





# West Gilgo to Captree NY Rising Community Reconstruction Plan

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This document was developed by the NY Rising Community Reconstruction (NYRCR) West Gilgo to Captree Planning Committee as part of the NY Rising Community Reconstruction (NYRCR) Program within the Governor's Office of Storm Recovery. The NYRCR Program is supported by New York State (NYS) Homes and Community Renewal, NYS Department of State, and NYS Department of Transportation. The document was prepared by the following consulting firms: Jacobs and Cameron Engineering.

**JACOBS**



CAMERON ENGINEERING  
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## Foreword

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### Introduction

In the span of approximately one year, beginning in August 2011, the State of New York experienced three extreme weather events. Hurricane Irene, Tropical Storm Lee, and Superstorm Sandy wreaked havoc on the lives of New Yorkers and their communities. These tragic disasters signaled that New Yorkers are living in a new reality defined by rising sea levels and extreme weather events that will occur with increased frequency and power. They also signaled that we need to rebuild our communities in a way that will mitigate against future risks and build increased resilience.

To meet these pressing needs, Governor Andrew M. Cuomo led the charge to develop an innovative, community-driven planning program on a scale unprecedented and with resources unparalleled. The NY Rising Community Reconstruction (NYRCR) Program empowers the State's most impacted communities with the technical expertise needed to develop thorough and implementable reconstruction plans to build physically, socially, and economically resilient and sustainable communities.

### Program Overview

The NYRCR Program, announced by Governor Cuomo in April of 2013, is a more than \$650 million planning and implementation process established to provide rebuilding and resiliency assistance to communities severely damaged by Hurricane Irene, Tropical Storm Lee, and Superstorm Sandy. Drawing on lessons learned from past recovery efforts, the NYRCR Program is a unique combination of bottom-up community participation and State-provided technical expertise. This powerful combination recognizes not only that community members are best positioned to assess the needs and opportunities of the places where they live and work, but also that decisions are best made when they are grounded in rigorous analysis and informed by the latest innovative solutions.

One hundred and two storm-affected localities across the State were originally designated to participate in the NYRCR Program. The State has allocated each locality between \$3 million and \$25 million to implement eligible projects identified in the NYRCR Plan. The funding for these projects is provided through the U.S. Department of Housing and Urban Development (HUD) Community Development Block Grant – Disaster Recovery (CDBG-DR) program.<sup>1</sup>

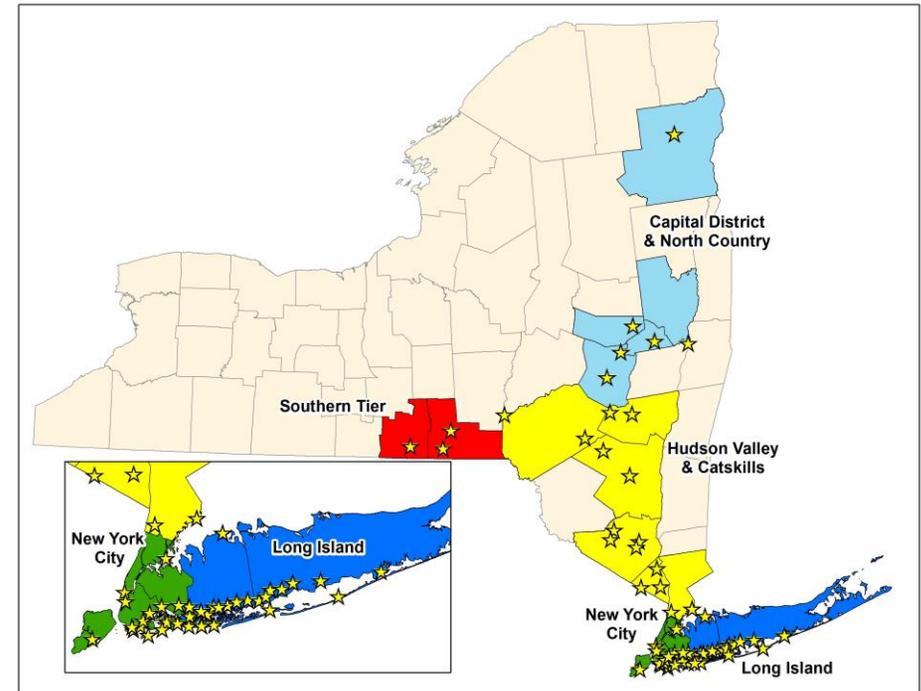
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<sup>1</sup> Five of the 102 localities in the program—Niagara, Herkimer, Oneida, Madison, and Montgomery Counties—are not funded through the CDBG-DR program.



# West Gilgo to Captree NY Rising Community Reconstruction Plan

Forty-five NYRCR Communities, each comprising one or more of the 102 localities, were created and led by a NYRCR Planning Committee composed of local residents, business owners, and civic leaders. Members of the Planning Committees were identified in consultation with established local leaders, community organizations, and in some cases municipalities. The NYRCR Program sets a new standard for community participation in recovery and resiliency planning, with community members leading the planning process. Across the State, more than 500 New Yorkers represent their communities by serving on Planning Committees. More than 400 Planning Committee Meetings have been held, during which Planning Committee members worked with the State's NYRCR Program team to develop community reconstruction plans and identify opportunities to make their communities more resilient. All meetings were open to the public. An additional 125-plus Public Engagement Events attracted thousands of community members, who provided feedback on the NYRCR planning process and proposals. The NYRCR Program's outreach has included communities that are traditionally underrepresented, such as immigrant populations and students. All planning materials are posted on the NYRCR Program's website ([www.stormrecovery.ny.gov/nyrcr](http://www.stormrecovery.ny.gov/nyrcr)), providing several ways for community members and the public to submit feedback on materials in progress.



Map includes those NYRCR Communities funded through the CDBG-DR program, including the NYRCR Communities announced in January 2014.

(More info. on NYRCR Program at: [www.stormrecovery.ny.gov/nyrcr](http://www.stormrecovery.ny.gov/nyrcr))

Throughout the planning process, Planning Committees were supported by staff from the Governor's Office of Storm Recovery (GOSR), planners from New York State (NYS) Department of State (DOS) and NYS Department of Transportation (DOT), and consultants from world-class planning firms that specialize in engineering, flood mitigation solutions, green infrastructure, and more.

With the January 2014 announcement of the NYRCR Program's expansion to include 22 new localities, the program comprises over 2.7 million New Yorkers and covers nearly 6,500 square miles, which is equivalent to 14% of the overall State population and 12% of the State's overall geography.



# West Gilgo to Captree NY Rising Community Reconstruction Plan

The NYRCR Program does not end with this NYRCR Plan. Governor Cuomo has allocated over \$650 million of funding to the program for implementing projects identified in the NYRCR Plans. NYRCR Communities are also eligible for additional funds through the program's NY Rising to the Top Competition, which evaluates NYRCR Communities across eight categories, including best use of technology in the planning process, best approach to resilient economic growth, and best use of green infrastructure to bolster resilience. The winning NYRCR Community in each category will be allocated an additional \$3 million of implementation funding. The NYRCR Program is also working with both private and public institutions to identify existing funding sources and create new funding opportunities where none existed before.

The NYRCR Program has successfully coordinated with State and Federal agencies to help guide the development of feasible projects. The program has leveraged the Regional Economic Development Council's State Agency Review Teams (SARTs), comprised of representatives from dozens of State agencies and authorities, for feedback on projects proposed by NYRCR Communities. The SARTs review projects with an eye toward regulatory and permitting needs, policy objectives, and preexisting agency funding sources. The NYRCR Program is continuing to work with the SARTs to streamline the permitting process and ensure shovels are in the ground as quickly as possible.

On the pages that follow, you will see the results of months of thoughtful, diligent work by NYRCR Planning Committees, passionately committed to realizing brighter, more resilient futures for their communities.

## The NYRCR Plan

This NYRCR Plan is an important step toward rebuilding a more resilient community. Each NYRCR Planning Committee began the planning process by defining the scope of its planning area, assessing storm damage, and identifying critical issues. Next, the Planning Committee inventoried critical assets in the community and assessed the assets' exposure to risk. On the basis of this work, the Planning Committee described recovery and resiliency needs and identified opportunities. The Planning Committee then developed a series of comprehensive reconstruction and resiliency strategies, and identified projects and implementation actions to help fulfill those strategies.

The projects and actions set forth in this NYRCR Plan are divided into three categories. The order in which the projects and actions are listed in this NYRCR Plan does not necessarily indicate the NYRCR Community's prioritization of these projects and actions. **Proposed Projects** are projects proposed for funding through a NYRCR Community's allocation of CDBG-DR funding. **Featured Projects** are projects and actions that the Planning Committee has identified as important resiliency recommendations and has analyzed in depth, but has not proposed for funding through the NYRCR Program. **Additional Resiliency Recommendations** are projects and actions that the Planning Committee would like to highlight and that are not categorized as Proposed Projects or Featured Projects. The Proposed Projects and Featured Projects found in this NYRCR Plan were voted for inclusion by official voting members of the Planning Committee. Those voting members with conflicts of interest recused themselves from voting on any affected projects, as required by the NYRCR Ethics Handbook and Code of Conduct.



## West Gilgo to Captree NY Rising Community Reconstruction Plan

NYRCR West Gilgo to Captree is eligible for up to \$3 million in CDBG-DR implementation funds.

While developing projects for inclusion in this NYRCR Plan, Planning Committees took into account cost estimates, cost-benefit analyses, the effectiveness of each project in reducing risk to populations and critical assets, feasibility, and community support. Planning Committees also considered the potential likelihood that a project or action would be eligible for CDBG-DR funding. Projects and actions implemented with this source of Federal funding must fall into a Federally-designated eligible activity category, fulfill a national objective (meeting an urgent need, removing slums and blight, or benefiting low to moderate income individuals), and have a tie to the natural disaster to which the funding is linked. These are among the factors that the Governor's Office of Storm Recovery will consider, in consultation with local municipalities and nonprofit organizations, when determining which projects and actions are best positioned for implementation.

The total cost of Proposed Projects in this NYRCR Plan exceeds the NYRCR Community's CDBG-DR allocation to allow for flexibility if some Proposed Projects cannot be implemented due to environmental review, HUD eligibility, technical feasibility, or other factors. Implementation of the projects and actions found in this NYRCR Plan are subject to applicable Federal, State, and local laws and regulations, including the Americans with Disabilities Act (ADA). Inclusion of a project or action in this NYRCR Plan does not guarantee that a particular project or action will be eligible for CDBG-DR funding or that it will be implemented. The Governor's Office of Storm Recovery will actively seek to match projects with funding sources.

In the months and years to follow, many of the projects and actions outlined in this NYRCR Plan will become a reality helping New York not only to rebuild, but also to build back better.



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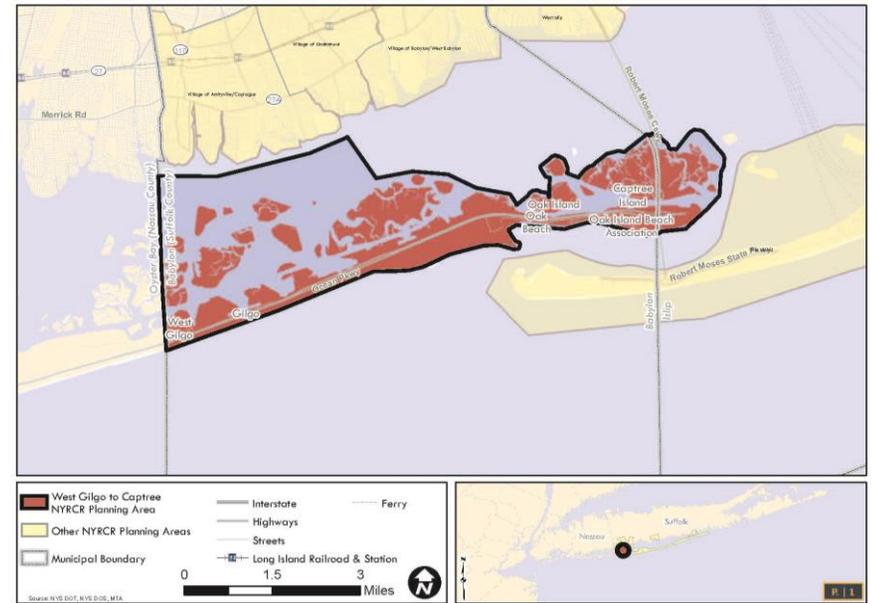
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## Executive Summary

*The NY Rising Community Reconstruction (NYRCR) West Gilgo to Captree Community (Community) encompasses six distinct barrier beach communities: West Gilgo, Gilgo, Oak Beach, Oak Island, Oak Island Beach Association, and Captree Island. All of the communities are located on Jones Beach Island, with the exceptions of Oak Island and Captree Island, which lie just north of Oak Beach in the Great South Bay. All of the communities are located in the Town of Babylon, except for the eastern portion of Captree Island, which lies in the Town of Islip.*

*As part of the ongoing recovery from Superstorm Sandy, the NYRCR West Gilgo to Captree Committee (Committee) took on the responsibility of developing a plan that laid the groundwork for the barrier island Community's resilient future. The Committee was comprised of a cross-section of the Community including local residents, leaders of local community organizations, and municipal representatives. The Committee's Chair was selected by the State in consultation with the Community. With members of all six barrier island communities involved, and with the help of New York State, the Committee has produced a pragmatic recovery and resiliency plan.*



Geographic scope of NYRCR West Gilgo to Captree planning area.  
(Map Source: Jacobs)

### Overview

The NYRCR West Gilgo to Captree Community is one of eight NYRCR Communities identified within Suffolk County. The name "West Gilgo to Captree" succinctly describes the geographic scope of the NYRCR Community from the westernmost community, West Gilgo, to the easternmost community, Captree Island. The six communities are spread out along 10 miles of barrier island coastline and on three separate islands. The communities fall within two different Towns—Islip and Babylon—and two different U.S. Census Designated Places (CDPs). Combined, the two CDPs are comprised of 417 residents in 7.8 square miles. (Census figures presumably reflect year-round residents.) Up to \$3 million has been allocated for resiliency projects within this Community.



## West Gilgo to Captree NY Rising Community Reconstruction Plan

NYRCR West Gilgo to Captree is a natural and scenic refuge and a vibrant, rural seaside community barely one mile as the crow (or seagull) flies from some of the nation's most populated South Shore communities. Yet, the barrier beaches—and the unique way of life this coastal environment engenders—are a world apart.

On October 29, 2012, sweeping out of the darkened skies with unexpected speed and savagery, Superstorm Sandy put the barrier island's protective landscape of beaches, dunes, and wetlands to the test. Superstorm Sandy spared the lives of the residents, but storm surge combined with wind and wave action caused widespread flooding and erosion of shoreline protections and damaged critical communication and sanitary infrastructure. Flooding, erosion, and upheaval of Oak Beach Road, Captree Road and the eastbound lanes of Ocean Parkway left these roads impassable until sediment removal and emergency repairs could be made. Residents were left feeling isolated and vulnerable to fires and other emergencies that may require rapid response from the mainland. Within the community of Gilgo, 52 of the 57 homes suffered major flooding. Microwave and cellular communication towers and equipment were damaged either by wind or flooding, disabling communication. Power was unavailable for more than 40 days in some areas, and, with the exception of West Gilgo, the lack of electricity meant lack of fresh water. (West Gilgo has its own municipal water system, but homes in other communities are connected to small water supply systems or individual wells with no backup power.)

Storm impacts devastated natural resources as well, but reassuringly, also highlighted nature's resiliency. The Town of Babylon estimated that the section of beach from West Gilgo east to Gilgo lost over 1 million cubic yards of beach material. The storm also weakened the dune system; one year after Superstorm Sandy, in October 2013, high winds from a coastal storm caused a football field-sized section of dunes in front of Gilgo Beach to collapse, leaving the Community even more exposed and susceptible in the midst of hurricane season. Even in the face of this destruction, Superstorm Sandy provided for some natural replenishment. The influx of fresh ocean water into the Great South Bay has led to improved water quality and a revival of the bay's ecology. The marshes of Captree Island, Oak Island, and across the northern shoreline of NYRCR West Gilgo to Captree provide a tremendous benefit to the barrier islands and mainland Long Island by slowing down and absorbing wave energy and reducing flooding.



A home lifted up and moved off of its pilings as a result of Superstorm Sandy's storm surge.  
(Photo Credit: NYRCR Committee)



A beach tunnel, regularly eight-feet in height, is nearly filled with sand after Superstorm Sandy.  
(Photo Credit: NYRCR Committee)



# West Gilgo to Captree NY Rising Community Reconstruction Plan

These documented effects, combined with the first-hand experiences shared by the Committee and residents at multiple well-attended public engagement events led to the identification of several critical issues facing the Community related to its recovery from Superstorm Sandy as well as future resiliency needs. These issues are indicative of the severe damage that the Community has suffered during Superstorm Sandy as well as the recurring flooding and resiliency issues that happen on a regular basis. These issues also served to define needs, opportunities, strategies, and eventually projects that would help make the Community more resilient and sustainable. Critical issues included:

- Commitment to conservation and rehabilitation of the natural barrier island landscape of dunes and beaches that protects inland Long Island, including the marshes of the Great South Bay;
- Evaluation and implementation of the best long-term means and methods of beach replenishment and dune restoration;
- Storm preparedness and communication of risk to all members of the barrier island communities;
- Hazard mitigation measures for utilities that are critical in the aftermath of an event—electricity, water, and communications;
- Improvements to fire mitigation and efficiency and access of fire response services, where current deficiencies pose risks following a disaster, as well as on a day-to-day basis; and
- Recognition of and attention to maintaining the unique character of the barrier island communities while making communities safer for years to come.

## ***NY Rising: A Community-Driven Process***

The Community's goal is "building back better." During many Committee meetings as well as Public Engagement Events, Committee members and the public drew on their own experiences and on input from their neighbors to formulate a future vision of a more resilient future on the barrier islands. The Community vision statement represents a consensus assessment of the direction towards which this Community wishes to move. The NYRCR Committee and residents together developed a vision statement that reflects the philosophy to be embraced in order to create a safe and resilient community 10-, 20-, and 50-years in the future. All strategies and projects identified were measured against the Community vision statement to ensure that recommended actions would not detract from the Community's ability to achieve its desired goals.



Residents enjoy Oak Beach Park on a sunny fall day. (Photo Credit: Jacobs)

## ***COMMUNITY VISION STATEMENT:***

*Restore, preserve and protect the natural resources that serve to provide habitat to a biologically diverse coastal ecosystem as well as to fortify the barrier island shielding the south shore of Long Island against storms. The priority is to improve storm preparedness while striving to retain and protect the culture and assets that make the barrier beach communities unique and desirable to both residents and visitors.*



## West Gilgo to Captree NY Rising Community Reconstruction Plan

In keeping with Governor Cuomo's emphasis on bottom-up planning, members of the Community were involved in each step of the NYRCR Program. The NYRCR Committee was composed of residents who could speak directly from experience of the character of the community, its needs, and strengths in good times and bad. Ten Committee meetings were held as of March 15, 2014. All Committee meetings were open to the public, with meeting dates and times posted on the NYRCR website ([www.stormrecovery.ny.gov/nyrcr](http://www.stormrecovery.ny.gov/nyrcr)). Comment forms were available at Committee meetings and public engagement events and on the State's website to provide an opportunity for the public to contribute their feedback, which was then passed along to the Committee.

The Community at-large was invited to take part in the NYRCR Program through a variety of methods. Their feedback was reviewed by the Committee and incorporated into the decision-making process that informed the development of this NYRCR Plan. Three well-attended, open-house style events were held during the development of the plan and a fourth will present this final document. Across the eight NYRCR Communities in Suffolk County, thousands of participants attended Committee meetings and Public Engagement Events. Additionally, the public was encouraged to complete a web-based survey to gauge public opinion on the Proposed Projects in conjunction with the third Public Engagement Event. Special efforts were also taken to reach out to younger members of the community. They were invited to participate in a web-based "Next Generation" survey to gather feedback on Proposed Projects that would likely affect their futures in the Community.

### *NYRCR Final Plan: A Blueprint for Resiliency*

An asset inventory was conducted for the Community to identify assets, both built and natural, which are critical to the safety, resiliency, and character of the barrier islands. The identified assets were evaluated in detail to understand their level of risk or potential for damage to future storm events. Identification of risks to critical assets provided the framework within which resiliency strategies were developed. Strategies are general approaches to types of projects, programs, policies, or other actions that specifically address an identifiable need or leverage an existing opportunity within the Community. For every need or opportunity, potential strategies were generated for each resiliency issue. The Committee revised and improved these strategies, and gradually defined their scopes into projects (see Figure ES-1). The list of projects spanned an array of methodologies and timeframes, from preparedness to retrofits, from immediate procedural improvements to long-range capital investment programs.



Oak Island Marina with Oak Island in the background. Oak Island is accessible only by boat. (Photo Credit: Jacobs)

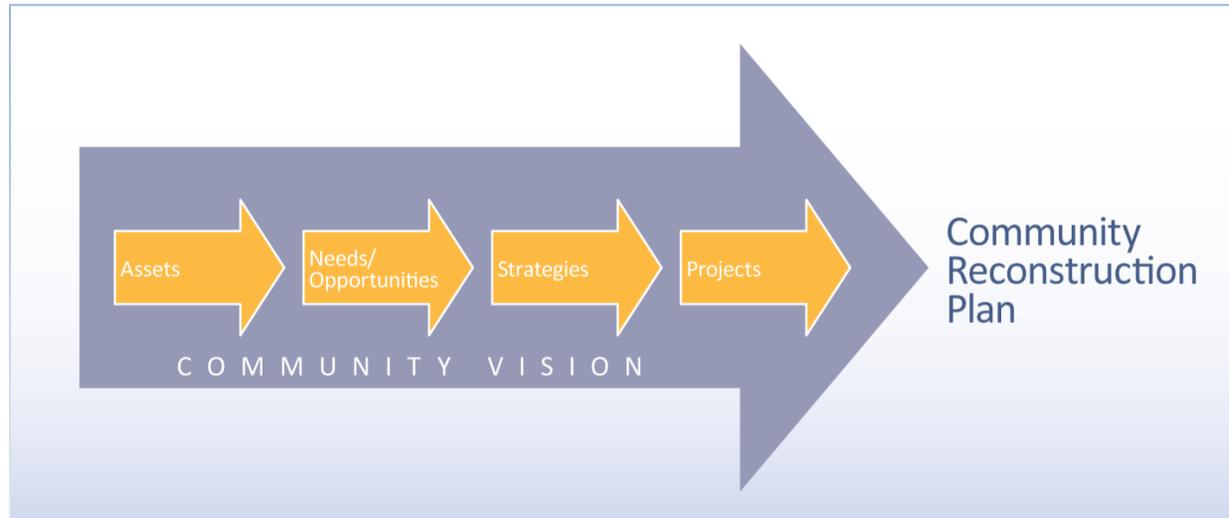
*"The preeminent challenge is how to most effectively maintain the integrity of these barrier beaches."*

—NYRCR West Gilgo to Captree  
Committee Member



# West Gilgo to Captree NY Rising Community Reconstruction Plan

Figure ES-1: What is a Community Reconstruction Plan?



Three tiers of projects were identified: Proposed Projects, Featured Projects, and Additional Resiliency Recommendations. It is important to note that there is no priority order or ranking of projects aside from the project tier.

- *Proposed Projects* are projects proposed for funding through a NYRCR Community's allocation of CDBG-DR funding.
- *Featured Projects* are innovative projects where an initial study or discrete first phase of the project is proposed for CDBG-DR funding or other identified funding.
- *Additional Resiliency Recommendations* are projects that the Committee would like to highlight, but which the Community will pursue independently or through other funding sources.



View from Captree State Park across Fire Island Inlet and the Robert Moses Causeway.  
(Photo Credit: Jacobs)



# West Gilgo to Captree NY Rising Community Reconstruction Plan

Table ES-1 below presents NYRCR West Gilgo to Captree’s Proposed and Featured Projects by strategy. In the months and years to follow, many of the projects and actions outlined in this NYRCR Plan will become a reality helping New York not only to rebuild, but also to build back better.

Table ES 1: NYRCR West Gilgo to Captree Proposed and Featured Projects		
Strategy	Project Name	Project Category
Improve communications and operations between various relevant entities during emergency management and evacuation/re-entry procedures.	Updates to Emergency Management Communications and Response Plan and Related Activities	Proposed
Mitigate power outages at key community facilities to increase resiliency.	Backup Power for Key Community Facilities	Proposed
Improve public safety services to reduce risk to residents.	Improvements to Fire Protection - Gilgo	Proposed
	Improvements to Potable Water and Fire Protection System - West Gilgo	Proposed
	Improvements to 911 GPS Data and Community Signage	Proposed
Protect shorelines to reduce flood risk and maintain evacuation routes.	Shoreline Stabilization - Oak Beach Phase I	Proposed
	Shoreline Stabilization - Captree Phase I	Proposed
Increase coastal protection through the restoration and enhancement of natural protective systems including dunes, beaches, and wetlands.	Enhancement of Wetlands	Proposed
	Strengthening of Dunes Feasibility Assessment	Proposed
	Strengthening of Dunes - Pilot Project	Featured



## Section I: Community Overview

*The NY Rising Community Reconstruction (NYRCR) West Gilgo to Captree Community (Community) encompasses six distinct barrier beach communities: West Gilgo, Gilgo, Oak Beach, Oak Island, Oak Island Beach Association (OIBA), and Captree Island. All of the communities are located on Jones Beach Island, with the exceptions of Oak Island and Captree Island, which lie just north of Oak Beach in the Great South Bay. All of the communities are located in the Town of Babylon, except for the eastern part of Captree Island, which lies in the Town of Islip.*

What is best about living on this or any barrier beach is also what's worst. On a clear day from West Gilgo to Captree Island visitors and residents alike can make out the spire of the Empire State Building, and on the busiest beach weekends the traffic on Ocean Parkway can be heard clearly. NYRCR West Gilgo to Captree is a natural and scenic refuge and a vibrant, rural seaside community barely one mile as the crow (or seagull) flies from some of the nation's most populated South Shore communities. Yet, the barrier beaches—and the unique way of life this coastal environment engenders—are a world apart.

The qualities that define NYRCR West Gilgo to Captree, however, also make this Community particularly vulnerable when nature raises its fury. The barrier beach where Robert Moses once called home is the first line of defense for the mainland against the wrath of Mother Nature. The Community's proximity to the ocean and its most basic infrastructure consisting of boardwalks, sandy paths, and narrow roads can be overwhelmed quickly by storm surge. Heavy winds and rising tides can incapacitate critical utilities, including electric, water, and sanitary services. Still, these risks do not outweigh the rewards of living this peaceful coastal life, and this commitment to seeing the residents through in good times and bad has come to define the character of this NYRCR Community.

NYRCR West Gilgo to Captree is a place with a deep and sometimes dangerous heritage. The sense of history is alive and well in the minds of the Community members. They are keenly aware and proud of the Community's role in the early development of the region's relationship with the ocean. Native Americans went whaling and summered off the shores, and later, slave traders and pirates used the coves to hide ships and contraband. Slave chains and caches of treasure have been found here. Rum



Historic postcard from Oak Beach. The first residents here leased land in 1878.



Residents enjoy a warm day at the Gilgo Beach Inn, one of the few commercial establishments in the Community.



## West Gilgo to Captree NY Rising Community Reconstruction Plan

Runners hid their wares in these dunes and marshes during prohibition. Some of these communities started as fishing and market gunning shacks. Colonial cattle were fed on rich salt grass. Walt Whitman lived near and swam these beaches and named his poetry collection "Leaves of Grass" after the Spartina grass.

### *Historic Context*

The earliest residents of the six communities that make up NYRCR West Gilgo to Captree settled in the late 1800s for exclusively recreational and residential purposes. In 1878, the Babylon Town Board authorized 18 Babylon residents to sign a 21-year lease to utilize lots on Oak Island. Soon, Babylon granted additional leases for other residential leases on both Oak Island and Oak Island Beach. In the early 1900s steam ferries brought residents and visitors between Oak Island and the Babylon docks. To this day, Oak Island is only accessible by boat and does not have power, sewer, or a public water system.

Captree is a State park on the eastern tip of Jones Beach Island. The island that shares its name, Captree Island, is the first island exit on the Robert Moses Causeway from West Islip to the barrier islands, a span that was completed in 1951. Postcards indicate that Captree was settled with summer cottages as early as the 1930s. Like Oak Island, Captree Island is entirely residential.

Heading east to west on Jones Beach Island, Oak Island Beach Association (OIBA) was granted its original lease in 1896 for a period of nine years with the understanding that at least 20 homes would be built before the lease expired. The Association was required to pay rent of \$100 per year, plus \$5 for each home constructed. Rent was to be paid on all property regardless of whether a house was built, an agreement that remains in effect to this day.<sup>i</sup>

According to legend, Gilgo is named after a famous fisherman named Gill Burch who lived on the mainland after the Civil War. When neighbors went fishing and wanted to ensure a good catch they would go where "Gill goes." Gilgo was the first home of the East Coast Surfing Championships from 1961 to 1964. Robert Moses owned a summer home in Gilgo until he died in 1981 at the age of 92.

West Gilgo, on the other hand, was settled under a different set of circumstances. The residents of High Hill Beach, a coastal community formerly located further west of NYRCR West Gilgo to Captree, were forced to relocate due to Robert Moses' creation of Jones Beach State Park. In the 1930s, some of the

*Life on the barrier islands can be as punishing as it is promising, a place where dreams have flourished and faltered for generations. In 1894, a minister built a community center large enough to seat 1,000 people; it stood seemingly safe on a high table of land with a spacious veranda on three sides. A year later, he picked July 4<sup>th</sup> for a grand opening with a clam bake, patriotic concert and fireworks. But the day dawned with torrential rains, and along with the voracious mosquitos and other problems, the minister soon abandoned his dream of a beachside religious retreat.*

—adapted from a history of  
Oak Island Beach<sup>i</sup>



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original houses were moved by barge eastward, while others were moved by road on the newly created Ocean Parkway and rebuilt at the site of West Gilgo. Some of the homes were also taken to Amityville and Oak Island.

With the exception of Oak Island, all of the beach communities saw increased development with the extension of the Robert Moses Causeway, which provided easy access to mainland Long Island.

### *Present Day*

The six communities are predominantly residential and the land is leased from the Trustees of the Town of Babylon to residents via long-term leases that will expire in the year 2065. The Town owns the land on which each lessee must construct and maintain a house, attached garage, and bulk-heading, boardwalk, or sidewalk depending on the leased parcel's location, all in accordance with the Town's specifications. The lessee pays rent for use of the land, but maintains full ownership and responsibility over the structures. All land that is not built upon, including boardwalks and walkways is accessible to the public. The Town of Babylon has a number of additional parcels that could be leased for residential use; the Town, however, currently has no plans to expand development on the barrier islands. The exception is the potential redevelopment of the site of the former Oak Beach Inn located adjacent to Oak Beach Park in Oak Beach.

Approximately 412 households lease land in the barrier island communities that make up NYRCR West Gilgo to Captree, many of whom are increasingly choosing to live there year-round. The number of leaseholds in each community are as follows: 80 in West Gilgo, 57 in Gilgo, 117 in Oak Beach, 72 in Oak Island Beach Association, 32 on Captree Island, and 54 are on Oak Island. Three of the communities—West Gilgo, Oak Island Beach Association, and Oak Island—are homeowner associations that have Master leases with the Town of Babylon. A Master lease encompasses a large physical area in which the associations give sub-leaseholds to successful applicants, who in turn agree to abide by association policies. The residents of the other three communities—Gilgo, Oak Beach, and Captree—have individual leases from the Town of Babylon.

Residents of NYRCR West Gilgo to Captree take full advantage of their coastal surroundings, while also enjoying the conveniences of nearby Islip and Babylon. Their children attend Babylon's schools. Many of the residents, some of whom represent the newest generation of a long family heritage tied to the



Children enjoy an afternoon of fishing off a jetty at Oak Beach Park.



Surfers return from a morning surf at Gilgo Beach.



## West Gilgo to Captree NY Rising Community Reconstruction Plan

Community, feel privileged to live in such close communion with nature and neighbors. Along with the risks, they feel a great responsibility to each other and a sense of stewardship to keep it appealingly safe and environmentally sound.

The *Environmental Study of the Barrier and Bay Island Communities*<sup>ii</sup>, prepared in 1994 for the Town of Babylon and covering a study area roughly the same as the NYRCR Community, states that "the potential for damage caused by a severe coastal storm is the most serious threat that faces the residents and property of the Outer Beach." The report explains that this is due to the location of all of the communities within the 100-year floodplain, with 81% of the houses in the V zone<sup>iii</sup>, just 42% of the houses in the study area conforming with the minimal flood prevention standard for first floor elevation, and less than 5% of those in the V zone complying with structural requirements for resistance against wind and waves. On the other hand, the report also states that the presence of the six communities has likely had beneficial effects on the natural environment, stating that the majority of residents partake in conservation efforts and feel strongly about protecting the ecological resources of the barrier islands.

### *West Gilgo*

Starting with the westernmost community within NYRCR West Gilgo to Captree, West Gilgo is a private community of 80 homes where about half of the residences are now winterized and a growing number of families are year-round. Non-residential assets include a small community chapel, a self-service library, and an unmanned post office. West Gilgo is unique in that it is the only barrier island neighborhood in NYRCR West Gilgo to Captree that is fully serviced by a public water system that the homeowner association owns and operates. While private, visitors frequently stroll the beach during the summer months and others visit by boat, docking at the Unqua Heading, which is adjacent to the community.

### *Gilgo*

Gilgo is a close-knit beach community where you will often see surfers ascending from the beach tunnels after catching the morning waves. The community is known for its care of the natural environment. The residents of Gilgo are continually involved in annual beach/dune grass plantings, annual spring beach clean-ups, and even dune maintenance. In 2008 Gilgo residents partnered with a local surf clothing company to create a mural project to paint the beach tunnel in an environmental theme. Not only focused on the environment, the community comes together for an annual surf day for

*Bert Pedersen, an engineer whose ancestors came to Babylon in the 1840s, built a glass-enclosed crow's nest atop his house with a telescope to watch for wildlife. Here he can see a heron, there an ibis and everywhere, on any day, an aviary of waterfowl. Once in a while he will spy a seal. In the reeds beyond the road out front, where the water can wet the pavement on the gentlest of days, Bert once nailed up a covered platform so his kids could quietly observe. "This is a way of life. We all love it or we wouldn't be here."*

— Bert Pedersen, NYRCR West Gilgo  
to Captree Committee Member



## West Gilgo to Captree NY Rising Community Reconstruction Plan

Autism called “Surfers Heal” and the annual blessing of the fleet. Residents regularly hang out at the Gilgo Beach Inn, one of the few commercial establishments in NYRCR West Gilgo to Captree.

### *Oak Beach*

Oak Beach is now entirely residential, though as recently as 1999 the community was known for a sometimes raucous establishment, the Oak Beach Inn (OBI). The OBI was torn down in 2003 and in its place is a fishing dock and parking lot, which is slated to be redeveloped into a park. The community, which contains 117 homes, is unique in that the houses in some areas sit three rows deep from the road to the water and are connected by a series of residential boardwalks. For the homes in the second and third rows from the road, the boardwalks are the sole means of access for the residents, as well as for emergency services. Maintenance of the boardwalk system is the responsibility of the adjacent homeowner.

### *Oak Island Beach Association*

OIBA is a homeowner association located just east of Oak Beach. OIBA residents pay for all road maintenance and other shared infrastructure. Similar to West Gilgo, the community is technically private but the land is open to the public by foot and by water and visitors can often be seen walking the community’s residential boardwalks.

### *Oak Island*

Oak Island maintains its identity as a seasonal community due to the fact that the island is not served by electricity. Residents travel back and forth from their individual docks on Oak Island to a community dock on Jones Beach Island.

