,585.27
	Organization of volunteer labor to offset 10% of the project costs	\$1,546,275.97	
	Market value of carbon sequestered	\$15,186,048.89	
	Market value of nitrogen offset	\$3,955,114.65	
	Market value of phosphorous offset	\$1,857,145.77	
Corporate Sponsors	Social license to operate (effects to reputation; positive impact on communities)	\$2,964,000.00	\$2,964,000.00
		<b>Total Present Value</b>	<b>\$25,664,585.27</b>
		<b>Total Investment</b>	<b>\$15,467,763.67</b>
		<b>Market Return on Investment (dollar returned per dollar invested)</b>	<b>1.66</b>



Figure 4. Social value per stakeholder group



### 11.2. STATEMENT OF RISKS OF OVERCLAIMING

Levels of counterfactual are low for this study. Levels are low because this project is a tree planting, environmental restoration project on public land that is expected to grow and mature over time. All outcomes are directly associated with the tree planting. Few stakeholders noted any instances of displacement or drop-off of area use as a result of the reforestation. Along these lines, no stakeholders identified any situation where the outcomes (more cypress forest) would occur/grow without this reforestation project or that any other activities would contribute to planting cypress trees. The Water Institute and Restore the Earth Foundation do not have any knowledge of other projects for reforestation in the area in the present or future.

### 11.3. CONSIDERATIONS AND LIMITATIONS

With an eye towards precaution in not over-claiming the SROI of the reforestation project, the following should be considered:

- While the bulk of data presented in this report is derived directly from stakeholder input as a result of qualitative research conducted by the Water Institute, much of the data used to calculate the majority of the SROI monetary figures emanates from the Environmental stakeholder group.





As such, these are figures derived from third party literature and scientific research provided by Restore the Earth and not directly mentioned by other stakeholder groups. This is important to remember when considering the financial totals on the SROI figures

- The unique environmental crisis that coastal Louisiana is facing with the combined impacts of land loss, predictions of sea-level rise, and the consistent threat of hurricanes and other severe weather events should not be overlooked in terms of potential impact on the project. As a participant from the State Wildlife Managers stakeholder noted: "With the wrong conditions even for a few months it [the restoration] can come undone. Historical trends in this area show steady increase in salt levels and that is why there aren't any cypress out there now. The only reason they are surviving now is because of the levee. But whether this will reverse the environmental history trend, I don't know" (Pointe-aux-Chenes interview 12/2016). The cypress reforestation project sits on the edge of open water that threatens to deteriorate the coastal wetlands more and more every day. To be sure, reforestation projects are an attempt to abate the rate of land loss in coastal Louisiana. Yet it cannot be emphasized enough that other environmental forces do threaten the long-term survivability of the project despite the fact that Restore the Earth has taken precautionary steps to reduce these risks (see Section 7 for more details).

## 12.0 Conclusions and Recommendations

This study evaluates the integrated social returns of a reforestation project in coastal Louisiana. Integrated return is defined as the comprehensive economic, social, and environmental benefits of a project and presents a holistic depiction of the interrelatedness of factors contributing to an organization's capacity to create value over time. Integrated reporting focuses on the nature and quality of an organization's relationship with its key stakeholders including how and to what extent the organization recognizes and responds to their key stakeholder's needs and interests. In this analysis, integrated social value was quantified using Restore the Earth's EcoMetrics model, which was built on the guiding principles of Social Value International's (SVI) Social Return on Investment (SROI) Methodology and the International Integrated Reporting Council's (IIRC) International Integrated Reporting Framework (IIRF). Stakeholder relationships are of primary importance to both methodologies. The SVI approach concerns an in-depth, evidence-based understanding of change for a full range of community stakeholders with recognition of both positive and negative changes as well as intended and unintended outcomes. Value in this context refers to the relative importance placed by a stakeholder group on one potential outcome over another. Assigning these valuations using SVI principles requires the use of financial proxies as many of the identified outcomes are difficult to quantify using conventional accounting practices. The IIRC methodology is principally concerned with the creation value for funding stakeholders and resources are allocated based on the potential benefit to the corporation and quantified using conventional accounting practices.

