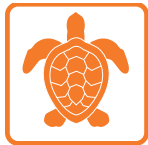


# Sea Turtles Restoration Type

## Open Ocean Restoration Area



Sea turtles in the Gulf of Mexico are widely distributed and cross state, federal, and international boundaries. They rely on a system

of interconnected beach, nearshore, and offshore habitats for their survival. Five of the world's seven sea turtle species (green, loggerhead, hawksbill, leatherback, and Kemp's ridley) live in the Gulf and are listed as threatened or endangered under the U.S. Endangered Species Act. The Gulf of Mexico provides important habitats for sea turtle reproduction, feeding, migration, and refuge.

All five sea turtle species and their habitats throughout the northern Gulf of Mexico were exposed to the *Deepwater Horizon* (DWH) oil spill. Sea turtles were exposed to, and injured by, oil in the open ocean, in continental shelf waters, and on beaches. Spill response activities also directly injured sea turtles and disrupted or deterred sea turtle nesting.

The sea turtle restoration projects proposed for implementation support the following restoration approaches identified in the

DWH Oil Spill Final Programmatic Damage Assessment and Restoration Plan and Programmatic Environmental Impact Statement:

- Enhance sea turtle hatchling productivity and restore and conserve nesting beach habitat.
- Reduce sea turtle bycatch in commercial fisheries through identification and implementation of conservation measures.

### Sea Turtles Restoration Goals

- Implement a portfolio of restoration approaches to address all injured species and life stages.
- Address primary threats to sea turtles both on land and at sea.
- Restore sea turtles in areas that are relevant to each injured species and life stage.
- Support existing conservation efforts by ensuring consistency with recovery plans.

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# Open Ocean Restoration Area

## Sea Turtles Restoration Type Proposed Projects

PROJECT NAME	PROJECT DESCRIPTION	EST. COST AND TIMEFRAME
<b>REPLENISH AND PROTECT LIVING COASTAL AND MARINE RESOURCES</b>		
Gulf of Mexico Sea Turtle Atlas	Knowledge of sea turtle distribution migratory movements, preferred habitats, and threats is needed to inform restoration planning. This project would develop a central platform to access and view existing and future sea turtle data that are currently dispersed across various entities. It would provide a public, web-based interface that is available to stakeholders, restoration planners, and restoration managers to inform restoration planning and facilitate prioritization of restoration needs and activities. This would be accomplished by supporting a collaborative community of data providers and efficient means to share data.	\$5,700,000 15 Years
Identifying Methods to Reduce Sea Turtle Bycatch in the Reef Fish Bottom Longline Fishery	Sea turtle bycatch in the Gulf of Mexico reef fish bottom longline (BLL) fishery has been documented by NOAA's Observer Program since 2005. This project would work to identify the factors contributing to sea turtle bycatch and identify opportunities for conservation measures through future restoration actions. NOAA data would be thoroughly analyzed to identify environmental factors and/or fishing practices that are associated with sea turtle bycatch. This project would inform future restoration to reduce bycatch in this fishery.	\$290,000 2 Years
Developing a Gulf-wide Comprehensive Plan for In-water Sea Turtle Data Collection	Assessing the status of sea turtle populations across broad areas and multiple life stages is difficult, and as a result, data gaps exist. This project would develop a statistically sound plan for a coordinated, Gulf-wide network for the in-water data collection and compilation of critical information on sea turtle abundance, demographics, and biology on all sizes and life stages of sea turtles.	\$655,000 2 Years
Developing Methods to Observe Sea Turtle Interactions in the Gulf of Mexico Menhaden Purse Seine Fishery	Fisheries observers help to characterize bycatch by observing where, when, and how many protected species are impacted by fishing gear so that bycatch reduction measures can be developed. The menhaden purse seine fishery currently lacks an effective observer methodology. The project would work with the Gulf of Mexico menhaden industry to develop an effective methodology for observing sea turtle interactions in the fishery and would fill knowledge gaps to inform future restoration to reduce interactions in this fishery.	\$3,000,000 4 Years
Reducing Juvenile Sea Turtle Bycatch Through Development of Reduced Bar Spacing in Turtle Excluder Devices	Turtle excluder devices (TEDs) are installed on otter trawls to reduce sea turtle mortality, but unfortunately, small juvenile turtles are still susceptible to capture due to their small size. This project would develop new TED prototype configurations, with smaller bar spacing, that would be evaluated and certified via the National Marine Fisheries Service small sea turtle TED testing protocol and tested aboard commercial fishing vessels. Collectively, these results could inform future restoration projects that may seek to implement new bycatch reduction technology.	\$2,153,000 4 Years
Long-term Nesting Beach Habitat Protection for Sea Turtles	Nesting female turtles and their hatchlings are impacted by artificial lighting, coastal armoring, and other habitat loss. This project would protect valuable, high-density sea turtle nesting habitat through acquisition of land from willing sellers near the Archie Carr National Wildlife Refuge on the Florida Atlantic coast. The project would seek to protect approximately 20 miles of essential nesting habitat in perpetuity; reduce future land-based threats from development; and enhance sea turtle hatchling productivity.	\$7,000,000 3 Years