### *Captree Island*

Captree Island consists today of a single entry road with 32 residential structures. Residents enjoy fishing, clamming, seining, kayaking, and birding, along with their sweeping views of the Bay, Jones Beach Island, and Fire Island. The island is divided by the Robert Moses Causeway. The western side of the island, which contains all of the permanent residences, is located under the Jurisdiction of the Town of Babylon. To the eastern side of the Causeway, the island lies in the Town of Islip. While no year-round residences are located on the Islip side, a collection of leases are held for seasonal residential structures; these are accessible only by boat.



The seasonal residences of Oak Island are only accessible by boat and are not served by electricity.



A charter boat, part of Long Island’s largest public fishing fleet, moored in Captree State Park.



## West Gilgo to Captree NY Rising Community Reconstruction Plan

Captree State Park flanks Jones Beach Island's easternmost point and is home to Long Island's largest public fishing fleet. Visitors to the park can partake in boat tours for fishing, scuba diving, and sightseeing excursions. Although a few additional commercial establishments operate throughout NYRCR West Gilgo to Captree, residents express the desire to leave commercial land uses to mainland Long Island.

The barrier island communities are a critical asset to mainland Long Island, serving as a recreational and cultural gem and the first line of defense from nor'easters and hurricanes. The economic importance of the barrier islands cannot be underscored enough. The barrier island residents and their commitment to maintaining clean beaches, sturdy dunes, and thriving wetlands attracts millions in tourism dollars every summer from visitors staying at hotels, eating at restaurants, and fueling up on the mainland before spending the day at the beaches. The character of the barrier island communities has always required a delicate balance between the interests of tourism promoters who may seek to exploit the coastal landscape, and residents who seek to maintain the sleepy village ambiance.

The perks of paradise also come with perils. It can take 30 to 40 minutes for a fire truck or an ambulance to reach the residences, depending on the time of day and location along the 10-mile stretch of sand on which the six communities are scattered. Bad weather of any type, even typical heavy rains, are often enough to isolate the Community from the mainland and mainland assistance. Superstorm Sandy was therefore a test beyond all prior tests of the Community's mettle, resolve, and resiliency.

To be the first line of defense for mainland Long Island almost always means taking the first—and worst—hit in a storm. The near-perpendicular approach of Superstorm Sandy's tidal surge and onshore winds wreaked havoc throughout the region but no more so than on these barrier islands already out at sea. The storm swamped houses that had rarely if ever taken water and blew away man-made and natural protective barriers, dunes and bulkheads alike. (Skip Gardner of the Babylon Department of Public Works carried people to safety in the bucket of a payloader.) The power went down early, even before the worst of the winds followed the record tides. And for some families it stayed down for more than six weeks.

Homes not only went dark, but also went quiet. Cell phones and internet service—spotty in the best of times—failed because the transmission system, including vulnerable towers, could not handle the

*"Barrier-beach living is not for everyone. Despite the romantic notions, there are inconveniences and dangers. It is removed from 'society' or 'the mainland' as we call it, not only a drive away across the Great South Bay but a place apart."*

— NYRCR West Gilgo to Captree  
Committee Member



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assault of wind and saltwater. The loss of back-up power at water supply wells meant no water for the dozens of people who were stranded, some for days, in the cold and dark. And if they had needed them, first responders would have been without water to put out a fire and, in some cases, without a fire jetty to hold the trucks in position.

If living on a barrier island means being the first to face the fury, the remoteness also often means being the last—or hardest—to be helped. The failure of the communication system compounded the danger for the Community. When the 911 notification system failed, some residents did not hear about the mandatory evacuation as the storm swept toward the island. Some other residents, who had in the past chosen to ride out storms like Hurricanes Irene and Gloria and even the "Long Island Express" of 1938, decided again not to evacuate when the call was issued to leave home for higher ground.

That was NYRCR Committee member Bert Pedersen's plan for himself, his disabled wife, daughter-in-law and full-time aide—until his son-in-law, Frank Bustamante, called from Farmingdale to see if they had fled. "I think it's time for you to go," Mr. Bustamante said. By the time Mr. Bustamante arrived over the Causeway in a full-sized pick-up truck, two feet of water covered the only road on and off the island. The three women were crammed into the cab of the truck. Mr. Pedersen stayed. And then, he said, as he watched the truck drive away through the torrent, it suddenly started sliding toward deeper water. It stopped, he said, just short of disaster. The truck made it to safety, but eventually the road would be covered by four feet of water, impossible to cross to get back for Mr. Pedersen.

Certainly, elevation is the key to taming the impact of severe storms, which, as the seas continue to rise and weather patterns change, are more likely to come again and more frequently than historic cycles would predict. As detailed below, the residents are aware that preserving their Community means raising it up, both literally—by increasing the elevation of key facilities and structures—and figuratively—by instituting projects and programs that give hope for a more resilient future. Most of those severely damaged sat at grade in the lowest-lying areas; many like Mr. Pedersen's remained unscathed because its first floor is nine feet above the ground. And it is intolerably dangerous, especially to elderly and disabled residents, if most emergency vehicles can't get through.

The NYRCR West Gilgo to Captree Planning Committee (Committee), which represented the Community at large, was integral in the process of creating strategies and project proposals. These resiliency



A house damaged by Superstorm Sandy.



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strategies reflect a deep understanding of the relationship between the people and the environment. Protecting dunes and tidal wetlands, such as Gilgo State Park and the marsh areas of Oak Island, from further damage, go hand in hand with engineering solutions, such as raising homes and roads and strengthening jetties.

Superstorm Sandy may have been the largest storm in history, but it was not a hurricane when it made landfall in New York. Inevitably, a larger storm will come, and that event has the potential to overwhelm the Community in more devastating ways than could be imagined prior to Superstorm Sandy, and only fearfully and dreadfully considered now. For this reason, it is critical that the system of communicating before, during and after emergencies be evaluated and augmented. Evacuation plans must be improved, and places of refuge established—warming and recharging centers—nearer to homes. Particularly needed is more reliable cell service and GPS locators to guide first-responders through a confusing maze of boardwalks and sandy paths. Improved signage is a tried and true, low-tech method of communication vital when all other technologies fail and people need to be found and saved. Public education is also vital—not only for residents but also for visitors staying one day or one week, who may be stranded in an unfamiliar environment without experience to help themselves to safety. Recovery and resiliency lends to economic stability, as well, and it is the intent of the Committee and Community that the implementation of the projects will result in lasting returns on the investment in terms of tourism and property values.

The NYRCR Gilgo to Captree Committee includes a lot of sturdy realists who have no illusions about how challenging it may be to achieve the goals described in this NYRCR Plan. The Committee and Community are aware of the limitations of funding and the logistical challenges of completing some initiatives, but they are determined to be safe from real dangers. After months of meetings and study, which informs this NYRCR Plan, the Committee hopes to continue to work collaboratively with Federal, State and local officials. The NYRCR Program has provided an opportunity for a systematic and inclusive approach to problems that have been with the Community for generations, giving hope that the next generation of residents can look back on this time as “when things changed” and some of the fear and risk went away for good.

*“It’s the closest thing to heaven and still be above ground.”*

— Skip Gardner, Babylon public works official who volunteers as a sort of caretaker on Captree Island where his family has lived since 1935



# West Gilgo to Captree NY Rising Community Reconstruction Plan

## A. Geographic Scope of the NYRCR Plan

Designating a geographic scope is a crucial responsibility for each NYRCR Committee, and the NYRCR Committee executed it as an early order of business. This laid the groundwork for every other aspect of the NYRCR Program by developing the places and parameters that informed the extent of the planning effort.

Looking to the future, the Committee chose how to define the geographic scope of the NYRCR Plan to include areas not only where assets are most at risk (typically near the coastline) but where future construction or reconstruction of existing development should be encouraged; or where key investment to improve the local economy can be instituted. By identifying more resilient areas for future development, the process outlined in this NYRCR Plan pays the dividend of guiding local officials when preparing municipal comprehensive plans as well as making other local regulatory decisions.

The six communities within this NYRCR fall under various overlapping jurisdictions (e.g., Town of Babylon and Town of Islip in the case of Captree Island) with regard to government, municipal services, and environmentally protected areas. In spite of this challenge, the Committee and the public defined a geographic scope for NYRCR West Gilgo to Captree that responds to the Community's specific physical and cultural geography, exposure to flood risk, and unique Community assets.

The name "West Gilgo to Captree" succinctly describes the geographic scope of the NYRCR Community from the westernmost community, West Gilgo, to the easternmost community, Captree. The six communities are spread out along 10 miles of barrier island coastline and on three separate islands – Jones Beach Island, Oak Island, and Captree Island. The communities fall within two different Towns—Islip and Babylon—and two different U.S. Census Designated Places (CDPs). This NYRCR Community is also bordered by other Suffolk County NYRCR areas, thereby enabling effective regional collaboration and public engagement. Oak Beach-Captree is a CDP with a 2010 population of 286 people<sup>iv</sup> in 2.8 square miles<sup>v</sup>. Gilgo to the west is also a CDP, encompassing 5.0 square miles<sup>v</sup> with a population of 131 people.<sup>iv</sup> (Census figures presumably reflect year-round residents.)

Figure 1 below illustrates the Geographic Scope of the NYRCR West Gilgo to Captree planning area.

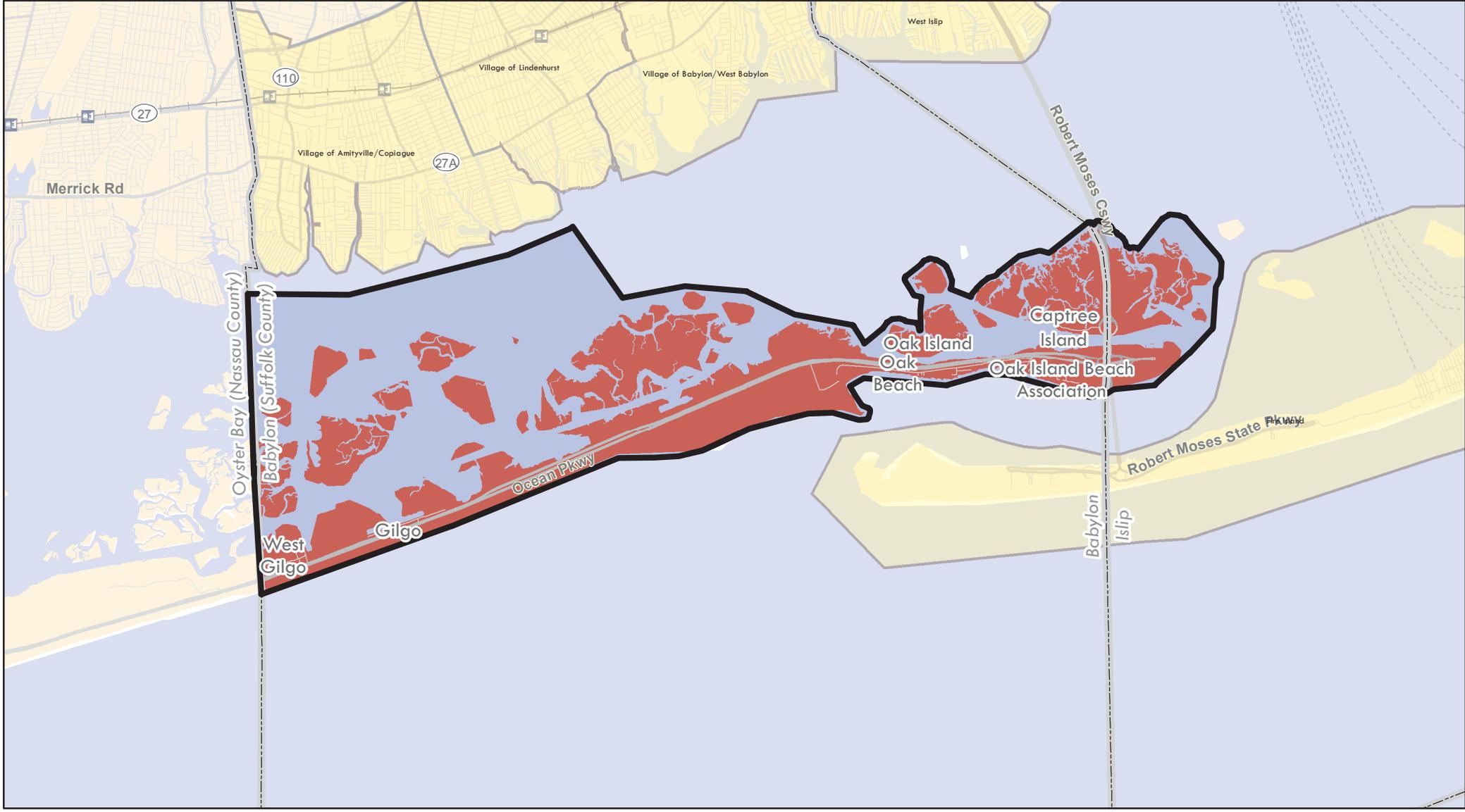
*"The whole New York Rising process is a unique opportunity to help with infrastructure we otherwise couldn't afford or even plan. Hopefully we will be able to do some good."*

— Jed Meade, NYRCR West Gilgo to Captree Committee Member



# West Gilgo to Captree NY Rising Community Reconstruction Plan

## Figure 1: NYRCR Planning Area Location



- West Gilgo to Captree NYRCR Planning Area
- Other NYRCR Planning Areas
- Municipal Boundary
- Interstate
- Highways
- Streets
- ++ Long Island Railroad & Station
- Ferry

0 1.5 3 Miles



Source: NYS DOT, NYS DOS, MTA



# West Gilgo to Captree NY Rising Community Reconstruction Plan

## Demographic Overview

### *Geographic Area and Data*

With the exception of data on ethnicity and race, all demographic data depicted below reflects data from the most recent American Community Survey at the Census Designated Place (CDP) level for both the Oak Beach-Captree and Gilgo CDPs. Demographic data relating to ethnicity and race were derived from the 2010 Census in order to provide the most recent data available in those categories.

The CDP level was selected because the availability and detail of current Census data vary by geographic location and level of analysis (CDP, Census Tract, Census Block, etc.). The CDP level provided a uniform level of data detail and reporting period. It is acknowledged that the CDP data may include some areas that are not contained within the identified NYRCR Community; however, across all CDPs in Suffolk County, the differences between the Census CDP boundaries and the NYRCR Community definitions are not large. Additionally, the Census data's intended use in this report is to provide an overview of the composition and general habits of the Community. It is unlikely that areas included in the CDP but excluded from the NYRCR Community would result in a substantial effect on the overview-level interpretation of the data or affect the identification of needs and opportunities and projects under the NYRCR Program.

### *NYRCR West Gilgo to Captree General Demographics*

The age of the population in NYRCR West Gilgo to Captree shows a typical suburban age distribution among the Census age groups, with about 40% under 35 years old, 35% of the population between 35 and 54 years old, and 25% over 55 years old.<sup>iv</sup>

The Community is 98% White with 1% Asian, and 1% classified as two or more races. Six percent of the White population is Hispanic or Latino. As reported in the Census, the residents report that everyone in the Community (100%) either speaks English as the only language at home or rate their English proficiency as "very good."<sup>vi</sup>



A Community member fishing off the pier at Oak Beach Park.



# West Gilgo to Captree NY Rising Community Reconstruction Plan

## **Income and Poverty**

The Community includes a diverse range of individual wage earners. More than half of the Community (58%) earn less than \$35,000; although a large percentage of these residents, 22%, earns less than \$10,000. A small percentage, 3%, is under 150% of the poverty level. Thirty percent of residents earn \$75,000 or more.<sup>iv</sup>

## **Employment and Journey to Work**

Understanding the general character of the Community's workforce helps identify needs, opportunities, and projects to maintain, restore, and enhance the economic vitality of the Community. Fewer than 25% of the residents in NYRCR West Gilgo to Captree work within Suffolk County, but all of the residents work elsewhere within New York. Nearly 80% of workers drive alone to work or carpool. The next largest means of travel to work is by rail, 12%, with the remaining working at home. There are no zero-car households, with almost 48% having two vehicles and 50% having three or more vehicles. While workers residing in the Community are employed in a diverse array of industries, the fields of education, health care and social services, information, finance, insurance, and real-estate compose 63% of all industries represented. Residents who are employed in the arts, entertainment, and recreation sectors make up almost 16% of the population.<sup>iv</sup>

## **Housing**

In NYRCR West Gilgo to Captree, all of the housing units are owner-occupied. More than half (53%) of the housing units are vacant, consisting primarily (45%) of seasonal residences.<sup>iv</sup>

## **Guidance and Insight from Demographic Analysis**

The demographic analysis indicated a few important trends and characteristics that shaped the identification of needs, opportunities, and projects for NYRCR West Gilgo to Captree. The journey to work data indicates that most of the Community's workers commute by car. This fact highlights the need for resilient roadway infrastructure to provide a means to travel to a worker's place of employment. Resiliency of the roadways in the Community is of particular importance because of the limited number of routes in and out of the communities and off of the island. At the same time the opportunity to create, improve, and increase the resiliency of the pedestrian, bicycle, and transit networks should not be overlooked. Lastly, housing type and occupancy indicate that almost half of the



A house elevation in progress. Many Community members have taken measures to protect their homes from flooding.



## West Gilgo to Captree NY Rising Community Reconstruction Plan

housing stock is used seasonally. This indicates that in the event of a catastrophic event, a good portion of the homes affected are secondary residences.

These Census findings have been incorporated into the ongoing dialogue and are reflected in the work of the NYRCR West Gilgo to Captree Committee.

### B. Description of Storm Damage

On Friday, October 19, 2012, a tropical depression formed in the Caribbean and in only six hours the depression intensified into a tropical storm. This 18th named storm of 2012 was designated Tropical Storm Sandy. By the following Wednesday on October 24 the storm's maximum sustained winds had increased to 74 mph and Tropical Storm Sandy was upgraded to a Hurricane.

After passing through the Caribbean including Jamaica, Cuba, and the Bahamas, and fluctuating between a Category 1 and Category 2 hurricane, on Saturday, October 27 Superstorm Sandy turned north toward the US coast. The storm made landfall around 8:00pm on Monday, October 29 near Atlantic City, NJ. The winds had decreased to just below the threshold for a Category 1 hurricane and meteorologists and the press christened this near hurricane as "Superstorm Sandy."

Superstorm Sandy's historically unprecedented track approached New Jersey and New York from the east; storms typically approach from the south.<sup>vii</sup> As a result, the track of Superstorm Sandy resulted in a worst-case scenario for storm surge and inundation for coastal regions from New Jersey north to Connecticut, including New York City and Long Island. The storm surge came ashore near the time of high tide along the Atlantic Coast and during a full moon when tides are strongest. These factors combined for record tide levels. The storm surge in New York Harbor reached almost 14 feet at the Battery. Forty-five miles away, on the south shore of Suffolk County in Islip, the storm surge reached nearly eight feet.<sup>viii</sup> This was on top of the morning tide that had already inundated West Islip's bay front shore and had yet to retreat.

In addition to the triple threat of the enormous storm surge, the coinciding high tide, and the full moon, other factors conspired to create the devastation that resulted from Superstorm Sandy. Nearby maximum wind gusts ranged from 79 mph in East Farmingdale to 90 mph at Long Island MacArthur

*Nothing in my 29 years with the Town prepared me for the level of physical and emotional damage caused by Sandy. My first FEMA briefing started with the rally the troops talk and how "tough" New Yorkers are but that image was shattered on the same day when I was doing damage inspections and in front of a "shell" of a house a mother and her children were sitting on the lawn weeping while the father climbed through what was once their home looking for anything that was salvageable... I want to see those people back in their homes but I want them safe so they do not have to go through this again.*

—Brian Zitani, NYRCR West Gilgo to Captree Committee Member



## West Gilgo to Captree NY Rising Community Reconstruction Plan

Airport in Islip. On the southward facing shores of Long Island, the storm surge was accompanied by fiercely destructive wave action. An off-shore buoy located 15 nautical miles southeast of Breezy Point on the Rockaway Peninsula reported a wave height of 32.5 feet (the largest since record keeping began).<sup>ix</sup>

The devastation along the mid-Atlantic seaboard was unprecedented. Many lives were lost and estimates of damage range from \$50 billion to \$100 billion dollars in damage. On the local level, along Long Island's South Shore, damage was also substantial.

Thankfully the residents of NYRCR West Gilgo to Captree remained mostly unharmed, but an incessant storm surge and destructive wave action caused widespread flooding and erosion of shoreline protections. East-facing communities, such as Oak Beach and parts of Oak Island, fared the worst as easterly winds and the mounting storm surge overwhelmed bulkheads, washed over jetties, submerged roads, and inundated homes. Waves battered and crumpled docks and boardwalks. A home on the eastern side of Oak Island was pushed off of its foundation and carried 250 feet into the surrounding marshes. The community of Gilgo also suffered immense water inundation. According to residents, 52 of the 57 homes suffered major flooding. Only 5, which were elevated on pilings, were spared.

The storm surge pushed water from the ocean through the inlets and into the bay, flooding yards, driveways, first floors, cars, roads, and parking lots and leaving debris that took months to remove. One year after Superstorm Sandy, the Town of Babylon was still emptying and replacing dumpsters for the disposal of damaged housing materials and other debris.

As discussed earlier in the report, one major issue was that many people did not evacuate the island prior to the storm, despite the fact that the Towns of Babylon and Islip had issued mandatory evacuation orders for all residents living in the 100-year floodplain. That includes all of the barrier island communities. One reason for this was because they never received the order. The reverse 911 system failed when the evacuation notice went out and, although residents knew of the impending storm, they were given a false sense of security since there appeared to be no mandatory evacuation. Most are long-time residents who had ridden out storms before. Unfortunately Superstorm Sandy's impact turned out to be worse than any storms experienced in their lifetimes.



Several inches of sediment left behind by Superstorm Sandy's storm surge trapped cars and made travel after the storm difficult.



A house in Gilgo on the verge of collapse following Superstorm Sandy.



## West Gilgo to Captree NY Rising Community Reconstruction Plan

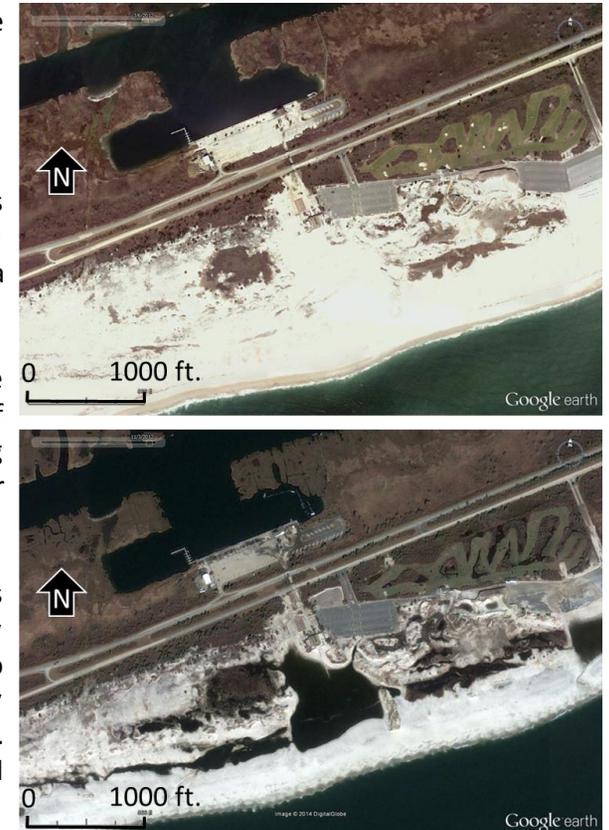
Returning to normal took a long time. In the immediate aftermath, residents reported that microwave towers, which provide cellular phone service, were nonoperational due to either flooding of electrical controls or wind damage. Attempts to connect with family and friends for updates on the response proved futile.

Power was out for as many as 40 days for some residents, meaning no electricity or heat. Temperatures dropped to freezing in the days after Superstorm Sandy and most families had no choice but to evacuate until power could be restored. After three weeks large truck-mounted generators were deployed as a temporary measure, but power from these generators was unpredictable.

With the exception of West Gilgo, which has its own municipal water system, most homes are connected to small water supply systems or individual wells with no backup power. The lack of electricity, therefore, also meant lack of fresh water. The weakening or failure of such networks during and after Superstorm Sandy highlighted the island communities' vulnerability as well as their dependence on connections to mainland Long Island.

Superstorm Sandy's remarkable power was revealed by the devastation to the landscape, the remnants of which remain to this day. Cedar Beach, located between Gilgo Beach and Oak Beach, is typically protected from erosion by Democrat Point on Fire Island, which extends further south of the beach into the Atlantic and diminishes the strength of the oncoming surf. Because of this, Cedar Beach is relatively wide, particularly when compared to Gilgo and West Gilgo, which require ongoing sand replenishment. Nevertheless, aerial photographs taken before and after Superstorm Sandy illustrate the damage and erosion wrought by Superstorm Sandy's powerful waves and storm surge.

The Town of Babylon estimated that the section of beach from West Gilgo east to Gilgo lost over 1 million cubic yards of beach material. Despite efforts by the State and U.S. Army Corps of Engineers (USACE) over the past year to restore and strengthen the dunes, residents are worried that their protective capacity has been compromised. A year after Superstorm Sandy, in October 2013, high winds from a coastal storm caused a football field-sized section of dunes in front of Gilgo Beach to collapse, leaving the Community even more exposed and susceptible in the midst of hurricane season.



Google Earth imagery of Cedar Beach before and after Superstorm Sandy shows substantial loss of beach material.



# West Gilgo to Captree NY Rising Community Reconstruction Plan

One of the most profound impacts of Superstorm Sandy was the 600-foot wide breach, which remains open, at the Old Inlet location on Fire Island, about 20 miles east of Captree. The influx of fresh ocean water into the Great South Bay has led to a revival of the bay's ecology. The marshes of Captree Island, Oak Island, and across the northern shoreline of NYRCR West Gilgo to Captree provide a tremendous benefit to the barrier islands and mainland Long Island by slowing down and absorbing wave energy and reducing flooding. The breach may be an opportunity to restore the formerly thriving wetlands within the Great South Bay as well as the flora and fauna that inhabit them.

## C. Critical Issues

Through the Committee process as well as a number of well-attended public engagement events, a number of critical issues were identified related to NYRCR West Gilgo to Captree's recovery from Superstorm Sandy as well as its future resiliency needs. These issues are indicative of the severe damage that the Community suffered during Superstorm Sandy as well as the reoccurring flooding and resiliency issues that are happening on a regular basis. These issues served to define needs, opportunities, strategies, and eventually projects that would help make the Community more resilient and sustainable. Critical issues include:

- Commitment to conservation and rehabilitation of the natural barrier island landscape of dunes and beaches that protects mainland Long Island, including the marshes of the Great South Bay;
- Evaluation and implementation of the best long-term means and methods of beach replenishment and dune restoration;
- Storm preparedness and communication of risk to all members of the barrier island communities;
- Hazard mitigation measures for utilities that are critical in the aftermath of an event—electric, water, and communications;
- Improvements to fire mitigation and efficiency and access of fire response services, where current deficiencies pose risks following a disaster, as well as on a day-to-day basis; and
- Recognition of and attention to maintaining the unique character of the barrier island communities while making communities safe for years to come.

*"It's personal now," blogged Dorian Dale. "We're the proverbial canaries in a coal mine, perched down here on a barrier beach."*

—Dorian Dale, NYRCR West Gilgo to Captree Committee Member



# West Gilgo to Captree NY Rising Community Reconstruction Plan

## D. Community Vision

The development of a Community Vision Statement was a critical early step for the NYRCR West Gilgo to Captree Planning Committee because the Vision would serve as a bellwether throughout the remainder of the planning process. All strategies and projects identified later were checked against the Community Vision to ensure that recommended actions would not detract from the Community achieving its desired goals.

The Committee members were asked to imagine their communities 10-, 20-, and 50-years in the future and envision what it would look like to be safe and resilient. The Committee was asked to suggest ideas, words, and phrases that illustrate their Community's livability, uniqueness and appeal, aspects that could be improved, and those that should be preserved. The Committee's ideas were then distilled into a cohesive statement. Members of the public were also invited to reflect on their current and future Community and contribute to the Community Vision.

Combining the Committee's ideas and the public's feedback, the Vision Statement for NYRCR West Gilgo to Captree is as follows:

*Restore, preserve and protect the natural resources that serve to provide habitat to a biologically diverse coastal ecosystem as well as to fortify the barrier island shielding the south shore of Long Island against storms. The priority is to improve storm preparedness while striving to retain and protect the culture and assets that make the barrier beach communities unique and desirable to both residents and visitors.*



# West Gilgo to Captree NY Rising Community Reconstruction Plan

Based on this Vision Statement, short-term, medium, and long-term goals for NYRCR West Gilgo to Captree are outlined below:

## Short-Term Goals:

- To identify the best, most cost-effective, long-term strategy for beach replenishment and dune maintenance.
- To achieve excellent communication of risk and emergency response to all residents.
- To create a functional and reliable system of providing water for fire suppression.

## Medium-Term Goals:

- To create a culture of dune protection amongst barrier island and mainland Long Island residents alike with continued recreational access in a way that preserves the integrity of the dune ecology.
- To reduce the frequency and duration of power outages.
- To achieve full and reliable coverage of cellular and Internet service.
- To maintain the salability and affordability of homes on the barrier islands while increasing safety.
- To ensure access on all residential roads.
- To preserve historic landmarks, maritime culture and coastal lifestyles.

## Long-Term Goals:

- To maintain a robust system of dunes to protect the mainland Long Island.
- To improve the water quality in the Great South Bay so that wetlands and wildlife can thrive once again.
- To rebuild the protective wetlands and to revitalize the shellfish habitat and industry.
- To support the long-term maintenance of the beaches and dunes.



A house being repaired and elevated in Gilgo after Superstorm Sandy.



# West Gilgo to Captree NY Rising Community Reconstruction Plan

## E. Relationship to Regional Plans

In order to better understand the planning environment and the work done to date within NYRCR West Gilgo to Captree (Community), it was paramount to understand the context and interrelated issues on both the local level and across Suffolk County and Long Island. A review of pertinent plans, studies and reports was conducted in order to understand the baseline conditions within the barrier island communities as well as the desired future condition.

### Review of Relevant Existing Plans and Studies

Many plans and studies have been prepared at the regional, County and local levels that encompass the Community. At the regional level, broad findings and strategies are made that generally do not address the Community in a specific manner but for which policies and actions can affect the region and its communities. At the local level, specific plans can have a more direct effect on the day-to-day lives of residents and the future of the Community.

The following is a summary of plans and studies that are relevant to NYRCR West Gilgo to Captree:

- Hurricane Damage Mitigation Plan for the South Shore of Nassau and Suffolk Counties, October 1984
- Environmental Study of the Barrier and Bay Island Communities, June 1994
- Long Island South Shore Estuary Reserve Comprehensive Management Plan, Long Island South Shore Reserve Council, New York State Department of State (DOS), 2001
- Disaster Mitigation Act 2000 Hazard Mitigation Plan – Suffolk County, New York, October 2008
- NYSDOT Ocean Parkway Shared-Use Path Project, 2008
- Fire Island Inlet to Montauk Point Reformulation Study (Update), U.S. Army Corps of Engineers, 2013
- Long Island Regional Planning Council's Long Island 2035 Visioning Initiative Final Report, December 2009
- Long Island Regional Economic Development Council, The Strategic Economic Development Plan for Nassau and Suffolk Counties 2013 Update, September 2013
- Suffolk County Department of Health, Comprehensive Water Resources Management Plan, January 2014



## West Gilgo to Captree NY Rising Community Reconstruction Plan

Planning information that relates specifically to the six communities of NYRCR West Gilgo to Captree was uncommon given their small size. However, several plans exist for Jones Beach Island overall, particularly from the perspectives of coastal management, barrier island protection, and hazard mitigation.

The *Environmental Study of the Barrier and Bay Island Communities*<sup>ii</sup> provided the greatest breadth of information about the communities and their natural surroundings. Written in 1994, the report's data, conclusions and recommendations are still pertinent today. The report states that the average length of time that a family has occupied the same house in the study area was 25 years and the median term was 21 years. This shows that the communities are very stable and well-established. Furthermore, several families have occupied the same home for close to 100 years, passing it down through generations since the communities' early days.

Regarding risk, the study states that residents may have developed a false sense of security as a result of having "escaped virtually unscathed from recent storms, which have wreaked extensive destruction in other areas of Long Island." It goes on to predict that as a result, "some residents will not react appropriately to official directives during a storm emergency." This expectation was realized during Superstorm Sandy when some residents did not evacuate due to this false sense of security (while many others simply were not notified of evacuation orders). The report also notes that in Oak Beach the row of houses closest to the water may be the most susceptible to damages from flooding and erosion because they are located in the Coastal Erosion Hazard Area (CEHA)<sup>x</sup>.

Several recommendations from this study are reflected in strategies developed by the Committee. Given the high susceptibility of residential structures in all six communities, the study refers to 82 vacant lots to which the most vulnerable homes could be relocated in order to lower their flood risk. Other recommendations for reducing risk include:

- Beach nourishment and dune restoration at West Gilgo and Gilgo using the dredge spoil from the inlet;
- Expansion of the Town of Babylon's participation in the Federal Emergency Management Agency (FEMA) Community Rating System (CRS) as part of the National Flood Insurance Program (NFIP);



View of Robert Moses Causeway from Captree State Park. The State Park is a significant draw for summer tourists.



## West Gilgo to Captree NY Rising Community Reconstruction Plan

- Significant strengthening of the permitting process and better enforcement of four-wheel drive access to ecologically sensitive areas; and
- The establishment of civic associations in any communities where they do not already exist to streamline compliance with codes and standards that reduce risk to the overall Community.

The *Long Island South Shore Estuary Reserve Comprehensive Management Plan (SSER CMP)*<sup>xi</sup> from 2001 takes a holistic approach to managing the South Shore Estuary Reserve (SSER) which stretches 70 miles from the western border of Nassau County to the center of Suffolk County encompassing all the Bays (Hempstead, South Oyster, Great South, Moriches, and Shinnecock) between Fire Island and Jones Beach Island. The SSER CMP addresses both human and environmental needs; making recommendations to improve and maintain the SSER's water quality, to protect and restore living resources, to expand public use, and to sustain and improve the related economies. The bay front communities of West Gilgo, Gilgo, Oak Island, and Captree Island are inextricably tied to the SSER both economically and environmentally. Recognition of this fact is reflected in strategies that seek to reduce polluted runoff into the bay, to restore shellfish breeding grounds, and to enhance wetlands resources.

The *Hurricane Damage Mitigation Plan for the South Shore of Nassau and Suffolk Counties*<sup>xii</sup> from 1984 contains strategies that continue to be discussed today, such as protecting and maintaining the dunes and constructing pedestrian crossover points where needed to protect the dunes. The plan also raises other, more controversial mitigation strategies, such as the gradual phase-out of leases to homeowners as risks of flooding and erosion increase and restrictions on rebuilding after severe damages for structures located in the most vulnerable areas.

According to the *Disaster Management Act of 2000 (DMA 2000) Hazard Mitigation Plan—Suffolk County*<sup>xiii</sup>, the Town of Babylon has experienced 64 natural hazard events between 1635 and 2007, the majority of which are listed as occurring during the 20<sup>th</sup> Century due to better record keeping. The report's natural hazard risk rating lists nor'easters, coastal erosion, severe winter storms, hurricanes, and flooding, in that order, as the highest risks to the Town of Babylon. Additionally, 24 of 26 nor'easter events between 1931 and 2006 were estimated to cause property, infrastructure, and economic damages exceeding 30% of the Town's total replacement cost for the years of the events. The report notes that Jones Island experiences the worst erosion rates along the entire eastern seaboard. Issues of flood reduction and erosion control are addressed by several strategies developed by the Committee,



## West Gilgo to Captree NY Rising Community Reconstruction Plan

including shoreline stabilization for Oak Beach and several projects related to the erosion of beaches at Gilgo and West Gilgo.