By integrating these two frameworks, the EcoMetrics model assesses the creation of social value for both community stakeholders and funding stakeholders. In this research, both market and non-market social value was generated for various stakeholder groups (Table 31). The relationship between these stakeholder groups can be quantified through application of the six capitals identified by the IIRC (Table 32). Financial capital increases as a corporate entity continues to benefit from additional financial opportunities generated by the value a restoration project creates for stakeholders and society. Manufactured capital increases as additional storm protection results in reduced storm damage and



increased waste and water treatment capacity results in a quality of life improvement for stakeholders. An increase in social capital results from the increase in corporate goodwill associated with successfully restored land and the positive association stakeholders maintain with the corporation. A corporate entity influences the formation of human capital through job creation and stimulates additional motivation toward continued stakeholder collaboration on ecosystem restoration activities. A corporate entity enhances its social license to operate, an increase in social capital, by engendering mutual trust with stakeholders and through improvements to quality of life that directly impact human health. Natural capital is created through ecosystem restoration and stakeholders benefit from increased biodiversity and improved eco-system health.

**Table 31: Social and market return on investment delineated by SVI stakeholder groups for reforestation in Pointe-aux-Chenes WMA**

Stakeholders	Real outcomes due to Pointe-aux-Chenes reforestation project	Market Value Creation	Social Value Creation	Market and Social Value Creation per Stakeholder Group
Environment	Social value of carbon sequestered		\$18,811,375.10	\$26,259,939.68
	Improved soil formation and nutrient cycling		\$1,342,049.29	
	Erosion control and sediment retention		\$15,676.22	
	Increased waste treatment capacity,		\$6,090,839.08	
Restore the Earth	Enhances Restore the Earth's reputation by planting the first 4,000 acres of 1 million acre goal	\$156,000.00		\$22,700,585.27
	Organization of volunteer labor to offset 10% of the project costs	\$1,546,275.97		
	Market value of carbon sequestered	\$15,186,048.89		
	Market value of nitrogen offset	\$3,955,114.65		
	Market value of phosphorous offset	\$1,857,145.77		
Volunteers involved in replanting	Sense of accomplishment		\$127,035.00	\$127,035.00
Corporate Sponsors	Social license to operate (effects to reputation; positive impact on communities)	\$2,964,000.00		\$2,964,000.00
Government agencies	Enhanced coastal protection for adjacent communities		\$30,006,508.50	\$30,006,508.50



Conservation organizations	Enhanced habitat refuge		\$23,365,326.49	\$23,365,326.49
Recreational users (general recreational users, hunters, fishers, wildlife viewers and birdwatchers)	Enhanced habitats for hunting		\$254,831.74	\$367,433.72
	Enhanced habitats for fishing		\$107,240.72	
	Enhanced habitats for general recreation		\$3,220.83	
	Enhanced habitats for birdwatching		\$2,140.44	
Those employed directly and indirectly by the reforestation project	Direct employment for local nursery and planting services		\$1,758,782.51	\$3,042,834.44
	Enhanced business opportunities		\$1,284,051.93	
	Enhanced habitat refuge		Shared value with Conservation organizations	
Communities surrounding the site and downstream/wind of it that benefit from water and air quality, waste treatment, storm protection, soil stabilization, biological control	Enhanced Water Quality. Value of Marginal Nitrogen and Phosphorus Mitigation.		\$37,383,790.69	\$134,021,266.95
			\$90,701,489.02	
	Increased atmospheric oxygen and cleaner air		\$5,935,987.24	
	Enhanced storm surge protection		Shared value with Government agencies	
Communities that benefit from other ecosystem services such as habitat refuge and cultural value	Sense of community pride; community gathering place		\$274,880.07	\$886,431.73
	Enhanced ecosystem that can be used for cultural rituals and traditions		\$604,736.16	
	More educational programs and opportunities		\$6,815.50	
<b>Total Present Value</b>		<b>\$25,664,585.27</b>	<b>\$218,076,776.51</b>	<b>\$243,741,361.79</b>
<b>Total Investment</b>				<b>\$15,467,763.67</b>
<b>Market and Non-Market Return on Investment (dollar returned per dollar invested)</b>		<b>1.66</b>	<b>14.10</b>	<b>15.76</b>



