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2025 Indian River Lagoon Economic Valuation

October 2025

IRLNEP
Technical
Report 2025-
02b

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Disclaimer

The opinions, findings, and conclusions expressed in this publication are those of the authors and not necessarily those of the Indian River Lagoon National Estuary Program.

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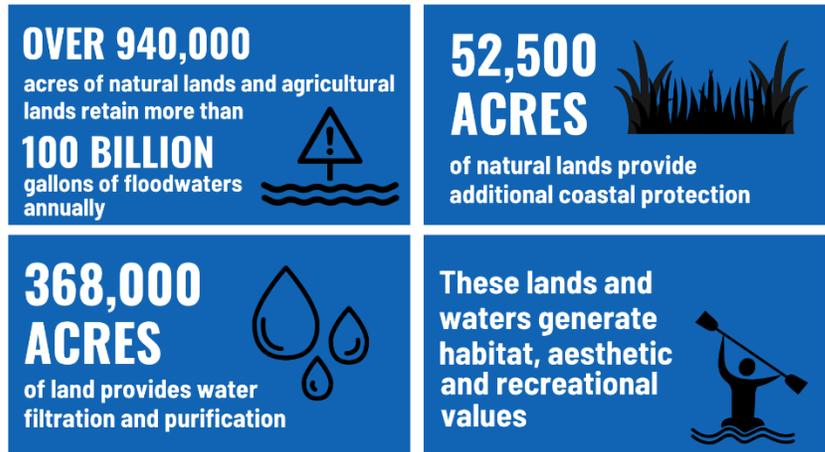
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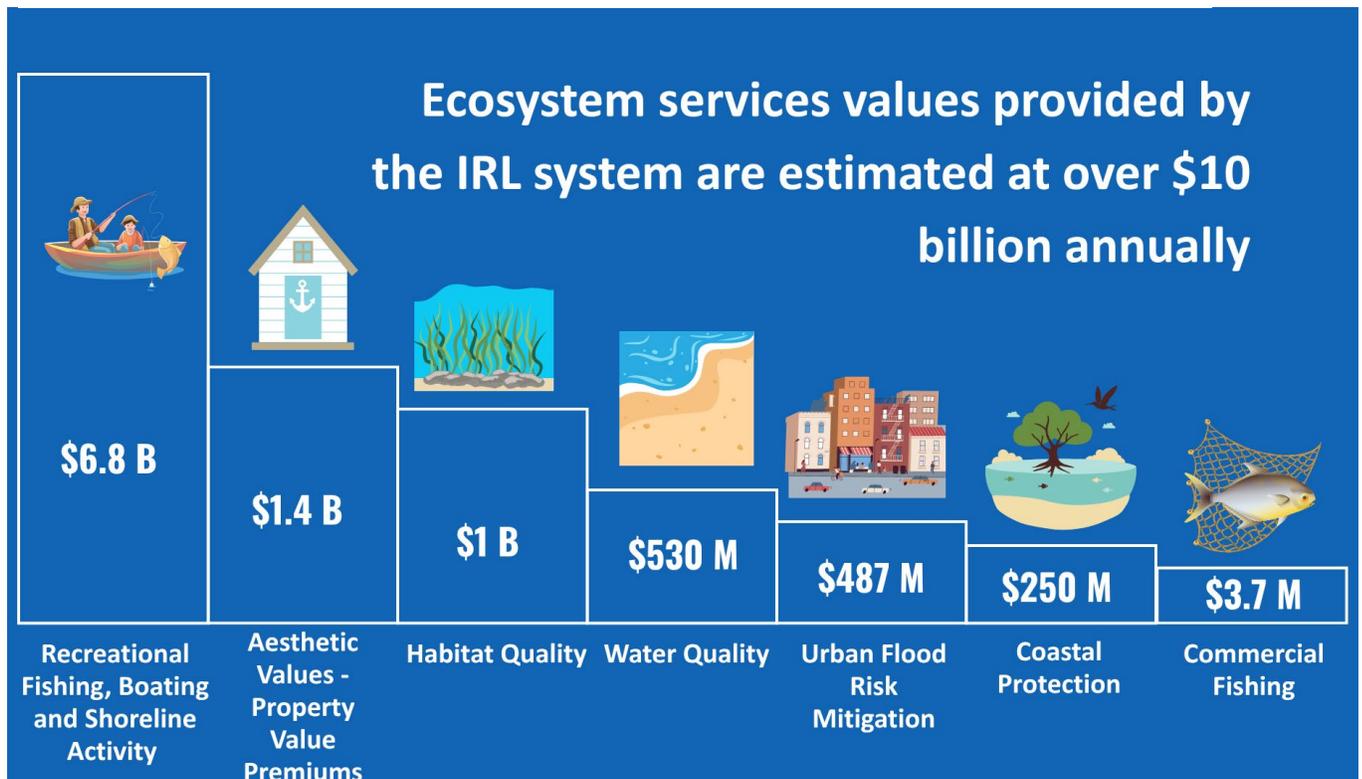
EXECUTIVE SUMMARY