The geographic scope of the *USACE Fire Island to Montauk Point Reformulation Study*<sup>xiv</sup> was extended in 2005 to include Gilgo, Cedar Beach, and Captree. The purpose of the study is “to evaluate a range of possible alternatives to address storm damage risk, including the screening of various Storm Damage Reduction (SDR) alternatives and their designs, analysis of potential impacts associated with various designs, design optimization, and selection of a recommended plan for the Project area.” The study looked at longshore sediment transport, cross-shore sediment transport, dune growth and evolution, bayside shoreline processes, and circulation and water quality—all of which are pertinent to the NYRCR West Gilgo to Captree Community. The study treats the beaches, dunes, sediments and marshes as one system that must be managed in order to increase resiliency. Likewise, the NYRCR Committee has approached strategies to protect their landscape as a similar system in which all components must be strengthened to truly reduce risk and achieve resiliency. For example, although the Committee’s projects for the restoration of beaches and strengthening of dunes are listed separately, the Committee is adamant that these projects would be most effective if implemented in parallel to maximize the consistency and co-benefits of the approaches.

The *Ocean Parkway Shared-Use Path Project*<sup>xv</sup> highlighted the auto-centric nature of the existing transportation infrastructure on the barrier islands. The landscape is dominated by the four-lane Ocean Parkway with periodic exits that provide access to residential communities as well as parking lots for visitors going to the beaches and marinas. The lack of distinct bicycle and pedestrian access lanes has created safety hazards for cyclists and runners who use Ocean Parkway’s shoulder. The planned bicycle and pedestrian shared pathway is designed to connect Wantagh State Parkway and the Robert Moses Causeway, the two bridges that bracket NYRCR West Gilgo to Captree. The study also recommends the installation of vegetated buffers to discourage illegal pedestrian crossing of the dunes. This project speaks to the communities’ recognition of the economic value that the barrier islands bring to the overall Long Island tourism economy. It also highlights the communities’ desire to plan recreational amenities that allow safe and sustainable access to the natural resources.

The *Comprehensive Water Resources Management Plan*<sup>xvi</sup> was conducted by Suffolk County Department of Health for the purpose of updating a similar study that was done in 1987, the antecedent of which



## West Gilgo to Captree NY Rising Community Reconstruction Plan

was the Long Island 208 Study (1978). The study involved the collection and testing of extensive groundwater samples as well as the mapping of land uses and build-out projections. The study reports that elevating levels of nitrogen in the Great South Bay have contributed to several measures of environmental deterioration including “degradation of our protective natural infrastructure—wetlands and seagrass beds that act as wave and storm surge buffers.” The report goes on to state that “sea level rise, which also contributes to marshland degradation, is projected to raise groundwater levels, increasing vulnerability to saltwater intrusion, and further compromising on-site wastewater treatment infrastructure.” The report contains startling evidence that the tidal wetlands and seagrass that help to attenuate wave action, minimize erosion, and create wildlife habitat, including around NYRCR West Gilgo to Captree, are being lost at a rapid rate: there was an 18-36% loss of tidal wetlands between 1974 and 2001 according to New York State Department of Environmental Conservation (NYS DEC) and the NYS Seagrass Taskforce estimates that the acreage containing seagrass in Long Island’s bays and harbors has shrunk by 90% since 1930. The NYRCR West Gilgo to Captree Community is uniquely positioned to observe these environmental losses and several project recommendations of the Committee reflect a deep concern for restoration of wetlands and shellfish breeding grounds. The report also delves into groundwater and surface water quality and implications for drinking water sources. Since NYRCR West Gilgo to Captree’s residents rely on groundwater as their sole source of drinking water, the quality and quantity of groundwater water is critical. Plan recommendations regarding water quality, such as drinking water standards and sampling/testing procedures for drinking water distribution systems, particularly impact the communities of West Gilgo, Oak Beach, and Oak Island Beach Association, for which the Committee has recommended projects to expand or improve the public potable water systems.

### *Potential Regional Issues and Concerns*

Long Island spans over 118 miles from New York Harbor to Montauk Point and has a maximum width of approximately 23 miles between the Long Island Sound to the north and the Atlantic Ocean to the south. Long Island, the 11<sup>th</sup> largest island in the nation, has a land area of over 1,400 square miles and is larger than the state of Rhode Island. Due to its island geography, many of the communities and counties within the Island share similar challenges as well as opportunities relative to the natural environment, physical infrastructure, and other built systems. Additionally, it is important to understand the cause and effect relationship that occurs on the Island. Discussions with the eight Suffolk County NYRCR Communities revealed several issue areas that are common across the south shore and in the



## West Gilgo to Captree NY Rising Community Reconstruction Plan

barrier islands. These planning topics are reiterated in the Long Island Regional Planning Council's *Long Island 2035 Visioning Initiative Final Report*<sup>xvii</sup>. Potential island-wide issues are expanded upon below.

**Natural Environment:** Long Island has 1,180 miles of shoreline fronting the Atlantic Ocean, Long Island Sound, and a number of lakes, bays, inlets and canals. Approximately one-fifth of Long Island's land is protected from development by Federal, State, county, or municipal entities. About half of this land represents over 800 public parks on Long Island ranging from small community playgrounds to larger parks like Gilgo State Park and Captree State Park.<sup>xvii</sup> The continued protection of Long Island's water supply from sole source aquifers is also a significant regional issue.

**Water Quality:** Long Island's aquifers receive their fresh water from precipitation that percolates into the ground and is recharged into the groundwater system. In coastal areas, as water is drawn for use, less groundwater is available to be discharged into the estuaries. The subsequent loss of water and pressure allows saltwater from the ocean to flow into the aquifer, causing the groundwater to become saline and undrinkable. This is known as "saltwater intrusion" and is a threat to the Island's drinking supply.<sup>xvii</sup> Other threats to water quality include non-point source pollution and stormwater runoff, which are county-wide concerns. Non-point sources typically include fertilizer and pesticides, oil and other automobile fluid, as well as animal and pet waste. This type of pollution has the potential to be carried into surface waters with stormwater runoff (such from large parking lots at Cedar Beach and Captree State Park) and alter the chemistry of the Great South Bay. The Great South Bay is a significant and diverse habitat comprised of features such as barrier beaches and islands, wetlands as well as marsh islands. Non-point source releases into the bay can result in increased bacteria levels which in turn can lead to the closure of large areas of the bay to economic activities such as Captree's fishing fleet and other recreational marine-dependent uses.

**Utilities:** Electricity and the susceptibility of the power grid are both national and regional issues of concern. Long Island's Regional Economic Development Council (REDC) *Strategic Economic Development Plan for Nassau and Suffolk Counties 2013 Update*<sup>xviii</sup> has similarly stressed the importance of addressing utility vulnerabilities that currently exist across the Island. More specifically, one of the longest-lasting impacts of Superstorm Sandy was the vulnerability of Long Island's electric power grid. The focus of many resiliency initiatives is autonomous control capabilities that when employed would make Long Island's grid more resilient during weather events and able to recover more quickly in the aftermath.



## West Gilgo to Captree NY Rising Community Reconstruction Plan

**Climate Change:** As a coastal area, the barrier islands are susceptible to sea level rise, especially as it relates to storm surges. Flooding generated by major weather events, 100-year storms, or just a heavy downpour, causing damage to residences and property, have been occurring with greater frequency. According to a report prepared by Columbia University, the City University of New York, and Cornell University, sea level is anticipated to increase by two to five inches in the New York City and Long Island region by the 2020s and by 12 to 23 inches by 2080.<sup>xix</sup> Should polar icecaps melt rapidly, climate models project that sea levels will rise even more. As a result, climate change is a significant island-wide issue.

**Emergency Preparedness:** Emergency preparedness projects are important to improve the overall safety of the barrier islands' population, including maintenance of evacuation route access and improvements to the communication capability for a multi-jurisdictional response during emergency events. Another regional consideration is the reliability and resiliency of the distribution of gasoline and diesel fuels after emergency events.



A nice picnic location in Captree State Park with the Captree fleet in the background.



## Section II: Assessment of Risk and Needs

### A. Description of Community Assets and Assessment of Risk

One goal of a successful NY Rising Community Reconstruction (NYRCR) Plan is ensuring that the NYRCR Community's social, economic, and natural resource assets and systems that were impacted by Superstorm Sandy are made more resilient against future storms. Toward that end, assets potentially at risk from storm events were identified and then evaluated in more detail. The risk assessment yielded information on each asset's degree of risk to future storms that aided in the development and selection of specific actions to reduce risk and sustain Community functions.

#### i. Description of Community Assets

Assets are places or entities where economic, environmental, and social functions of the NYRCR West Gilgo to Captree Community (Community) occur. Examples of assets include public facilities such as Coast Guard stations; emergency and public safety services including fire protection; as well as natural, cultural, and recreational resources such as State Parks, beaches, and Community centers. Assets also include critical infrastructure such as transportation roadways and utility networks required to support those essential Community functions.

The purpose of the inventory is to create a comprehensive description of the assets within or servicing of the NYRCR Community whose loss or impairment due to flood events would compromise essential functions or critical facilities of the Community. The inventory documents both landscape features and vulnerable features of the asset itself that contribute to flood risk and provides the basis for examining assets in more detailed risk mapping and assessment.

Assets were initially identified based on their location within three geographic areas at risk to storm inundation and sea level rise<sup>xx</sup>:



## West Gilgo to Captree NY Rising Community Reconstruction Plan

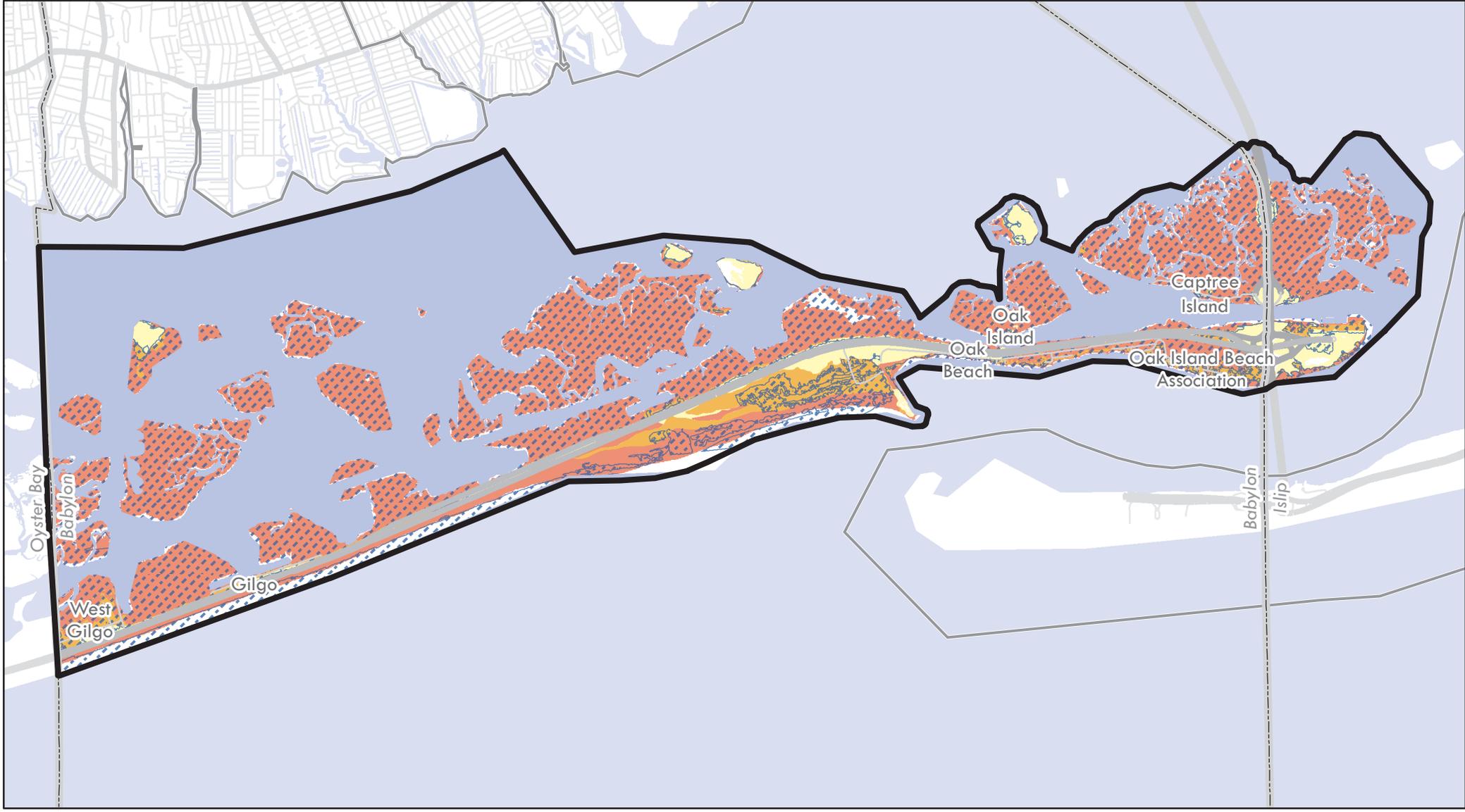
- **Extreme Risk Area:** Assets located in the extreme risk area are currently at risk of frequent inundation, vulnerable to erosion in the next 40 years, or likely to be inundated in the future due to sea level rise;
- **High Risk Area:** Assets located outside of the Extreme Risk Area that are currently at occasional risk of inundation or at future risk from sea level rise;
- **Moderate Risk Area:** Assets upland of the High Risk Area that are currently at infrequent risk of inundation or at risk in the future from sea level rise.

Figure 2 below illustrates the Extreme, High, and Moderate Risk Areas within NYRCR West Gilgo to Captree, as well as the extent of Superstorm Sandy's flood inundation.



# West Gilgo to Captree NY Rising Community Reconstruction Plan

## Figure 2: Risk Area and Hurricane Inundation



### Risk Area

- Extreme
- High
- Moderate
- Hurricane Inundation

- Interstate
- Highways
- Long Island Railroad & Station

- West Gilgo to Captree NYRCR Planning Area
- Other NYRCR Planning Areas
- Municipal Boundary



Source: NYS DOT, NYS DOS, MTA



## West Gilgo to Captree NY Rising Community Reconstruction Plan

The complete inventory provides more detail on each identified asset, such as its classification as a critical or non-critical facility, whether the asset serves a vulnerable population, and the relative value, or importance, of the asset to the Community. The NYRCR West Gilgo to Captree Committee (Committee) identified the assets' Community Value as high, medium, or low.

**High:** Asset(s) that are so significant in the support of that community's day to day function that the loss of that asset or extended lack of functioning would create severe impacts to the community's long-term health and well-being or result in the loss of life or injury to residents employees or visitors.

**Medium:** Asset(s) that are important to the functioning of that community's day to day life and that the loss of that asset or extended lack of functioning would cause hardship to the community's well-being but whose function could be replaced or duplicated in a mid-term time frame without significant burden to a community's long-term health.

**Low:** Asset(s) that play a role in the functioning of a community's day to day life, but whose loss could be managed and overcome with in a community without substantial impact to that community's functioning. Can be started, replaced or temporarily duplicated in a short-term time frame with limited burden to a community's long-term health.

In addition, contributing landscape attributes and physical features of the asset that tend to influence the severity of storm impacts are categorized. For example, assets that are located near shorelines absent of wide beaches, healthy dunes, and protective vegetation are at increased risk of flooding. Specific features of the asset that are at risk (e.g. mechanical equipment below flooding elevation) are also recorded in the inventory to help guide the selection of appropriate strategies and projects for risk reduction.

The Community assets and their corresponding risk areas, identified by the Committee and Community at large, are presented in the following tables. The complete asset inventory is found in Section V, "Additional Materials."



# West Gilgo to Captree NY Rising Community Reconstruction Plan

An overview of NYRCR Community assets for each asset class is provided below. Over 200 assets were originally catalogued based on this initial level of review. The asset classifications, which include facilities, places, and systems, are as follows:

- Natural and Cultural Resources
- Health and Social Services (Life Safety, Administration, and Education)
- Infrastructure Systems (Transportation and Utilities)
- Housing
- Economic

### *Natural and Cultural Resources*

Natural and Cultural Resources include natural habitats, wetlands and marshes, recreation facilities, parks, open spaces, agricultural areas, religious establishments, libraries, museums, historic landmarks, and performing arts venues.

The barrier islands have historically been and continue to be a natural and recreational resource. Built assets along the coastline are most likely to be inundated and damaged during a storm event, but natural resources assets on the coastline provide protective capacity by lessening the impact of storm surges on inland locations. Many of these resources are relatively large in geographic area and span multiple risk areas.

NYRCR West Gilgo to Captree is dominated by tidal features and resources. Most of the tidal wetlands are located along the northern shore of the Community (see Table 1). These areas are identified as parks, but serve more of an ecological function than a traditional recreational one.

**Table 1: Parkland Resources**

Asset	Risk Area(s)	Community Value
Petteanger Island State Tidal Wetlands	High and Extreme	High
Babylon Marsh State Tidal Wetlands	Extreme	High
Gilgo State Park (undeveloped)	High and Extreme	High
Captree State Park	Moderate and High	Medium



A sign warns beachgoers that a dune restoration project is in progress. Recreational users must be careful to stay off the dunes for their structural integrity.



# West Gilgo to Captree NY Rising Community Reconstruction Plan

The parkland resources double as natural resources. This category also includes the Maritime Beach Natural Heritage Community, located primarily along the southern shore of the Community (see Table 2).

**Table 2: Natural Resources**

Asset	Risk Area(s)	Community Value
Tidal Wetlands	High and Extreme	High
Natural Heritage Priority Communities: Maritime Beach	Extreme	High

The Community also identified the Oak Beach Community Center, West Gilgo Chapel, and Gilgo Beach Offices/Restrooms as key Community facilities in need of protection. The available state data did not identify National-Register listed historic resources in NYRCR West Gilgo to Captree.

### *Health and Social Services: Life Safety*

Life Safety facilities include fire protection, police, hospitals, and emergency operations. In Suffolk County, there are five Emergency Operations Facilities, which coordinate rescue and other services during an emergency. Two of these facilities are located on the South Shore of Long Island. The Babylon Town Civil Defense facility is located directly north of NYRCR Village of Lindenhurst and the Islip Public Safety facility is located between the NYRCR West Islip and Oakdale/West Sayville Communities.

NYRCR West Gilgo to Captree does not have a police station within it. The Suffolk County Police Department provides police services for the Community. The Community also does not have a fire station within it. In some cases, fire protection is first provided by the residents of the communities themselves using small, manually operated equipment to contain fires, and then from the Babylon Fire Department upon their arrival from the mainland. There are no hospitals located within the Community. Good Samaritan Hospital Medical Center is located in West Islip near the Robert Moses Causeway, a minimum of five miles away. The lack of life safety assets in the Community means that these assets are not vulnerable to typical barrier island hazards of flooding and erosion. On the other hand, their distance from the Community results in lengthy response times and access hazards that can increase risk to residents and property who may require emergency medical or fire response services.



# West Gilgo to Captree NY Rising Community Reconstruction Plan

## *Health and Social Services: Administration and Education*

Health and Social Services: Administration and Education assets serve a variety of public functions, from health treatment facilities to general-purpose shelters in public schools, and post offices to town halls. During a storm event, these facilities could potentially serve as critical disaster response and recovery centers, the identification of which is essential to future disaster management and preparedness.

Three state-owned facilities are located throughout the NYRCR Community (see Table 3). In Gilgo State Park and at the Cedar Beach area, two facilities fall within moderate to extreme risk areas. Cedar Beach Marina includes a marine education facility that may be used in the future as a refuge/warming center. One additional facility is located in a moderate risk area inside Captree State Park.

**Table 3: State-owned Buildings and Properties**

Asset	Risk Area(s)	Community Value
Main office Parks & Recreation-Captree State Park	Moderate	Low
Main office Parks & Recreation - Gilgo State Park	Moderate, High, and Extreme	Low

## *Infrastructure: Transportation*

Assets in this category include both transportation infrastructure as well as transportation-related facilities. Ocean Parkway provides east/west access and passes through a moderate risk area within this NYRCR Community. The Robert Moses Causeway (moderate risk area) provides a north/south route from West Islip to NYRCR West Gilgo to Captree. Scour critical bridges<sup>xxi</sup> within this NYRCR Community are situated along the Robert Moses Causeway as shown in Table 4. The Robert Moses Causeway crossing the State Boat Channel has been slated by Governor Andrew Cuomo's Administration for bridge replacement.<sup>xxii</sup>



# West Gilgo to Captree NY Rising Community Reconstruction Plan

**Table 4: Scour Critical Bridges**

Asset	Risk Area(s)	Community Value
Robert Moses Causeway crossing Great South Bay	Extreme	High
Robert Moses Causeway crossing State Boat Channel	Moderate	High

\*Includes northbound and southbound spans

A review of available state data did not identify any other transportation-related infrastructure within the Community, but the Committee identified Ocean Parkway, Captree Road, and Oak Beach Road as critical assets. Ocean Parkway is the only road that runs the length of Jones Beach Island and connects West Gilgo, Gilgo, Oak Beach, Oak Island, and Oak Island Beach Association to the mainland by way of the Robert Moses Causeway and the Wantagh Bridge. After Superstorm Sandy, Ocean Parkway was only partially drivable because the storm's force had rippled, torn up, and distorted the roadway causing NYS Department of Transportation (NYS DOT) to close parts of it for repair. This road closure exacerbated existing emergency services access and response time issues for the Community. To make matters worse, the communities of Captree Island and Oak Beach are served by single entry roads, Captree Road and Oak Beach Road, respectively, which were ravaged and undermined by flooding and debris from Superstorm Sandy. The increased resiliency of these assets is important for these communities.

### *Infrastructure: Utilities*

Water treatment plants, drinking water wells and communications towers are distributed throughout the Community. Approximately half of these facilities are located in the moderate risk area (see Table 5). However, over a third of such utilities are found in the extreme risk area. A major concern with water wells in the risk areas is the possibility of floodwaters overtopping the wellheads and contaminating the water supply. The water and overhead electric distribution systems have not been mapped and quantified here but are typically distributed throughout developed areas in the risk areas.



# West Gilgo to Captree NY Rising Community Reconstruction Plan

**Table 5: Infrastructure Resources**

Asset	Risk Area(s)	Community Value
7 drinking water wells	Extreme	High
1 drinking water treatment plant	Extreme	High
3 drinking water wells	Moderate	High
1 water treatment plant	Moderate	High
1 cell tower	Moderate	Medium
6 microwave towers	Moderate	Medium

## *Housing*

Residences in NYRCR West Gilgo to Captree are comprised almost entirely of single-family structures. Approximately half of these residences are in extreme risk areas while one-third is located in the high risk areas (see Table 6). The remaining residences are in the moderate risk area. Residences throughout the barrier islands are vulnerable to flooding and those in the Coastal Erosion Hazard Area (CEHA) are at further risk to erosion of their shoreline.

**Table 6: Housing Resources**

Asset	Risk Area(s)	Community Value
223 single-family structures	Extreme	Medium
146 single-family structures	High	Medium
74 single-family structures	Moderate	Medium



# West Gilgo to Captree NY Rising Community Reconstruction Plan

## *Economic Centers*

There are three commercial properties in the Community all located within the high risk assessment area (see Table 7). The primary economic assets within the Community are the Captree Fleet and associated marina, bait and tackle shop, fueling station, and restaurant. Located in the marina within Captree State Park at the eastern tip of Jones Beach Island, the fleet provides open and charter boats for touring, fishing, scuba diving, and sightseeing excursions. Although a few additional commercial establishments operate throughout NYRCR West Gilgo to Captree, residents expressed the desire to leave commercial land uses to mainland Long Island.

**Table 7: Economic Resources**

Asset	Risk Area(s)	Community Value
3 commercial properties	High	Low



The Captree fleet in Captree State Park takes visitors out for sightseeing, fishing, and scuba diving excursions.



# West Gilgo to Captree NY Rising Community Reconstruction Plan

## ii. Assessment of Risk to Assets and Systems

Risk is the chance that an asset will be damaged or destroyed. Assessing the risk to Community assets and systems helped the Committee identify projects and understand measures to help restore and protect its assets at greatest flood risk while also ensuring appropriate long-term economic growth.

A standardized risk assessment tool was used to assist the NYRCR West Gilgo to Captree Committee to assess and quantify the risk to their assets, and later, to test whether various projects are effective at reducing risk. The asset inventory provided a baseline to identify the most critical assets in the Community to be advanced through the risk assessment tool for further analysis. The assets selected from the inventory for input into the risk assessment tool included:

- Assets situated in extreme and high risk areas
- Assets designated by FEMA as “FEMA-critical”<sup>xxiii</sup> in moderate risk areas
- Locally-significant Community identified assets (High Community Value) in moderate risk areas
- Assets with High Community Value located outside of the extreme, high, or moderate risk areas
- Assets providing critical life safety services

In addition, assets in close proximity with similar functions and vulnerable characteristics were grouped as a single asset to the maximum extent possible because these assets would likely experience the same effects from storm events. For example, residential neighborhoods with similar construction were combined by risk area.

For each asset, or group of assets, that was advanced through the risk assessment tool, a risk score was produced based on three contributing factors to an asset’s overall risk:<sup>xxiv</sup>

$$\text{Hazard} \times \text{Exposure} \times \text{Vulnerability} = \text{Risk}$$



Damage to bulkheads and a boardwalk on a residential property as a result of Superstorm Sandy. Residents on the bay side of the Community faced significant storm surge as winds relentlessly pushed water into the Great South Bay.



## West Gilgo to Captree NY Rising Community Reconstruction Plan

The three factors that contribute to the measure of overall risk for each asset are:

- **Hazard:** The likelihood and magnitude of future storm events. Examples of the most common hazard risks include coastal flooding, flooding in a 100-year floodplain, sea level rise, or hurricanes. Typically, an asset located in an extreme risk area experiences hazards with greater frequency and intensity than assets in a high or moderate risk area. This risk assessment uses the “100-year” flood event, which has a 1% chance of occurrence in any given year, as the baseline event.
- **Exposure:** The variability of local topographic and shoreline features which tend to increase or decrease storm effects on assets. If assets are more exposed (e.g., situated on low-lying floodplains, directly exposed to a probable storm surge, or otherwise unprotected), they are more likely to suffer storm effects than similar assets located at a higher elevation, on a rocky shoreline, or protected by dunes. Similarly, landscape features and vegetation are more important for an asset proximate to a flood source than an asset further inland.
- **Vulnerability:** The level of impairment or consequences that assets may experience from a storm event, expressed by the capacity of an asset to return to service after a storm. If an asset recovers quickly with limited interruption in service it has low vulnerability. An asset with extended service loss or permanently reduced capacity would be considered to be significantly vulnerable.

The final risk scores provide the Community with a general sense of which assets are at greatest risk and where projects and management measures are needed to adapt assets to future storms and environmental changes. The list of assets advanced through the risk assessment tool, and their corresponding risk scores, are provided in Section V, “Additional Materials.”

*My children and I evacuated to the mainland during the storm, but my husband stayed at the house with the pets. For about 12 hours after the storm hit we had no contact whatsoever. It was harrowing. It was then 4 days until the kids and I were allowed to return to the house. We found extensive damage and destruction. Windows had blown out upstairs and our downstairs took on nearly two feet of water. For several weeks we had to proceed through a series of police checkpoints and my kids' school bus was not allowed down to West Gilgo Beach. That left us with the burden of figuring out how to get the kids to and from school each day.*

—Cindy Dale  
NYRCR West Gilgo to Captree



# West Gilgo to Captree NY Rising Community Reconstruction Plan

## *NYRCR West Gilgo to Captree Risk Assessment Results*

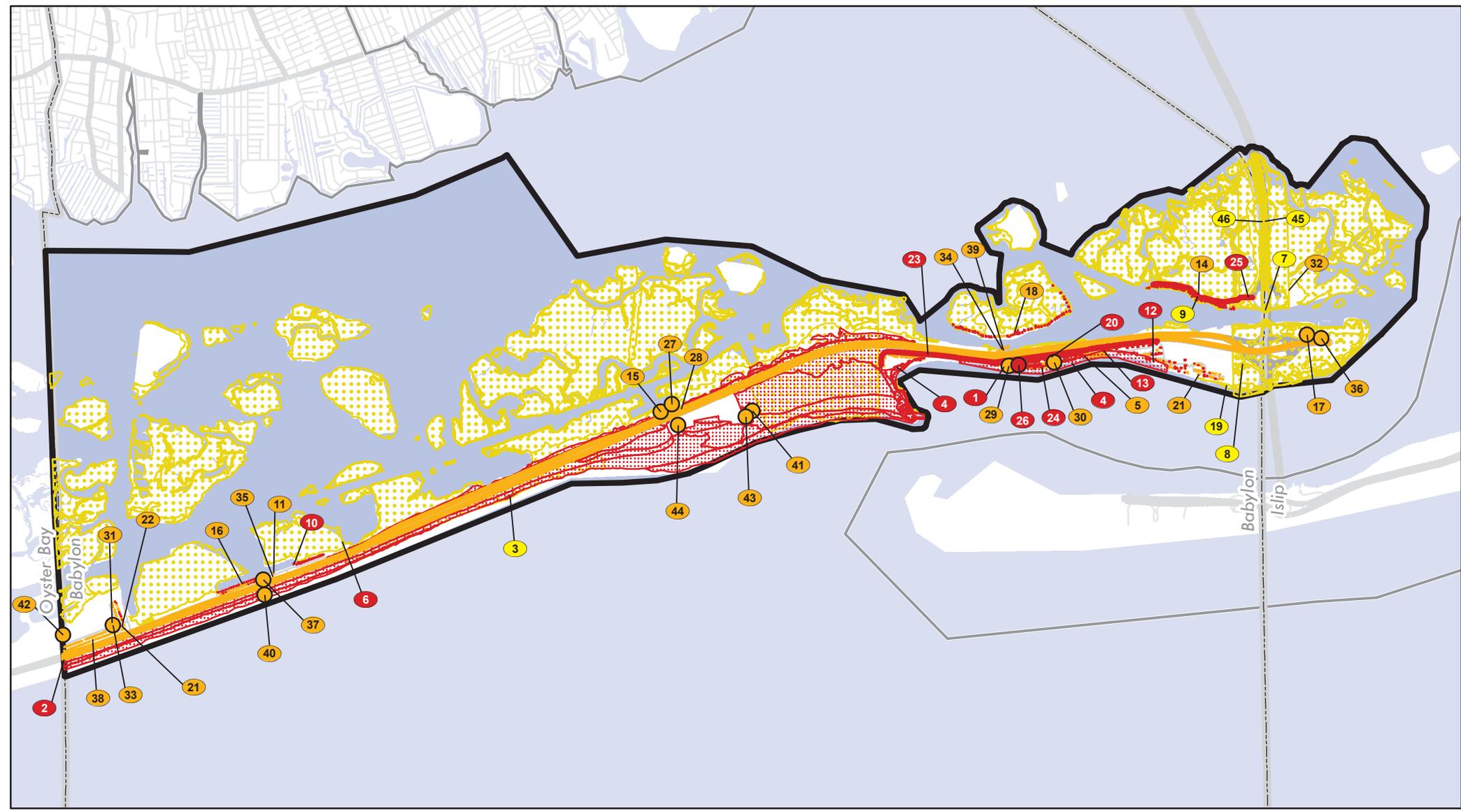
The Figure 3 and Table 8 illustrate NYRCR West Gilgo to Captree's assessment of risk to assets and systems. The identification number on the table corresponds to the ID number shown on the map. The table is also color coded by risk level and an overview follows. Assets were placed into the following risk categories, based upon their risk scores.

- **Severe Risk** assets are shown in red in the table and map. Assets at Severe Risk have both very high exposure and very high vulnerability to storm effects, which could represent that the asset is in a dangerous situation or location.
- **High Risk** assets are shown in orange. Assets at high risk have either very high exposure or very high vulnerability to storm effects, which could lead to significant negative outcomes from a storm event.
- **Moderate Risk** assets are shown in yellow. Storm events pose moderate to serious consequences on these assets, but adaptation may be of lower priority due to one factor, either the exposure or vulnerability, remaining relatively low.
- **Residual Risk** assets are shown in green. Both the exposure and vulnerability of these assets are relatively low. This situation suggests floods would pose a minor threat or infrequent consequences.



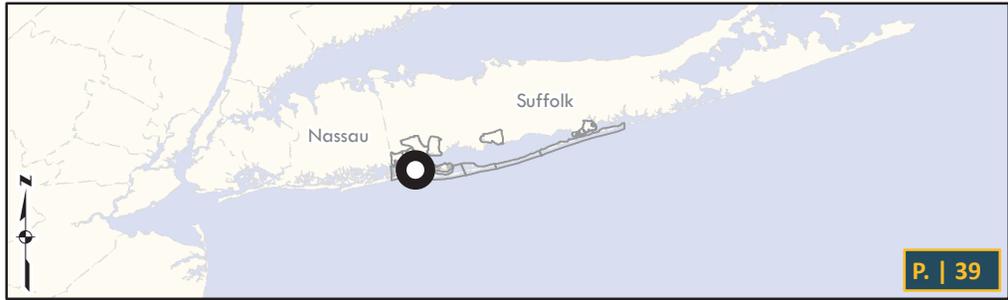
# West Gilgo to Captree NY Rising Community Reconstruction Plan

## Figure 3: Assets at Risk



		Severe Risk		West Gilgo to Captree NYRCR Planning Area
		High Risk		Other NYRCR Planning Areas
		Moderate Risk		Municipal Boundary
		Residual Risk		

0 0.75 1.5 Miles



Source: NYS DOT, NYS DOS, MTA



# West Gilgo to Captree NY Rising Community Reconstruction Plan

**Table 8: Assessment of Risk to Assets**

ID#	Name
<b>Natural and Cultural Resources</b>	
1	Oak Beach Community Center
2	Jones Beach Island - Dunes, interdunal swales, shrubland
3	Jones Beach Island - Maritime beach
4	Oak Beach, Dunes, and Sand Bar
5	Oak Beach Park
6	Gilgo State Park (undeveloped)
7	Captree State Park
8	Freshwater Wetland
9	Tidal Wetlands
<b>Economic</b>	
10	Seasonal Pump Out Station
11	Gilgo Beach Inn
<b>Health and Social Services</b>	
12	Fire Jetties
13	Fire Wells - Oak Beach
14	Fire Wells - Captree Island
15	Main office Parks & Recreation - Gilgo State Park
16	Fire Pump and Wells - Gilgo
17	Main office Parks & Recreation - Captree State Park
18	Fire House - Oak Island
19	Fire Road - Oak Island Beach Association
<b>Housing</b>	
20	Residence - Extreme Risk Area
21	Residence - High Risk Area
22	Residence - Moderate Risk Area

ID#	Name
<b>Infrastructure Systems</b>	
23	Oak Beach Road
24	Pedestrian Boardwalks
25	Captree Island Road
26	McCarren Water Supply Well #1
27	Cedar Beach Sportfishing Education Center Drinking Water Well
28	Ocean Pkwy (West Gilgo to Captree State Park)
29	Dougherty Water Company Well #1
30	McCrodden Water Company Well #1
31	Public Water- Deep Wells
32	Transformer
33	West Gilgo Beach Association Ocean Walk Water Treatment Plant and Well
34	Oak Island Marina
35	Cablevision Microwave Tower
36	Captree State Park Drinking Water Treatment and Well
37	Gilgo Beach Drinking Water Well
38	LIPA Box
39	Power Station
40	Gilgo Beach Drinking Water Treatment and Well
41	New York SMSA Limited Partnership Microwave Tower
42	New York SMSA Limited Partnership Microwave Tower
43	Overlook Beach Drinking Water Well
44	Cedar Beach (Campground/Concession) Drinking Water Treatment and Well
45	Robert Moses Causeway NB
46	Robert Moses Causeway SB

**Risk Range Key**

	Severe Risk Range
	High Risk Range
	Moderate Risk Range
	Residual Risk Range



## West Gilgo to Captree NY Rising Community Reconstruction Plan

Generally, but not in all instances, risk dissipates the further upland an asset is from the water. The inventory catalogued approximately 40 assets, which were carried through for analysis in the risk assessment tool. These assets range from residential areas within moderate, high, and extreme risk areas to economic assets such as the Gilgo Beach Inn in the high risk area. Natural resource systems such as the dunes and interdunal swales are also inventoried. Other asset categories include transportation facilities like Ocean Parkway and Oak Beach Road, fire protection resources including fire wells and fire jetties, and critical utilities. Risk score classifications range from moderate risk to severe risk. It is noteworthy that none of the assets identified by the Committee and Community fall into the lowest risk score category of residual.