**Table 32: Social return on investment delineated by IIRC shared value capital for reforestation in Pointe-aux-Chenes WMA.**

Shared Value Capital	Real outcomes due to Pointe-aux-Chenes reforestation project	Market Value Creation	Social Value Creation	Market and Social Value Creation per Shared Value Capital
<b>Financial</b>	Enhances Restore the Earth's reputation by planting the first 4,000 acres of 1 million acre goal	\$156,000.00		\$25,743,419.71
	Organization of volunteer labor to offset 10% of the project costs	\$1,546,275.97		
	Market value of carbon sequestered	\$15,186,048.89		
	Market value of nitrogen offset	\$3,955,114.65		
	Market value of phosphorous offset	\$1,857,145.77		
	Direct employment for local nursery and planting services		\$1,758,782.51	
	Enhanced business opportunities		\$1,284,051.93	
<b>Manufactured</b>	Enhances coastal protection for adjacent communities		\$30,006,508.50	\$30,006,508.50
	Enhanced storm surge protection		Shared value with Government agencies	
<b>Human</b>	Enhanced habitats for hunting		\$254,831.74	\$367,433.72
	Enhanced habitats for fishing		\$107,240.72	
	Enhanced habitats for general recreation		\$3,220.83	
	Enhanced habitats for birdwatching		\$2,140.44	
<b>Social and Relationship</b>	Sense of accomplishment; positive reputation for organization		\$127,035.00	\$27,342,793.22
	Social license to operate (effects to reputation; positive impact on communities)	\$2,964,000.00		
	Enhances habitat refuge		\$23,365,326.49	



	Sense of community pride; community gathering place		\$274,880.07	
	Enhanced ecosystem that can be used for cultural rituals and traditions		\$604,736.16	
	More educational programs and opportunities		\$6,815.50	
<b>Natural</b>	Social value of carbon sequestered		\$18,811,375.10	\$160,281,206.63
	Improved soil formation and nutrient cycling		\$1,342,049.29	
	Erosion control and sediment retention		\$15,676.22	
	Increased waste treatment capacity,		\$6,090,839.08	
	Enhanced Water Quality. Value of Marginal Nitrogen and Phosphorus Mitigation		\$37,383,790.69	
			\$90,701,489.02	
	Increased atmospheric oxygen and cleaner air		\$5,935,987.24	
<b>Total Present Value</b>	<b>\$25,664,585.27</b>	<b>\$218,076,776.51</b>	<b>\$243,741,361.79</b>	
<b>Total Investment</b>	<b>\$15,467,763.67</b>			
<b>Market and Non-Market Return on Investment (dollar returned per dollar invested)</b>	<b>1.66</b>	<b>14.10</b>	<b>15.76</b>	

An investment of \$15,467,764 in the 2016 financial year creates approximately \$218,076,777 of net social impact over 40 years, resulting in an indicative SROI ratio of 14.10:1. In other words, the SROI analysis presents evidence that substantiates that for every dollar invested in reforestation in the Points-aux-Chenes WMA by Restore the Earth and corporate sponsors, \$14.10 is returned to community stakeholders in social value. Additionally, \$25,664,585 in direct market value is returned to Restore the Earth and corporate investors, a direct market return of \$1.66 for every dollar invested.