For additional information, contact Stephen Heverly: [stephen.heverly@noaa.gov](mailto:stephen.heverly@noaa.gov)

# Gulf of Mexico Sea Turtle Atlas

## Sea Turtles Restoration Type



This project would develop a Gulf of Mexico Atlas that provides a platform to better understand sea turtle population distribution, abundance, and/or density.

Knowledge of sea turtle distribution, migratory movements, preferred habitats, and threats

### Estimated Cost and Timeframe

\$5,700,000 • 15 years

is needed to inform restoration planning. This project proposes a central platform to access and view existing and future sea turtle data that are currently dispersed across various entities. The information would be accessible to restoration planners and resource managers, and would better inform sea turtle restoration efforts. The database would be updated over time to ensure that it remained both current and easily accessible.

This project would develop needed information to maximize restoration planning efforts for sea turtles injured by the *Deepwater Horizon* oil spill and supports all the Trustees' restoration goals for sea turtles.



## Project Objectives

- Provide a centralized location for relevant biogeographical information for all species of sea turtles occurring in the Gulf of Mexico.
- Support efforts to enhance mortality investigations and emergency response.
- Collaborative development of the atlas with existing data providers and managers to ensure restoration needs are addressed.



## Components

This project would require coordination among numerous entities. A steering committee would be formed to identify, locate, and prioritize data needs. The committee would also be responsible for developing strategies for engaging existing data holders and addressing the technical requirements of the database. Incentives may be offered to facilitate participation and develop data sharing agreements.

Following data acquisition and development of the interface, data would be processed, standardized, and incorporated in an efficient

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***Knowledge of sea turtle distribution, migratory movements, preferred habitats, and threats is needed to inform restoration planning.***

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and user-friendly format. The atlas would be a place where data summaries or products could be contributed by several sources. The atlas would be publicly launched with ongoing refinement, monitoring, and management. Maintenance would include troubleshooting technical issues, ongoing incorporation of new datasets, updating of existing datasets, and supporting external uses of datasets.

The project geographic area of focus includes the entire Gulf of Mexico and would engage partners from the Gulf states. The first two years of the project would focus on development of the atlas framework. Years two through three would involve data processing and standardizing. Years four through 15 would be spent tracking usage, updating data, and maintaining the atlas.

## We Want Your Comments

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# Identifying Methods to Reduce Sea Turtle Bycatch in the Reef Fish Bottom Longline Fishery

## Sea Turtles Restoration Type



This project would work to identify factors contributing to sea turtle incidental captures in the reef fish bottom longline (BLL) fishery and identify opportunities to restore loggerhead sea turtles by reducing the number of captures and mortality in the fishery.

Sea turtle bycatch in reef fish BLL gear can lead to serious injury or death through entanglement in or ingestion of gear. This project would thoroughly evaluate existing National Oceanic and Atmospheric Administration observer program data to identify factors that influence the bycatch of loggerhead sea turtles in the eastern Gulf of Mexico reef fish BLL fishery.