All of the residential areas in the six barrier island communities that make up the NYRCR West Gilgo to Captree Community are at high or severe risk. This is partly due to the landscape attributes and partly due to the vulnerability of the infrastructure and utilities that serve these residential areas, such as electricity, which took up to six weeks to be fully restored following Superstorm Sandy. This area is subject to persistent, recurring power outages during both major storms and typical seasonal weather. Throughout the course of the planning process, the susceptibility of this utility was raised by Community residents at the public engagement events and by Committee members at their working sessions.

Although all of the residences on the barrier island face unique vulnerability and exposure issues, those on the southern side of the island, such as in Oak Beach and Oak Island Beach Association, are at particular risk as these residences typically fall within the coastal erosion hazard area, meaning that the shoreline is at continuous risk of instability from erosion. These homes all scored in the severe risk range.

Other assets with severe risk scores include several assets in Oak Beach and Oak Island Beach Association, including the fire jetties, Oak Beach's McCarren water supply well, Oak Beach's fire wells, and Oak Beach Community Center. These fire protection infrastructure and water supply utilities are classified as FEMA-critical facilities and were also assessed by the Community as being of High Community Value. Roadways, which were also classified as High Community Value, that are at severe risk include Captree Road and Oak Beach Road. Other transportation and access-related assets include the pedestrian boardwalks in Oak Beach, Oak Island Beach Association, Oak Island, and Captree Island.



Flooding of the Gilgo Beach parking lot during Superstorm Sandy threatened the residents' ability to evacuate.



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Perhaps most importantly to both the existence of the barrier island communities and the mainland communities is the severe risk classification of the barrier island dunes, interdunal swales, shrublands, and beaches. These systems of natural shoreline protection were also assessed as being of High Community Value.

The scoring of these assets helped to inform, focus and provide context for the development of needs and opportunities and the types of resiliency strategies and management measures considered by the Committee.

## B. Assessment of Needs and Opportunities

The Committee identified needs and opportunities based on the Community's reconstruction and economic growth goals, risk to Community assets, existing plans and studies, and the Community's overall vision for its future.

During a disaster, many things can go wrong, including communications breakdowns, equipment failure, infrastructure damage and more. The term 'need' is used here to illustrate infrastructure and services that were damaged or rendered inoperable by Superstorm Sandy as well as methods and operations that failed to work during the storm event or experienced insufficient capacity to respond effectively.

Thinking through what took place during the storm event, as well as the damages that ensued, provided the Committee with insight to the inherent resiliency of those structures, procedures, and operations. This assessment process led to a frank discussion of Community needs and included recognition of changing climate patterns and the economic and practical necessity of factoring resiliency and adaptive capacity into recovery and redevelopment actions.

Opportunities are based on the idea that additional resiliency benefits, whether economic, environmental, social or cultural, may be achieved through the integration of new methods, procedures and materials into the normal course of rebuilding. The post-disaster environment presents opportunities to rebuild in such a way as to create a Community that is stronger and more resilient to future storms. Resilient communities tend to have redundant infrastructure and communication systems, robust social and civic institutions, diverse and flexible adaptation strategies, and collaborative public and private partnerships.



A member of the public provides feedback on needs and opportunities at a public engagement event.



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Throughout this plan, strategies and projects are categorized and discussed in terms of their Recovery Support Function (RSF). Six RSFs were established by President Barack Obama in 2011 through the “National Disaster Recovery Framework (NDRF).” An RSF is an operational or coordinating structure defined by the federal government for the purpose of delivering recovery assistance to State, local and tribal governments. The six RSFs are listed and defined below.

- **Community Planning and Capacity Building:** The Community’s ability both to implement storm recovery activities and to plan to mitigate the effects of future storms.
- **Economic Development:** Returning economic and business activities to a state of health and developing new economic opportunities that result in a stronger, more resilient Community.
- **Health and Social Services:** The restoration, and potential expansion of public health programs, health care facilities and essential social services, especially for vulnerable populations on the Island.
- **Housing:** An assessment of local housing conditions and associated risk levels is critical as communities continue to rebuild.
- **Infrastructure:** Investments in infrastructure can be effective both in rebuilding capabilities lost during the storm and in reducing future risks to critical assets.
- **Natural and Cultural Resources:** The rehabilitation, management and protection of the natural and cultural resources that define the Community’s physical and human character. Natural resources include aspects of a community’s underlying ecological habitat such as ground and surface waters, streams and creeks, woodlands, wetlands and open marsh, beaches and dunes. Cultural resources may include historic properties and places that are part of that community’s identity and social life.

The Committee and Community identified several needs and opportunities through the NYRCR planning process that fall under the RSFs.



## West Gilgo to Captree NY Rising Community Reconstruction Plan

### *Community Planning and Capacity Building*

The Community would benefit from improved coordination and communication of disaster response entities at the local, County, and State levels. Lines of communication regarding the approaching storm and mandatory evacuations failed. Subsequent messaging and recovery procedures during post-event response and re-entry activities were further muddled amongst various public safety entities. This confusion exacerbated the risk and stress of the event for the island residents.

In addition, as stewards of the barrier island beaches and dunes, the Community feels the need for increased education and awareness of island residents as well as visitors and tourists from the main island regarding the local ecosystem, the critical protective services of the landscape for everyone's protection, and proper stewardship and etiquette when using these resources to prevent their degradation.

Finally, the Community experienced an extremely difficult six weeks following Superstorm Sandy without dependable electricity and for most, without reliable water supply. The Community realized the need for a few key public facilities where residents could reliably find necessities such as water and heat without driving several miles to the mainland. This need led to the opportunity to make the existing public facilities in the barrier island communities more resilient with backup power.

### *Economic Development*

The Community's economic resilience is inextricably linked to the value of their homes because very few businesses are located on the island. When Committee members and the public discussed economic needs of the barrier islands, they were typically referring to maintaining the affordability and salability of the houses, such as by ensuring that barrier island residents feel reasonably safe from natural hazards and supported by mainland-based emergency services, and that homeowners and the Town of Babylon take measures to minimize increases to insurance rates. The continuation of the barrier island residential communities is also important to the Towns of Babylon and Islip, who benefit from the rental income from the barrier island parcels.

Despite the relatively low number of commercial businesses in the six barrier islands, the importance of the barrier islands to Long Island's tourism economy cannot be overstated. According to the Long Island Regional Economic Development Council's (REDC) 2013 Update report,<sup>xviii</sup> "Long Island is the second

*For Jim Schappert and his wife who didn't evacuate, the first night after Sandy was a long one. "My wife and I took shifts on the couch downstairs and alternately sleeping upstairs," he said. "Thank goodness, the kids slept through it. We were isolated then, cut off from our loved ones because cell service and electricity were both down. I was afraid mostly of fire. I knew that a fire would mean we were on our own. The road was under four to five feet of water, impassable to fire trucks or ambulance."*

— Jim Schappert,  
NYRCR West Gilgo to Captree  
Committee Chair



## West Gilgo to Captree NY Rising Community Reconstruction Plan

most popular tourism destination in New York State after New York City, with travelers spending nearly \$5.2 billion in the region in 2012. This spending was distributed as 41% in Food, Beverage & Lodging, 26% in Transportation and the remainder amongst Retail, Service Stations, Recreation and Second Homes . . . Overall, tourism supports more than 74,000 jobs or 5.9% of all jobs on Long Island and is responsible for generating nearly \$628 million in state and local tax dollars . . . Tourism is a significant sector of the Long Island economy and has incredible potential for continued growth if properly marketed and cultivated.” It is critically important to rebuild and strengthen the assets of the barrier islands for residents and visitors alike to continue to build upon Long Island’s strong base of tourism, both in the short term and far into the future.

### *Health and Social Services*

The Community would benefit greatly from improvements to fire protection. In the event of a fire, residents report that it takes the Babylon Fire Department about 30 to 40 minutes to arrive on the scene where they utilize fire jetties or drafting wells. Given the heightened threat of electrical fire hazards following a flood event, increased access to fire jetties and drafting wells is a critical need of the Community.

Fire jetties are a unique feature of Oak Beach and Oak Island Beach Association where they are strategically built along the length of the shoreline. The Fire Department backs a fire truck far out onto a fire jetty, which projects into Fire Island Inlet, close to the water and pumps water through connected hoses to the fire. Fire jetties were damaged and undermined by Superstorm Sandy’s strong wave action.

In certain communities residents have access to manually-operated water pumps with which to temporarily contain fires by connecting to fire drafting wells or pumping directly from the adjacent body of water. Fire drafting wells are relatively shallow artesian wells that are installed on Captree Island and in West Gilgo. The Community can hook up to these wells with their manually-operated water pumps until the Babylon Fire Department arrives and also connects to them. In the community of West Gilgo, the fire wells are deeper and serve the dual purpose of potable water supply and fire protection. These wells were nearly overtopped by Superstorm Sandy’s storm surge, which would have contaminated West Gilgo’s public water supply.



An example of a fire drafting well. Residents with manual water pumps, as well as the Babylon Fire Department, connect to the artesian wells to contain fires.



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The community of Gilgo has no fire jetties or drafting wells and is particularly concerned about post-event fire hazards.

On Oak Island, a small red shed houses the island residents' fire protection equipment, including manual water pumps and a small boat on which manual pumps can be mounted, all of which was destroyed in Superstorm Sandy. The island homeowner's association paid to replace all of the damaged equipment, but the firehouse remains a vulnerable asset. Oak Island residents will fight to contain a fire until the Babylon Fire Department arrives in their fireboat.

### *Housing*

The need for more resilient housing construction was an ongoing theme throughout the recovery planning process. Residences in NYRCR West Gilgo to Captree are comprised almost entirely of single family structures located in extreme, high and moderate risk areas. The housing stock was built prior to 1990 and needs to be elevated and hardened against future storms. Other measures should include improved site drainage and elevated home construction that would allow floodwaters to pass underneath; elevation of heating systems and electrical panels above projected flood levels; upgrading windows, doors, and other openings; roof strapping; and overall reinforcement of the structural integrity of the homes. The Town of Babylon reported that housing permits issued for the barrier island communities indicate that owners are making these improvements, but much more needs to be done.

Although affordability of housing may be a concern for barrier island residents, particularly in anticipation of rising flood insurance premiums, increasing the number of units is not an option because the Town of Babylon does not currently lease new land for development. There may be an opportunity, however, to assess options for relocation of residences to safer parcels on the barrier islands or on mainland Long Island.

### *Infrastructure*

Issues with flooding, impaired vehicular access and egress, power outages, and downed communications during and after Superstorm Sandy were the strongest themes heard from Committee and Community members. Although most barrier island residents expect flooding to some extent, their biggest concern is flooding that compromises transportation routes and disrupts evacuation or access by emergency services. Captree Road and Oak Beach Road were completely inundated with floodwaters



A house elevation in progress on Captree Island. The low-lying island is subject to flooding from both the boat channel and the Great South Bay.



## West Gilgo to Captree NY Rising Community Reconstruction Plan

and left with several inches of sediment when the waters subsided. Ocean Parkway was also severely damaged for several miles, including buckling and uplift, that forced the NYS DOT to shut down the eastbound lanes for immediate repairs.

Superstorm Sandy's disruption to the power supply dramatically affected barrier island residents and slowed the recovery for weeks. Some residents describe the power supply being down for up to six weeks and although large truck bed generators were provided after three or four weeks, generator power was unreliable. Some residents may be equipped in their homes with propane or gasoline backup generators, but fuel supply was an additional hurdle after the storm with intermittent supply and rationing. Additionally, residents describe cellular and Internet services as being generally expensive, inadequate, and unreliable. This common inconvenience escalated Superstorm Sandy's threat by undercutting efforts to communicate between the mainland and island residents during and after the event.

### *Natural and Cultural Resources*

The NYRCR West Gilgo to Captree Committee members and other island residents have a distinctly close connection with the beaches, dunes and marshes that surround them, and a unique appreciation for the natural protective services they offer. The Community wants to strengthen their resiliency by ensuring the sustainability of the natural resources to which their existence is so closely tied. The Community repeatedly and wholeheartedly supports all efforts to strengthen and rehabilitate the barrier islands and the Great South Bay. They would like to see wide beaches that are replenished regularly; a robust system of dunes with deeply rooted vegetation that can stand up to most storm events; and sturdy marsh island that consist of a full array of healthy native plant species that are capable of adapting to rising sea levels. The communities also are adamant about preserving and improving their community centers, parks, and other recreational amenities of which they take full advantage.

Table 9 summarizes the Needs and Opportunities identified through the planning process.



# West Gilgo to Captree NY Rising Community Reconstruction Plan

**Table 9: NYRCR West Gilgo to Captree Needs and Opportunities**

<b>Community Planning and Capacity Building</b>
<b>Need:</b> Enhanced emergency management protocols and procedures. <b>Opportunity:</b> Increase public awareness and knowledge of Risk and Disaster Management.
<b>Need:</b> Access to reliable power. <b>Opportunity:</b> Increase resiliency of public facilities.
<b>Economic Development</b>
<b>Need:</b> Maintenance of local tax base. <b>Opportunity:</b> Maintain the salability of housing through resilient housing construction.
<b>Health and Social Services</b>
<b>Need:</b> Increased access to public safety services. <b>Opportunity:</b> Improve and expand fire protection infrastructure.
<b>Housing</b>
<b>Need:</b> Housing that is safe and resistant to flooding and storm force winds. <b>Opportunity:</b> Increase resiliency of housing.
<b>Infrastructure</b>
<b>Need:</b> Mitigation of repetitive flooding. <b>Opportunity:</b> Improve emergency access and evacuation routes.
<b>Need:</b> Protection of utility services. <b>Opportunity:</b> Strengthen communications, power, and drainage systems.
<b>Natural and Cultural Resources</b>
<b>Need:</b> Protection and enhancement of recreational, cultural, and historic assets. <b>Opportunity:</b> Improve the sustainability of the local and regional environment.



## Section III: Reconstruction and Resiliency Strategies

The process of identifying the post-storm needs and opportunities of NYRCR West Gilgo to Captree (Community) informed the NYRCR Committee's (Committee) development of strategies to resolve these needs and realize opportunities. In turn, the strategies assisted in the conceptualization and design of projects to specifically address these needs and opportunities. Strategies are general approaches to types of projects, programs, policies, or other actions that specifically address an identifiable need. Typically, there exist several strategies to address a given need. For example, communities are most successful when they blend traditional stabilization and repair actions with a holistic, long-range, forward-looking view of recovery and economic development. This section presents the strategies developed by the Committee for how best to use Community assets, capitalize on opportunities, and resolve critical issues.

The Committee developed reconstruction strategies, which were derived from a review of the inventory of assets that were identified as being at risk relative to the Community's needs (discussed in the previous section of this report). For every reconstruction and resiliency need or opportunity, potential strategies were generated from multiple management angles. The list of strategies spanned an array of methodologies and timeframes, from preparedness to retrofits, from immediate procedural improvements to long-range capital investment programs. Strategies also included conservation of natural protective features, regulatory changes and building code updates, structural defenses, resiliency retrofits, market measures, land-use planning, and education and outreach in an effort to employ multiple, complementary actions rather than relying on a single means of protection.

Each strategy was designed to take into account the following considerations:

- whether it reduced the level of risk and met an identified Community need;
- whether it helped (or improved the resiliency of) vulnerable populations; and
- whether it could be implemented through discrete programs and/or projects.

*"I am hopeful that we can begin the process of building smarter on the south shore's barrier islands to minimize man's interference with the natural processes of a dynamic shoreline. The goal should be to create a symbiotic relationship where storms can come, and storms can go with minimal damage to structures while residents and visitors serve as stewards responsible for the protection of these essential islands."*

—NYRCR West Gilgo to Captree  
Committee Member



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Careful consideration was given to what is at risk, what resources are available, and the capacity to implement various management measures. As general resiliency strategies evolved to specific projects and actions several factors were considered to begin prioritizing the most effective and feasible strategies, and thus identify the best use of recovery funds. These considerations included how each strategy relates to Superstorm Sandy's impacts on the West Islip Community, to what extent each strategy would reduce current and projected risk, whether it contributed to protection of vulnerable populations, feasibility of a successful implementation, compliance with existing regulations, upfront and long-term maintenance costs, direct and indirect benefits, and public perception.

The Community's reconstruction strategies are discussed below. Each is followed by a table which list Proposed and Featured Projects that would help to implement the strategy.



The view from Jones Beach Island to Oak Island. The small red building is the community's firehouse where manual pump carts and other equipment are stored.



# West Gilgo to Captree NY Rising Community Reconstruction Plan

**Strategy: Improve communications and operations between various relevant entities during emergency management and evacuation/re-entry procedures.**

This strategy was developed in response to difficulties faced by residents as a result of lack of information, misinformation, and breakdowns in the communication networks prior to and following Superstorm Sandy. This strategy would address the previously identified needs to enhance emergency management protocols and procedures, strengthen communications systems, and increase public awareness and knowledge of risk and disaster management. The strategy has the potential to reduce risk for the entire Town of Babylon by enhancing emergency management protocols and procedures via reviews and updates to current plans based on lessons learned. The strategy is relevant to the elderly residents of the barrier islands who are a vulnerable population, by creating consistency and redundancy in the communication of risk for all residents.

The Proposed Project to Update the Emergency Management Communications and Response Plan and the Additional Resiliency Recommendation for Emergency Management Communications Equipment were developed to implement this strategy and would address resiliency issues related to the Recovery Support Function Community Planning and Capacity Building. These projects can be implemented over 12 months or less. Additional information can be found about these projects in Table 10, Section IV, “Implementation – Project Profiles,” and Section V, “Additional Materials.”



A first responder answers calls in an emergency operations center.

**Table 10: Strategy: Improve communications and operations between various relevant entities during emergency management and evacuation/re-entry procedures.**

Project Name	Short Project Description	Estimated Cost	Proposed/Featured Project	Regional Project (Y/N)
Updates to Emergency Management Communications and Response Plan and Related Activities	This project would fund updates to emergency management plans and evacuation/re-entry procedures to streamline communications and operations between relevant local, county, and state entities and trial runs of emergency notification systems. It would also establish a barrier island resident access identification system to simplify post-event access and recovery actions on the barrier islands.	\$125,000	Proposed	Y



# West Gilgo to Captree NY Rising Community Reconstruction Plan

## Strategy: Mitigate power outages at key community facilities to increase resiliency.

This strategy was formulated in direct response to the Community’s struggles with long-term power outages after Superstorm Sandy. With no local public facilities on the island with backup power, residents traveled to the mainland to access electricity. This strategy would also address the previously identified need to protect and enhance recreational, cultural and historic assets because the public facilities on the island are typically community centers and educational centers. The strategy would reduce risk for barrier island residents by increasing their access to facilities with backup power and reducing the need to travel long distances for a basic necessity. The strategy particularly benefits the elderly population who may rely on electronic medical devices.

The Proposed Project to provide Backup Power for Key Community Facilities was developed to implement this strategy. This project can be implemented over 12 months or less and addresses resiliency issues related to Community Planning and Capacity Building. Additional information can be found about this project in Table 11, Section IV, “Implementation – Project Profiles,” and Section V, “Additional Materials.”

**Table 11: Strategy: Mitigate power outages at key community facilities to increase resiliency.**

Project Name	Short Project Description	Estimated Cost	Proposed/Featured Project	Regional Project (Y/N)
Backup Power for Key Community Facilities	This project would fund the installation of backup generators at key Community facilities which would then serve as drop-in centers where residents can warm up, recharge cell phones and other electronics, access the internet and exchange community news. Facilities include Cedar Beach Marina Aqua Center, Oak Beach Community Center, West Gilgo Community Chapel, and the Gilgo Beach Office and Restroom Facility.	\$400,000	Proposed	N



# West Gilgo to Captree NY Rising Community Reconstruction Plan

## Strategy: Improve public safety services to reduce risk to residents.

This strategy was developed as a result of every Community within NYRCR West Gilgo to Captree feeling vulnerable to fires after Superstorm Sandy. As discussed in the previous section, emergency response times to the barrier island communities are lengthy from the mainland even during non-emergency times. Once in the Community, response can be further hampered by inaccurate GIS address data, a confusing residential boardwalk system, inadequate signage, and inadequate water supply infrastructure. Not only was the risk of fire heightened after Superstorm Sandy due to electrical wiring being inundated with floodwaters during the storm, access by emergency responders was hindered by flooded, debris-laden, damaged roadways. This strategy would increase access to reliable public safety services and lower risk to barrier island residents by reducing deficiencies in access and response time of fire protection services. The strategy is particularly beneficial to the elderly or disabled population who may be more in need of emergency medical services, more at risk of physical injury when a fire breaks out, more likely to require evacuation assistance, etc.

The Proposed Projects for Improvements to Fire Protection in Gilgo; Improvements to Potable Water and Fire Protection System in West Gilgo; and Improvements to 911 GPS Data and Community Signage were developed to implement this strategy. Additional Resiliency Recommendations, including the Oak Island Firehouse and Improvements to the Residential Boardwalk Systems, were also developed to implement this strategy. The improvements to public safety services would be accomplished through these projects by enhancing the fire protection facilities (retrofitting and expanding the water supply system in West Gilgo and installing fire drafting wells in Gilgo) and accelerating response times (increasing the accuracy of locational data and wayfinding tools (e.g. signs)).

These projects can be implemented over 12 months or less and address resiliency issues related to Health and Social Services. Additional information can be found about these projects in Table 12, Section IV, "Implementation – Project Profiles," and Section V, "Additional Materials."



A system of residential boardwalks is the only means of access for emergency services for many homes on the barrier islands.



# West Gilgo to Captree NY Rising Community Reconstruction Plan

**Table 12: Strategy: Improve public safety services to reduce risk to residents.**

Project Name	Short Project Description	Estimated Cost	Proposed/Featured Project	Regional Project (Y/N)
Improvements to Fire Protection - Gilgo	Fire hazards become a major safety concern following a flood event when electrical wiring and equipment may have become corroded and prone to catching fire. This project would fund the installation of five drafting wells located strategically throughout Gilgo for better access by the community and the Babylon Fire Department to contain and put out fires.	\$115,000	Proposed	N
Improvements to Potable Water and Fire Protection System - West Gilgo	West Gilgo's water supply system, used for fire protection and domestic uses, nearly became submerged by Superstorm Sandy's floodwaters. This project would fund mitigation measures for West Gilgo's water supply system to make it more flood resistant, including raising the tops of the well heads, elevating the standby generator and propane fuel tank, and installing new pump house storage tanks and piping.	\$210,000	Proposed	N
Improvements to 911 GPS Data and Community Signage	Fire hazards become a major safety concern following a flood event when electrical wiring and equipment may have become corroded and prone to catching fire. Residential boardwalk systems, which function similarly to public streets, may be the only access point for fire rescue and emergency evacuation services for many residences of the barrier island communities. This project would fund updates to GIS data for roads, boardwalks, and address locations, as well as installation of signage on residential boardwalks for improved fire rescue and emergency services response.	\$195,000	Proposed	N



# West Gilgo to Captree NY Rising Community Reconstruction Plan

## Strategy: Protect shorelines to reduce flood risk and maintain evacuation routes.

This strategy was formulated in direct response to severe flooding of housing and critical roadways during Superstorm Sandy and concerns by the Community that continuing erosion of the shoreline stabilization structure and undermining of infrastructure and roadways will lead to worsening flooding in the future. The strategy would reduce risk for barrier island residents by ensuring the passability of critical roadways during flood events. The strategy particularly benefits the elderly or disabled populations who may require quick access by emergency services and egress in case of evacuation.

The Proposed Projects for Shoreline Stabilization of Oak Beach and Shoreline Stabilization of Captree were developed to implement this strategy and to address resiliency issues related to Infrastructure. The Additional Resiliency Recommendations for Shoreline Stabilization - Oak Beach Phase II and Shoreline Stabilization - Captree Phase II were also developed to implement this strategy. These projects can be implemented over a period of 12 to 36 months including a planning and design phase and construction. Additional information can be found about these projects in Table 13, Section IV, “Implementation – Project Profiles,” and Section V, “Additional Materials.”

**Table 13: Strategy: Protect shorelines to reduce flood risk and maintain evacuation routes.**

Project Name	Short Project Description	Estimated Cost	Proposed/Featured Project	Regional Project (Y/N)
Shoreline Stabilization - Oak Beach Phase I	Oak Beach residents, located on the inlet and subject to extensive wave action and erosion, face several hazards including the destabilization of the shoreline, breaches during storm events, damage to fire jetties, and destabilization of the southern flank of Oak Beach Road. This project would fund the strengthening of the shoreline stabilization structures at the most critical points along Oak Beach's shoreline.	\$1,285,000	Proposed	N
Shoreline Stabilization – Captree Phase I	Captree Road on Captree Island is a single entry road that serves 32 residences. The low-lying roadway becomes frequently inundated with water from the marshes to the north as well as the boat channel to the south due to its low elevation and lack of protection. The flooding restricts access and egress to residents, potentially blocking evacuation and/or emergency vehicle access during an emergency event. This project would raise the roadway and strengthen the shoreline stabilization in the most critical areas along Captree Road.	\$600,000	Proposed	N



## West Gilgo to Captree NY Rising Community Reconstruction Plan

**Strategy: Increase coastal protection through the restoration and enhancement of natural protective systems including dunes, beaches, and wetlands.**

This strategy was developed out of the Community's ardent recognition that the barrier island ecosystem is their reason for being, in more ways than one. The bay and the beaches provide the recreational opportunities and the stunning backdrop of their daily lives that drew them to live in the barrier islands to begin with. The dunes and marshes provide protection from the ocean's unforgiving storms and waves and make living there feasible. These natural resources, however, are under threat from erosion, sea level rise, and water quality degradation, which all contribute to the weakening of the ecological services that these landscapes have provided in the past. This strategy would reduce risk to barrier island residents and residents across the Great South Bay by investing in the long-term establishment of ecologically healthy and robust dune and wetland systems that will, over the long term, improve water quality, help to attenuate wave action and erosion, and provide wildlife habitat. The strategy is beneficial to all residents on the barrier islands and Long Island who rely on the barrier islands as the first line of defense against the ocean and bay's waves and storm surges.

The Proposed Projects for a Strengthening of Dunes Feasibility Assessment and Enhancement of Wetlands, as well as the Featured Project for a Strengthening of Dunes Pilot Project were developed to implement this strategy. The feasibility assessment and the wetlands restoration project can be implemented over 12 months or less, while the pilot project can be implemented over a longer timeframe of 36 months and longer. These projects address resiliency issues related to Natural and Cultural Resources. The Additional Resiliency Recommendations for Ocean Parkway Narrowing/Relocation; Replenishment of Beaches; Restoration of Shellfish Breeding Grounds; and Study of Restoration of the North/South Orientation of Fire Island Inlet were also developed to implement this strategy. Additional information can be found about these projects in Table 14, Section IV, "Implementation – Project Profiles," and Section V, "Additional Materials."



An ongoing shoreline restoration project underway in Gilgo requires that Community members refrain from trampling vegetation.



# West Gilgo to Captree NY Rising Community Reconstruction Plan

**Table 14: Strategy: Increase coastal protection through the restoration and enhancement of natural protective systems including dunes, beaches, and wetlands.**

Project Name	Short Project Description	Estimated Cost	Proposed/Featured Project	Regional Project (Y/N)
Enhancement of Wetlands	The wetlands of the Great South Bay have struggled to remain healthy under the stresses of excess nutrients in the water and sea level rise. This project would fund a pilot project for integrated marsh management that would involve the rebuilding of the wetlands through such activities as using dredge spoils to fill in “dead pannes” (low-lying areas of marsh islands), planting native species, and reverting mosquito ditches, particularly around Captree Island and Oak Island.	\$500,000	Proposed	Y
Strengthening of Dunes Feasibility Assessment	The barrier island communities depend wholly on the strength of the dune system for the protection of their communities. Current standards and methodologies are proving to be insufficient, as indicated by large sections of the dunes collapsing from periods of strong winds in October 2013. This project would fund a comprehensive review of current and alternative methods of dune replenishment and strengthening with site specific application in Gilgo, West Gilgo, and Oak Beach. The focus would be on long-term resiliency of the dune system, as well as funding options for long-term maintenance.	\$295,000	Proposed	Y
Strengthening of Dunes - Pilot Project	Intended to complement the Proposed Project Strengthening of Dunes Feasibility Assessment to review the best methods of dune strengthening, this project would fund a pilot project to restore dunes in the areas of Gilgo/West Gilgo and Oak Beach, demonstrating the best methodologies identified in the comprehensive study.	\$10,000,000	Featured	Y



## Section IV: Implementation – Project Profiles

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The NYRCR Program has allocated to the NYRCR West Gilgo to Captree Community (Community) up to \$3 million. The funding is provided through the U.S. Department of Housing and Urban Development (HUD) Community Development Block Grant – Disaster Recovery (CDBG-DR) program. While developing projects and actions for inclusion in the NYRCR Plan, the NYRCR West Gilgo to Captree Committee (Committee) took into account cost estimates, cost-benefit analyses, the effectiveness of each project in reducing risk to populations and critical assets, feasibility, and community support. The Committee also considered the potential likelihood that a project or action would be eligible for CDBG-DR funding. The projects and actions set forth in the NYRCR Plan are divided into three categories. The order in which the projects and actions are listed in the NYRCR Plan does not necessarily indicate the Community prioritization of these projects and actions.

Proposed Projects are projects proposed for funding through the Community's allocation of CDBG-DR funding. Featured Projects are projects and actions that the Committee has identified as important resiliency recommendations and has analyzed in depth, but has not proposed for funding through the NYRCR Program. Additional Resiliency Recommendations (see Section V, "Additional Materials") are projects and actions that the Committee would like to highlight and that are not categorized as Proposed Projects or Featured Projects.

The total cost of Proposed Projects in the NYRCR Plan exceeds the NYRCR Community's CDBG-DR allocation to allow for flexibility if some Proposed Projects cannot be implemented due to environmental review, HUD eligibility, technical feasibility, or other factors. Implementation of the projects and actions found in the NYRCR Plan are subject to applicable Federal, State, and local laws and regulations, including the Americans with Disabilities Act (ADA). Inclusion of a project or action in the NYRCR Plan does not guarantee that a particular project or action will be eligible for CDBG-DR funding or that it will be implemented.



## West Gilgo to Captree NY Rising Community Reconstruction Plan

This section provides a complete Project Profile for each Proposed or Featured Project identified by the Committee and the Community. In addition to providing a detailed description of each project, the profiles include information on two important elements used by the Committee to evaluate each project—a Cost-Benefit Analysis and a Risk Reduction Analysis. Before proceeding to the projects themselves, it is important to understand these two analytical elements of the Project Profiles.

### **Cost-Benefit Analysis**

A cost-benefit analysis (CBA) evaluates and compares the benefits and costs associated with a project. The CBA provides decision-makers with a framework for comparing different projects (i.e., anticipated cost of implementation against total expected benefits), and determining whether the benefits of a particular project outweigh the costs. More specifically, the value of the CBA is two-fold: (1) to inform the selection of projects for implementation; and (2) to support grant applications for funds.

Because the NYRCR Program is a Community-driven process, the CBA has focused on identifying project costs and benefits that easily relate to the Community. Community and Committee input—informed by a true understanding of local conditions, needs, and Community values—plays a crucial role in the selection of projects that are implemented. With this in mind, the CBA has used a mix of both quantitative and qualitative factors in its analysis.

The CBA cannot, however, anticipate costs with complete certainty; rather, it provides the Community with a practical understanding of the potential estimated costs of project implementation and the potential benefits that will accrue to the Community with the project in place. The costs and benefits used to evaluate projects through the CBA are explained further below.

### ***Project Costs***

Each Project Profile includes total project costs that represent the full implementation of the Proposed or Featured Project, from planning and design through to construction, as well as an overall lifecycle cost.

The cost of implementing a project is just one aspect of the justification for funding these Proposed Projects. Conversely, another important variable is the future costs of not implementing these projects, which have the potential to negatively impact the long-term viability of both the barrier island



## West Gilgo to Captree NY Rising Community Reconstruction Plan

communities and their neighboring communities across the bay. While these costs are more difficult to quantify, they are no less important to our analysis, and are therefore addressed qualitatively. These costs include, but are not limited to:

- Extensive, repetitive damage to personal property (vehicles, residences) and public infrastructure resulting from frequent recurring flooding and future storm events;
- Economic loss to residents and to local and regional employers as a result of the inability to work; and
- Hindrance in the provision of life safety and emergency services resulting in repeated inability to access areas of the Community.

### *Project Benefits*

The types of benefits considered in the CBA include:

- **Risk Reduction:** The extent to which a project reduces the risk of damage to a Community asset from a future storm event (discussed further below under “Risk Reduction Analysis”).<sup>xxv</sup>
- **Economic Resiliency:** The project’s potential to help minimize economic costs and reduce the time it takes for the local economy to rebound from a storm event. Economic data included, where applicable, an estimate of permanent jobs secured/added; relationship to, and/or furtherance of, Regional Economic Development Plan goals; potential for additional economic activity; and the net effect on local municipal expenditures.<sup>xxvi</sup>
- **Health, Social and Public Safety Services:** Qualitative information was provided on the overall population benefits of improved access to health and social service facilities and public safety services; type and size of socially vulnerable population secured;<sup>xxvii</sup> and degree to which essential health and social service facilities are able to provide services to a community during a future storm or weather event as a result of the project.
- **Environmental Protection:** Benefits include the protection of crucial environmental assets or high-priority habitat, threatened and endangered species, migration or habitat connectivity; any clean-up resulting from the action; creation of open space or a new recreational asset.



# West Gilgo to Captree NY Rising Community Reconstruction Plan

## *Risk-Reduction Analysis*

A risk reduction analysis estimates the extent to which Proposed and Featured Projects will reduce flooding risk to specific Community assets when the project is in place. The extent to which a project would reduce such risk is also considered as a benefit in the CBA (see “Project Benefits” above). Risk reduction is different from the risk assessment in the previous section in a very important way—risk assessment looks at storm and flood risks to Community assets before the project is implemented; risk reduction looks at the anticipated reduced flood risk assuming the project is in place.

For this risk reduction analysis, projects were evaluated under a three foot rise in sea level scenario for their potential to reduce an asset’s level of exposure and/or vulnerability to future storms. This helps communities and decision-makers understand the potential environmental, social, and economic outcomes associated with each project. (For a more detailed discussion of the methodology and factors used in the risk reduction analysis, see Section V, “Additional Materials”).



Superstorm Sandy’s storm surge wreaked havoc on the residential boardwalk systems, hampering access and egress.



## ***Proposed Project: Updates to Emergency Management Communications and Response Plan and Related Activities***

### ***Project Description***

The purpose of this project is to address communications failures that arose during Superstorm Sandy that put barrier island residents at risk. Residents faced miscommunication and inconsistency of information with regards to evacuation and re-entry procedures leading up to and following Superstorm Sandy. First, the Reverse 911 evacuation notification system failed, resulting in many residents staying at their barrier island residences during the storm. During and after the storm, cellular, landline, and Internet services failed, leaving island residents completely cut off from communications. Following the storm, re-entry procedures were inconsistently applied, resulting in many residents being unable to access their homes after evacuating or visiting the mainland for employment/supplies.