The Indian River Lagoon National Estuary Program (IRLNEP) recognizes the economic importance of an ecologically healthy Indian River Lagoon (IRL). A healthy lagoon is a driver of both economic vitality of nearby communities, and quality of life for residents and visitors alike. The IRLNEP retained The Balmoral Group (TBG) to conduct an economic valuation of the habitat restoration efforts throughout the watershed, the ecosystem services provided by the IRL System, and the economic impacts generated by the Lagoon.



Natural resources in the IRLNEP region produce diverse and valuable ecosystem services

Figure 1. Summary of Ecosystem Services Values



This report comprises Phase II of the economic valuation, which includes two economic analyses:

1. **Economic return on investment value of habitat restoration projects** including projects funded with a \$9.4 million NOAA Transformational Habitat Restoration grant, and
2. **Revision and update of the IRL Economic Valuation** (ECFRPC and TCRPC, 2016).

To assess the NOAA grant investment, a Benefit-Cost Analysis was conducted for nine habitat types, using selected sites as case studies. Concurrently, TBG estimated the ecosystem services values generated by the Lagoon, and their associated economic impacts.

Ecosystem services, in turn, sustain significant economy activity. Recreational fishing, boating and shoreline activities, tourism, commercial fishing, boat-building, natural resource management and Lagoon-driven aerospace sectors generate \$28 billion in annual spending.



Combined, these sectors add \$14 billion in Value Added Gross Domestic Product (GDP) to the local, regional and state economy, supporting more than 128,000 jobs annually. Importantly, the average wage is higher than other regions of Florida, meaning that each additional job contributes greater GDP than a typical Florida job. **Table 1** shows all impacts from IRL and **Table 2** shows impacts by type.

Table 1. Economic Impact from IRL

Total	Employment	Labor Income	Value Added		Output
			(in Millions \$)		
Direct	71,689	\$5,163	\$8,473		\$17,110
Indirect	33,462	\$2,022	\$3,016		\$5,817
Induced	23,249	\$1,157	\$2,474		\$3,983
Property Value Impacts, Annualized*					\$1,377
Total	128,400	\$8,342	\$13,963		\$28,288

*The total contribution to 2025 property values was \$23 billion, annualized at a 6% discount rate to \$1.3 billion.
Source: TBG Work Product

Table 2. Economic Impact from IRL by Type

Impact Type	Employment	Labor Income	Value Added		Output
			(in Millions \$)		
Recreation	75,206	\$3,171	\$5,579	\$10,545	
Natural Resource Management	1,041	\$77	\$112	\$222	
Commercial Fishing	30	\$0	\$3	\$3	
Boat Dealers	1,445	\$111	\$166	\$431	
Aerospace	50,679	\$4,983	\$8,103	\$15,710	
Property Value Impacts, Annualized*					\$1,377
Total Annual Impacts	128,400	\$8,342	\$13,963	\$28,288	

*The total contribution to 2025 property values was \$23 billion, annualized at a 6% discount rate to \$1.4 billion.