This SROI analysis is based on stakeholder consultation, previous research conducted by Restore the Earth, and secondary research. By integrating the guiding principles of SVI with those of the IIRC, this analysis focuses on the nature and quality of an organization's relationship with its key stakeholders including how and to what extent the organization recognizes and responds to their key stakeholder's needs and interests. Overall, SROI analysis shows that restoring historic cypress forest to the Pointe-aux-Chenes region of coastal Louisiana provides environmental and social returns. Despite the environmental uncertainties that accompany any effort to reforest parts of the coast, like the residents who continue to



live there despite the environmental risks, Restore the Earth and its partners' believe that investment in coastal Louisiana is of great importance to the state. As a participant from the Community Services and Outreach stakeholder group emphasized, any investment in environmental sustainability - public, private, or both - is also investments in the future of coastal Louisiana and future generations: "The kids would have that sense of value because they've seen the difference [reforestation can make] and they would want more out of it. It would probably bring more kids out to do more for their community. They will see that [reforestation] works. Right now nothing works. They've tried everything. But I think the tree planting with be the roots will hold the land and the people together" (Pointe-aux-Chenes interview 12/2016).

## 12.1. STAKEHOLDER REVIEW AND VERIFICATION OF RESULTS

The Water Institute of the Gulf was contracted by Restore the Earth Foundation to gather data and produce the enclosed report on the Social Return on Investment for Pointe-aux-Chenes WMA. The Water Institute recommends that Restore the Earth Foundation shares the initial results of this forecast study with stakeholders involved prior to the distribution of this report and/or abridged forms of this report to potential new funders and clients. This will ensure that stakeholders have an opportunity to review the study's findings - specifically the theory of change, range of outcomes, and relative value of outcomes.

The Water Institute can provide the name and contact information of stakeholders should Restore the Earth Foundation decide to maintain contact with stakeholders in the future to review the forecast and, eventually, the evaluation of this project. It is suggested that Restore the Earth Foundation present to stakeholders in a public meeting format, in simple and clear language, the results of this study. At least 3 meetings of this sort would be sufficient at the beginning (year 1), mid-point (year 5), and end of the reforestation (year 10). The Water Institute also recommends conducting follow-up stakeholder engagement - via focus group and interviews - at several intervals through the 40 year forecast period so as to maintain accurate and up-to-date data for their EcoMetrics model. This will ensure that participants and the broader stakeholder community will have an opportunity to participate in and review results from this initial SROI study and from the ongoing forecasts of the EcoMetrics model.

## 12.2. RECOMMENDATIONS

The SROI analysis identified several areas where Restore the Earth and its partners can improve their operations and better demonstrate the social value that the Pointe-aux-Chenes reforestation project creates in local communities and the broader region.

- *Continued stakeholder engagement.* This SROI analysis has demonstrated the value of formally engaging with local and regional community members who are potentially going to be impacted by the reforestation of the Pointe-aux-Chenes project site in order to understand from their perspective what will change and how they value that change. To establish the long-term impact of the reforestation project on these local and regional stakeholders, Restore the Earth should continue to stay in engaged with participants from Pointe-aux-Chenes as the project progresses and repeat the stakeholder engagement in the future.
- *Communicate the impact.* The SROI analysis reveals several impacts that cypress forest reforestation can have on coastal residents, locally and regionally. Many of these impacts may be readily apparent to local stakeholders, such as the physical alteration of the landscape while other impacts, such as the management of carbon, phosphorus, and nitrogen, may be less apparent. It is contingent on Restore the Earth to communicate the results of the reforestation project to impacted stakeholders and potential investors in coastal restoration and reforestation projects to



demonstrate the outcomes achieved by the project. Restore the Earth should also assure that collected information be shared with LDWF managers of the Pointe-aux-Chenes WMA.

- *Measure the outcomes of the reforestation project.* Use the methodology and lessons learned from this analysis to monitor the outcomes of the Pointe-aux-Chenes reforestation project, using the theory of change as the framework from which to identify expected and unexpected outcomes. Restore the Earth should engage with stakeholders at the start of the project and at regular intervals to understand the social value creation process over time.



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# Appendix 1 – Stakeholder Engagement Facilitator Guide

Pointe-aux-Chenes Reforestation Meeting  
Monday, Nov. 7th 2016  
6-8pm  
Chauvin, LA

## Facilitator Guide

**Facilitators:** Please use these questions to help guide conversation at your table. In addition to this, please encourage participants to mark places of value or concern on the maps (they can mark or you can if they would rather not).