This project would fund activities to improve communication of emergency information between mainland emergency services and the barrier island communities, as well as streamline procedures and communications amongst emergency response teams. First, updates would be made to emergency management plans and evacuation/re-entry procedures with a focus on streamlining communications and operations between the relevant entities involved in administering these procedures (the Federal Emergency Management Agency (FEMA), Town of Babylon, New York State Police, New York Park Police, and Suffolk County Police). Joint training would be conducted for each relevant partner at the local, County, and State level on the newly updated evacuation and re-entry procedures of island residents, preferably in conjunction with trial runs of primary and backup early warning systems (e.g., Reverse 911). The project would also establish a barrier island resident access identification card/vehicle tag to simplify access rights and re-entry following emergencies.

### ***Estimated Project Costs***

The total estimated project cost of \$125,000 includes \$100,000 for plan updates, training, and the implementation of a barrier resident identification system, and \$25,000 for contingency. The lifecycle of this project has two components: the barrier island resident identification system, which would be a new program that would be continued in perpetuity at a very low additional operational cost to the

UPDATES TO EMERGENCY  
MANAGEMENT COMMUNICATIONS  
AND RESPONSE PLAN AND RELATED  
ACTIVITIES

***Recovery Support Function:***  
Community Planning and Capacity  
Building

***Cost:*** \$125,000

***Assets made more Resilient:***  
All residents of NYRCR West Gilgo to  
Captree

***Risk Reduction & Benefits:***  
Improved evacuation and re-entry  
procedures for residents and  
optimization of government  
operations



## West Gilgo to Captree NY Rising Community Reconstruction Plan

Town of Babylon. The second component is ongoing training at various levels of government on evacuation and emergency response, as well as re-entry procedures for barrier island residents. The total lifecycle cost of this project is \$145,000.

### ***Project Benefits***

#### ***Risk Reduction Benefits***

Updates to the plans and procedures relating to disaster communication and response have the potential to dramatically reduce risk to residents of the barrier islands by relaying important evacuation and re-entry information. Without a reliable notification system and consistent re-entry procedures, residents may not know to, or may choose not to, evacuate. This project would thus reduce risk to an estimated 1,018 seasonal and year-round barrier island residents.

#### ***Economic Benefits***

The intention of this project is to streamline the operations and efficiency of multiple layers of public safety and emergency response entities, specifically relating to evacuation and re-entry procedures for the barrier island communities, while more broadly touching on the need for collaborative preparedness training prior to storm events to optimize the resources required for emergency response. Clarity of procedures and efficacy of communication between response agencies as well as with the public will minimize the time and resources required for this activity, minimize disruption to the barrier island residents' lives, and free up resources for other critical disaster response activities. Once the plan is developed, the resources required to implement the procedures during an emergency would be significantly reduced, resulting in a net reduction of government expenditures.

#### ***Health and Social Benefits***

This project would benefit residents of all six barrier island communities—an estimated 1,018 seasonal and year-round residents. Additionally, of this population, 22.3% of the residents, or an estimated 227 people, are 65 or older,<sup>iv</sup> a group designated as a vulnerable population.



Example of an evacuation route sign. Residents expressed the need for better and more coordinated communication before and after emergencies.



## West Gilgo to Captree NY Rising Community Reconstruction Plan

### ***Cost-Benefit Analysis***

The total estimated cost of this project of \$125,000, which is expected to resolve communication breakdowns related to storm warnings, evacuation notifications, and re-entry procedures, has a high cost to benefit relationship. Once established, the barrier island resident identification system will be a very low cost program to maintain and should greatly reduce confusion following storm events when restricted re-entry procedures are enacted.

### ***Risk Reduction Analysis***

This project would reduce risk of miscommunication and misinformation related to emergency management for an estimated 1,018 seasonal and year-round residents of the barrier island communities. Residents will be more informed of their own risk leading up to future acute events and more likely and willing to evacuate out of harm's way in a timely and safe manner.

### ***General Timeframe for Implementation***

Intra-agency coordination on updating plans could begin immediately within 0-3 months upon project approval, followed by training within 3-6 months. A Town program to register and implement a barrier island resident identification system could be integrated into an existing Town service, such as property tax or the barrier beach lease agreements and implemented within six months of project approval.

### ***Regulatory Requirements Related to Project***

The project components for updates to emergency management plans and training require input and participation from several governmental organizations including the Federal Emergency Management Agency (FEMA), Town of Babylon, Suffolk County Office of Emergency Management, Suffolk County Police, New York State Police, and New York State Parks Police. The New York State Office of Parks, Recreation, and Historic Preservation (NYS OPRHP) may request review and comment on the plan if procedures affect the State parklands and parkways. However, there are no regulations that would guide this coordination.

### ***Jurisdiction***

This project would fall under the jurisdiction of the Town of Babylon.



## **Proposed Project: Backup Power for Key Community Facilities**

### **Project Description**

The purpose of this project is to provide local Community facilities with reliable backup power sources that can be accessed by Community members who lose power. Residents of the barrier islands experienced up to six weeks without power following Superstorm Sandy, meaning loss of heat, water, lights, or any other daily needs and conveniences that rely on electricity. The barrier islands are essentially the end of the line with regards to power supply because the utilities cross the Robert Moses Causeway from the mainland to the Captree substation (which flooded during Superstorm Sandy) and power lines then distribute electricity throughout the six communities. When widespread damages are incurred to the power supply infrastructure, such as during Superstorm Sandy, the barrier islands are the last to have their power restored.

This project would fund the installation of permanent, mounted propane-fueled generators at key Community facilities, which could then serve as drop-in/warming centers where residents can access heat, rest, recharge cell phones and other electronics, access the internet, and exchange community news. Each of the key facilities identified by the communities is equipped with bathrooms and power outlets and two of the facilities are equipped with showers. They include Cedar Beach Marina Aqua Center, Oak Beach Community Center, West Gilgo Community Chapel, and the Gilgo Beach Office and Restroom Facility.

### **Estimated Project Costs**

The estimated project cost of \$400,000, or approximately \$100,000 per facility for four Community facilities, includes the \$320,000 for procurement, materials, and labor for the installation of an emergency standby generator system (100kw to 125kw), automatic transfer switch, and weather proof enclosure, the construction of a cement base pad, permits, and startup inspection; and \$80,000 for soft costs. The useful life of a permanently installed generator is about 15 years<sup>xxviii</sup> and the generators would require brief monthly maintenance and inspection for an anticipated operation and maintenance cost of \$90,000 over the life of the generators, or \$22,500 per generator. Fuel would also be an expense following each generator's use. The total lifecycle cost of this project is \$490,000.

### **BACKUP POWER FOR KEY COMMUNITY FACILITIES**

#### **Recovery Support Function:**

Community Planning and Capacity Building

**Cost:** \$400,000

#### **Assets made more Resilient:**

Four community facilities: Cedar Beach Marina Aqua Center, Oak Beach Community Center, West Gilgo Community Chapel, and the Gilgo Beach Office and Restroom Facility

#### **Risk Reduction & Benefits:**

Reduced power outages at key facilities and benefit of reliable power source and water for all community members



# West Gilgo to Captree NY Rising Community Reconstruction Plan

## ***Project Benefits***

### ***Risk Reduction Benefits***

The prolonged power outages following Superstorm Sandy impacted every aspect of the barrier island residents' lives, cutting off lights, heat, communications, and water for up to six weeks. Adding backup power capability for at least four key facilities in the six barrier island communities would reduce risk to the facilities themselves, as well as provide residents with a safe location to access in times of need. With the exception of the Oak Beach Community Center, none of the key facilities identified by the Community experienced flooding; they were mainly affected by the prolonged power outage and related issues.

### ***Health and Social Benefits***

This project would provide drop-in facility access to residences and businesses of all six barrier island communities, or an estimated 1,018 people. For 22.3% of residents who are ages 65 years and greater,<sup>iv</sup> or an estimated 227 people, and considered to be a vulnerable population, this project would create significant added benefits because senior residents often require electronic medical devices that need charging or a power source.

### ***Cost-Benefit Analysis***

Residents faced power outages for up to six weeks following Superstorm Sandy. These communities are at the end of the power distribution system and most strategies that would mitigate future power outages are cost prohibitive for the communities to implement on their own. This project allows the communities to adapt to a future reality in which major storm events may increasingly overwhelm the power infrastructure. The provision of backup power at key facilities would at least provide a set of locations where residents could reliably access restroom facilities and charge cell phones and electronics without having to drive several miles off the island. The estimated cost of \$400,000, or about \$100,000 per community center, is a very reasonable and cost-effective alternative as compared to other large-scale power utility projects.



Oak Beach Community Center, one of four facilities that would be provided with a backup generator through this project.



## West Gilgo to Captree NY Rising Community Reconstruction Plan

### ***Risk Reduction Analysis***

Three of the four facilities targeted in this project experienced no flooding or minimal flooding, but were out of operation due to a lack of power. This project would keep these three facilities in operation throughout future events. The fourth facility, Oak Beach Community Center, did flood, but the Town of Babylon has applied for funding to elevate and repair the facility; the backup generator from this project would complement those mitigation measures.

Not only would this project protect four community centers that would otherwise suffer damages related to loss of power, it would also mitigate the physical and mental anguish suffered by residents as a result of 42 days without power. Additional risks that can arise from lack of power, and which this project would help to alleviate, include inoperability of medical devices, untreated water, hypothermia, and potentially unhygienic conditions.

### ***General Timeframe for Implementation***

Permitting, procurement, and installation could take place within 0-6 months of project approval.

### ***Regulatory Requirements Related to Project***

Backup generators and fuel tanks will be installed at a height at or above base flood elevation<sup>xxix</sup> and in compliance with Town of Babylon building codes.

### ***Jurisdiction***

This project would fall under the jurisdiction of the Town of Babylon.



## **Proposed Project: Improvements to Fire Protection—Gilgo**

### **Project Description**

The purpose of this project is to reduce the risk of post-flooding fire hazards to the residential structures in the barrier island community of Gilgo. When a fire breaks out in Gilgo, the Babylon Fire Department may take 30 to 40 minutes to arrive on the scene. Upon arrival, the firefighters extend a hose directly into the bay and draft water for use on the burning structure. By this time, a typical wood frame structure would be completely engulfed in flames, which could then spread to neighboring structures. In the aftermath of a hurricane with a major storm surge (as with Superstorm Sandy), the electrical wiring and equipment of residential structures is likely to have been flooded and prone to igniting a fire. This vulnerable situation is exacerbated following acute events when the local fire departments are overstretched and preoccupied with fire response on the mainland and/or cannot access the barrier island communities due to road or bridge blockages. One hazard mitigation option is to make the Gilgo community more self-reliant in such a situation by installing fire drafting wells, which the residents can access using manual fire pump carts. Similar wells have been installed and are used by other communities, such as West Gilgo, where residents can utilize personal or shared manual water pumps to contain a blaze until the Babylon Fire Department arrives and connects their equipment to the drafting wells.

The proposed project would fund the installation of five drafting wells located strategically throughout the Gilgo community to minimize the distance between fire wells and residential structures. The coverage area of each fire well will augment the residents' and the Babylon Fire Department's ability to suppress fires in Gilgo. When assistance from the fire department is too far away or cannot access the community, residents would fight their own fires by hand cart by connecting to the wells. This project would empower and equip the community to be more resilient during or after a natural disaster when communications and access may be compromised.

### **Estimated Project Costs**

The estimated cost of \$115,000 includes \$75,000 for hard costs (materials and labor for the installation of five 10-inch diameter wells), \$20,000 for soft costs (design, permitting, environmental compliance), and \$20,000 for contingency. The useful life of a fire well is expected to be 50 years<sup>xxviii</sup> and with the cost

### IMPROVEMENTS TO FIRE PROTECTION—GILGO

**Recovery Support Function:**  
Health and Social Services

**Cost:** \$115,000

**Assets made more Resilient:**  
57 residential structures in Gilgo

**Risk Reduction & Benefits:**  
Reduces risk of post-flooding electrical fire hazards for 135 residents



# West Gilgo to Captree NY Rising Community Reconstruction Plan

of annual inspections by the Town of Babylon, would incur costs of approximately \$50,000 to operate and maintain, for a full lifecycle cost of \$165,000. The fire wells proposed for drilling in Gilgo would be new construction and therefore this would be a new cost for the Town of Babylon.

## ***Project Benefits***

### ***Risk Reduction & Resiliency Benefits***

The five fire wells would be located in strategic locations to minimize the distance between fire wells and residential structures. Implementation of this project would reduce risk of fires consuming homes and threatening life and safety for an estimated 141 residents.

### ***Economic Benefits***

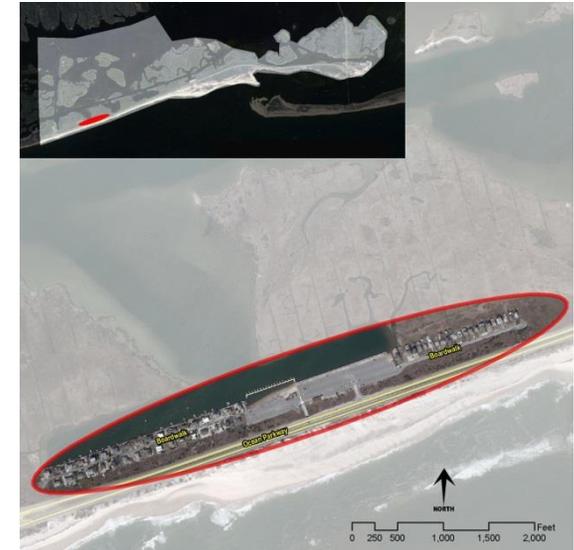
There are benefits to be captured from implementing this project in the form of avoided future costs in terms of damage to residential structures resulting from lack of fire response capabilities. In addition, this project would create temporary jobs for the installation of fire wells. An estimated 1.4 full time equivalent employee positions<sup>xxx</sup> would be created. This project would help to maintain the value and salability of the homes in Gilgo.

### ***Health and Social Benefits***

This project would secure the provision of fire response services for the entire Gilgo community of 57 single-family homes, or an estimated 141 people, during acute events. Of this population, 22.3%, or an estimated 31 residents, served by this fire protection system are 65 years of age or older,<sup>iv</sup> thereby protecting this potentially vulnerable population.

### ***Cost-Benefit Analysis***

Superstorm Sandy heightened everyone's awareness of the dangers of fires related to major long-term flooding, as evidenced by the hundreds of residences and businesses lost in Breezy Point, NY and Seaside, NJ. The barrier island communities are already at a higher risk to fires due to distance of the Babylon Fire Department across the Great South Bay and the lack of a hydrant system. The firefighting options are limited to fire jetties and fire wells and in light of Superstorm Sandy's damages, it is of critical importance that these fire protection systems be expanded in anticipation of future storm events. The fire protection benefit gained for the residents of Gilgo justifies a project cost of approximately \$115,000.



The site map highlights the community of Gilgo in which this project would be implemented.



## West Gilgo to Captree NY Rising Community Reconstruction Plan

### ***Risk Reduction Analysis***

The risk of fires is heightened following flood events due to four factors: saltwater corrosion of electrical equipment significantly increases the chance of fires; communication systems may be out of service, rendering residents unable to call for help; the fire department may be responding to multiple rescue calls; and access to the community by bridges or Ocean Parkway may be limited due to blockages and/or failures. This project reduces risk of losing homes and lives to fires by supplementing the fire department's ability to fight fires in the community.

### ***General Timeframe for Implementation***

Permitting and procurement could be implemented within 0-6 months of project approval and construction could be completed within three months of completing permitting and procurement.

### ***Regulatory Requirements Related to Project***

The installation of new wells will require review and permitting from the New York State Department of Environmental Conservation (NYS DEC) for water withdrawal. This may also involve the U.S. Army Corps of Engineers (USACE) and Coastal Zone Management (CZM) consistency concurrence with New York State Department of State (NYS DOS). Wells would be installed with wellheads set to an elevation at or above base flood elevation and in compliance with Town of Babylon codes.

### ***Jurisdiction***

This project would fall under the jurisdiction of the Town of Babylon.



Improved fire protection and suppression is considered to be a need in the barrier island communities.



## ***Proposed Project: Improvements to Potable Water and Fire Protection System—West Gilgo***

### ***Project Description***

This purpose of this project is to increase the resiliency of West Gilgo’s public water supply system on which the community relies for both fire suppression and potable water/domestic uses. The system is classified as a public water supply system because it is regulated by the New York State Department of Health; it is the community homeowners association, however, that owns and maintains the system (the land on which the system is built is leased from the Town of Babylon). When a fire breaks out in West Gilgo, Babylon Fire Department can take between 30 and 40 minutes to arrive on the scene (anecdotally, residents report response times of up to 45 minutes during non-emergency times). Upon arrival, the firefighters would connect to West Gilgo’s well system and draft water for use on the burning structure. While awaiting fire rescue, the West Gilgo community can use manual fire pump carts to connect to the public wells and contain the blaze. By this time, a typical wood frame structure would be completely engulfed in flames and possibly spreading to neighboring structures.

In the aftermath of a hurricane with a major storm surge (as with Superstorm Sandy), the electrical wiring and equipment of residential structures is likely to have been flooded and prone to igniting a fire. This vulnerable situation is exacerbated following acute events when the local fire departments are overstretched and preoccupied with fire response on the mainland and/or cannot access the barrier island communities due to road or bridge blockages. Ocean Parkway, for example, was buckled and impassable at points for several weeks after Superstorm Sandy. The community of West Gilgo wants to protect and enhance their ability to contain a fire until the fire department arrives by mitigating the infrastructure that is currently at risk and slightly expanding the system for increased coverage.

West Gilgo’s water system nearly failed during Superstorm Sandy due to floodwaters rising to nearly above the well heads, the generator, and the electrical controls. The community was extremely lucky to retain the fire suppression capabilities after the storm. The fact that the system did not fail during the storm was additionally advantageous to the community, which had potable water throughout the recovery period when other barrier island communities were without water for up to six weeks. This

### IMPROVEMENTS TO POTABLE WATER AND FIRE PROTECTION SYSTEM—WEST GILGO

***Recovery Support Function:*** Health and Social Services

***Cost:*** \$210,000

***Assets made more Resilient:***  
80 residential structures

***Risk Reduction & Benefits:***  
Reduces risk of post-flooding electrical fire hazards for 200 residents



# West Gilgo to Captree NY Rising Community Reconstruction Plan

project would raise the tops of the well heads, elevate the standby generator and propane fuel tank, and acquire and install new pump house storage tanks and piping. The project would also drill four additional wells at critical points in the community to expand fire suppression services to all 80 homes and upgrade two existing wells.

## **Estimated Project Costs**

The estimated cost of \$210,000 includes \$150,000 for hard costs (materials and labor for elevation of the wellheads, standby generator, and fuel tank; installation of new pump house storage tanks and piping; installation of four additional fire wells; and retrofit of two existing fire wells), \$30,000 for soft costs (design, permitting, environmental compliance), and \$30,000 for contingency. The useful life of this project, assuming that the system is maintained properly, is expected to be 50 years.<sup>xxviii</sup> Because this project is essentially an elevation retrofit for West Gilgo's existing public water system pump house and controls, there are no anticipated net increases to West Gilgo's operations and maintenance expenses.

## **Project Benefits**

### *Risk Reduction & Resiliency Benefits*

With the elevation of the electrical equipment, backup generator, and wellhead to above future projected flood events, the vulnerability of the system to flood inundation or contamination would decrease and there would be reduced interruption to services in future flood events. As a result, the vulnerability of the residents of Gilgo would decrease because they would have a more reliable source of water for fire suppression purposes and a dependable and uncontaminated source of drinking water.

### *Economic Benefits*

The community of West Gilgo funds the regular operations and maintenance of its water system. However, the community does not have the resources or funds to repair future damages that could be incurred to their entire water system should a future storm event contaminate the wells or destroy the electrical equipment. This project is critical, therefore, to minimize the net effect on the community's expenditures so that the community may remain fiscally viable. Additionally, this project will create temporary jobs for the construction activities. An estimated 2.6 full time equivalent employee positions<sup>xxx</sup> would be created. There are also benefits to be captured from implementing this project in the form of avoided future costs in terms of damage to residential structures resulting from loss of fire



The site map highlights the community of West Gilgo in which this project would be implemented.



## West Gilgo to Captree NY Rising Community Reconstruction Plan

response capabilities. Finally, this project will help to maintain the value and salability of the homes in West Gilgo.

### *Environmental Benefits*

Elevating the water system would protect the aquifer from potential contamination that would occur from salt and floodwaters inundating the wellhead.

### *Health and Social Benefits*

The proposed project would secure the provision of water for fire response and domestic uses for the entire West Gilgo community of 80 single-family homes, or an estimated 198 people, during acute events. An estimated 40 of those residents served by this water supply and fire protection system are senior citizens, thereby protecting this vulnerable population.

### *Cost-Benefit Analysis*

Superstorm Sandy heightened everyone's awareness of the dangers of fires related to major long-term flooding, as evidenced by the hundreds of residences and businesses lost in Breezy Point, NY and Seaside, NJ. The barrier island communities are already at a higher risk to fires due to distance of the Babylon Fire Department across the Great South Bay and the lack of a hydrant system. West Gilgo's water system, upon which the community relies for both drinking water and fire suppression, was nearly destroyed by Superstorm Sandy's floodwaters as the levels of flooding rose to almost the elevation of the electrical controls and the wellhead. The project cost of approximately \$215,000 is justified by the protection of the community's ability to provide water for domestic use throughout any future storm, as well as to suppress fires that may arise during or after a future flood event.

### *Risk Reduction Analysis*

The implementation of this project would reduce risk to 80 residential structures, as well as increase the resiliency of the water system and its associated equipment, which is categorized as FEMA-critical equipment.

### *General Timeframe for Implementation*

Permitting and procurement could be implemented within 0-6 months of project approval and construction could be completed within three months of completing permitting and procurement.



West Gilgo's water supply system nearly failed as the floodwaters rose almost to above the well heads.



## West Gilgo to Captree NY Rising Community Reconstruction Plan

### ***Regulatory Requirements Related to Project***

The installation of additional wells will require review and permitting from New York State Department of Environmental Conservation (NYS DEC) for water withdrawal. This may also involve the U.S. Army Corps of Engineers (USACE) and Coastal Zone Management (CZM) consistency concurrence with New York State Department of State (NYS DOS). Well heads, electrical equipment, and the propane fuel tank would be elevated at or above base flood elevation and ensure compliance with Town of Babylon codes.

### ***Jurisdiction***

This project would fall under the jurisdiction of the Town of Babylon.



## ***Proposed Project: Improvements to 911 GPS Data and Community Signage***

### ***Project Description***

The purpose of this project is to enhance the efficiency of emergency response services for residents in each barrier island community. Fire hazards become a major safety concern following a flood event when electrical wiring and equipment may have become corroded and prone to catching fire. Residential boardwalk systems, which function similarly to public streets in the barrier island communities, are the only access point for fire rescue and emergency evacuation services for many residences. However, 911 and fire rescue services have difficulty responding to residences due to the lack of signage and incomplete GPS (global positioning system) address locations. The ability for emergency response services to locate and respond effectively to specific homes was a major concern for residents following Superstorm Sandy when the boardwalk system was battered by floodwaters and sediment and sometimes destroyed. Although it is typically the responsibility of the lessees to maintain the residential boardwalks adjacent to their residential structures, residents have less control over the ability of first responders to find them in an emergency event due to inaccurate or incomplete geographic information system (GIS) data and inadequate signage around the communities. This project would fund updates to GIS data for roads, boardwalks, and address locations, as well as installation of signage for residential boardwalks for improved fire rescue and emergency services response.

### ***Project Costs***

The estimated total project cost of \$195,000 includes \$100,000 for labor to update the GIS database for the entire NYRCR West Gilgo to Captree Community with field verification; \$30,000 for soft costs to develop improved signage for communities that contain residential boardwalk systems, including West Gilgo, Oak Beach, Oak Island, Oak Island Beach Association, and the eastern end of Captree Island; \$25,000 for materials and installation of signage; and \$40,000. The useful life of parcel data for these barrier island communities can be projected out to 2065, or 51 years, when the land leases expire for all of the residential and commercial properties. Little if any additional development is expected in these communities in the future. Once the GIS component of this project is completed, therefore, the address and parcel GIS data would not likely require updating. The installation of improved signage for roads and

IMPROVEMENTS TO 911 GPS  
DATA AND COMMUNITY  
SIGNAGE

***Recovery Support Function:***  
Health and Social Services

***Cost:*** \$195,000

***Assets made more Resilient:***  
412 residential structures

***Risk Reduction & Benefits:***  
Increase efficiency of emergency  
response services for 1,018  
residents



## West Gilgo to Captree NY Rising Community Reconstruction Plan

residential boardwalks would have a useful life of 30 years,<sup>xxviii</sup> and barring theft or vandalism would require very little maintenance. The total lifecycle cost of this project is \$195,000.

### ***Project Benefits***

#### *Risk Reduction & Resiliency Benefits*

A recurring theme for the barrier island communities is the need to facilitate rapid response for emergency services, which is hampered by distance from the mainland, a confusing address system and incomplete GIS data, and lack of adequate signage. The situation was further exacerbated during and after Superstorm Sandy when hurricane winds and storm surges obliterated residential boardwalks, which were previously used to identify the beginning of pathways to the more isolated residential structures. In the residential areas of Oak Island and Captree Island that are only accessible by boat, it is questionable how easily a rescue vehicle could find a household in need of medical services or evacuation during an acute event. Improving the wayfinding (signage and other means of identifying locations) for emergency services by validating the Suffolk County Fire Rescue and Emergency Services' residential GIS data and adding proper signage at or near the boardwalks (in case they were to be swept away in a future storm) would reduce response times for emergency services and reduce risk to life and safety of residents, particularly in the aftermath of an acute event.

#### *Economic Benefits*

Reducing the local government expenditures on emergency response costs can capture economic benefits. Time and resources are wasted when the fire department and emergency medical services cannot locate a residence because of incorrect direction from 911 dispatch or lack of adequate wayfinding tools. Verification of GIS data and signage are simple and cost-effective ways to cut inefficiencies in response time. Additionally, this project will secure jobs for the GIS verification and signage installation. An estimated 2.4 full time equivalent employee positions would be secured.<sup>xxx</sup> Finally, there are benefits to be captured from implementing this project in the form of avoided future costs in terms of damage to residential structures resulting from delayed emergency response.



This project would aim to reduce response times of emergency services to barrier island residents.



# West Gilgo to Captree NY Rising Community Reconstruction Plan

## *Health and Social Benefits*

This project would help to ensure continuity of fire rescue and emergency response services for residences and businesses of all six barrier island communities, or an estimated 1,018 people. For approximately 22.3% of residents who are ages 65 years of age and older,<sup>iv</sup> or an estimated 227 people, considered to be a vulnerable population, this project would improve their chances of surviving life threatening situations. With projections for more frequent and higher magnitude storm events in the future, the procurement of accurate GIS data and provision of adequate signage is a basic preparedness task.

## *Cost-Benefit Analysis*

The project cost of \$195,000 with minimal maintenance cost and minimal operational costs is a justifiable expense for the benefit to residents who would get the security of knowing that they would be able to be located by emergency service professionals during an emergency situation or a severe storm event. The project would benefit residents of all six barrier island communities, including the 227 residents age 65 and older.

## *Risk Reduction Analysis*

The implementation of this project would reduce risk to 412 residential structures by improving GIS data throughout the Community, as well as improve emergency services response times for an estimated 1,018 seasonal and year-round residents.

## *General Timeframe for Implementation*

GIS data verification can be completed within 0-3 months of project approval. Planning and installation of signage can be completed within 3-6 months of project approval.

## *Regulatory Requirements Related to Project*

Signage would comply with Town of Babylon Code Enforcement.

## *Jurisdiction*

This project would fall under the jurisdiction of the Town of Babylon and/or Suffolk County Fire Rescue and Emergency Services.



Residential boardwalks serve as the main means of access for many houses on the barrier islands.



## ***Proposed Project: Shoreline Stabilization – Oak Beach Phase I***

### ***Project Description***

The purpose of this project is to reduce shoreline erosion and flood risk to residences and related infrastructure in Oak Beach and Oak Island Beach Association (“the Association”). The residents of Oak Beach and the Association are located on the inlet and are subject to extensive wave action and erosion. The communities face several hazards during hurricanes and nor’easters as evidenced by the destruction of Superstorm Sandy, including the destabilization of the shoreline, breaches in shoreline protection infrastructure that contribute to extensive flooding and sediment movement, damage to fire jetties, and destabilization of the southern flank of Oak Beach Road.

Oak Beach Road is a single entry road that serves all of Oak Beach’s residents and which becomes impassable during flood events due to its proximity to the inadequately protected shoreline. Part of the western edge of the road actually collapsed due to the destabilization of the shoreline and subsurface material. Although the Town of Babylon conducted basic stabilization and repairs in order to put the road back into use, the shoreline along the road is in dire need of long-term stabilization with potential improvements needed to the roadway and drainage infrastructure to reduce future inundation. Several additional breach points, particularly adjacent to fire jetties, permitted the storm surge to enter the community and significantly added to the magnitude of flooding. These jetties need to be reinforced, upgraded for anticipated sea level rise, and sturdily connected to the adjacent shoreline structures (e.g. adjacent bulkheading or revetments) to mitigate these breach points in the future.

This project seeks to reduce flooding to residences and the infrastructure on which they rely, including Oak Beach Road, water systems, and public facilities. The cost to stabilize the entire shoreline of these communities would overspend the NYRCR funding allocation for NYRCR West Gilgo to Captree; therefore, this project would seek to mitigate flooding in the most vulnerable locations along the shoreline. This project would fund the strengthening of the shoreline stabilization structures, which may include bulkheading, fire jetties, beaches, dunes, and revetments. The project would also fund improvements to Oak Beach Road to reduce on-street flooding and improve drainage, particularly through the incorporation of green infrastructure. Improvements to the roadway may additionally include altering the pitch of the road, utilization of the northern vegetated flank as a bioswale, and

### SHORELINE STABILIZATION – OAK BEACH PHASE I

***Recovery Support Function:***  
Infrastructure

***Cost:*** \$1,285,000

***Assets made more Resilient:***  
189 residential structures in Oak Beach and Oak Island Beach Association

***Risk Reduction & Benefits:***  
Reduce flooding and protect evacuation routes for 468 residents



## West Gilgo to Captree NY Rising Community Reconstruction Plan

optimization of Oak Beach Park at the easterly start of the roadway for the infiltration of excess stormwater. Additional shoreline stabilization work is proposed in the Additional Resiliency Recommendation, “Shoreline Stabilization—Oak Beach Phase II.”

### ***Estimated Project Costs***

The estimated project cost of \$1,285,000 includes \$205,000 for soft costs (planning and design to identify the most vulnerable shoreline structures in need of stabilization, as well as permitting and environmental compliance); \$820,000 for hard costs to construct the shoreline stabilization structures, reinforce the rock jetties, and construct other recommended measures; and \$260,000 for contingency. The useful life of shoreline stabilization structures and roadways, if designed to anticipate sea level rise, is 50 years.<sup>xxviii</sup> With an anticipated annual maintenance cost of \$3,000, the project’s lifecycle cost is \$1,435,000. However, the Town of Babylon has an existing program of road maintenance; the net impact on the local operations and maintenance budget, therefore, will be essentially zero.

### ***Project Benefits***

#### ***Risk Reduction & Resiliency Benefits***

The strengthening and proper maintenance of shoreline stabilization structures, including bulkheads, fire jetties, beaches, dunes, and revetments, as well as improving the drainage and construction of Oak Beach Road, will reduce the effects of incoming storm surge and wave energy on critical assets in Oak Beach and Oak Island Beach Association, including 189 residential structures, over two miles of residential boardwalks, three public water wells, Oak Beach Park, and Oak Beach Community Center. These assets are currently at severe or high risk to future storm inundation and sea level rise. Structural defenses are prone to failure if storm surge, sea level rise, or precipitation exceeds their design capacity; therefore properties are still at risk unless secondary protective measures are employed. Resilient building construction techniques, for example, should be considered to augment structural protection and manage residual risk.

#### ***Economic Benefits***

Strengthening and maintaining dunes, structural defenses, and beaches can provide storm protection up to a design standard and may enhance beach recreation value. Healthy beaches and dunes attract tourists and outdoor recreationists for day trips and seasonal rentals. These users contribute to the



Damage to Oak Beach Road shoreline stabilization structures as a result of Superstorm Sandy.



## West Gilgo to Captree NY Rising Community Reconstruction Plan

tourism economy as well as several other service industries, including recreation, restaurants, fuel/service stations, and other retail.

Economic benefits from implementing this project include avoided future costs from damage to personal property (e.g., vehicles and residences) that will likely result from repetitive future flooding. Additionally, this project will create jobs for the construction activities over the full implementation period. An estimated 16 full time equivalent employee positions would be created.<sup>xxx</sup> This project will help to maintain the value and salability of the homes in Oak Beach and Oak Island Beach Association. In addition, this project aligns with and supports the REDC “Key Strategy” to create jobs relating to infrastructure and recreation: “Produce a new generation of sustainable, well-paying jobs in the legacy sectors of agriculture, aquaculture, fisheries and tourism by expanding export opportunities, infrastructure, recreation facilities, research partnerships and workforce training.”<sup>xviii</sup>

### *Health and Social Benefits*

This project would help to reduce flood risk to routes for evacuation and access by emergency response services. The beneficiaries for this project include 189 residences, or an estimated 467 seasonal and year-round residents. Of this population, 22.3%, or an estimated 104 residents, are 65 years of age or older.<sup>iv</sup>

### *Environmental Benefits*

Desired improvements to Oak Beach Road include the incorporation of green infrastructure to capture and infiltrate excess stormwater from the roadway. This water will naturally filter through the sediments, improving water quality and recharging the groundwater.

### *Cost-Benefit Analysis*

This project has the potential to minimize risk to residences, water systems, roads, public boardwalks, a key community center, and 467 residents. Less costly and less frequent damages to personal property and reduced risk to the life and safety of residents depend on continuing maintenance to maintain the design level of protection.



## West Gilgo to Captree NY Rising Community Reconstruction Plan

### ***Risk Reduction Analysis***

This project will reduce storm surge and wave action exposure to 189 residential structures, over two miles of residential boardwalks, three public water wells, Oak Beach Park, and Oak Beach Community Center, all of which are currently at high or severe risk to future storm impacts, by enhancing dunes and other shoreline structures to an appropriate design standard, to be determined (such as FEMA's 500-year flood elevation).

### ***General Timeframe for Implementation***

Planning, design, and permitting for this project could be implemented in 6-9 months of project approval with construction requiring about 9-18 months thereafter.

### ***Regulatory Requirements Related to Project***

Shoreline stabilization designs will involve the U.S. Army Corps of Engineers (USACE) and Coastal Zone Management (CZM) consistency concurrence with New York State Department of State (NYS DOS). New York State Department of Environmental Conservation (NYS DEC) Tidal Wetlands and other permits will be required for the installation of new, or the modification of existing, shoreline stabilization structures. Work on roadways, particularly related to drainage, also requires DEC permits. Review of plans will also be required by the New York State Office of Parks, Recreation, and Historic Preservation (NYS OPRHP) if the project impacts State parkland and parkways. Finally, shoreline and roadway designs must also comply with Town of Babylon codes and standards.

### ***Jurisdiction***

This project would fall under the jurisdiction of the Town of Babylon.



Oak Beach Road pictured here after Superstorm Sandy completely submerged.