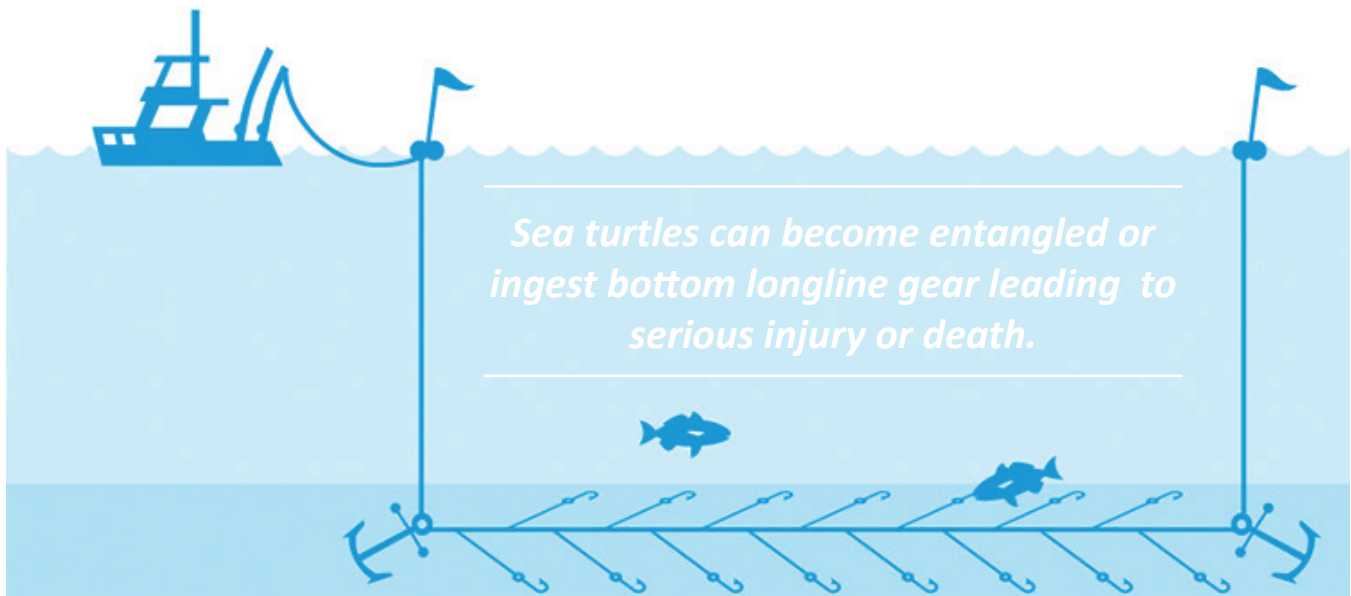
### Estimated Cost and Timeframe

\$290,000 • 2 years

This project would serve as Phase 1 of a multi-phased approach to identify potential gear modifications or other voluntary changes to fishing practices to reduce sea turtle bycatch in the fishery.

This project supports the goal to restore sea turtles injured by the *Deepwater Horizon* oil spill by addressing threats to sea turtles in the marine environment such as bycatch in commercial fisheries.





## Project Objectives

- Analyze existing Gulf of Mexico reef fish BLL fishery data to evaluate environmental conditions and fishing practices associated with sea turtle bycatch.
- Fill critical data gaps to design and implement future voluntary bycatch reduction restoration alternatives.
- Develop a framework to inform future restoration projects.

## Components

The project would begin with an analysis of existing data from the Gulf of Mexico reef fish BLL fishery to evaluate the factors which influence the bycatch of loggerhead sea turtles. These factors would include, but are not limited to, area, latitude, season, depth, number of hooks, hook type and size, bait used, soak time, and sea surface temperature.

Project findings would be used to inform and develop future restoration projects. Future projects may entail efforts such as enhanced data collection, stakeholder outreach, gear or fishing practice modification and testing, pilot project efforts, and implementation of voluntary programs. Data analyses would occur in year one, followed by the identification of potential future restoration options in year two.

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## Developing a Gulf-wide Comprehensive Plan for In-water Sea Turtle Data Collection

### Sea Turtles Restoration Type



This project would develop a comprehensive plan to coordinate the collection of data on sea turtles in the Gulf of Mexico.