Please try to get as much detail out of people as possible. Ask them where, why, or how they see or understand particular values, outcomes, changes and concerns.

Note takers: Please make sure that all the topics here are covered. Also be sure to have a device **recording** your table’s conversation and periodically check the device during meeting to be sure you are recording.

## Introduction to exercise

**Facilitators,** please explain what we will be doing and the kinds of questions we will ask. Make sure to note that we will be **recording** and that responses will be **anonymous**. The discussion should take about 30-45 minutes. We are looking for as much detail as possible. Also explain that this is a **forecast [SVI 2.1]** kind of workshop, where we are asking about expectations and future impacts of reforestation. We can draw on past experiences with other projects, but we will mainly be talking about expectations. There are no right or wrong answers. Your input will help us to figure out what to look for in the future for managing the current reforestation projects as well as potential new ones.

## How to use the maps

Please encourage participants to mark places of use, value, or concern on the maps (they can mark or you can if they would rather not). Also note important locations in the WMA that they utilize. Having actual indications of places of use, value, concern, or impact will be helpful for future efforts to map reforestation projects and change.

## Introductory questions

### Identifying stakeholders [SVI 1.1]

Please tell us your name and what made you decide to come to this meeting. What kind of ‘stakeholder’ do you think you are or represent?

What is your relationship to the Pointe-aux-Chenes WMA and surrounding environment?

How would you ideally like to describe Pointe-aux-Chenes 50 years from now?

### Establishing the baseline situation [SVI 1.1]

*This part of the conversation will be used to discuss participant's' relationship to the existing WMA area, pre reforestation project. It will also ask about past restoration projects and their experiences with them.*

How do you use the WMA now? How does it impact you as a community member and as a certain kind of 'stakeholder' (gov't, LDWF, community leader, educator, researcher) ○ You visit it regularly for fishing, hunting, or recreation?

- You or your family has personal ties to the area?
- You are employed by the WMA in some way? ○ Your work is directly connected to the WMA?
- You don't really use the WMA

Have you seen other reforestation and ecosystem restoration projects in the area?

For example: CWPPRA, CPRA, BTNEP, CRLC projects, etc.

- What are your thoughts or experiences with them?
- Has it impacted you directly? Changing hunting, birdwatching, fishing?
- Changed your job?
- Marginally related to your work and life?

What do you think would happen to the area **without** restoration and reforestation projects? [ SVI 2.6.1]

### Defining outcomes [SVI 1.2]

*In this part, we want to ask you all about what you think the outcomes of this kind of restoration project in Pointe-aux-Chenes. We'd like you to respond in terms of the kinds of perspectives you represent - as a teacher, hunter, resident, indigenous community leader, etc. We realize that most of you occupy more than one 'stakeholder' position. As best you can, please speak to the range of perspectives you have, letting us know which you are referring to [SVI 2.2.1]. We will also want to get details of how you might recognize particular outcomes. Remember this is thinking about the future, but we're hoping you can base your input on what you have seen and learned in the past.*

When you first hear about restoration projects like the cypress planting on the WMA, what are your immediate thoughts?

For example: You generally support it; you are really excited; you feel a bit skeptical; you don't think it will change the area much.

*Restoration projects can have all sorts of outcomes. We'd like to know some of the different ones you foresee with a project here in Point aux Chenes. These can range from expected, unexpected, positive, and negative outcomes [SVI 2.2.2]*

What do you think the outcome of the reforestation project will be? If we can, let's discuss this in terms of these categories:

- 1) Personal value (family and cultural heritage)
- 2) Economic value (commercial and subsistence hunting and fishing; local business)
- 3) Recreational value (hunting, fishing, eco-tourism)
- 4) Educational value (for k-12 schools and researchers)
- 5) Environmental restoration and conservation
- 6) Coastal protection (local and regional)
- 7) Other (health, housing value, etc)

How do you think the area would change over time as a result of reforestation? How do you think it would be used differently?