## ***Proposed Project: Shoreline Stabilization – Captree Phase I***

### ***Project Description***

The purpose of the Proposed Project is to reduce shoreline erosion and flood risk of Captree Road in order to maintain access to residences on Captree Island. Captree Road on Captree Island is a single entry road that serves 32 residences. The low-lying roadway becomes frequently inundated with water from the marshes to the north as well as the boat channel to the south due to its low elevation and lack of protection. The flooding restricts access and egress to residents, potentially blocking evacuation and/or emergency vehicle access during an emergency event. The Community reported that severe flooding of Captree Road during Superstorm Sandy prevented some residents from evacuating when they awoke to find that storm surge had inundated the roadway by four feet.

This project would raise the roadway and strengthen the shoreline in the most critical areas along Captree Road. The cost to stabilize the entire length of Captree Road would overspend the NYRCR funding allocation for NYRCR West Gilgo to Captree; this project, therefore, would seek to mitigate flooding in the most vulnerable locations along the road. According to the Town of Babylon, the road is currently surveyed at an elevation of one foot above sea level. Anecdotally, it has been reported that parts of the road are frequently inundated with up to four feet of water. Emergency vehicles cannot move through four feet of water, though they are able to traverse 18 to 24 inches without damage to the vehicles. Residents are requesting that the worst parts of the road, where the road dips to particularly low elevations, be raised and stabilized to at least an elevation that would allow these emergency vehicles to pass. Additional shoreline stabilization and road raising is proposed in the Additional Resiliency Recommendation, “Shoreline Stabilization—Captree Phase II.”

### ***Estimated Project Costs***

The estimated total project cost of \$600,000 includes \$100,000 for soft costs (planning and design to identify the most vulnerable roadway locations in need of raising and shoreline stabilization, as well as permitting and environmental compliance), \$380,000 for hard costs to (materials, labor, and construction), and \$120,000 for contingency. The useful life of shoreline stabilization structures and roadways, if designed to anticipate sea level rise, is 50 years.<sup>xxviii</sup> With an anticipated annual maintenance cost of \$1,200, the project’s lifecycle cost is \$660,000. However, the Town of Babylon has

### SHORELINE STABILIZATION – CAPTREE PHASE I

***Recovery Support Function:***  
Infrastructure

***Cost:*** \$600,000

***Assets made more Resilient:***  
32 residential structures

***Risk Reduction & Benefits:***  
Reduce flooding and protect  
evacuation routes for 80 residents



## West Gilgo to Captree NY Rising Community Reconstruction Plan

an existing program of road maintenance; the net impact on the local operations and maintenance budget, therefore, is essentially zero.

### ***Project Benefits***

#### ***Risk Reduction & Resiliency Benefits***

The raising of Captree Road, as well as the bolstering of the northern shoreline adjacent to the marsh at key locations, would reduce risk for all 32 residences of Captree Island. Although not yet designed, the current intention of the project is to administer mitigation measures at the eastern start of the road closest to the Robert Moses Causeway as this would benefit the greatest number of residents who all need to drive in this direction to access and depart the Island. This project will essentially elevate the roadway to a height that will reduce the risk of flooding, while also enhancing the adjacent landscape attributes to reduce erosion and prolong the useful life of the roadway. The road at this location will be more frequently and reliably passable for residents and emergency service vehicles alike.

#### ***Economic Benefits***

There are economic benefits to be captured from implementing this project in the form of avoided future costs from damage to personal property (e.g., flooded vehicles) that will likely result from repetitive future flooding. Likewise, there are avoided future costs related to decreased productivity of residents who would otherwise need to miss work due to the impassability of the roadway. Additionally, this project will create jobs for the construction activities over the full implementation period. An estimated 7.5 full time equivalent employee positions would be created.<sup>xxx</sup> This project will also help to maintain the value and salability of the homes on Captree Island. Finally, this project aligns with and supports the Regional Economic Development Council's "Key Strategy" to "Produce a new generation of sustainable, well-paying jobs in the legacy sectors of agriculture, aquaculture, fisheries and tourism by expanding export opportunities, infrastructure, recreation facilities, research partnerships and workforce training."<sup>xviii</sup>

#### ***Health and Social Benefits***

This project would help to protect the only vehicular route for evacuation and access by emergency response services for Captree Island residents. The beneficiaries for this project include 32 residences, or an estimated 79 seasonal and year-round residents, of which an estimated 18 are elderly citizens.



A high water vehicle performing rescue operations. Captree Road floods so severely that emergency vehicles sometimes cannot access residences.



# West Gilgo to Captree NY Rising Community Reconstruction Plan

## *Environmental Benefits*

This project will endeavor to remain within the footprints of the current roadway and adjacent stabilization structures, thereby helping to protect Captree Island residents without sacrificing the natural resources that surround them.

## *Cost-Benefit Analysis*

This project would help to mitigate extreme repetitive flooding on Captree Road and thus safeguard the evacuation route for 32 residences with 79 residents, an estimated 18 of whom are ages 65 of age and older. Lower and less frequent damages will occur to personal property and risks to the life and safety of residents will be greatly reduced.

## *Risk Reduction Analysis*

Strengthening the shoreline will essentially reduce a key portion of Captree Road's exposure to storm impacts and chronic flooding. This project is also anticipated to reduce the amount of time that the roadway is impassable to personal and emergency response vehicles, making evacuation and day-to-day travel easier and safer for 32 residences with 79 residents, an estimated 18 of whom are ages 65 of age and older.

## *General Timeframe for Implementation*

Planning, design, and permitting for this project could be implemented in 6-9 months of project approval with construction requiring about 9-18 months thereafter.

## *Regulatory Requirements Related to Project*

Shoreline stabilization designs will involve the U.S. Army Corps of Engineers (USACE) and Coastal Zone Management (CZM) consistency concurrence with New York State Department of State (NYS DOS). New York State Department of Environmental Conservation (NYS DEC) Tidal Wetlands and other permits will be required for the installation of new, or the modification of existing, shoreline stabilization structures. Work on roadways, particularly related to drainage, also requires DEC permits. Review of plans will also be required by the New York State Office of Parks, Recreation, and Historic Preservation (NYS OPRHP) if the project impacts State parkland and parkways. Finally, shoreline and roadway designs must also comply with Town of Babylon codes and standards.

## *Jurisdiction*

This project would fall under the jurisdiction of the Town of Babylon.



View of Captree Road with the Great South Bay in the background.



## **Proposed Project: *Enhancement of Wetlands***

### **Project Description**

The purpose of this project is to enhance the natural ability of the marsh islands around Captree Island and Oak Island to provide storm and erosion protection to the residents of those islands. The wetlands of the Great South Bay have struggled to remain healthy under the stresses of excess nutrients in the water and sea level rise. This project would fund a pilot project for integrated marsh management that would involve the rebuilding of the wetlands through the use of dredge spoils to fill in “dead pannes” (low-lying areas of marsh islands), planting of native species, and reverting of mosquito ditches around Captree Island and Oak Island. This project aligns with recommendations from the Suffolk County Department of Health in their 2014 *Comprehensive Water Resources Management Plan*.<sup>xvi</sup>

### **Estimated Project Costs**

The estimated cost of \$500,000 includes planning and design, permitting and environmental requirements, materials, and labor. The useful life of a successfully constructed marsh management pilot project, which would become fully integrated with surrounding bay ecology and fortify naturally over time with the growth of native vegetation, could be considered 50 years.<sup>xxviii</sup> Without understanding the scope of work for the pilot project, the extent of required operations and maintenance costs is unknown. It can be assumed that the project will require monitoring and maintenance in its initial phase until the vegetation takes root and begins to accumulate sediment naturally.

### **Project Benefits**

#### ***Risk Reduction & Resiliency Benefits***

The building up and restoration of the wetland areas that shield Captree Island and Oak Island from wave action, which currently erodes their shorelines and exacerbates flooding on the low-lying Captree Road, would provide benefits to the residents of these islands as well as benefit the wetlands. More broadly, as a pilot project, the success of this wetland restoration project has the potential to be replicated elsewhere to reduce risk to other communities in Long Island.

### ENHANCEMENT OF WETLANDS

**Recovery Support Function:** Natural and Cultural Resources

**Cost:** \$500,000

**Assets made more Resilient:**  
86 residences on Oak Island and Captree Island

**Risk Reduction & Benefits:** Reduced wave action and erosive forces for the residential areas of Oak Island and Captree Island; improved water quality; and restored wildlife habitat



## West Gilgo to Captree NY Rising Community Reconstruction Plan

The marsh islands in the Great South Bay are at risk of “drowning” due to their slow degradation from sea level rise and nutrient loading. Excess nutrients are changing the vegetation patterns of the marsh pannes and destabilizing the sediment foundation, one critical result of which is that the vegetation and sediment accumulation are not keeping pace with the rising waters. This pilot project would alter the landscape attributes of the marsh islands so that they will grow and function, while keeping pace with projected sea level rise.

The enhanced marsh islands would shield Captree Island and Oak Island and reduce wave action that currently threatens to undermine the Captree Road’s substrate and Oak Island’s residential properties and thereby contributes to repetitive flooding. Although the presence of the marsh pannes does not have a significant mitigation effect on storm surge, they can absorb some floodwaters and mitigate the energy of the waves from incoming storm surges, both of which can cause long-term erosion.

The implementation of this project will reduce the vulnerability of Captree Road, which directly abuts the marsh and is frequently inundated by tidal surges, which in turn will reduce the vulnerability of the inhabitants of Captree Island’s 32 residences, who depend on the single-entry road for access and evacuation purposes. The road would still require raising and stabilization to repair the damages wrought by Superstorm Sandy and to keep up with future sea levels, but the road would be less threatened by erosive wave action. Helping to adapt Captree Island and Oak Island to future environmental changes would greatly benefit the islands’ residents who face hardships related to erosion and access on a regular basis.

The implementation of this project will also reduce the vulnerability of Oak Island’s 54 residential properties, which are currently very susceptible to the degradation of their marsh and erosion of their shoreline.

### *Economic Benefits*

The greatest benefits that will result from this project may be the most difficult to quantify. The restoration, enhancement, and protection of the Great South Bay’s wetlands will secure the ecological services that these natural resources provide and which have economic benefits. These include cascading benefits of improved water quality from filtration, expanded and enhanced habitat for flora



The Community strives for healthy, vibrant wetlands.



## West Gilgo to Captree NY Rising Community Reconstruction Plan

and fauna that once thrived in the Great South Bay, and the economic value of ecotourism recreational opportunities.

Furthermore, flooding along Captree Road has increased over time, partly due to the degradation of the marsh islands and resulting destabilization of the roadway. Repetitive flooding of greater than 18 inches causes damage to cars and reduced economic productivity and increased travel time cause economic burdens to the residents, which will increase in the future if the marsh islands are not stabilized. This project will also help to maintain the value and salability of the homes on Captree Island and Oak Island.

Finally, this project will create jobs for the construction activities over the full implementation period. An estimated 6.25 full time equivalent employee positions would be created.<sup>xxx</sup> As a pilot project, research jobs may also be secured for the purpose of monitoring and reporting on the performance of the project.

### *Health and Social Benefits*

This project would help to secure Captree Island and Oak Island's 86 households, or an estimated 212 people, during acute events. In the case of Captree Island, households are situated along a single access road that frequently floods and limits access and egress, creating difficulties for evacuation and emergency service provision. Of the 212 beneficiaries, an estimated 47 are ages 65 years and older,<sup>iv</sup> thereby protecting this vulnerable population that relies on the ecological services of the marsh islands to slow down and absorb oncoming storm surge and wave energy.

### *Cost-Benefit Analysis*

This pilot project to restore and build up the marsh islands surrounding Captree Island and Oak Island is a critical step toward a more resilient future in which the health of the bay and protection of the ecological services provided therein are upheld as crucial investments. The islands, home to 86 households, are in dire need of protection from erosion and flooding that are exacerbated by encroaching sea level rise. The reestablishment and enhancement of the marsh islands is one critical component of their coastal protection. Furthermore, as a pilot project, the implementation and study of this project may produce exponential benefits by its replication throughout the Great South Bay to protect many more communities who recognize the importance of healthy and robust wetland areas.



# West Gilgo to Captree NY Rising Community Reconstruction Plan

## ***Risk Reduction Analysis***

This project will reduce risk for 86 households on Captree Island and Oak Island, as well as Captree Road and the Oak Island firehouse.

## ***General Timeframe for Implementation***

Planning, design, and permitting for this project could be implemented in 6-9 months of project approval with implementation requiring another 0-3 months thereafter.

## ***Regulatory Requirements Related to Project***

The implementation of the pilot project will involve the U.S. Army Corps of Engineers (USACE) and Coastal Zone Management (CZM) consistency concurrence with New York State Department of State (NYS DOS), as well as New York State Department of Environmental Conservation (NYS DEC) Tidal Wetlands and other permits. NYS DEC and NYS DOS need to be involved in the planning and design of this project, including site selection, project design, implementation plan, etc.

## ***Jurisdiction***

This project would likely fall under the jurisdiction of the Town of Babylon with coordination with New York State Department of Environmental Conservation (NYS DEC).



Marsh islands adjacent to Captree Road with Robert Moses Causeway in the background.



## ***Proposed Project: Strengthening of Dunes Feasibility Assessment***

### ***Project Description***

The purpose of this project is to identify and document the most feasible and cost-effective means of long-term dune restoration in targeted locations in NYRCR West Gilgo to Captree. The barrier island communities depend on the strength of the dune system for the protection of their communities because the dunes serve to attenuate wave action from the Atlantic Ocean and reduce risk of flooding to communities on the bay. The barrier island dunes also serve as the first line of defense for Long Island's South Shore, reducing the flooding and erosive power of waves and storm surge from the Atlantic. Superstorm Sandy's extreme storm surge and powerful wave action pounded the beaches and dunes along NYRCR West Gilgo to Captree, causing extensive erosion of the beaches and the collapse of the dunes in certain locations. The State rapidly undertook efforts to rebuild the dunes to pre-Sandy condition in preparation for the summer tourist season. The current standards and methodologies for rebuilding and stabilizing dunes, however, are proving to be insufficient, as evidenced by large sections of dunes collapsing in front of the Gilgo and West Gilgo communities in October 2013 from periods of strong winds.

This project would fund a comprehensive review of current and alternative methods of dune replenishment and strengthening with site specific application in Gilgo, West Gilgo, and Oak Beach. The Gilgo and West Gilgo communities are located in a section of beach that gradually loses sand due to the direction of wind, currents, and sediment flow. In addition, the communities have tunnels that run beneath Ocean Parkway to connect the bay with the beach. Both of these factors contribute to particular sites that could be viewed as weak points to be targeted by this feasibility assessment. The Oak Beach community is located next to Fire Island Inlet in the Coastal Erosion Hazard Area<sup>x</sup> and has observed severe erosion of the Sore Thumb peninsula (westernmost area of Oak Beach where the land projects into the Inlet). This presents another weak point to be targeted by the assessment. The focus would be on long-term resiliency of the dune system, as well as funding options for long-term maintenance. The Community also recommends a Featured Project, "Strengthening of Dunes - Pilot Project," that would complement this Proposed Project, and could potentially be funded through other funding sources.

### STRENGTHENING OF DUNES FEASIBILITY ASSESSMENT

**Recovery Support Function:**  
Natural and Cultural Resources

**Cost:** \$295,000

**Assets made more Resilient:**  
Outcomes of study could potentially protect 326 residences

**Risk Reduction & Benefits:**  
Empowerment of well-documented information on the best future dune mitigation projects



# West Gilgo to Captree NY Rising Community Reconstruction Plan

## ***Estimated Project Costs***

The estimated total project cost of \$295,000 includes planning efforts and analysis to produce a feasibility assessment of the most feasible, long-term options for dune restoration in West Gilgo, Gilgo, and Oak Beach. No operations, maintenance, or other costs for the feasibility assessment have been identified. The total lifecycle cost of this project is \$295,000.

## ***Project Benefits***

### ***Risk Reduction & Resiliency Benefits***

The preparation of a feasibility assessment to identify the best practices and most practical methodologies for dune restoration of target areas within the six barrier island communities would lay the groundwork for a pilot project to be implemented for the re-establishment and reinforcement of dunes in front of the West Gilgo, Gilgo, and Oak Beach communities. If successful, that pilot project would provide dramatic benefits to the residents and Community assets in both of those communities, as well as bolster the barrier island's ability to protect mainland Long Island.

### ***Economic Benefits***

The development of regionally appropriate dune restoration methods, as well as site-specific recommendations, contributes to the REDC's Key Strategy<sup>xviii</sup> to create jobs in infrastructure and research partnerships: "Produce a new generation of sustainable, well-paying jobs in the legacy sectors of agriculture, aquaculture, fisheries and tourism by expanding export opportunities, infrastructure, recreation facilities, research partnerships and workforce training." This feasibility study would lead Long Island's coastal communities toward innovative methods for natural resource protection that in turn will support tourism, ecotourism, recreation, fisheries, and aquaculture.

### ***Environmental Benefits***

This feasibility assessment would take into account the natural resource assets of the dunes and associated beaches, interdunal swales, and shrubland; the protection and optimization of the ecological services that these landscapes provide; and the conservation of habitat for threatened and endangered species. If implemented, the recommended pilot project(s) from this feasibility assessment have the potential to enhance critical wildlife habitat and natural resources on the barrier islands, in the Great South Bay, and even on mainland Long Island.



A view of vegetated dunes on Jones Beach Island. A system of healthy and robust dunes is essential for the protection of the Community and mainland Long Island.



# West Gilgo to Captree NY Rising Community Reconstruction Plan

## ***Health and Social Benefits***

The restoration of the barrier island dune system must be viewed as protecting all of Long Island's South Shore and all vulnerable populations who reside there, including populations who are low income, immigrants, disabled, homeless, at risk of becoming homeless, and senior citizens.

## ***Cost-Benefit Analysis***

The feasibility assessment is a relatively low-cost step in the direction of viewing dune restoration as an ongoing essential activity that can determine the long-term viability of life on Long Island's South Shore. The most promising, most innovative, most cost-effective means of strengthening the dunes in the target areas of West Gilgo, Gilgo, and Oak Beach areas, areas that may be at high risk of erosion and eventual breach, are not known. This feasibility assessment would bring to light to practical and achievable pilot projects and lay the necessary foundation for future funding sources.

## ***Risk Reduction Analysis***

This project is likely to yield less tangible risk reduction benefits, such as increased knowledge and awareness of the barrier island dunal ecosystem. The far more tangible risk reduction benefits would accrue following the implementation of the feasibility assessment's recommendations.

## ***General Timeframe for Implementation***

This feasibility assessment could be implemented within 9-12 months of project approval.

## ***Regulatory Requirements Related to Project***

There are no regulatory requirements related to conducting a feasibility assessment. However, the assessment will likely result in the recommendation of projects requiring review and permits from New York State Department of Environmental Conservation (NYS DEC), New York State Office of Parks, Recreation, and Historic Preservation (NYS OPRHP), the U.S. Army Corps of Engineers (USACE), and review for Coastal Zone Management (CZM) consistency concurrence with New York State Department of State (NYS DOS). These agencies should therefore be consulted throughout the planning efforts.



# West Gilgo to Captree NY Rising Community Reconstruction Plan

## ***Jurisdiction***

This project would likely fall under the jurisdiction of the Town of Babylon. The implementation of the assessment's recommendations would fall under various jurisdictions, including NYS OPRHP, NYS DEC, and USACE.



A work crew repairs sections of dune in front of Gilgo and West Gilgo in November 2013 when a period of strong winds caused a stretch of dunes to collapse.



## ***Featured Project: Strengthening of Dunes - Pilot Project***

### ***Project Description***

The purpose of the proposed project is to implement site-specific pilot projects, as recommended in the Proposed Project “Strengthening of Dunes Feasibility Assessment,” to strengthen the dunal system in perceived “weak spots” in front of the West Gilgo/Gilgo and Oak Beach communities. The barrier island communities depend wholly on the strength of the dune system for the protection of their communities because the dunes serve to attenuate wave action from the Atlantic Ocean and reduce risk of flooding to communities on the bay. The barrier island dunes also serve as the first line of defense for Long Island’s South Shore, reducing the flooding and erosive power of waves and storm surge from the Atlantic. Superstorm Sandy’s extreme storm surge and powerful wave action pounded the beaches and dunes along NYRCR West Gilgo to Captree, causing extensive erosion of the beaches and the collapse of the dunes in certain locations. The State rapidly undertook efforts to rebuild the dunes to pre-Sandy conditions in preparation for the summer tourist season. The current standards and methodologies for rebuilding and stabilizing dunes, however, are proving to be insufficient, as evidenced by large sections of dunes collapsing in front of the Gilgo and West Gilgo communities in October 2013 from periods of strong winds.

The Gilgo and West Gilgo communities are located in a section of beach that gradually loses sand due to the direction of wind, currents, and sediment flow. In addition, the communities have tunnels that run beneath Ocean Parkway to connect the bay with the beach for pedestrian access. The Oak Beach community is located adjacent to the inlet in the Coastal Erosion Hazard Area<sup>x</sup> and has observed severe erosion of the Sore Thumb peninsula. The Proposed Project, “Strengthening of Dunes Feasibility Assessment,” will target these weak points and recommend the best means of dune strengthening at these specific locations.

This Featured Project is intended to complement the Proposed Project, “Strengthening of Dunes Feasibility Assessment,” by funding a pilot project to restore dunes in the areas of Gilgo/West Gilgo and Oak Beach, demonstrating the best methodologies identified in the comprehensive feasibility assessment. This Featured Project is not being recommended by the Community for funding through

### **STRENGTHENING OF DUNES - PILOT PROJECT**

***Recovery Support Function:*** Natural and Cultural Resources

***Cost:*** \$10,000,000

***Assets made more Resilient:***  
Protection of at least 326 residences and their associated infrastructure, utilities, and public facilities

***Risk Reduction & Benefits:***  
Increased stability of the dune systems that diminish ocean wave action, storm surge, and erosion for barrier island communities and mainland Long Island communities



## West Gilgo to Captree NY Rising Community Reconstruction Plan

NYRCR West Gilgo to Captree's NYRCR allocation of funding; however, the Featured Project could potentially be funded through other funding sources.

### ***Estimated Project Costs***

The total estimated cost for this pilot project is \$10,000,000, including \$6,400,000 for hard costs, \$1,600,000 for soft costs, and \$2,000,000 for contingency. The scope of the pilot project will be developed in the Proposed Project, "Strengthening of Dunes Feasibility Assessment." This project cost is intended to fund planning, design, and engineering, permitting and environmental compliance, and construction. The useful life of a successfully constructed dune pilot project that is fully integrated with surrounding dunes and beaches and fortified naturally over time with the growth of native vegetation could be 50 years.<sup>xxviii</sup> Without understanding the scope of work for the pilot project, the prescribed means and methods for which will be recommended in the Proposed Project, Strengthening of Dunes Feasibility Assessment, the extent of required operations and maintenance costs is unknown. It can be assumed that the project will require maintenance in its initial phase until the dune strengthening measures are able to "take root" and allow for a naturally accruing dune to establish.

### ***Project Benefits***

#### ***Risk Reduction & Resiliency Benefits***

The implementation of a pilot project, as recommended in the Proposed Project, "Strengthening of Dunes Feasibility Assessment," for a comprehensive review of methods for dune restoration, would reduce risk for the dunes as a natural resource asset, from severe to moderate. This pilot project would also have positive benefits for several other Community assets, including Ocean Parkway, all residences and infrastructure within the communities of West Gilgo, Gilgo, and Oak Beach, and mainland Long Island that depend on the dunes for storm protection. Strengthening of the dunes would reduce Ocean Parkway's exposure to storm effects, which is periodically impassable during and after storm events. Residents of the barrier island and the mainland alike would gain benefits from the continued operation and safety of this major roadway, a key link in the Community's transportation network.

#### ***Economic Benefits***

From the perspective of protection of economic assets, beaches and dunes are the first line of defense against coastal storms for mainland Long Island as these natural features absorb much of the energy and impact of wave action and hurricane force winds. The Town of Babylon estimated that during



A beach replenishment project underway on Jones Beach Island.



## West Gilgo to Captree NY Rising Community Reconstruction Plan

Superstorm Sandy the section of beach from West Gilgo east to Gilgo lost over one million cubic yards of sand. If this pilot project is successful, the risk reduction to the mainland cannot be understated. Billions of dollars of investments along Long Island's South Shore are at risk if the barrier island's landscape is not managed, maintained, and protected.

Storm surges are slowed down by the interference of the dunes and channeling of the floodwaters through inlets, giving time to mainland communities to protect assets and evacuate. The economic impact of Superstorm Sandy on Suffolk County, according to the U.S. Department of Commerce, totals \$1,784,900,000.<sup>xxx</sup> The damages and disruptions to commerce along Suffolk County's South Shore would have been far greater had the dune systems on the barrier beaches failed. Protective measures must be taken to ensure that the dunes are healthy and robust and can perform as needed in future storms, protecting Suffolk County's economy from potentially devastating effects. The recommendations from the feasibility assessment will be formulated to achieve this goal.

From the perspective of economic development, strengthening of the barrier island dunes aligns with the REDC's Key Strategies<sup>xviii</sup> in its initiative to prioritize "Investments in Our Natural Resources." The strategy to "Produce a new generation of sustainable, well-paying jobs in the legacy sectors of agriculture, aquaculture, fisheries and tourism by expanding export opportunities, infrastructure, recreation facilities, research partnerships and workforce training" would be met by this project through the jobs created for the pilot project construction, by the strengthened dune system that frames the beach recreational resources, and through the consequent support for Long Island's tourism and ecotourism sectors.

Additionally, this project will create jobs for the construction activities over the full implementation period. An estimated 125 full time equivalent employee positions would be created.<sup>xxx</sup>

### *Environmental Benefits*

This pilot project has the potential to secure significant expanses of dunes, as well as the ecological services that the beach, dunes, marshes, and shrubland make available (wildlife habitat, erosion control, protection from ocean waves and storm surge, water quality, etc.). The dunes at risk are in front of the Gilgo and West Gilgo communities and span about four miles. The target dune risk area of Oak Beach spans approximately three miles along the inlet channel. Using the U.S. Army Corps of Engineers current



A view of dunes and beach on Jones Beach Island. A broad beach and tall, wide dunes are ideal for protection of the communities behind them.



## West Gilgo to Captree NY Rising Community Reconstruction Plan

design standards for dune replenishment on Fire Island of a 15-foot high and 90-foot wide dune, this project can potentially result in the protection of 5,050 acres of dunes in front of Gilgo and West Gilgo and 3,800 acres of protective dunes in front of Oak Beach.

Replenishment and strengthening of the dune systems secures habitat for important species of wildlife, including the federally-classified “threatened”/State-classified “endangered” piping plover. Other State or federally-listed species that use the barrier island dunes for habitat and/or reproduction include the American oystercatcher, black skinner, several species of tern, the seabeach amaranth, the Northeastern beach tiger beetle, and the horseshoe crabs<sup>xxxii</sup>. Environmental review and permitting will ensure that any actions implemented through this pilot project would not impair the viability of the dunes as a critical wildlife habitat.

Furthermore, the strengthening of the dune system on the barrier island also serves to protect the environmental assets of the Great South Bay and mainland Long Island beyond, including tidal marshes, wetlands, forests, creeks, and habitat for diverse flora and fauna.

### *Health and Social Benefits*

The implementation of this project will reduce risk for an estimated 805 residents of the barrier islands; of these residents, 22.3% or an estimated 180 of whom are 65 years of age or older.<sup>iv</sup> The restoration of the barrier island dune system can also be viewed as protecting all of Long Island’s South Shore and all vulnerable populations who reside there, including populations who are low income, immigrants, disabled, homeless, at risk of becoming homeless, and senior citizens.

### *Cost-Benefit Analysis*

The pilot project’s likely future target areas of West Gilgo, Gilgo, and Oak Beach, which are at high risk of erosion and potential breach, would secure thousands of acres of environmental assets, and in doing so would safeguard hundreds of thousands of people and billions of dollars of economic assets on Long Island’s South Shore. While there is no guarantee that the pilot projects would be completely successful, the alternative of continuing to use the current inadequate means and methods may put the residents of the barrier islands and mainland Long Island at greater risk for future damages from increasingly dangerous storm events.



# West Gilgo to Captree NY Rising Community Reconstruction Plan

## ***Risk Reduction Analysis***

Immediately in the barrier island communities, risk would be reduced for at least 322 residences, as well as Ocean Parkway, Oak Beach Road, other infrastructure and utilities, Gilgo Beach Inn, and Oak Beach Community Center. Beyond the barrier beach communities, the South Shore of Long Island will have reduced risk because the natural protective services of the dune system will be “shored up” at a group of it weakest points.

## ***General Timeframe for Implementation***

This project would require extensive planning and design, as well as permitting and environmental compliance of about 12-24 months upon project approval. The project construction period would likely require another 12 months to complete, with ongoing observation and monitoring and an understanding that native plantings will take longer to fully establish.

## ***Regulatory Requirements Related to Project***

Recommended projects will require review and permits from New York State Department of Environmental Conservation (NYS DEC), New York State Office of Parks, Recreation, and Historic Preservation (NYS OPRHP), the U.S. Army Corps of Engineers (USACE), and review for Coastal Zone Management (CZM) consistency concurrence with New York State Department of State (NYS DOS).

## ***Jurisdiction***

The implementation of the pilot project would fall under various jurisdictions including the Town of Babylon, NYS OPRHP, NYS DEC, and USACE.



## Section V: Additional Materials

### A. Additional Resiliency Recommendations

Presented in Table 15 below are Additional Resiliency Recommendations identified during the planning process. The Community will pursue these initiatives independently or through other funding sources.

Table 15: Additional Resiliency Recommendations				
Strategy	Project Name	Short Description	Estimated Cost	Regional (Y/N)
Improve communications and operations between various relevant entities during emergency management and evacuation/re-entry procedures.	Emergency Management Communications Equipment	This project would fund the procurement of two-way radio equipment for each of the six communities, for use during the pre-storm emergency notification phase and the post-storm response phase.	\$15,000	N
Address beach access issues and increase public awareness of the importance of healthy dune systems and beach-goer etiquette.	Creation of a Beach Access Plan and related activities	Current deficiencies in the planning and/or enforcement of beach hours, permitting, and legal dune crossings have led to illegal crossings and degradation of the dunes. This plan would fund the development of a Beach Access Plan and related activities, such as environmental and recreational planning, code updates, improved signage and education for designated dune crossings, more restrictive permitting for four-wheel drive vehicles, manned access points and patrols, and a user fee to fund ongoing dune maintenance.	\$500,000	Y



# West Gilgo to Captree NY Rising Community Reconstruction Plan

**Table 15: Additional Resiliency Recommendations (cont'd)**

Strategy	Project Name	Short Description	Estimated Cost	Regional (Y/N)
Explore feasibility of short-term deployment protection systems to reduce flooding.	Inflatable Tunnel Plugs	The tunnels that run beneath Ocean Parkway between the beach and the bay at Gilgo, West Gilgo, and Cedar Beach Marina became conduits of treacherous ocean water and storm debris during Superstorm Sandy. This project would fund the installation of inflatable tunnel plugs in the beach access tunnels to be inflated during preparations for future storm events.	\$1,010,000	Y
Update current evacuation routes based on road and bridge hazards and install route signage.	Evacuation Routes and Procedures	This project would support the work of Suffolk County, Nassau County, and NYS DOS to improve evacuation routes and procedures throughout Long Island. The project would plan and install signage for evacuation routes for barrier island residents, as well as increase public awareness of emergency preparedness and evacuation.	\$200,000	Y
Improve public safety services to reduce risk to residents.	Oak Island Firehouse	Oak Island residents built and maintain a small firehouse in which manual water pumps are kept for containing fires until the Babylon Fire Department's fireboat arrives. Superstorm Sandy's floodwaters damaged the building and destroyed the equipment. Though the community has replaced the equipment, the structure needs basic mitigation measures to prevent future flooding and protect the equipment. This project would fund the elevation of the firehouse facility and reconstruction/extension of the boardwalks on four sides of the building to maximize access to and maneuverability of the fire protection equipment.	\$390,000	N



# West Gilgo to Captree NY Rising Community Reconstruction Plan

**Table 15: Additional Resiliency Recommendations (cont'd)**

Strategy	Project Name	Short Description	Estimated Cost	Regional (Y/N)
	Improvements to Residential Boardwalk Systems	Residential boardwalk systems, which function similarly to public streets, may be the only access point for fire rescue and emergency evacuation services to many residences of the barrier island communities. Superstorm Sandy's flooding and sediment movement, which wrecked many of these boardwalks and impeded access and egress, highlighted the criticality of this infrastructure and the need for the boardwalks to be strengthened. This project would fund the strengthening of residential boardwalks in critical areas of Oak Beach, Oak Island Beach Association, Oak Island, and eastern Captree Island.	\$5,500,000	N
Plan for more resilient residential structures with short, medium, and long-term mitigation strategies.	Increased Incentives for Resiliency of Housing	This project would fund incentives for hazard mitigation measures at the residential level - such as elevation, roof strapping, and shutters - through such means as grants or low interest loans; tax relief; and participation in the FEMA Community Rating System (CRS) as part of the National Flood Insurance Program (NFIP).	\$400,000	N
	Increased Options to Relocate Residential Structures	Residents whose homes are at severe risk in the face of future storm events may want to explore options to relocate on the barrier island or to the mainland to a safer location. This project would fund an inventory of available plots that are outside of the Coastal Erosion Hazard Area and the extreme and high risk assessment areas and establish a process whereby current barrier island residents can pursue options for relocation.	\$100,000	N
	Land Use, Building and Flood Code Updates	Land use and building codes may need to be updated to correspond with the residential structures' relative exposure to wave action, flood, erosion, and wind. This project would support updates to the Town of Babylon's land use and building codes to take into account such risk indicators as FEMA DFIRM, the NYS DEC Coastal Erosion Hazard Area, and projected sea level rise, as well as the adoption of more stringent building standards.	\$100,000	Y



# West Gilgo to Captree NY Rising Community Reconstruction Plan

**Table 15: Additional Resiliency Recommendations (cont'd)**

Strategy	Project Name	Short Description	Estimated Cost	Regional (Y/N)
Protect shorelines to reduce flood risk and maintain evacuation routes.	Shoreline Stabilization - Oak Beach Phase II	Oak Beach residents, located on the inlet and subject to extensive wave action and erosion, face several hazards including the destabilization of the shoreline, breaches during storm events, damage to fire jetties, and destabilization of the southern flank of Oak Beach Road. Oak Beach Road is the single entry main road that serves all of the Oak Beach community's residents. It frequently floods limiting access and egress and potentially blocking evacuation and/or emergency vehicle access during an emergency event. This project would fund the stabilization of the inlet shoreline against erosive wave action and storm surges with particular attention of Oak Beach Road.	\$5,280,000	Y
	Shoreline Stabilization - Captree Phase II	Captree Road on Captree Island is a single entry road that serves 32 residences. The low-lying roadway becomes frequently inundated with water from the marshes to the north as well as the boat channel to the south due to its low elevation and lack of protection. The flooding restricts access and egress to residents, potentially blocking evacuation and/or emergency vehicle access during an emergency event. This project would raise the roadway and stabilize its adjacent northern shoreline along the entire length of the road to mitigate flooding and minimize access disruptions.	\$1,630,000	Y
Increase resiliency of public water supply systems.	Improvements to Potable Water System - Oak Beach	Oak Beach's public water wells do not have backup power and residents endured up to six weeks without water to their homes. This project would fund the combining and upgrading of Oak Beach's three public water supply systems with additional capacity to serve up to 94 homes. Systems would be built to current codes and standards, including controls elevated above the 500-year flood elevation, above ground tanks, and a backup power supply.	\$2,540,000	N