Source: TBG work product, from IMPLAN, data from FDOR, FDEP, FWC and others.

Existing ecosystem services are diminished, due to decades of urban and agricultural runoff, and infrastructure that has altered natural hydrologic processes. Current restoration projects are intended to improve ecosystem condition and function. Beyond the improved natural resource, the restoration work itself produces economic benefits. Case studies were evaluated to estimate the return on investment from the NOAA-funded work. **The analysis finds that these projects are expected to produce a 24x return on investment.** Benefit-Cost Ratios across the case studies range from 1.2 to 65.1 for the massive impoundment restoration in Merritt Island National Wildlife Refuge, which has generated far greater restoration areas than originally anticipated, and will produce more than 2,000 acres of restored Lagoon in sensitive waters, improving fish passage, water circulation and habitat.



This is a hopeful message for the Lagoon. IRLNEP and local partners are whittling away, slowly and steadily, against a backlog of almost \$4 billion in restoration projects¹. The NOAA funded projects alone are expected to generate almost half a billion dollars in real economic benefits over the next ten years. Continued funding is needed to finish the job – and continue the economic benefits that the IRL provides to Floridians and visitors every year.

¹ IRLNEP Strategy for Financing the CCMP (2021) https://onelagoon.org/wp-content/uploads/Finance-Plan_FINAL_FullDocument_03-29-22-1.pdf.

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LIST OF ACRONYMS

- | | |
|--|--|
| BCR – Benefit Cost Ratio | FNAI - Florida Natural Areas Inventory, which maintains FEGN data through FSU |
| BLS – U.S. Bureau of Labor Statistics, which is housed in the U.S. Department of Commerce | FSU – Florida State University |
| CCMP - Comprehensive Conservation Management Plan | FWC – Florida Fish and Wildlife Conservation Commission |
| CLC – Cooperative Land Cover, Florida Wildlife Commission’s detailed habitat mapping product | GDP – Gross Domestic Product, or a measure of total economic production |
| FDOR – Florida Department of Revenue | InVEST – Integrated Valuation of Ecosystem Services and Tradeoffs, an ecosystem services modeling platform |
| FDOT – Florida Department of Transportation | IRL – Indian River Lagoon |
| FEGN – Florida Ecological Greenways Network, a statewide database of conservation lands that are connected to maintain large-scale ecological functions. | IRLNEP – Indian River Lagoon National Estuary Program |
| FEMA – Federal Emergency Management Agency | MGD – Million Gallons Per Day |
| FLUCCS – Florida Land Use and Cover Classification System | NOAA – National Oceanic and Atmospheric Administration |
| | QCEW - Quarterly Census of Employment and Wages, produced by BLS |

INTRODUCTION

The Indian River Lagoon National Estuary Program (IRLNEP) recognizes the importance of understanding the socioeconomic values relating to ecosystem services provided by the lagoon.

The IRLNEP successfully obtained funding by NOAA with a \$9.4 million NOAA Transformational Habitat Restoration grant where organizations will spearhead the ecosystem-based restoration of seagrasses, oyster reefs, living shorelines, wetlands, clam populations, and fish reefs throughout the IRL. The funding supports 15 habitat restoration projects across the watershed. In addition to the restoration efforts, and to support the NOAA grant, the IRLNEP retained TBG to conduct an economic valuation of the habitat restoration efforts throughout the watershed, and an economic valuation of the ecosystem services provided by the IRL System.

This report comprises Phase II of the economic valuation, which includes two economic analyses:

1. Economic return on investment value of habitat restoration proposed in the NOAA project, and
2. Revision and update of the IRL Economic Valuation (ECFRPC and TCRPC, 2016). This is a significant expansion of scope and project value.