- Can you tell us how a certain outcome happens? [SVI 2.3]
- What would be an indication of an outcome? [SVI 2.4]

Do outcomes change over time? As the site changes and grows, does it impact who uses it differently? [SVI 1.3 & 2.3]

For example, how is reforestation linked to less or more duck hunting? Better storm protection? Increased or decreased housing values? Is this different 5 years from now versus 10 or 15 years from now?

Do certain outcomes impact groups differently?

For example, what does more cypress forest growth mean for alligator hunters as opposed to birdwatchers? What about for education or research purposes?

What would the impacts of the reforestation be to your personal use of the WMA? [SVI 2.6.1]

What about as a member of some of the above-mentioned groups?

Do you directly or indirectly contribute anything to the reforestation efforts through your activities as a member of one of the groups? [SVI 3.1]

For example, do you plan to do a volunteer planting if offered? Will activities you participate in be enhanced the reforestation?

### Deadweight, drop off, attribution [SVI 1.3 & 2.2.2]

*In this part of our discussion, we want to talk about what possible neutral, unexpected or negative outcomes might occur associated with the reforestation. To address these types of questions, begin with a conversation on how the stakeholders see the usage of the site changing as the restoration project takes hold and begins to thrive. In other words, as the cypress trees begin to mature and grow, how will that impact the usage of the site. This conversation will then shift towards a discussion of the types of circumstances where stakeholders see site use decline.*

What possibilities are there for reduced or increased usage over time and for whom?

What kinds of uses might drop off or change over time?

Do you think it might have unintended negative impacts or outcomes over time?

### Wrapping-up

If you could change the project, how would you change it?

What are the ideal outcomes of reforestation for you personally and for the Terrebonne community?

Do you have any recommendations for managing the project in the future?

How best do you think we can use the information we discussed tonight?

**Anything we missed or need to incorporate into this discussion?**

**Scott and Taylor will discuss where we go from here with the information gathered from this meeting.**

## Appendix 2 – Stakeholder Survey

### Pointe-aux-Chenes WMA

This survey is designed to gather input on your usage of the Pointe-aux-Chenes WMA and the ways the Restore the Earth Foundation Cypress Reforestation project will impact the value and use of the Pointe-aux-Chenes WMA.

**1. Name**

.....

**2. Please list your contact information**

.....

**3. What ‘stakeholder’ group do you belong to? Please indicate your primary and secondary group affiliations. *Check all that apply.***

- Community Stakeholder (general)
- State/Federal Wildlife Manager
- Local Government
- Community services and outreach
- Education and Research
- Volunteer
- National Conservation Group
- Employed by Restoration
- User - Hunting, Fishing, trapping, etc.
- User - Boating, Paddling, Photography, Birdwatching
- Local Business
- Landowner
- Indigenous community
- Other: .....

**4. Can you describe your primary stakeholder position?**

.....

**5. What are you or your organization's current hunting, fishing, or trapping uses of the WMA? *Check all that apply.***

- Fishing
- Crabbing
- Duck hunting
- Trapping
- Frogging
- Crawfishing
- Commercial fishing
- Commercial crabbing
- Alligator hunting
- Other: .....

**6. How often do you or your organization use the WMA for these activities?**

*Check all that apply.*

- Once a year
- 2-5 times per year
- More than 5 times per year
- On a weekly basis
- Other: .....

**7. What are you or your organization's current recreational uses of the WMA?**

*Check all that apply.*

- Business (landowner, contractor, conservation organization, small business hunting/fishing)
- Employment (state and federal wildlife management)
- Shooting
- Birdwatching
- Camping
- Boating
- Sight seeing
- Education
- Research
- Kayaking / Paddling
- Other: .....

**8. How often do you or your organization use the WMA for these activities?**

*Check all that apply.*

- Once a year
- 2-5 times per year
- More than 5 times per year
- On a weekly basis
- Other: .....

## Current value of the Pointe-aux-Chenes WMA

Please answer the following questions from the perspective of your 'stakeholder' position (e.g. as a hunter, LDWF, resident, member of an indigenous community, etc.).