# West Gilgo to Captree NY Rising Community Reconstruction Plan

**Table 15: Additional Resiliency Recommendations (cont'd)**

Strategy	Project Name	Short Description	Estimated Cost	Regional (Y/N)
	Improvements to Potable Water System - Oak Island Beach Association	Oak Island Beach Association residents are connected to private potable water wells either as individual households or jointly with up to three other lease holders on one well. Most of the private wells do not have a backup power source and residences on these wells lost the ability to draw or filter water during and after Sandy for up to six weeks. This project would connect all residents to a newly constructed public water system, built to current codes and standards, including elevation and a backup power supply.	\$5,000,000	N
Increase resiliency of evacuation by creating redundancy in evacuation options.	Retrofit Public Boat Ramps	In the event of a future catastrophic storm, a parkway or bridge failure could isolate barrier island residents from the services on the main island. Redundancy of access and egress routes, therefore, is a critical risk reduction consideration. This project would fund retrofits to public boat ramps to account for future sea level rise so that they may reliably serve as a means of evacuation by boat.	\$600,000	Y
Mitigate power outages during and post-storm events by adding mitigation and redundancy to the power system.	Mitigation of Power Outages	The residents of the barrier islands faced extensive power outages after Sandy wreaked havoc on the power distribution network with some residents experiencing as many as six weeks without power. The residents, therefore, also lost water, heat, and communications, creating immense difficulties and delays in the recovery process. This project would fund measures to mitigate future power outages, such as elevating and hardening the power substation on Captree Island, intelligent metering for residences, and subsidies for off-the-grid energy installations.	\$1,130,000	Y



# West Gilgo to Captree NY Rising Community Reconstruction Plan

**Table 15: Additional Resiliency Recommendations (cont'd)**

Strategy	Project Name	Short Description	Estimated Cost	Regional (Y/N)
Work with communications service providers to ensure cellular and internet service to all residents during events.	Mitigation of Failures to Cellular Service	Communication is critical in the lead up and response to an emergency situation and cellular phones have become the most valuable tool to communicate with family and friends, request emergency services, and receive and pass along updates on evacuation, weather, power outages, fuel supplies, and myriad other emergency management issues. This project would help to ensure continuity of cellular service by updating codes that require the elevation of electrical controls on all microwave towers and installation of backup power sources.	\$100,000	Y
	Expansion of Internet Coverage	The barrier island communities are not currently covered by a reliable Internet service provider (ISP), which becomes a public safety issue in times of impending emergency situations. Access to information becomes a life safety issue when living on a barrier island and many residents were not sufficiently notified of Superstorm Sandy's magnitude, nor did they receive the reverse 911 mandatory evacuation notifications. This project would expand internet service to each community by working with ISPs to assess and install the most cost-effective means to achieve adequate and reliable coverage.	\$100,000	Y
Increase coastal protection through the restoration and enhancement of natural protective systems including dunes, beaches, and wetlands.	Ocean Parkway Narrowing/Relocation	A healthy barrier island dune system should be constructed with sufficient height and width for stability and adequate room inland to migrate with rising sea levels. The barrier island communities are witnessing the effects of these natural processes as the dunes slowly encroach on the eastbound lanes of Ocean Parkway. This project would fund a feasibility study of shifting or narrowing Ocean Parkway to give the dunes more room to move inland.	\$150,000	Y



# West Gilgo to Captree NY Rising Community Reconstruction Plan

**Table 15: Additional Resiliency Recommendations (cont'd)**

Strategy	Project Name	Short Description	Estimated Cost	Regional (Y/N)
	Replenishment of Beaches	Wider beaches reduce storm damage because the energy contained in wave action and storm surge is dissipated by the break and slope of the sand. The mechanics of the littoral drift in Gilgo and West Gilgo locations takes the sand away more than it replenishes the supply, leaving the beaches here narrow and the dunes and assets behind them more vulnerable. This project would fund nonstructural and structural strategies to protect the barrier island's beaches in Gilgo and West Gilgo, while restoring and maintaining the ecosystem's natural protective features and processes.	\$10,000,000	Y
	Study of Restoration of N/S-Oriented Fire Island Inlet	The current east-west orientation of Fire Island Inlet between Sore Thumb and Democrat Point, combined with the westward direction of the littoral drift, leads to sand bypassing the beaches at Gilgo and West Gilgo, making the beaches there recede and the dunes behind the beaches exposed and vulnerable. Previously, the Fire Island Inlet had been north-south oriented at approximately the location of Fire Island Lighthouse five miles to the east. This project would fund a comparative study to investigate the long-term beach replenishment and dredging maintenance costs of the current E/W inlet and the potential costs associated with the reestablishment of the N/S inlet.	\$400,000	Y
	Restoration of Shellfish Breeding Grounds	Shellfish populations serve several benefits in the Great South Bay, including filtration of water, sustenance, and economic development for the fishing industry. Healthy populations of oysters have the added benefit of providing shoreline stabilization and storm protection by serving as natural breakwaters. Shellfish were once abundant in the Great South Bay, but a combination of overfishing and degradation of the habitat and water quality have stressed the population to very low levels. This project would partner with organizations to fund the reestablishment of shellfish beds in strategic locations for storm protection.	\$500,000	Y



# West Gilgo to Captree NY Rising Community Reconstruction Plan

**Table 15: Additional Resiliency Recommendations (cont'd)**

Strategy	Project Name	Short Description	Estimated Cost	Regional (Y/N)
Utilize stormwater best management practices and green infrastructure to reduce runoff pollution to the bay.	Green Parking Lots	A major cause of the degradation of the marshes in the Great South Bay is nutrient loading in the bay's waters from the stormwater that runs off of lawns, roads, and parking lots. The barrier islands have several large parking lots to accommodate the summer crowds with little to no design measures to prevent stormwater runoff from flowing directly into the bay. The parking areas, which are currently wide-open paved expanses, could contribute to the beauty of the landscape and provide ecological stormwater services by incorporating "Best Management Practices" such as rain gardens, trees, and permeable pavement. Considering the barrier islands' issues with loss of power, the parking lots are also an underutilized open space for solar energy. Innovative designs for solar paneled sun shades over parking areas would keep cars cool and produce solar power year-round. This project would fund the design and construction of green parking lots for Gilgo, Cedar/Overlook Beach, Oak Beach, and Captree State Park.	\$3,000,000	Y
Preserve historic and culturally significant landmarks.	Oak Beach Park Improvements	Oak Beach Park, which currently consists of a parking lot, grassy area, beach, and fishing pier, has been reimagined as a park that reflects the community's needs with natural, native plantings, green infrastructure to manage stormwater and occasional floodwaters, and educational programming and signage for youth. If properly designed, the park would also function as a means of mitigating flooding on Oak Beach Road. The project would fund infrastructure and drainage improvements, walking paths, vegetation, and limited redesign and reconstruction of Oak Beach Road to direct floodwaters to the open space.	\$5,500,000	Y



## West Gilgo to Captree NY Rising Community Reconstruction Plan

**Table 15: Additional Resiliency Recommendations (cont'd)**

Strategy	Project Name	Short Description	Estimated Cost	Regional (Y/N)
	Oak Beach Community Center	Oak Beach Community Center, which over time has served as a U.S. Life Saving Station, post office, chapel, yacht club, civic association, and now as the center of community gatherings, has been closed for repairs since Sandy due to wind and flood damages. This project would fund elevating the building to above the 500-year flood elevation, strengthening the structure, windows, and doors for wind resistance, limited repairs to the interior, and ADA compliance.	\$1,230,000	N



# West Gilgo to Captree NY Rising Community Reconstruction Plan

## B. Master Table of Projects

Presented in Table 16 below are all projects identified by the NYRCR West Gilgo to Captree Planning Committee. This table includes Proposed Projects, Featured Projects, and Additional Resiliency Recommendations.

Table 16: Master Project Table					
Strategy	Project Name	Short Description	Project Category	Estimated Cost	Regional (Y/N)
Improve communications and operations between various relevant entities during emergency management and evacuation/re-entry procedures.	Updates to Emergency Management Communications and Response Plan and Related Activities	This project would fund updates to emergency management plans and evacuation/re-entry procedures to streamline communications and operations between relevant local, county, and state entities and trial runs of emergency notification systems. It would also establish a barrier island resident access identification system to simplify post-event access and recovery actions on the barrier islands.	Proposed	\$125,000	Y
	Emergency Management Communications Equipment	This project would fund the procurement of two-way radio equipment for each of the six communities, for use during the pre-storm emergency notification phase and the post-storm response phase.	Additional Resiliency Recommendation	\$15,000	N
Mitigate power outages at key community facilities to increase resiliency.	Backup Power for Key Community Facilities	This project would fund the installation of backup generators at key Community facilities which would then serve as drop-in centers where residents can warm up, recharge cell phones and other electronics, access the internet and exchange community news. Facilities include Cedar Beach Marina Aqua Center, Oak Beach Community Center, West Gilgo Community Chapel, and the Gilgo Beach Office and Restroom Facility.	Proposed	\$400,000	N



# West Gilgo to Captree NY Rising Community Reconstruction Plan

**Table 16: Master Project Table (cont'd)**

Strategy	Project Name	Short Description	Project Category	Estimated Cost	Regional (Y/N)
Improve public safety services to reduce risk to residents.	Improvements to Fire Protection - Gilgo	Fire hazards become a major safety concern following a flood event when electrical wiring and equipment may have become corroded and prone to catching fire. This project would fund the installation of five drafting wells located strategically throughout Gilgo for better access by the community and the Babylon Fire Department to contain and put out fires.	Proposed	\$115,000	N
	Improvements to Potable Water and Fire Protection System - West Gilgo	West Gilgo's water supply system, used for fire protection and domestic uses, nearly became submerged by Sandy's floodwaters. This project would fund mitigation measures for West Gilgo's water supply system to make it more flood resistant, including raising the tops of the well heads, elevating the standby generator and propane fuel tank, and installing new pump house storage tanks and piping.	Proposed	\$210,000	N
	Improvements to 911 GPS Data and Community Signage	Fire hazards become a major safety concern following a flood event when electrical wiring and equipment may have become corroded and prone to catching fire. Residential boardwalk systems, which function similarly to public streets, may be the only access point for fire rescue and emergency evacuation services for many residences of the barrier island communities. This project would fund updates to GIS data for roads, boardwalks, and address locations, as well as installation of signage on residential boardwalks for improved fire rescue and emergency services response.	Proposed	\$195,000	N



# West Gilgo to Captree NY Rising Community Reconstruction Plan

**Table 16: Master Project Table (cont'd)**

Strategy	Project Name	Short Description	Project Category	Estimated Cost	Regional (Y/N)
	Oak Island Firehouse	Oak Island residents built and maintain a small firehouse in which manual water pumps are kept for containing fires until the Babylon Fire Department's fireboat arrives. Superstorm Sandy's floodwaters damaged the building and destroyed the equipment. Though the community has replaced the equipment, the structure needs basic mitigation measures to prevent future flooding and protect the equipment. This project would fund the elevation of the firehouse facility and reconstruction/extension of the boardwalks on four sides of the building to maximize access to and maneuverability of the fire protection equipment.	Additional Resiliency Recommendation	\$390,000	N
	Improvements to Residential Boardwalk Systems	Residential boardwalk systems, which function similarly to public streets, may be the only access point for fire rescue and emergency evacuation services to many residences of the barrier island communities. Superstorm Sandy's flooding and sediment movement, which wrecked many of these boardwalks and impeded access and egress, highlighted the criticality of this infrastructure and the need for the boardwalks to be strengthened. This project would fund the strengthening of residential boardwalks in critical areas of Oak Beach, Oak Island Beach Association, Oak Island, and eastern Captree Island.	Additional Resiliency Recommendation	\$5,500,000	N



# West Gilgo to Captree NY Rising Community Reconstruction Plan

**Table 16: Master Project Table (cont'd)**

Strategy	Project Name	Short Description	Project Category	Estimated Cost	Regional (Y/N)
Protect shorelines to reduce flood risk and maintain evacuation routes.	Shoreline Stabilization - Oak Beach Phase I	Oak Beach residents, located on the inlet and subject to extensive wave action and erosion, face several hazards including the destabilization of the shoreline, breaches during storm events, damage to fire jetties, and destabilization of the southern flank of Oak Beach Road. This project would fund the strengthening of the shoreline stabilization structures at the most critical points along Oak Beach's shoreline.	Proposed	\$1,285,000	N
	Shoreline Stabilization - Captree Phase I	Captree Road on Captree Island is a single entry road that serves 32 residences. The low-lying roadway becomes frequently inundated with water from the marshes to the north as well as the boat channel to the south due to its low elevation and lack of protection. The flooding restricts access and egress to residents, potentially blocking evacuation and/or emergency vehicle access during an emergency event. This project would raise the roadway and strengthen the shoreline stabilization in the most critical areas along Captree Road.	Proposed	\$600,000	N



# West Gilgo to Captree NY Rising Community Reconstruction Plan

**Table 16: Master Project Table (cont'd)**

Strategy	Project Name	Short Description	Project Category	Estimated Cost	Regional (Y/N)
	Shoreline Stabilization - Oak Beach Phase II	Oak Beach residents, located on the inlet and subject to extensive wave action and erosion, face several hazards including the destabilization of the shoreline, breaches during storm events, damage to fire jetties, and destabilization of the southern flank of Oak Beach Road. Oak Beach Road is the single entry main road that serves all of the Oak Beach community's residents. It frequently floods limiting access and egress and potentially blocking evacuation and/or emergency vehicle access during an emergency event. This project would fund the stabilization of the inlet shoreline against erosive wave action and storm surges with particular attention of Oak Beach Road.	Additional Resiliency Recommendation	\$5,280,000	Y
	Shoreline Stabilization - Captree Phase II	Captree Road on Captree Island is a single entry road that serves approximately 30 residences. The low-lying roadway becomes frequently inundated with water from the marshes to the north as well as the boat channel to the south due to its low elevation and lack of protection. The flooding restricts access and egress to residents, potentially blocking evacuation and/or emergency vehicle access during an emergency event. This project would raise the roadway and stabilize its adjacent northern shoreline along the entire length of the road to mitigate flooding and minimize access disruptions.	Additional Resiliency Recommendation	\$1,630,000	Y



# West Gilgo to Captree NY Rising Community Reconstruction Plan

**Table 16: Master Project Table (cont'd)**

Strategy	Project Name	Short Description	Project Category	Estimated Cost	Regional (Y/N)
Increase coastal protection through the restoration and enhancement of natural protective systems including dunes, beaches, and wetlands.	Enhancement of Wetlands	The wetlands of the Great South Bay have struggled to remain healthy under the stresses of excess nutrients in the water and sea level rise. This project would fund a pilot project for integrated marsh management that would involve the rebuilding of the wetlands through such activities as using dredge spoils to fill in “dead pannes” (low-lying areas of marsh islands), planting native species, and reverting mosquito ditches, particularly around Captree Island and Oak Island.	Proposed	\$500,000	Y
	Strengthening of Dunes Feasibility Assessment	The barrier island communities depend wholly on the strength of the dune system for the protection of their communities. Current standards and methodologies are proving to be insufficient, as indicated by large sections of the dunes collapsing from periods of strong winds in October 2013. This project would fund a comprehensive review of current and alternative methods of dune replenishment and strengthening with site specific application in Gilgo, West Gilgo, and Oak Beach. The focus would be on long-term resiliency of the dune system, as well as funding options for long-term maintenance.	Proposed	\$295,000	Y
	Strengthening of Dunes - Pilot Project	Intended to complement the Proposed Project Strengthening of Dunes Feasibility Assessment to review the best methods of dune strengthening, this project would fund a pilot project to restore dunes in the areas of Gilgo/West Gilgo and Oak Beach, demonstrating the best methodologies identified in the comprehensive study.	Featured	\$10,000,000	Y



# West Gilgo to Captree NY Rising Community Reconstruction Plan

**Table 16: Master Project Table (cont'd)**

Strategy	Project Name	Short Description	Project Category	Estimated Cost	Regional (Y/N)
	Ocean Parkway Narrowing/Relocation	A healthy barrier island dune system should be constructed with sufficient height and width for stability and adequate room inland to migrate with rising sea levels. The barrier island communities are witnessing the effects of these natural processes as the dunes slowly encroach on the eastbound lanes of Ocean Parkway. This project would fund a feasibility study of shifting or narrowing Ocean Parkway to give the dunes more room to move inland.	Additional Resiliency Recommendation	\$150,000	Y
	Replenishment of Beaches	Wider beaches reduce storm damage because the energy contained in wave action and storm surge is dissipated by the break and slope of the sand. The mechanics of the littoral drift in Gilgo and West Gilgo locations takes the sand away more than it replenishes the supply, leaving the beaches here narrow and the dunes and assets behind them more vulnerable. This project would fund nonstructural and structural strategies to protect the barrier island's beaches in Gilgo and West Gilgo, while restoring and maintaining the ecosystem's natural protective features and processes.	Additional Resiliency Recommendation	\$10,000,000	Y



# West Gilgo to Captree NY Rising Community Reconstruction Plan

**Table 16: Master Project Table (cont'd)**

Strategy	Project Name	Short Description	Project Category	Estimated Cost	Regional (Y/N)
	Restoration of Shellfish Breeding Grounds	Shellfish populations serve several benefits in the Great South Bay, including filtration of water, sustenance, and economic development for the fishing industry. Healthy populations of oysters have the added benefit of providing shoreline stabilization and storm protection by serving as natural breakwaters. Shellfish were once abundant in the Great South Bay, but a combination of overfishing and degradation of the habitat and water quality have stressed the population to very low levels. This project would partner with organizations to fund the reestablishment of shellfish beds in strategic locations for storm protection.	Additional Resiliency Recommendation	\$500,000	Y
	Study of Restoration of N/S-Oriented Fire Island Inlet	The current east-west orientation of Fire Island Inlet between Sore Thumb and Democrat Point, combined with the westward direction of the littoral drift, leads to sand bypassing the beaches at Gilgo and West Gilgo, making the beaches there recede and the dunes behind the beaches exposed and vulnerable. Previously, the Fire Island Inlet had been north-south oriented at approximately the location of Fire Island Lighthouse five miles to the east. This project would fund a comparative study to investigate the long-term beach replenishment and dredging maintenance costs of the current E/W inlet and the potential costs associated with the reestablishment of the N/S inlet.	Additional Resiliency Recommendation	\$400,000	Y



# West Gilgo to Captree NY Rising Community Reconstruction Plan

**Table 16: Master Project Table (cont'd)**

Strategy	Project Name	Short Description	Project Category	Estimated Cost	Regional (Y/N)
Address beach access issues and increase public awareness of the importance of healthy dune systems and beach-goer etiquette.	Creation of a Beach Access Plan and related activities	Current deficiencies in the planning and/or enforcement of beach hours, permitting, and legal dune crossings have led to illegal crossings and degradation of the dunes. This plan would fund the development of a Beach Access Plan and related activities, such as environmental and recreational planning, code updates, improved signage and education for designated dune crossings, more restrictive permitting for four-wheel drive vehicles, manned access points and patrols, and a user fee to fund ongoing dune maintenance.	Additional Resiliency Recommendation	\$500,000	Y
Explore feasibility of short-term deployment protection systems to reduce flooding.	Inflatable Tunnel Plugs	The tunnels that run beneath Ocean Parkway between the beach and the bay at Gilgo, West Gilgo, and Cedar Beach Marina became conduits of treacherous ocean water and storm debris during Superstorm Sandy. This project would fund the installation of inflatable tunnel plugs in the beach access tunnels to be inflated during preparations for future storm events.	Additional Resiliency Recommendation	\$1,010,000	Y
Update current evacuation routes based on road and bridge hazards and install route signage.	Evacuation Routes and Procedures	This project would support the work of Suffolk County, Nassau County, and NYSDOS to improve evacuation routes and procedures throughout Long Island. The project would plan and install signage for evacuation routes for barrier island residents, as well as increase public awareness of emergency preparedness and evacuation.	Additional Resiliency Recommendation	\$200,000	Y



# West Gilgo to Captree NY Rising Community Reconstruction Plan

**Table 16: Master Project Table (cont'd)**

Strategy	Project Name	Short Description	Project Category	Estimated Cost	Regional (Y/N)
Plan for more resilient residential structures with short, medium, and long-term mitigation strategies.	Increased Incentives for Resiliency of Housing	This project would fund incentives for hazard mitigation measures at the residential level - such as elevation, roof strapping, and shutters - through such means as grants or low interest loans; tax relief; and participation in the FEMA Community Rating System (CRS) as part of the National Flood Insurance Program (NFIP).	Additional Resiliency Recommendation	\$400,000	N
	Increased Options to Relocate Residential Structures	Residents whose homes are at severe risk in the face of future storm events may want to explore options to relocate on the barrier island or to the mainland to a safer location. This project would fund an inventory of available plots that are outside of the Coastal Erosion Hazard Area and the extreme and high risk assessment areas and establish a process whereby current barrier island residents can pursue options for relocation.	Additional Resiliency Recommendation	\$100,000	N
	Land Use, Building and Flood Code Updates	Land use and building codes may need to be updated to correspond with the residential structures' relative exposure to wave action, flood, erosion, and wind. This project would support updates to the Town of Babylon's land use and building codes to take into account such risk indicators as FEMA DFIRM, the NYS DEC Coastal Erosion Hazard Area, and projected sea level rise, as well as the adoption of more stringent building standards.	Additional Resiliency Recommendation	\$100,000	Y



# West Gilgo to Captree NY Rising Community Reconstruction Plan

**Table 16: Master Project Table (cont'd)**

Strategy	Project Name	Short Description	Project Category	Estimated Cost	Regional (Y/N)
Increase resiliency of public water supply systems.	Improvements to Potable Water System - Oak Beach	Oak Beach's public water wells do not have backup power and residents endured up to six weeks without water to their homes. This project would fund the combining and upgrading of Oak Beach's three public water supply systems with additional capacity to serve up to 94 homes. Systems would be built to current codes and standards, including controls elevated above the 500-year flood elevation, above ground tanks, and a backup power supply.	Additional Resiliency Recommendation	\$2,540,000	N
	Improvements to Potable Water System - Oak Island Beach Association	Oak Island Beach Association residents are connected to private potable water wells either as individual households or jointly with up to three other lease holders on one well. Most of the private wells do not have a backup power source and residences on these wells lost the ability to draw or filter water during and after Sandy for up to six weeks. This project would connect all residents to a newly constructed public water system, built to current codes and standards, including elevation and a backup power supply.	Additional Resiliency Recommendation	\$5,000,000	N
Increase resiliency of evacuation by creating redundancy in evacuation options.	Retrofits to Public Boat Ramps	In the event of a future catastrophic storm, a parkway or bridge failure could isolate barrier island residents from the services on the main island. Redundancy of access and egress routes, therefore, is a critical risk reduction consideration. This project would fund retrofits to public boat ramps to account for future sea level rise so that they may reliably serve as a means of evacuation by boat.	Additional Resiliency Recommendation	\$600,000	Y



# West Gilgo to Captree NY Rising Community Reconstruction Plan

**Table 16: Master Project Table (cont'd)**

Strategy	Project Name	Short Description	Project Category	Estimated Cost	Regional (Y/N)
Mitigate power outages during and post-storm events by adding mitigation and redundancy to the power system.	Mitigation of Power Outages	The residents of the barrier islands faced extensive power outages after Sandy wreaked havoc on the power distribution network with some residents experiencing as many as six weeks without power. The residents, therefore, also lost water, heat, and communications, creating immense difficulties and delays in the recovery process. This project would fund measures to mitigate future power outages, such as elevating and hardening the power substation on Captree Island, intelligent metering for residences, and subsidies for off-the-grid energy installations.	Additional Resiliency Recommendation	\$1,130,000	Y
Work with communications service providers to ensure cellular and internet service to all residents during events.	Mitigation of Failures to Cellular Service	Communication is critical in the lead up and response to an emergency situation and cellular phones have become the most valuable tool to communicate with family and friends, request emergency services, and receive and pass along updates on evacuation, weather, power outages, fuel supplies, and myriad other emergency management issues. This project would help to ensure continuity of cellular service by updating codes that require the elevation of electrical controls on all microwave towers and installation of backup power sources.	Additional Resiliency Recommendation	\$100,000	Y



# West Gilgo to Captree NY Rising Community Reconstruction Plan

**Table 16: Master Project Table (cont'd)**

Strategy	Project Name	Short Description	Project Category	Estimated Cost	Regional (Y/N)
	Expansion of Internet Coverage	The barrier island communities are not currently covered by a reliable internet service provider (ISP), which becomes a public safety issue in times of impending emergency situations. Access to information becomes a life safety issue when living on a barrier island and many residents were not sufficiently notified of Superstorm Sandy's magnitude, nor did they receive the reverse 911 mandatory evacuation notifications. This project would expand internet service to each community by working with ISPs to assess and install the most cost-effective means to achieve adequate and reliable coverage.	Additional Resiliency Recommendation	\$100,000	Y



# West Gilgo to Captree NY Rising Community Reconstruction Plan

**Table 16: Master Project Table (cont'd)**

Strategy	Project Name	Short Description	Project Category	Estimated Cost	Regional (Y/N)
Utilize stormwater best management practices and green infrastructure to reduce runoff pollution to the bay.	Green Parking Lots	A major cause of the degradation of the marshes in the Great South Bay is nutrient loading in the bay's waters from the stormwater that runs off of lawns, roads, and parking lots. The barrier islands have several large parking lots to accommodate the summer crowds with little to no design measures to prevent stormwater runoff from flowing directly into the bay. The parking areas, which are currently wide-open paved expanses, could contribute to the beauty of the landscape and provide ecological stormwater services by incorporating "Best Management Practices" such as rain gardens, trees, and permeable pavement. Considering the barrier islands' issues with loss of power, the parking lots are also an underutilized open space for solar energy. Innovative designs for solar paneled sun shades over parking areas would keep cars cool and produce solar power year-round. This project would fund the design and construction of green parking lots for Gilgo, Cedar/Overlook Beach, Oak Beach, and Captree State Park.	Additional Resiliency Recommendation	\$3,000,000	Y



# West Gilgo to Captree NY Rising Community Reconstruction Plan

**Table 16: Master Project Table (cont'd)**

Strategy	Project Name	Short Description	Project Category	Estimated Cost	Regional (Y/N)
Preserve historic and culturally significant landmarks.	Oak Beach Park Improvements	Oak Beach Park, which currently consists of a parking lot, grassy area, beach, and fishing pier, has been reimagined as a park that reflects the community's needs with natural, native plantings, green infrastructure to manage stormwater and occasional floodwaters, and educational programming and signage for youth. If properly designed, the park would also function as a means of mitigating flooding on Oak Beach Road. The project would fund infrastructure and drainage improvements, walking paths, vegetation, and limited redesign and reconstruction of Oak Beach Road to direct floodwaters to the open space.	Additional Resiliency Recommendation	\$5,500,000	Y
	Oak Beach Community Center	Oak Beach Community Center, which over time has served as a U.S. Life Saving Station, post office, chapel, yacht club, civic association, and now as the center of community gatherings, has been closed for repairs since Sandy due to wind and flood damages. This project would fund elevating the building to above the 500-year flood elevation, strengthening the structure, windows, and doors for wind resistance, limited repairs to the interior, and ADA compliance.	Additional Resiliency Recommendation	\$1,230,000	N



# West Gilgo to Captree NY Rising Community Reconstruction Plan

## C. Public Engagement Process

Governor Andrew Cuomo has been a strong proponent of bottom-up, community-driven planning; in other words, the real “experts” are the residents of the communities that have been confronted first-hand by these natural disasters. A critical component, therefore, of the NYRCR West Gilgo to Captree Program was the exchange of information between the NYRCR Consultant Team, the NYRCR Committee (Committee), and the public to identify appropriate projects, strategies, and solutions that were likely to obtain NYRCR West Gilgo to Captree (Community) support. The public included area residents, employees, civic groups, neighborhood and homeowner associations, environmental and other interest groups, business interests, governmental agencies, educational, medical, religious, and other institutions, the media, and elected/ appointed officials, as well as other stakeholders who express interest in the process.

The Public Engagement Strategy:

- Established the means to engage and facilitate information-sharing with the public throughout the development of the final NYRCR Plan.
- Educated the public and elicit public comments and suggestions regarding all aspects of the Plan within the NYRCR Community.
- Employed outreach techniques that allow for collection and coordination of public communication and comments.
- Reached out to groups that might normally be underrepresented in a planning study, such as minorities, Spanish-speaking residents, low-income residents, seniors, youth, and the disabled.

The NYRCR Consultant Team utilized a number of dissemination techniques to achieve a thorough, responsive, open, and transparent communication process. An important component of the outreach program is to understand public sentiment and to be able to answer questions and address public concerns. Several methods were provided for the public to make comments and ask questions. The NYRCR Planning Committee used these comments to enhance and improve the NYRCR Plan.



Members of the Community gather for an outdoor public engagement event held in conjunction with a beach clean-up day.



# West Gilgo to Captree NY Rising Community Reconstruction Plan

## **NYRCR Planning Committee Members/Meetings**

NYRCR Committee meetings were held on a regular basis at which time Committee members discussed agenda items and reached consensus on topics such as the Community Vision Statement, critical assets and risks, Community Needs and Opportunities, public event planning and feedback, NYRCR West Gilgo to Captree Conceptual Plan development, strategies, projects, and costs.

Ten Committee meetings have been held as of March 31, 2014. All Committee meetings were open to the public, with meeting dates and times posted on the NYRCR website ([www.stormrecovery.ny.gov/nyrcr](http://www.stormrecovery.ny.gov/nyrcr)). For each Committee meeting, notifications were sent and meeting materials were prepared. They included agendas, sign-in sheets, minutes, comment log, PowerPoint presentations, graphics/boards, and handouts. The public was invited to comment on the work of the Committee by filling out a comment form available at each Committee meeting.

## **Public Engagement**

While the Committee represented the interests of many, it was important to provide opportunities for the public to participate in the development of the NYRCR Plan. While the primary vehicle for this effort was public engagement events, additional outreach opportunities for comment were provided at different venues in the Community and through the NYRCR website.

## **Public Engagement Events**

Each public engagement event included the presentation of work completed to date, as well as opportunities for attendees to provide feedback. The NYRCR Consultant Team provided the following materials for each meeting: public notice (including press releases, announcements, individual mailings, and other appropriate means), outreach to underserved communities and displaced stakeholders, information gathering from those attending, and the collection and inclusion of feedback into the ongoing planning process. A summary of each public engagement event was available both in hard copy and electronically.

Public engagement events were scheduled to coincide with major project milestones. A targeted and well-executed public involvement process is intended to educate and raise awareness during the development of the plan, which ensures that when the plan is put into implementation, the public, elected officials, and key stakeholders have had ample opportunity to actively participate in the



A member of the public looks over the draft plan materials at a public engagement event.



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decision-making process. Members of the public who are informed and engaged in the process are more likely to support the overall plan or become interested in a targeted component within the plan.

Outreach for public engagement events included: media outlets including Babylon Village Patch and Newsday; press releases from local legislators to constituents; postings on websites for Save the Beaches, Gilgo.com, and the Long Island Beach Access Group; email notifications to Save the Beaches and all civic and community email listservs; Committee members' contacts and social media; phone calls to elected officials/leaders in the Babylon and Islip community; posting on the state NYRCR webpage and other electronic media; and flyers and posters at strategic locations throughout the community including libraries, community centers, and other centers of activity.

The desired outcome of each public engagement event was to obtain the public's reactions and feedback to the Committee's work in order to incorporate their input. These comments were compiled by the NYRCR Consultant Team and provided to the Committee in a clear and comprehensive manner. The Committee reviewed the public's feedback and incorporated it into the NYRCR Plan.

Although the meetings were advertised as events for the NYRCR Planning Program, Community members attended who were often interested in assistance with individual property concerns. In order to accommodate these individuals at each public engagement event, tables were available in a separate area for State, the Federal Emergency Management Agency (FEMA), and non-governmental organizations (NGO) staff from the various intake centers to provide individual assistance. These Community members were subsequently encouraged to participate in the NYRCR Planning process.

The following public engagement events were held:

- Public Engagement Event 1. At this open house-style event, held in conjunction with the Save the Beaches International Coastal Clean-Up Day, the program background, planning process, Community visions, needs and opportunities and Community assets were presented.
- Public Engagement Event 2. This event included both an open house for viewing materials and a formal presentation by the Committee Co-Chair. Information discussed at this meeting included the strategies and potential projects.
- Public Engagement Event 3. At this open house event the risk assessment, Proposed Projects, Featured Projects, and Additional Resiliency Recommendations were presented. This event also



## West Gilgo to Captree NY Rising Community Reconstruction Plan

included an online survey component that was open from February 24 to March 9, 2014, that included all materials presented at the February 24 event and an opportunity for participants to rate Proposed Projects.

- A fourth Public Engagement Event will be held in spring 2014 to present this NYRCR Plan to the public.

### *Expert Sessions*

A Power (Electric/Gas) Resiliency Education Session which was held on Tuesday, December 17, 2013 at the West Islip Community Center on Higbie Lane. Over 30 members from the various Suffolk County NYRCR Committees were in attendance. The education session focused on National Grid/LIPA (now operated by PSEG Long Island as of January 1, 2014) lessons learned post-Superstorm Sandy as well as current and future hardening projects/initiatives that are being undertaken by the utilities within the County.

A Flooding & Erosion Protection Education Session was held on January 21, 2014, at the West Islip Fire Department, 309 Union Boulevard in West Islip. Representatives from New York Sea Grant and the NYS DEC gave innovative presentations about existing and potential treatments of the natural shoreline, coastal resiliency options for flood mitigation and erosion control, and best practices for the Long Island coastal context.

### *Outreach Activities*

In addition to the public engagement events, other outreach activities were conducted. The Suffolk Regional Lead regularly met with elected and public officials—local, County and Federal (FEMA)—to report on the progress of the Committee and to generate input. This outreach involved:

**Online Outreach:** A web-based survey was used to gauge public opinion on the Proposed Projects in conjunction with Public Engagement Event #3. An advantage of an online survey is its potential to reach individuals who cannot or choose not to attend public engagement events. Surveys were restricted to one survey completion per computer.



A Community member provides feedback on the NYRCR Planning Committee's work.



## West Gilgo to Captree NY Rising Community Reconstruction Plan

**Schools/Youth** A web-based survey targeting school-age persons 10 to 23-years old was conducted to receive input on the Proposed Projects from the “Next Generation” in the Community. This online survey was also held in conjunction with Public Event #3.

**Website:** The NYRCR West Gilgo to Captree website (<http://stormrecovery.ny.gov/nyrcr/community/west-gilgo-captree>) served as a repository for downloadable versions of all public information and event notifications. Posted materials included an overview of the planning process, maps, the NYRCR West Gilgo to Captree Conceptual Plan, summaries, notices, and materials from public engagement events, and contact information. The website includes an area to accept public comment.

**Print and Broadcast Media:** Planning information was disseminated through local print media to keep the Community informed and to respond to media inquiries.

**NYRCR Staff Communication:** The NYRCR staff was available to directly answer specific questions and receive comments. The primary contact for the Community was the NYRCR Suffolk County Regional Lead.

**E-Mail:** E-mail comments and requests for information could be sent to the State’s e-mail address at: [info@stormrecovery.ny.gov](mailto:info@stormrecovery.ny.gov). This email address was prominently displayed on all materials and the website so that it was widely disseminated and available for public use.

**Comment Forms:** Comment forms were available at Committee meetings and public engagement events and on the State’s website to provide an opportunity for the public to contribute their feedback, which were then passed along to the Committee.



Members of the Community gather for a presentation by the NYRCR Committee Chair at a public engagement event.



## D. Community Asset Inventory

As discussed in Section II, “Assessment of Risk and Needs,” a standardized risk assessment tool was used to assist the NYRCR West Gilgo to Captree Committee to assess and quantify the risk to their assets and to test whether various projects and management measures will reduce the risk to those assets. The risk assessment tool is available at <http://stormrecovery.ny.gov/nyrcr>.

### Using the Risk Assessment Tool

The dual purpose of the risk assessment tool was: (1) to provide risk information as a means to identify and prioritize management measures; and (2) to provide a standardized risk assessment process for the NYRCR Program.