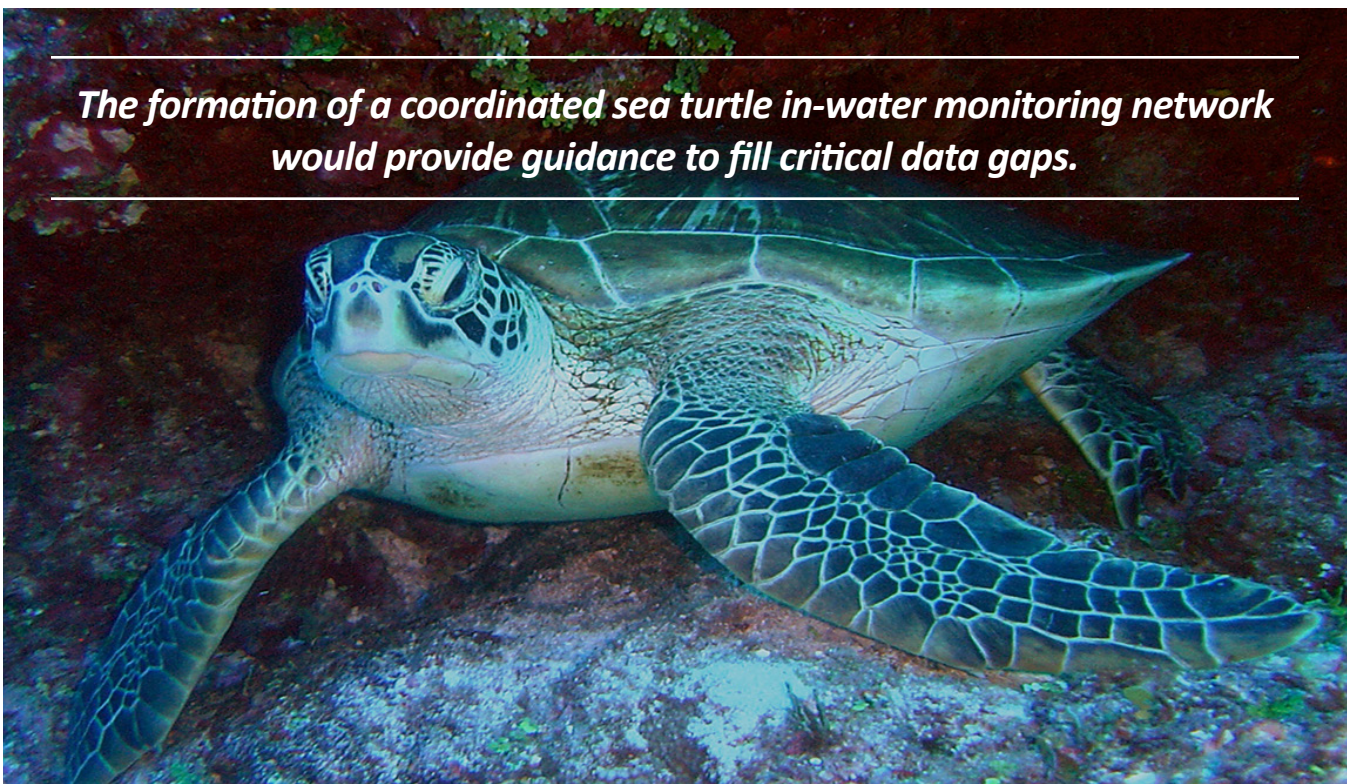
Sea turtles have long lifespans and complex life histories. They are highly migratory and take a long time to mature. Assessing the status of sea turtle populations across broad areas and multiple life stages is difficult. Aerial surveys are used to count turtles at the ocean surface, but they cannot detect small turtles and they do not provide information

#### Estimated Cost and Timeframe

\$655,000 • 2 years

such as size, sex, or genetic identity. As a result, data gaps exist regarding sea turtle distribution, abundance, and survival rates. Recovery from injuries due to the *Deepwater Horizon* oil spill could take decades, and data sets are needed to aid in restoration project design and to assess project success and the long-term effectiveness of restoration efforts.

*The formation of a coordinated sea turtle in-water monitoring network would provide guidance to fill critical data gaps.*



## Project Objectives

- Identify the information gaps critical to assist in the development, implementation, and monitoring of restoration projects for sea turtles in the Gulf of Mexico.
- Identify a scientifically and statistically appropriate in-water data collection strategy to provide abundance and demographic data.
- Finalize a strategic plan providing guidance for initiation of sea turtle abundance and demographic data collection and compilation.