The economic analysis will continue for the life of the NOAA project. Within this report, three elements of Phase II are included:

1. Benefit-Cost Analysis of Selected Case Studies
2. Economic Valuation Update
3. Data Collection for Project Monitoring

The IRLNEP, Brevard County, Florida Department of Environmental Protection, other state and local governments and non-profits, have and continue to contribute significant investments to reverse decades of impairment to the Lagoon. The report herein provides a glimpse of the benefits from these investments.

BENEFIT-COST ANALYSIS OF SELECTED CASE STUDIES

Benefit-Cost Analysis was conducted for selected NOAA projects. In each case, relevant data was collected through interviews with the Principal Investigators, review of grant materials, and discussion with local sources for representative installation cost and other information. The analysis includes estimates of costs associated with the projects, which may include materials purchases (plants for living shorelines, reef material for reef restoration, or wetland plantings); installation costs (labor, equipment, permitting and other expenses); operating and maintenance (O&M) costs for annual expenses to maintain, repair, replacement, regulatory compliance and reporting etc. over a 10-year operating period. Ten years was determined as the appropriate analysis period based on published research regarding time periods to achieve full productivity from the various ecological restorations, including artificial reefs, mangroves, and seagrass². Where available, historical costs were obtained from Principal Investigators (P.I.'s), state agencies, design architects and or ecologists, based on actual project costs, or experience from similar projects.

Benefits vary by project, but may include avoided costs for clean-up of pollutant loads, recreational benefits valued by user payments, public values for wildlife habitat, public values for improved water quality (over and above the direct cost of clean-up), avoided costs for reduced flood damage, and similar values, over a 10-year period.

In every case, the costs and benefits are compared to the status quo base case – in the absence of this project, what would the costs and benefits be? This

CASE STUDIES F

Through coordina
IRL team, no
Studies were
accordance with
selected from the

² See for example Becker, et al. (2022).

is industry best practice to isolate incremental improvements and ensure reporting only of marginal benefits. The IRL Base Case is one of deteriorating conditions. As the CCMP notes:

The IRL experienced a dramatic shift from a system where benthic aquatic vegetation was expanding to one dominated by planktonic microalgae following an unprecedented algal bloom in 2011 (referred to as the “2011 superbloom”). The post-2011 IRL is characterized by intense, recurring, and long-lasting algal blooms; widespread loss of seagrasses; and episodic wildlife mortality events. Ongoing blooms of picocyanobacteria, nanoplanktonic chlorophytes, and the brown tide species ..., Aureoumbra lagunensis, now appear to be the “new normal” for the central and northern IRL. This shift emphasizes the need for improved scientific understanding of IRL nutrient loads, cycling, and tipping points. ...Concurrent with these stress-response issues, the southern IRL is impacted seasonally by freshwater releases from Lake Okeechobee during times of high water. During the summers of 2013, 2016, and 2018, billions of gallons of freshwater were released through the St. Lucie Estuary to the southern IRL. As a result, the St. Lucie Estuary and southern IRL experienced dramatic salinity shifts including sustained freshwater conditions. The combination of freshwater, high nutrients, sediments, and an inoculant of the cyanobacteria Microcystis from Lake Okeechobee, in addition to nutrients from the IRL watershed, fueled harmful algal blooms (HABs) in portions of the southern IRL. In 2013, 2016, and again in 2018, these releases initiated an intense Microcystis HAB, with reported concentrations of the toxin microcystin exceeding World Health Organization standards³.

In this context, the Base Case assumes continued deterioration of the area in question for each project. This is a challenging Base Case to define: fish that find a newly restored fish passage do not stay in the 500 acres of fish passage restoration area, nor do they suddenly re-populate the entire 150-square mile Lagoon. For purposes of the analysis, the restoration area at maturity, which will vary by habitat type, is used as the area of continued deterioration and also as the area of benefit, representing a lower bound of improvement. Nonetheless, defining the area of continued degradation at least documents the continued costs to clean up areas that will undoubtedly require repeated attention, in the absence of restoration.