Most of the risk assessment tool fields that required basic data such as asset name and type, asset category, risk area, and asset class, were populated using appropriate data from the consolidated database or were automatically filled in. This included the Hazard Score.

**Hazard Score:** This risk assessment assigned a hazard score of 3 for each asset based on a 100-year event occurring within a 100-year planning timeframe. Hazard scores may range from 1 to 5 depending on whether a higher (e.g., 500-year event) or lower (e.g., 10-year event) magnitude event are used for the analysis.

Two additional important factors in the tool, exposure and vulnerability scores, were populated using a combination of technical and local knowledge.

**Exposure Score:** Exposure scores range from 0.5 to 5. The exposure score takes into consideration the risk area in which the asset is located and local landscape attributes that influence the potential for storm impacts, including the local erosion rate, beach width, presence and condition of natural protective features, presence and condition of engineered shore defenses, and soils. Assets located in the extreme, high, and moderate risk area began with an exposure score of 2, 1, or 0.5, respectively. Each landscape attribute that increases an asset’s exposure to storm effects increases the exposure score by 0.5.



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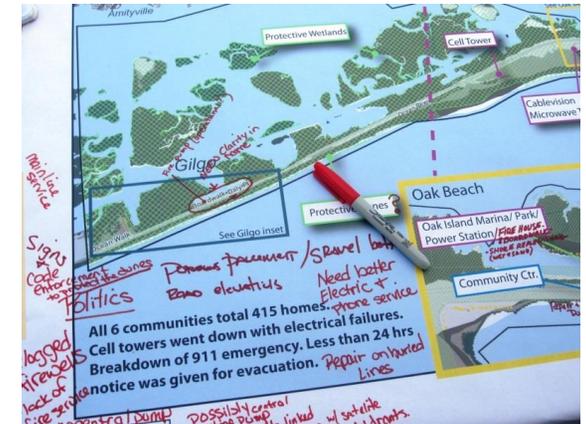
Data that informed the exposure score included a review of Coastal Erosion Hazard Area (CEHA) maps, aerial imagery, and site reconnaissance, as well as a reliance on local knowledge and input from the NYRCR Consultant Team, Committee, and Community residents.

**Vulnerability Score:** Vulnerability generally pertains to the length of time that an asset is out of service from a storm event. The vulnerability score of each asset was determined from local knowledge of how assets were affected during past storm events. The vulnerability scores range from 1 to 5 as follows:

- Insignificant (1): limited interruption in service/short-term reduction in service
- Minor (2): service loss for up to 1 week/longer-term reduction in service
- Moderate (3): service loss of more than 1 week up to 1 month
- Significant (4): service loss for more than 1 month/permanent reduction in capacity
- Major (5): permanent loss of service/asset

**Risk Score Range:** After populating the risk assessment tool with hazard area, exposure, and vulnerability data, a risk score is automatically generated. The risk score relies on past experience as a predictor of future risk and includes some subjective analysis. For a 100-year event the risk score ranges from residual (less than 6) to moderate (6 to 23) to high (24 to 53) to severe (54 to 75) and serves as a valuable means of comparing the relative risk of assets to each other to better inform the Committee's development and evaluation of projects.

Presented on the following pages is a baseline inventory of assets in the Community, followed by the risk assessment tool results. Included in the risk assessment spreadsheet for each asset is the asset name, risk area, asset class, critical facility designation, Community value, landscape attributes, and risk assessment scores.



An asset map with hand-written feedback from members of the Community for incorporation into the planning process.



# West Gilgo to Captree NY Rising Community Reconstruction Plan

Asset Inventory Worksheet												
Asset Information							Landscape Attributes					
Asset Name	Risk Area	Asset Class	Asset Subcategory	Socially Vulnerable Populations	Critical Facility	Community Value	<i>Erosion Rate:</i> Long-term average erosion rate 1 foot or more/year, or unknown	<i>Beach Width:</i> Waterline frequently at shore defense or upland vegetation	<i>Shore Defenses:</i> Shore defenses absent, not constructed to anticipated storm or sea level rise conditions, or deteriorating	<i>Vegetation:</i> Protective vegetation, wetlands, or intervening structures between asset and flood source absent	<i>Dunes or Bluffs:</i> Dunes absent, below BFE, or eroding (scarped), discontinuous, or have little vegetation. Bluff slope is unstable, partially vegetated.	<i>Soils:</i> Asset located on a coastal barrier island or filled wetland
Seasonal Pump Out Station	Extreme	Economic	Marine commerce facilities	Yes	Yes, FEMA	Low	No	Yes	Yes	Yes	Yes	Yes
Gilgo Beach Inn	High	Economic	Restaurants	Yes	No	Low	No	Yes	Yes	Yes	Yes	Yes
Fire House - Oak Island	Extreme	Health and Social Services	Emergency Operations/Response	Yes	Yes, FEMA	High	No	No	Yes	Yes	No	Yes
Fire Road - Oak Island Beach Association	Extreme	Health and Social Services	Emergency Operations/Response	Yes	Yes, FEMA	High	Yes	Yes	Yes	No	Yes	Yes
Fire Wells - Oak Beach	Extreme	Health and Social Services	Emergency Operations/Response	Yes	Yes, FEMA	High	Yes	Yes	Yes	No	Yes	Yes
Fire Wells - Captree Island	Extreme	Health and Social Services	Emergency Operations/Response	Yes	Yes, FEMA	High	No	Yes	Yes	Yes	No	Yes
Fire Jetties	Extreme	Health and Social Services	Emergency Operations/Response	Yes	Yes, FEMA	High	Yes	Yes	Yes	Yes	Yes	Yes
Fire Pump and Wells - Gilgo	High	Health and Social Services	Emergency Operations/Response	Yes	Yes, FEMA	High	No	Yes	Yes	Yes	Yes	Yes
Residence - Extreme Risk Area	Extreme	Housing	Single-Family Residence	Yes	No	Medium	Yes	Yes	Yes	Yes	Yes	Yes
Residence - High Risk Area	High	Housing	Single-Family Residence	Yes	No	Medium	Yes	Yes	Yes	Yes	Yes	Yes
Residence - Moderate Risk Area	Moderate	Housing	Single-Family Residence	Yes	No	Medium	Yes	Yes	Yes	Yes	Yes	Yes
Captree Island Road	Extreme	Infrastructure Systems	Transportation	Yes	No	High	No	Yes	Yes	Yes	Yes	Yes
Oak Beach Road	Extreme	Infrastructure Systems	Transportation	Yes	No	High	Yes	Yes	Yes	Yes	Yes	Yes
Robert Moses Causeway NB	Extreme	Infrastructure Systems	Transportation	Yes	No	High	No	Yes	Yes	Yes	Yes	Yes
Robert Moses Causeway SB	Extreme	Infrastructure Systems	Transportation	Yes	No	High	No	Yes	Yes	Yes	Yes	Yes
Cedar Beach Sportfishing Education Center Drinking Water Well	Extreme	Infrastructure Systems	Water Supply	Yes	Yes, FEMA	High	No	Yes	Yes	Yes	No	Yes
McCarren Water Supply Well #1	Extreme	Infrastructure Systems	Water Supply	Yes	Yes, FEMA	High	Yes	Yes	Yes	No	Yes	Yes
Oak Island Marina	Extreme	Infrastructure Systems	Transportation	Yes	No	Medium	No	Yes	Yes	Yes	Yes	Yes
Pedestrian Boardwalks	Extreme	Infrastructure Systems	Transportation	Yes	No	Medium	Yes	Yes	Yes	Yes	Yes	Yes
Transformer	Extreme	Infrastructure Systems	Power Supply	Yes	Yes, FEMA	High	No	No	Yes	Yes	No	Yes



# West Gilgo to Captree NY Rising Community Reconstruction Plan

Asset Information							Landscape Attributes					
Asset Name	Risk Area	Asset Class	Asset Subcategory	Socially Vulnerable Populations	Critical Facility	Community Value	Erosion Rate: Long-term average erosion rate 1 foot or more/year, or unknown	Beach Width: Waterline frequently at shore defense or upland vegetation	Shore Defenses: Shore defenses absent, not constructed to anticipated storm or sea level rise conditions, or deteriorating	Vegetation: Protective vegetation, wetlands, or intervening structures between asset and flood source absent	Dunes or Bluffs: Dunes absent, below BFE, or eroding (scarped), discontinuous, or have little vegetation. Bluff slope is unstable, partially vegetated.	Soils: Asset located on a coastal barrier island or filled wetland
Ocean Pkwy (West Gilgo to Captree State Park)	High	Infrastructure Systems	Transportation	Yes	No	High	Yes	Yes	Yes	Yes	Yes	Yes
Cedar Beach (Campground/Concession) Drinking Water Treatment and Well	High	Infrastructure Systems	Water Supply	Yes	Yes, FEMA	High	No	No	Yes	No	No	Yes
Dougherty Water Company Well #1	High	Infrastructure Systems	Water Supply	Yes	Yes, FEMA	High	Yes	Yes	Yes	No	Yes	Yes
McCrodden Water Company Well #1	High	Infrastructure Systems	Water Supply	Yes	Yes, FEMA	High	Yes	Yes	Yes	No	Yes	Yes
New York SMSA Limited Partnership Microwave Tower	High	Infrastructure Systems	Telecommunications	Yes	No	Medium	Yes	No	Yes	No	No	Yes
Overlook Beach Drinking Water Well	High	Infrastructure Systems	Water Supply	Yes	Yes, FEMA	High	Yes	No	Yes	No	No	Yes
West Gilgo Beach Association Ocean Walk Water Treatment Plant and Well	High	Infrastructure Systems	Water Supply	Yes	Yes, FEMA	High	No	Yes	Yes	Yes	Yes	Yes
Public Water- Deep Wells	High	Infrastructure Systems	Public Works Facilities	Yes	Yes, FEMA	High	No	Yes	Yes	Yes	Yes	Yes
Captree State Park Drinking Water Treatment and Well	Moderate	Infrastructure Systems	Water Supply	Yes	Yes, FEMA	High	No	Yes	Yes	Yes	Yes	Yes
Gilgo Beach Drinking Water Well	Moderate	Infrastructure Systems	Water Supply	Yes	Yes, FEMA	High	No	Yes	Yes	Yes	Yes	Yes
Gilgo Beach Drinking Water Treatment and Well	Moderate	Infrastructure Systems	Water Supply	Yes	Yes, FEMA	High	No	Yes	Yes	No	Yes	Yes
New York SMSA Limited Partnership Microwave Tower	Moderate	Infrastructure Systems	Telecommunications	Yes	No	Medium	No	Yes	Yes	Yes	Yes	Yes
Cablevision Microwave Tower	Moderate	Infrastructure Systems	Telecommunications	Yes	No	High	No	Yes	Yes	Yes	Yes	Yes
LIPA Box	Moderate	Infrastructure Systems	Power Supply	Yes	Yes, FEMA	High	No	Yes	Yes	Yes	Yes	Yes
Power Station	Moderate	Infrastructure Systems	Power Supply	Yes	Yes, FEMA	High	No	Yes	Yes	Yes	Yes	Yes
Main office Parks & Recreation - Gilgo State Park	Extreme	Natural and Cultural Resources	Parks and Recreation	Yes	No	Low	No	Yes	Yes	Yes	No	Yes
Tidal Wetlands	Extreme	Natural and Cultural Resources	Wetlands and marshes	Yes	No	High	No	No	Yes	Yes	No	Yes
Captree State Park	Extreme	Natural and Cultural Resources	Parks and Recreation	Yes	No	Medium	Yes	Yes	Yes	No	Yes	Yes
Freshwater Wetland	Extreme	Natural and Cultural Resources	Wetlands and Marshes	Yes	No	High	No	Yes	Yes	No	Yes	Yes
Gilgo State Park (undeveloped)	Extreme	Natural and Cultural Resources	Parks and Recreation	Yes	No	Medium	Yes	Yes	Yes	Yes	Yes	Yes



# West Gilgo to Captree NY Rising Community Reconstruction Plan

Asset Information							Landscape Attributes					
Asset Name	Risk Area	Asset Class	Asset Subcategory	Socially Vulnerable Populations	Critical Facility	Community Value	<i>Erosion Rate:</i> Long-term average erosion rate 1 foot or more/year, or unknown	<i>Beach Width:</i> Waterline frequently at shore defense or upland vegetation	<i>Shore Defenses:</i> Shore defenses absent, not constructed to anticipated storm or sea level rise conditions, or deteriorating	<i>Vegetation:</i> Protective vegetation, wetlands, or intervening structures between asset and flood source absent	<i>Dunes or Bluffs:</i> Dunes absent, below BFE, or eroding (scarped), discontinuous, or have little vegetation. Bluff slope is unstable, partially vegetated.	<i>Soils:</i> Asset located on a coastal barrier island or filled wetland
Jones Beach Island - Maritime beach	Extreme	Natural and Cultural Resources	Natural Protective Features	Yes	No	High	Yes	Yes	Yes	No	Yes	Yes
Jones Beach Island - dunes, interdunal swales, shrubland	Extreme	Natural and Cultural Resources	Natural Protective Features	Yes	No	Medium	Yes	Yes	Yes	No	Yes	Yes
Oak Beach, Dunes, and Sand Bar	Extreme	Natural and Cultural Resources	Natural Protective Features	Yes	No	High	Yes	Yes	Yes	No	Yes	Yes
Oak Beach Park	Extreme	Natural and Cultural Resources	Parks and Recreation	Yes	No	Medium	Yes	Yes	Yes	Yes	Yes	Yes
Tidal Marsh	Extreme	Natural and Cultural Resources	Wetlands and Marshes	Yes	No	High	No	Yes	Yes	No	No	Yes
Oak Beach Community Center	Extreme	Natural and Cultural Resources	Community Centers	Yes	No	Medium	Yes	Yes	Yes	Yes	Yes	Yes
Main office Parks & Recreation - Captree State Park	Moderate	Natural and Cultural Resources	Parks and Recreation	Yes	No	Low	No	Yes	Yes	Yes	Yes	Yes



# West Gilgo to Captree NY Rising Community Reconstruction Plan

Risk Assessment Tool																	
Asset Information							Landscape Attributes							Risk Assessment			
Asset	Risk Area	Asset Class	Asset Sub-category	Socially Vulnerable Populations	Critical Facility	Community Value	Erosion Rate $\geq 1$ foot per year or unknown	Waterline frequently at shore defense or upland vegetation	Shore defenses absent, not constructed to anticipated conditions, or deteriorating	Protective vegetation between asset and flood source absent	Dunes absent, below BFE, eroding, little vegetation; Bluff slope unstable, little vegetation	Asset on coastal barrier island or filled wetland	Landscape Attribute Score ("Yes" = +0.5)	Hazard Score	Exposure Score	Vulnerability Score	Risk Score
Seasonal Pump Out Station	Extreme	Economic	Marine commerce facilities	Yes	Yes, FEMA	Low	No	Yes	Yes	Yes	Yes	Yes	2.5	3	4.50	4	54
Gilgo Beach Inn	High	Economic	Restaurants	Yes	No	Low	No	Yes	Yes	Yes	Yes	Yes	2.5	3	3.50	4	42
Fire House - Oak Island	Extreme	Health and Social Services	Emergency Operations/ Response	Yes	Yes, FEMA	High	No	No	Yes	Yes	No	Yes	1.5	3	3.50	3	32
Fire Road - Oak Island Beach Association	Extreme	Health and Social Services	Emergency Operations/ Response	Yes	Yes, FEMA	High	Yes	Yes	Yes	No	Yes	Yes	2.5	3	4.50	1	14
Fire Wells - Oak Beach	Extreme	Health and Social Services	Emergency Operations/ Response	Yes	Yes, FEMA	High	Yes	Yes	Yes	No	Yes	Yes	2.5	3	4.50	4	54
Fire Wells - Captree Island	Extreme	Health and Social Services	Emergency Operations/ Response	Yes	Yes, FEMA	High	No	Yes	Yes	Yes	No	Yes	2	3	4.00	4	48
Fire Jetties	Extreme	Health and Social Services	Emergency Operations/ Response	Yes	Yes, FEMA	High	Yes	Yes	Yes	Yes	Yes	Yes	3	3	5.00	4	60
Fire Pump and Wells - Gilgo	High	Health and Social Services	Emergency Operations/ Response	Yes	Yes, FEMA	High	No	Yes	Yes	Yes	Yes	Yes	2.5	3	3.50	4	42
Residence - Extreme Risk Area	Extreme	Housing	Single-Family Residence	Yes	No	Medium	Yes	Yes	Yes	Yes	Yes	Yes	3	3	5.00	4	60
Residence - High Risk Area	High	Housing	Single-Family Residence	Yes	No	Medium	Yes	Yes	Yes	Yes	Yes	Yes	3	3	4.00	4	48
Residence - Moderate Risk Area	Moderate	Housing	Single-Family Residence	Yes	No	Medium	Yes	Yes	Yes	Yes	Yes	Yes	3	3	3.50	4	42
Captree Island Road	Extreme	Infrastructure Systems	Transportation	Yes	No	High	No	Yes	Yes	Yes	Yes	Yes	2.5	3	4.50	4	54
Oak Beach Road	Extreme	Infrastructure Systems	Transportation	Yes	No	High	Yes	Yes	Yes	Yes	Yes	Yes	3	3	5.00	4	60
Robert Moses Causeway NB	Extreme	Infrastructure Systems	Transportation	Yes	No	High	No	Yes	Yes	Yes	Yes	Yes	2.5	3	4.50	1	14
Robert Moses Causeway SB	Extreme	Infrastructure Systems	Transportation	Yes	No	High	No	Yes	Yes	Yes	Yes	Yes	2.5	3	4.50	1	14
Cedar Beach Sportfishing Education Center Drinking Water Well	Extreme	Infrastructure Systems	Water Supply	Yes	Yes, FEMA	High	No	Yes	Yes	Yes	No	Yes	2	3	4.00	4	48
McCarran Water Supply Well #1	Extreme	Infrastructure Systems	Water Supply	Yes	Yes, FEMA	High	Yes	Yes	Yes	No	Yes	Yes	2.5	3	4.50	4	54
Oak Island Marina	Extreme	Infrastructure Systems	Transportation	Yes	No	Medium	No	Yes	Yes	Yes	Yes	Yes	2.5	3	4.50	3	41
Pedestrian Boardwalks	Extreme	Infrastructure Systems	Transportation	Yes	No	Medium	Yes	Yes	Yes	Yes	Yes	Yes	3	3	5.00	4	60
Transformer	Extreme	Infrastructure Systems	Power Supply	Yes	Yes, FEMA	High	No	No	Yes	Yes	No	Yes	1.5	3	3.50	4	42
Ocean Pkwy (West Gilgo to Captree State Park)	High	Infrastructure Systems	Transportation	Yes	No	High	Yes	Yes	Yes	Yes	Yes	Yes	3	3	4.00	4	48
Cedar Beach (Campground/Concession) Drinking Water Treatment and Well	High	Infrastructure Systems	Water Supply	Yes	Yes, FEMA	High	No	No	Yes	No	No	Yes	1	3	2.00	4	24
Dougherty Water Company Well #1	High	Infrastructure Systems	Water Supply	Yes	Yes, FEMA	High	Yes	Yes	Yes	No	Yes	Yes	2.5	3	3.50	4	42
McCrodden Water Company Well #1	High	Infrastructure Systems	Water Supply	Yes	Yes, FEMA	High	Yes	Yes	Yes	No	Yes	Yes	2.5	3	3.50	4	42
New York SMSA Limited Partnership Microwave Tower	High	Infrastructure Systems	Telecommunications	Yes	No	Medium	Yes	No	Yes	No	No	Yes	1.5	3	2.50	4	30



# West Gilgo to Captree NY Rising Community Reconstruction Plan

Asset Information							Landscape Attributes							Risk Assessment			
Asset	Risk Area	Asset Class	Asset Sub-category	Socially Vulnerable Populations	Critical Facility	Community Value	Erosion Rate $\geq 1$ foot per year or unknown	Waterline frequently at shore defense or upland vegetation	Shore defenses absent, not constructed to anticipated conditions, or deteriorating	Protective vegetation between asset and flood source absent	Dunes absent, below BFE, eroding, little vegetation; Bluff slope unstable, little vegetation	Asset on coastal barrier island or filled wetland	Landscape Attribute Score ("Yes" = +0.5)	Hazard Score	Exposure Score	Vulnerability Score	Risk Score
Overlook Beach Drinking Water Well	High	Infrastructure Systems	Water Supply	Yes	Yes, FEMA	High	Yes	No	Yes	No	No	Yes	1.5	3	2.50	4	30
West Gilgo Beach Association Ocean Walk Water Treatment Plant and Well	High	Infrastructure Systems	Water Supply	Yes	Yes, FEMA	High	No	Yes	Yes	Yes	Yes	Yes	2.5	3	3.50	4	42
Public Water- Deep Wells	High	Infrastructure Systems	Public Works Facilities	Yes	Yes, FEMA	High	No	Yes	Yes	Yes	Yes	Yes	2.5	3	3.50	4	42
Captree State Park Drinking Water Treatment and Well	Moderate	Infrastructure Systems	Water Supply	Yes	Yes, FEMA	High	No	Yes	Yes	Yes	Yes	Yes	2.5	3	3.00	4	36
Gilgo Beach Drinking Water Well	Moderate	Infrastructure Systems	Water Supply	Yes	Yes, FEMA	High	No	Yes	Yes	Yes	Yes	Yes	2.5	3	3.00	4	36
Gilgo Beach Drinking Water Treatment and Well	Moderate	Infrastructure Systems	Water Supply	Yes	Yes, FEMA	High	No	Yes	Yes	No	Yes	Yes	2	3	2.50	4	30
New York SMSA Limited Partnership Microwave Tower	Moderate	Infrastructure Systems	Telecommunications	Yes	No	Medium	No	Yes	Yes	Yes	Yes	Yes	2.5	3	3.00	4	36
Cablevision Microwave Tower	Moderate	Infrastructure Systems	Telecommunications	Yes	No	High	No	Yes	Yes	Yes	Yes	Yes	2.5	3	3.00	4	36
LIPA Box	Moderate	Infrastructure Systems	Power Supply	Yes	Yes, FEMA	High	No	Yes	Yes	Yes	Yes	Yes	2.5	3	3.00	4	36
Power Station	Moderate	Infrastructure Systems	Power Supply	Yes	Yes, FEMA	High	No	Yes	Yes	Yes	Yes	Yes	2.5	3	3.00	4	36
Main office Parks & Recreation - Gilgo State Park	Extreme	Natural and Cultural Resources	Parks and Recreation	Yes	No	Low	No	Yes	Yes	Yes	No	Yes	2	3	4.00	4	48
Tidal Wetlands	Extreme	Natural and Cultural Resources	Wetlands and marshes	Yes	No	High	No	No	Yes	Yes	No	Yes	1.5	3	3.50	1	11
Captree State Park	Extreme	Natural and Cultural Resources	Parks and Recreation	Yes	No	Medium	Yes	Yes	Yes	No	Yes	Yes	2.5	3	4.50	1	14
Freshwater Wetland	Extreme	Natural and Cultural Resources	Wetlands and Marshes	Yes	No	High	No	Yes	Yes	No	Yes	Yes	2	3	4.00	1	12
Gilgo State Park (undeveloped)	Extreme	Natural and Cultural Resources	Parks and Recreation	Yes	No	Medium	Yes	Yes	Yes	Yes	Yes	Yes	3	3	5.00	1	15
Jones Beach Island - Maritime beach	Extreme	Natural and Cultural Resources	Natural Protective Features	Yes	No	High	Yes	Yes	Yes	No	Yes	Yes	2.5	3	4.50	4	54
Jones Beach Island - dunes, interdunal swales, shrubland	Extreme	Natural and Cultural Resources	Natural Protective Features	Yes	No	Medium	Yes	Yes	Yes	No	Yes	Yes	2.5	3	4.50	4	54
Oak Beach, Dunes, and Sand Bar	Extreme	Natural and Cultural Resources	Natural Protective Features	Yes	No	High	Yes	Yes	Yes	No	Yes	Yes	2.5	3	4.50	4	54
Oak Beach Park	Extreme	Natural and Cultural Resources	Parks and Recreation	Yes	No	Medium	Yes	Yes	Yes	Yes	Yes	Yes	3	3	5.00	3	45
Tidal Marsh	Extreme	Natural and Cultural Resources	Wetlands and Marshes	Yes	No	High	No	Yes	Yes	No	No	Yes	1.5	3	3.50	1	11
Oak Beach Community Center	Extreme	Natural and Cultural Resources	Community Centers	Yes	No	Medium	Yes	Yes	Yes	Yes	Yes	Yes	3	3	5.00	5	75
Main office Parks & Recreation - Captree State Park	Moderate	Natural and Cultural Resources	Parks and Recreation	Yes	No	Low	No	Yes	Yes	Yes	Yes	Yes	2.5	3	3.00	4	36



# West Gilgo to Captree NY Rising Community Reconstruction Plan

## E. Glossary

### *Acronyms*

**ADA** - Americans with Disabilities Act

**CBA** - Cost-benefit analysis

**CDP** - Census Designated Place

**CEHA** - Coastal Erosion Hazard Area

**CERT** - Communication Emergency Response Team

**FEMA** - Federal Emergency Management Agency

**GIS** - Geographic Information Systems

**NOAA** - National Oceanic and Atmospheric Administration

**NGO** - Non-governmental organization

**NYRCR** - NY Rising Community Reconstruction

**NYS DEC** - New York State Department of Environmental Conservation

**NYS DOS** - New York State Department of State

**NYS DOT** - New York State Department of Transportation

**NYS OPRHP** - New York State Office of Parks, Recreation, and Historic Preservation

**RSF** - Recovery Support Function

**USACE** - U.S. Army Corps of Engineers



A pretty painted window on a dormer of the Oak Beach Community Center.



# West Gilgo to Captree NY Rising Community Reconstruction Plan

## *Terms*

**Asset** - Places or entities where economic, environmental and social functions of the Community occur.

**Asset Inventory** - Completing an inventory of the Community's social, economic, and natural resource assets that have been, or will be, affected by coastal or riverine hazards.

**Community Vision** - The overall goal of the Community throughout the NYRCR planning process.

**Conceptual Plan** - A snapshot of the current thoughts of the Community and planning Committee. The plans will evolve as communities analyze the risk to their assets, their needs and opportunities, the potential costs and benefits of projects and actions, and their priorities.

**Exposure** - Local landscape characteristics that tend to increase or decrease storm effects.

**Geographic scope** - The planning area identified by the Community and State guidelines where assets are most at risk; where future construction or reconstruction of existing development should be encouraged or discouraged; or where key investment to improve the local economy can be instituted.

**Hazard** - The likelihood and magnitude of anticipated hazard events.

**Need** - Infrastructure and services that were damaged or rendered inoperable by Superstorm Sandy as well as methods and operations that failed to work during the storm event or experienced insufficient capacity to respond effectively.

**Needs and Opportunities Assessment** - Determining needs and opportunities to improve local economic growth and enhance resilience to future storms.

**Opportunity** - Additional resiliency benefits, whether economic, environmental, social or cultural, that may be achieved through the integration of new methods, procedures and materials into the normal course of rebuilding.

**Public Engagement** - Offering opportunities for public input and involvement at key milestones in the planning process.



## West Gilgo to Captree NY Rising Community Reconstruction Plan

**Resilience** - The ability of a system to absorb impacts while retaining the same basic structure and ways of functioning, the capacity for self-organization, and the capacity to adapt.

**Risk** - The degree to which a system is susceptible to, or unable to cope with, adverse effects of climate change, including climate variability and extremes.

**Risk Area** - Geographic areas at risk from coastal hazards according to differences in the exposure of the landscape.

**Risk Assessment** - Assessing risk to key Community assets based on the three factors contributing to risk: hazard, exposure, and vulnerability.

**Risk Assessment Tool** - Evaluation of risk based on the formula: Hazard x Exposure x Vulnerability.

**Risk Score** - The result of the risk assessment tool evaluation.

**Strategy** - A specific way or ways to address the needs and realize opportunities presented by the committee.

**Vulnerability** - The capacity of an asset to return to service after an event.



# West Gilgo to Captree NY Rising Community Reconstruction Plan

## F. End Notes

Photo Credits: Photos contained in this document were taken by Jacobs or reprinted with permission from NYRCR Committee Members or others.

- <sup>i</sup> Oak Beach Civic Association website, *History of the Barrier Island Leases—Oak Island Beach Association*. 5 March 2014. <http://oakbeachcivicassociation.com/about/history>.
- <sup>ii</sup> Cashin Associates, P.C. *Environmental Study of the Barrier and Bay Island Communities*. New York: Babylon, 1994. <<http://www.gpo.gov/fdsys/pkg/CZIC-tc425-c37-n7-1994/html/CZIC-tc425-c37-n7-1994.htm>>.
- <sup>iii</sup> Areas along coasts subject to inundation by the 1-percent-annual-chance flood event with additional hazards associated with storm-induced waves.
- <sup>iv</sup> United States. Census Bureau. "2008-2012 American Community Survey 5-Year Estimates." U.S. Census Bureau's American Community Survey Office, 2013. Web. 5 March 2014. <<http://factfinder2.census.gov>>.
- <sup>v</sup> United States. Census Bureau. "State-Based Places Gazetteer Files for New York." *2013 U.S. Gazetteer*. Web. 5 March 2014. <[http://www2.census.gov/geo/gazetteer/2013\\_Gazetteer/2013\\_gaz\\_place\\_36.txt](http://www2.census.gov/geo/gazetteer/2013_Gazetteer/2013_gaz_place_36.txt)>.
- <sup>vi</sup> United States. Census Bureau. "Profile of General Population and Housing Characteristics: 2010." *2010 Demographic Profile Data*. Web. 5 March 2014. <<http://factfinder2.census.gov>>.
- <sup>vii</sup> US Department of Commerce, NOAA, National Weather Service. *Hurricane/Post-Tropical Cyclone Superstorm Sandy, October 22–29, 2012 May 2013*. p. 1.
- <sup>viii</sup> Monitoring storm tide and flooding from Hurricane Sandy along the Atlantic coast of the United States, U.S. Geological Survey, October 2012.
- <sup>ix</sup> City of New York. *2014 New York City Hazard Mitigation Plan*, January 2014. p. 250.
- <sup>x</sup> The Coastal Erosion Hazard Area (CEHA) Permit Program is administered by the NYS Department of Environmental Conservation (DEC) and provides written approval of regulated activities or land disturbance to properties within the coastal erosion hazard areas within DEC's jurisdiction. The Coastal Erosion Hazard Areas Law (Environmental Conservation Law Article 34) empowers DEC to identify and map coastal erosion hazard areas and to adopt regulations (6 NYCRR [Part 505](#)) to control certain activities and development in those areas.
- <sup>xi</sup> South Shore Estuary Reserve Council. *Long Island South Shore Estuary Reserve Comprehensive Management Plan*. New York: Albany, 2001.
- <sup>xii</sup> Long Island Regional Planning Board. *Hurricane Damage Mitigation Plan for the South Shore of Nassau and Suffolk Counties*. New York: Hauppauge, 1984.
- <sup>xiii</sup> Suffolk County. *DMA 2000 Hazard Mitigation Plan*. New York: Suffolk County, 2008.
- <sup>xiv</sup> U.S. Army Corps of Engineers. *Fire Island Inlet to Montauk Point (FIMP), New York, Storm Damage Reduction Project, Reformulation Study*. New York: New York, 2009.
- <sup>xv</sup> New York State Department of Transportation, Region 10, Long Island. *Ocean Parkway Shared-Use Path Wantagh State Parkway to Robert Moses Causeway Nassau and Suffolk Counties, Final Design Report*. New York: Hauppauge, 2011.
- <sup>xvi</sup> Suffolk County Department of Health, *Comprehensive Water Resources Management Plan*, January 2014.
- <sup>xvii</sup> Long Island Regional Planning Council. *Long Island 2035 Visioning Initiative Final Report*. December 2009.
- <sup>xviii</sup> Long Island Regional Economic Development Council, *The Strategic Economic Development Plan for Nassau and Suffolk Counties 2013 Update*, September 2013.
- <sup>xix</sup> New York State Energy Research and Development Authority (NYSERDA) ClimAID Team. (2011). Responding to Climate Change in New York State: The ClimAID Integrated Assessment for Effective Climate Change Adaptation Final Report. C. Rosenzweig, W. Solecki, A. DeGaetano, M. O'Grady, S. Hassol, P. Grabhorn, Eds. New York State Energy Research and Development Authority, 17 Columbia Circle, Albany, NY 12203. Retrieved from <http://www.nyserda.ny.gov/climaid>.
- <sup>xx</sup> <http://stormrecovery.ny.gov/resources-0>
- <sup>xxi</sup> Scour critical bridges are at risk of failure due to scour. Scour is "the result of the erosive action of flowing water, removing sediment from the streambed and banks of streams and from around the piers (intermediate supports) and abutments (end supports) of bridges." <https://www.fhwa.dot.gov/engineering/hydraulics/pubs/idfieldpoa.pdf>.
- <sup>xxii</sup> <http://www.governor.ny.gov/bridge-replacements#longisland>



# West Gilgo to Captree NY Rising Community Reconstruction Plan

<sup>xxiii</sup> New York State Department of State, *Guidance for Community Reconstruction Zone Plans - Appendix 3*. "Extracted from *Local Multi-Hazard Mitigation Guidance*, FEMA, July 1, 2008, pp. 42-43. Based on authority in FEMA Mitigation Planning Regulations, 44 CFR, Part 201. Critical Facilities are essential to the health and welfare of the whole population and are especially important following hazard events. For purposes of this mitigation planning guidance, critical facilities may include emergency service facilities such as hospitals and other medical facilities, jails and juvenile detention centers, police and fire stations, emergency operations centers, public works facilities, evacuation shelters, schools, and other uses that house special needs populations.

<sup>xxiv</sup> The risk assessment tool is available at <http://stormrecovery.ny.gov/nyrcr>.

<sup>xxv</sup> NY Rising Community Reconstruction Program. *NYRCR Program Guidance to Firms, Project Evaluation, December 30, 2013*. p.3.

<sup>xxvi</sup> These costs could relate to reduced emergency and recovery expenditures in the future less implementation costs for the life of the project.

<sup>xxvii</sup> Socially vulnerable population may be derived from the following criteria: poverty/low income, immigrant status, education level, institutionalization, renter-occupied household status, single senior-citizen household status.

<sup>xxviii</sup> FEMA Hazard Mitigation Grant Program. *How do I determine Project Useful Life?*. FEMA HMGP BCA Module 4.8.

<sup>xxix</sup> The computed elevation to which floodwater is anticipated to rise during the base flood. Base Flood Elevations (BFEs) are shown on Flood Insurance Rate Maps (FIRMs) and on the flood profiles. Base flood is the flood having a one percent chance of being equaled or exceeded in any given year. This is the regulatory standard also referred to as the "100-year flood."

<sup>xxx</sup> The full time equivalent position is calculated by assuming half the project cost is labor-related and applying an average of \$40,000 per job. The \$40,000 salary is based on the Bureau of Labor Statistics' May 2012 Metropolitan and Nonmetropolitan Area Occupational Employment and Wage Estimates for Nassau-Suffolk, NY Metropolitan Division for Construction and Extraction Occupations ([http://www.bls.gov/oes/current/oes\\_35004.htm#47-0000](http://www.bls.gov/oes/current/oes_35004.htm#47-0000)).

<sup>xxxi</sup> U.S. Department of Commerce, *Economic Impact of Hurricane Superstorm Sandy – Potential Economic Activity Lost and Gained in New Jersey and New York*, September 2013.

<sup>xxxii</sup> Long Island Sound Study, *Long Island South Habitat Restoration Initiative – Technical Support for Coastal Habitat Restoration – Coastal Barriers, Beaches, and Dunes*, February 2003.



**NY Rising Community Reconstruction Program**  
**[www.stormrecovery.ny.gov/nycrcr](http://www.stormrecovery.ny.gov/nycrcr)**