The focus of this project is to develop a strategic plan for coordinated in-water data collection efforts across the Gulf of Mexico and to establish standardized monitoring protocols. This would provide important context for project and resource-level monitoring, and would allow comparisons across multiple sea turtle restoration projects. This project would also be used to guide the formation of a coordinated sea turtle in-water monitoring network to fill critical data gaps.

This project supports all the Trustees' restoration goals for sea turtles. In particular, the project supports the Trustees' goal to implement an integrated portfolio of restoration approaches to address all injured life stages (hatchling, juvenile, and adult) and species of sea turtles.

## Components

The project is anticipated to take two years and would involve the formation of a steering

committee, selection of a working group, facilitation of stakeholder meetings, and completion of a comprehensive in-water survey plan. Standardized methods and data collection would be central to the project. The data collection planning effort would develop an appropriate survey design to improve the understanding of population trends and important population parameters. The project would also identify critical information gaps which would help inform restoration planning.

Opportunities for forming a network of partners for data collection would also be identified, and stakeholder outreach to state, academic, federal, and non-government organization partners would occur. A final strategic plan would provide guidance for Gulf of Mexico sea turtle abundance and demographic data collection and compilation to enhance restoration planning and monitoring. The final plan would also describe potential partners, field data collection methods, database structure, and data management.

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## Developing Methods to Observe Sea Turtle Interactions in the Gulf of Mexico Menhaden Purse Seine Fishery

### Sea Turtles Restoration Type



The project would work with the menhaden fishery to improve observer approaches to monitor sea turtle interactions.

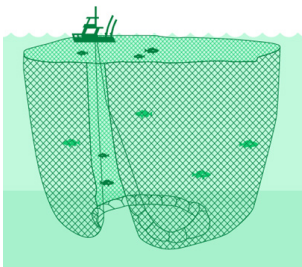
#### Estimated Cost and Timeframe

\$3,000,000 • 4 years

Menhaden fishing involves the use of a specialized net, called a purse seine, to capture schools of menhaden fish. During the fishing process, everything within the net is brought on board the carrier vessel. Due to this type of fishing and the overlap of the fishing season with the presence of sea

turtles, there is the potential for bycatch of sea turtles.

Currently, no effective observer program is present in the fishery, and the extent of sea turtle bycatch is not well documented or understood.



*Menhaden purse seine fishing involves the use of seine (or nets) to capture schools of menhaden fish.*



## Project Objectives

- Work with the menhaden fishery to improve observer approaches for monitoring sea turtle interactions during fishing operations.
- Evaluate and test observer methodologies; implement a two-year pilot monitoring program within the Gulf of Mexico menhaden purse seine fishery for sea turtle interactions.
- Recommend next steps to support efforts to reduce interactions in this fishery based on data collected.

The focus of this project would be to develop an effective observer methodology for the Gulf of Mexico menhaden purse seine fishery. Through this observer methodology the project would eventually provide a better understanding of sea turtle bycatch in the fishery. This in turn would support efforts to reduce sea turtle bycatch in the commercial menhaden fishery and potentially inform future restoration projects.

The project supports the Trustees' goal to restore sea turtles injured by the *Deepwater Horizon* oil spill by addressing primary threats to sea turtles in the marine and terrestrial environment, such as bycatch in commercial and recreational fisheries.

## Components

The project would be coordinated with fishery industry representatives, appropriate state and federal science and fisheries management agencies, and with individuals who have knowledge and experience related to protected species observer programs.

Proof-of-concept tests may include exploring various configurations of alternative monitoring technologies during regular fishing operations to determine feasibility in real-time industry operations. The resulting data would be analyzed to determine which technologies, and what configuration of those technologies, appear to be viable methods for observing the fishery. The selected approach(s) would then be tested further in a subsequent two-year pilot observer program. The findings would be shared with the industry to review the results, problems, and possible changes, to then develop an effective observer program.

It is expected that the project will be concentrated in areas of the Gulf of Mexico where the menhaden purse seine fishery operates, such as Louisiana, Mississippi, and Texas bays, sounds, and nearshore coastal waters. Year one would involve planning, coordination, and concept development. Years two and three would include proof-of-concept testing and a pilot observer program. Year four would focus on review of the final methodologies.