The specifics of each project are described in this section.

Nine NOAA projects were selected as case studies for Benefit-Cost Analysis. **Table 3** shows the case study sites by habitat type as well as the additional ecosystem impacts that are anticipated from the restoration efforts.

³ IRLNEP CCMP: A 10-Year Comprehensive Conservation and Management Plan for the Indian River Lagoon, Florida

Table 3. Case Study Sites Selected by Habitat Type

Habitat Type	Case Study Site	Additional Ecosystem Impacts
Salt Marsh	Caron Bay	Living Shoreline, Clams
Fish Reef	RC Center	Oyster Reefs, Living Shoreline, Mangroves, Salt Marsh, Clams
Clams	River Breeze Park	Seagrasses, Oyster Reefs, Living Shoreline, Mangroves, Salt Marsh
Oyster Reef	North CANA	Seagrasses
Living Shoreline	Eldora House	Seagrasses, Mangroves, Salt Marsh
Wetland	MINWR/KSC	Fish Passage
Seagrass	Big Slough	Mangrove
Fish Passage	Bee Gum Point Marsh	Seagrasses, Wetland Reconnection, Living Shoreline, Mangroves, Fish Reef
Mangroves	Walton Scrub Preserve	Seagrasses, Oyster Reefs, Living Shoreline, Salt Marsh

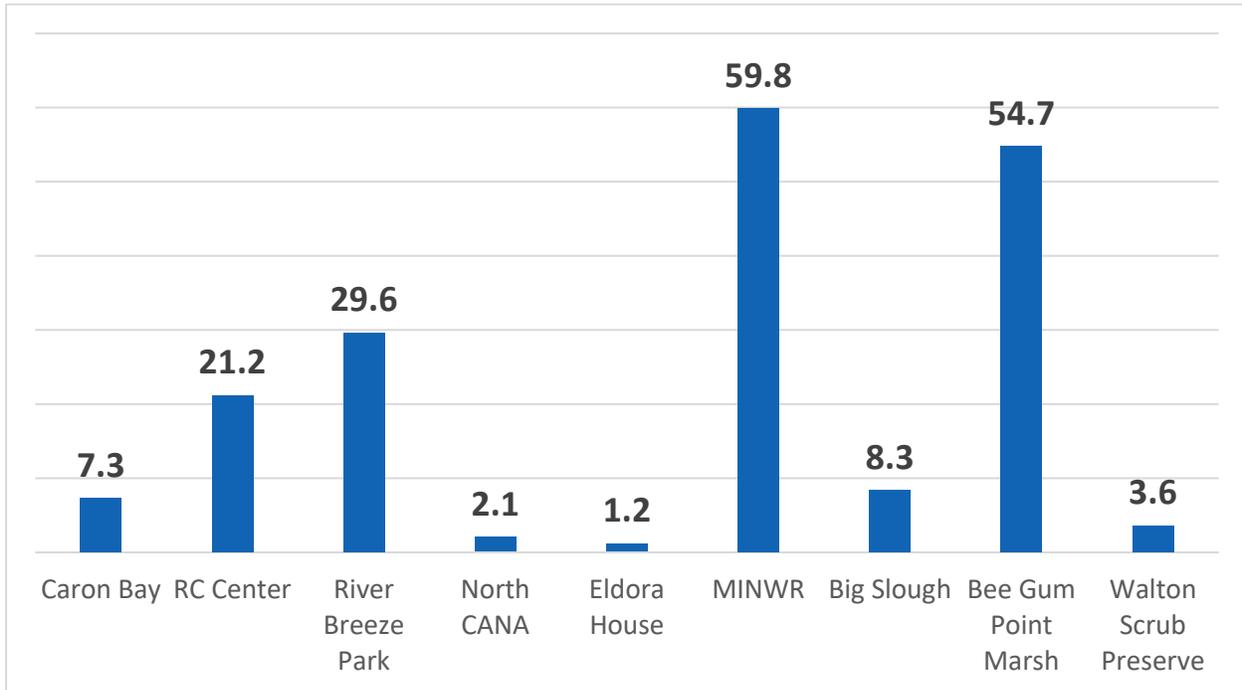
Source: TBG work product, based on discussion with IRLNEP.