**9. On a scale of 1 to 5, please rate the economic value of the WMA to you or your organization.**

Including commercial fishing and hunting, local business, and tourism.  
*Mark only one oval.*

	1	2	3	4	5	
The WMA has no economic value.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	The WMA has significant economic value.

**10. If you answered 2-5, can you specify particular economic values?**

.....

**11. On a scale of 1 to 5, what is the recreational value of the WMA to you or your organization?**

Including: Fishing, hunting, ecotourism, birding, camping, boating, etc.  
*Mark only one oval.*

	1	2	3	4	5	
There is no recreational value.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	The recreational value is significant.

**12. If you answered 2-5, can you specify particular recreational values?**

.....

**13. On a scale of 1-5, what is the cultural value of the WMA to you or your organization?**

Including: Cajun and indigenous culture, historical significance, family traditions, etc.  
*Mark only one oval.*

	1	2	3	4	5	
There is no cultural value to the WMA.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	There is significant cultural value to the WMA.

14. **If you answered 2-5, can you specify particular cultural values?**

.....

15. **On a scale of 1-5, what is the education and research value of the WMA to you or your organization?**

Including: K-12 education, university education, natural and social science research, adult education. *Mark only one oval.*

	1	2	3	4	5	
The WMA has no educational or research value.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	The WMA has tremendous educational and research value.

16. **If you answered 2-5, can you specify particular education and research uses?**

.....

17. **On a scale of 1-5, what is the ecological value of the WMA to you or your organization?**

Including: Habitat protection, environmental quality, restoration, and conservation. *Mark only one oval.*

	1	2	3	4	5	
The WMA has no ecological value.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	The WMA has tremendous ecological value.

18. **If you answered 2-5, can you specify particular ecological values of the WMA?**

.....

19. **On a scale of 1-5, what is the coastal protection value of the WMA to you or your organization?**

Including: Storm surge reduction, water retention, wave attenuation, wind buffer, etc. *Mark only one oval.*

1      2      3      4      5



---

The WMA provides no coastal protection.      The WMA provides tremendous coastal protection.

---

20. **If you answered 2-5, can you specify particular storm protection values of the WMA?**

.....

## Impacts of reforestation project on WMA

Please answer the following questions from the perspective of your 'stakeholder' position (e.g. as a hunter, LDWF, resident, member of an indigenous community, etc.).

21. **On a scale of 1-5, what are the economic impacts of reforestation to you or your organization?**  
 Including commercial fishing and hunting, local business, and tourism.  
*Mark only one oval.*

1          2 3          4          5

---

No impact.      Tremendous impact.

---

22. **If you answered 2-5, can you specify particular economic impacts?**

.....

23. **On a scale of 1-5, what are the recreational impacts of reforestation to you or your organization?**  
 Including: Fishing, hunting, ecotourism, birding, camping, boating, etc.  
*Mark only one oval.*

1          2 3          4          5

---

No impact      Significant impact

---

24. **If you answered 2-5, can you specify particular recreational impacts?**

.....

25. **On a scale of 1-5, what are the cultural impacts of reforestation to you or your organization?**  
 Including: Cajun and indigenous culture, historical significance, family traditions, etc.  
*Mark only one oval.*

	1	2	3	4	5	
No impact	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Significant impact

26. **If you answered 2-5, can you specify particular cultural impacts?**

.....

27. **On a scale of 1-5, what are the education and research impacts of reforestation to you or your organization?**

Including: K-12 education, university education, natural and social science research, adult education. *Mark only one oval.*

	1	2	3	4	5	
No impact	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Significant impact

28. **If you answered 2-5, can you specify particular education and research impacts?**

.....

29. **On a scale of 1-5, what are the ecological impacts of reforestation to you or your organization?**

Including: Habitat protection, environmental quality, restoration, and conservation. *Mark only one oval.*

	1	2	3	4	5	
No impact	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Significant impact

30. **If you answered 2-5, can you specify particular ecological impacts?**

.....