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## Reducing Juvenile Sea Turtle Bycatch through Development of Reduced Bar Spacing in Turtle Excluder Devices

### Sea Turtles Restoration Type



This proposed project would develop new turtle excluder device (TED) prototypes to reduce the incidental capture of small juvenile sea turtles in the shrimp trawl fishery and inform future restoration projects to restore sea turtles.

#### Estimated Cost and Timeframe

\$2,153,000 • 4 years

A turtle excluder device is a specialized metal grid that is installed in the trawl net and allows sea turtles to escape through an opening.



## Project Objectives

- Develop and evaluate reduced bar spacing TEDs designed to exclude small sea turtles in the shrimp otter trawl fishery.
- Test and certify small bar spacing TED prototypes through the NMFS small turtle testing protocol.
- Conduct independent and dependent bycatch reduction and target-catch retention testing.
- Determine bycatch reduction rates and corresponding restoration potential for sea turtles for each TED prototype produced.

Although otter trawls (a type of net) used for shrimping are currently required to use TEDs, small juvenile turtles are still vulnerable to capture because their small size allows them to slip through the TED bar spaces into the net or inhibits them from pushing through the TED opening to escape. By adjusting the dimensions and/or configuration of TEDs, there may be improved escapement of small turtles and a decrease in sea turtle mortality.

The project supports the Trustees' goal to restore sea turtles injured by the *Deepwater Horizon* oil spill by addressing primary threats to sea turtles in the marine environment such as bycatch in commercial fisheries.

## Components

Initial project activities include the collection and captive rearing of loggerhead hatchlings for approximately one year to a size appropriate for TED prototype testing.

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***Adjusting the dimensions or configuration of turtle excluder devices may improve their effectiveness for small sea turtles.***

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Loggerhead sea turtle hatchlings will be raised in captivity in a permitted facility to an appropriate size in order to test small bar spacing TED designs for turtle escapement.

TED prototype testing would take place near the National Marine Fisheries Service's (NMFS) Panama City, Florida Laboratory. Turtles would be released upon completion of TED prototype testing.

The collection of loggerhead hatchlings and captive-rearing to target size would take place during years one through three. Iterative development of TED prototypes would occur in years one through three. Testing of selected TED prototypes for sea turtle exclusion and target catch retention rates would occur in years three and four of the project.

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# Long-term Nesting Beach Habitat Protection for Sea Turtles

## Sea Turtles Restoration Type



This project would protect high-density sea turtle nesting beach habitat to enhance nesting success and hatchling survival.

Beaches used for nesting by sea turtles are threatened by development and human activity. This project would focus on conservation of high-density sea turtle nesting habitat through acquisition of parcels

### Estimated Cost and Timeframe

\$7,000,000 • 3 years

at the Archie Carr National Wildlife Refuge located along Florida's central east coast at Melbourne Beach. This area hosts the highest density nesting beach habitat in the world for loggerhead sea turtles.



## Project Objectives

- Protect high-density nesting habitat for injured sea turtle species through the acquisition of sea turtle beach habitat.
- Reduce disturbances from human-caused threats, including artificial beachfront lighting and coastal armoring.
- Enhance sea turtle nesting success and hatchling survival.

The Refuge is also considered the most significant nesting area for green sea turtles in North America, and is increasingly important for nesting leatherback sea turtles. Many of these sea turtles inhabit the Gulf of Mexico during various stages of their lives.

The project is consistent with all of the Trustees' restoration goals for Sea Turtles. This project would restore sea turtles injured by the *Deepwater Horizon* oil spill by addressing primary threats to sea turtles such as the loss or degradation of nesting beach habitat.

## Components

Priority parcels of land would be protected through acquisition or by conservation easement from willing sellers. Parcels have been prioritized through the coordinated efforts of the Department of the Interior, the State of Florida, and the National Oceanic and Atmospheric Administration. Project activities would focus on property acquisition including property appraisals, due diligence tasks, and negotiations with willing sellers. It is anticipated that land acquisition would occur as properties become available throughout the three-year project timeline.

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*This project would focus on conservation of high-density sea turtle nesting habitat through acquisition of land parcels at the Archie Carr National Wildlife Refuge, Florida.*

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