In all cases, real values (net of inflation) were used and future values discounted using estimated market rates of return (7%), with sensitivity analysis at 3% and 10% discount rates⁴. The alternative discount rates permit comparison of intergenerational effects of investment, with a lower discount rate bestowing some advantage to projects with longer-term benefits, which may reflect preferences for future generations. Higher discount rates generate returns geared toward current generations and beneficiaries.

Restoration projects often have benefits that extend beyond the 10-year period evaluated here, and results shown should be considered a lower bound of benefit estimates. **Overall, benefits outweighed costs nearly 24:1, with individual benefit-cost ratios by project ranging from just over 1 to nearly 60**, as shown in **Figure 2**.

⁴ In accordance with federal guidelines at [Benefit-Cost Analysis | FEMA.gov](https://www.fema.gov/benefit-cost-analysis)

Figure 2. Benefit-Cost Ratios by Project

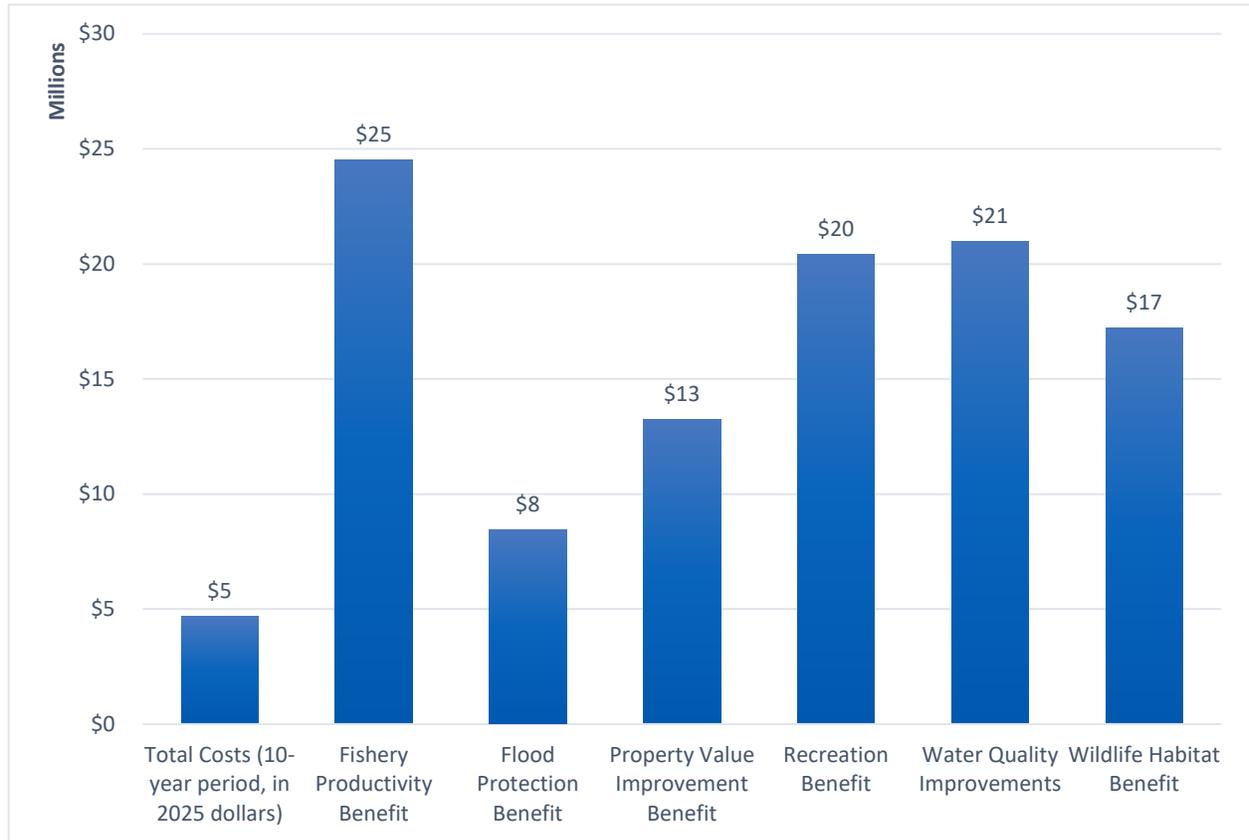


Source: TBG work product.

The nine projects selected for Benefit-Cost Analysis are generally representative of dozens more that are needed, in some cases underway and, in other cases, awaiting funding. These will likely bring similar returns, upon completion. **The projects reviewed are estimated to cost \$4.6 million in total and generate over \$106 million in total ecosystem service benefits, with per-project natural resource benefits ranging from \$5 million to over \$20 million**, as shown in **Figure 3**.

Brief descriptions of each selected project follow. Note that all costs and benefits shown are relative to base case, or status quo. Thus, if the existing condition costs \$100,000 annually, and the new project costs are \$150,000 annually (hypothetically), the marginal costs of \$50,000 annually are shown as total costs.

Figure 3. Total Costs and Benefits Across Selected Projects



Source: TBG Work Product

Caron Bay – Salt Marsh

Caron Bay was selected as the case study for Salt Marsh habitat. This project will be undertaken by Riverside Conservancy in coordination with Bethune-Cookman University and the University of Florida Whitney Lab. The effort includes planting 1,400 linear feet of salt marsh grass for a living shoreline in the project area. In addition to the 1,000 salt marsh grass plantings, this project will plant 2 million clams per acre in the 3.75-acre bay for a total of 7.5 million clams. The project is expected to result in significant water quality enhancements, as each clam can filter up to 40 gallons of water per day once it reaches adulthood⁵.