31. **On a scale of 1-5, what are the coastal protection impacts of reforestation to you or your organization?**

Including: Storm surge reduction, water retention, wave attenuation, wind buffer, etc. *Mark only one oval.*

	1	2	3	4	5	
No impact	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Significant impact

32. If you answered 2-5, can you specify particular coastal protection impacts?

.....

## Changing use of the WMA

Please answer the following questions from the perspective of your 'stakeholder' position (e.g. as a hunter, LDWF, resident, member of an indigenous community, etc.).

33. On a scale of 1-5, what is the likelihood that you or your organization's use of the WMA will increase as a result of the reforestation? *Mark only one oval.*

	1	2	3	4	5	
My use will not change.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	I will use the WMA much more frequently.

34. If you marked 2-5 for above, please check which hunting, fishing, or trapping activities would change for you or your organization: *Check all that apply.*

- Fishing
- Crabbing
- Duck hunting
- Trapping
- Frogging
- Crawfishing
- Commercial fishing
- Commercial crabbing
- Alligator hunting
- Other: .....

35. What would the frequency of your or your organization's use change to? *Check all that apply.*

- Once a year
- 2-5 times per year
- More than 5 times per year
- On a weekly basis
- Other: .....

36. **If you marked 2-5 for above, please check which recreational activities would change for you or your organization:** *Check all that apply.*

- Business (landowner, contractor, conservation organization, small business hunting/fishing)
- Employment (state and federal wildlife management)
- Birdwatching
- Camping
- Boating
- Sight seeing
- Education
- Research
- Kayaking / Paddling
- Shooting

Other: .....

37. **What would the frequency of your or your organization's use change to?**

*Check all that apply.*

- Once a year
- 2-3 times per year
- More than 5 times per year
- On a weekly basis
- Other: .....

## Assessing monetary values of reforestation

It costs \$3,000 per acre in corporate donations to restore the site. The total cost to restore the site will be \$X. With this in mind, please answer the following questions.

38. **Is this a good use of corporate donations to the region?**

39. **Is this project important enough that it would be worth more than the current donations? If so, how much more?**

.....

40. Do you think this project costs too much money and some of the funds should be used for other purposes? What purposes? How much?

.....

41. How much would you be personally willing to give to visit the WMA today? *Mark only one oval.*

- No Contribution
- \$1
- \$2 - \$5
- \$6 - \$10
- \$10+
- Other: .....

42. How much would you be personally willing to give to visit the WMA after reforestation? *Mark only one oval.*

- No Contribution
- \$1
- \$2 - \$5
- \$6 - \$10
- \$10+
- Other: .....

## Drop-off, deadweight, attrition

Please answer the following questions from the perspective of your 'stakeholder' position (e.g. as a hunter, LDWF, resident, member of an indigenous community, etc.).

43. On a scale of 1-5, what is the likelihood that you or your organization will use the WMA less often after reforestation? *Mark only one oval.*

	1	2	3	4	5	
No change in use	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	I will use the WMA much less frequently.

44. **If you answered 2-5 above, what hunting, fishing, or trapping uses of the WMA do you or your organization think would decrease?** *Check all that apply.*

- Fishing
- Crabbing
- Duck hunting
- Trapping
- Frogging
- Crawfishing
- Commercial fishing
- Commercial crabbing
- Alligator hunting
- Other: .....

45. **Why would this decrease happen?**

.....

46. **If you answered 2-5 above, what recreational uses of the WMA do you or your organization think would decrease?** *Check all that apply.*

- Business (landowner, contractor, conservation organization, small business hunting/fishing)
- Employment (state and federal wildlife management)
- Birdwatching
- Camping
- Boating
- Sight seeing
- Education
- Research
- Kayaking / Paddling
- Shooting
- Other: .....

47. **Why would this decrease happen?**

.....

- 48. **What other unexpected or unanticipated factors might result in a drop-off of use for the WMA after reforestation?**
- 49. **Considering the various kinds of outcomes of this reforestation project, what do you think the most direct outcome will be for you or your organization?**

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