Source: IRLNEP

In the Caron Bay example, the status quo is one of continued degradation. For the base case, continued decline of clam productivity is assumed for the area of restoration (3.75 acres). Based on Florida Fish and Wildlife Commission (FWC) records showing long-term clam production in the IRL, clam productivity declined an average of 14% annually by pounds landed over the last 15 years. This has ripple effects in support of general health of surrounding fisheries, as juvenile clams are also food for larger fish, as well as the filter feeder benefits which bivalves provide. In the base case, we assume continued declines in productivity of shellfish and fisheries habitat from the 17,900 acres of salt marsh reported by FWC. This results in an annual loss of about \$31,000, or \$224,000 over ten years.

⁵ NOAA Fisheries. <https://www.fisheries.noaa.gov/feature-story/how-much-clam-worth-coastal-community#:~:text=An%20adult%20oyster%20can%20filter,they%20filter%20feed%20on%20algae>.

Zhang (2020) found in a global study of more than 100 sites that successful seagrass restoration with clams resulted in average 500% area expansion from the planted area after one year. Accordingly, the area of restoration is estimated at 500% of the initial clam restoration area for estimation of benefits. **NOAA research has found that adult clams filter about 40 gallons of water each day; with 7.5 million clams, this equates to about 2.1 billion gallons of water cleaned every week.** To generate this much water treatment through built infrastructure would require a water treatment plant capable of producing 300 million gallons per day (MGD), which **in current market conditions would likely cost nearly \$1.5 billion.** Based on expected capacity from plantings at maturity, 124 acres of water filtration benefit is estimated.

Personnel costs include Principal Investigator, Field staff and supervision costs. Travel costs include 20 days of planting and monitoring effort for four people. Equipment includes boat rental, fuel and underwater remote sensing cameras. Contractual costs include planting assistance, required signage, and purchase of material.

In addition to the water quality and fisheries productivity benefits, the avoided costs of continued degradation are estimated as benefits. Economic values estimated for this project are shown in **Table 4.**

Table 4. Summary Benefit-Cost Analysis, Caron Bay – Salt Marsh

Costs, relative to base case/status quo:	
Personnel	\$236,175
Equipment and Supplies	\$9,060
Contractual	\$118,083
Other	\$20,500
Total Costs (10-year period, in 2025 dollars)	\$383,817
Benefits, relative to base case/status quo:	
Fishery Productivity	\$1,954,258
Water Quality Improvements	\$615,514
Avoided Costs	\$223,760
Total Benefits (10-year period, in 2025 dollars)	\$ 2,793,532
Benefit-cost ratio	7.3

Source: TBG Work Product. **Note:** Benefit-cost ratios show the amount of benefits received for each dollar spent; in this case, we estimate \$7.30 in benefits for each dollar in costs.

Additional benefits are expected to occur for priority communities, which the Riverside Conservancy describes as opportunities for students at Bethune-Cookman University, a Historically Black College or University (HBCU), located in Daytona Beach, FL. The student engagement will enhance awareness of coastal issues.

RC Center – Fish Reef

Spartan fish reefs are man-made patch reefs that are typically installed under existing docks or as a component of living shoreline restoration, and are included as demonstration projects to showcase the importance of hard reef structures as habitat to support biodiversity and fishes. The site selected for the case study for the Spartan fish reef demonstration habitat type is Riverside Conservancy Center. This project will be undertaken by Riverside Conservancy in coordination with the Spartan Reef team. This site is described as building a Spartan reef encompassing 576 square feet of surface area and 150 square feet of foot print area (**Figure 5**). **In addition to the fish reef, the project will include seagrass planting, installation of 900 linear feet of living shoreline, oyster and mangrove restoration, and distribution of 500,000 clams for water filtration benefits.**

Artificial reefs are built to protect and improve habitat and increase populations of marine life. Thus, for the full quantification of benefits, monitoring of species changes will be important to track. The Riverside Conservancy already routinely monitors for water quality impacts, and will track changes in water quality before the project is constructed and after as part of the organization's routine monitoring efforts. While these reef systems provide biological benefits, they also deliver benefits to human users.



Man-made reef structures are utilized by recreational anglers and other user groups and the existence and use of these provide significant benefits to communities near the reefs. See **Figure 6** for one example structure.

The RC Center status quo is one of continued degradation, for the project area only, of 14% annually in fisheries productivity, based on FWC published fisheries data for the Lagoon. In the base case, this continued decline is assumed for the area of restoration, and costs estimated using FEMA values or \$14,436 per year. Based on literature values, the area generating benefits is estimated at maturity at about eight (8) acres⁶. Benefits values are included for fisheries productivity, based on FEMA values of \$2,245 per acre per year; FEMA public values for habitat at \$2,852 per acre or \$22,815 per year; FEMA recreation values of \$2,385 or \$20,346 per year;

⁶ Zhang (2020)

and water filtration at \$5,657 per acre or \$48,252 per year⁷. Economic values estimated for this project are shown in **Table 5**.

Table 5. Summary Benefit-Cost Analysis, RC Center – Fish Reef

Personnel	\$15,075
Equipment and Supplies	\$578
Contractual	\$7,537
Other	\$1,308
Total Costs (10-year period, in 2025 dollars)	\$24,499
Fishery Productivity	\$126,081
Flood Protection	\$58,126
Recreation	\$16,745
Water Quality Improvements	\$142,826
Habitat WTP	\$160,166
Avoided Costs	\$14,436
Total Benefits (10-year period, in 2025 dollars)	\$518,379
Benefit-cost ratio	21.2

Source: TBG Work Product

Additional benefits are expected to occur in priority communities, which the Riverside Conservancy describes as opportunities for students at Bethune-Cookman University, an HBCU located in Daytona Beach, FL. The student engagement will enhance awareness of coastal issues and opportunities for employment and research in coastal resource management.



⁷ FEMA (2022)

River Breeze Park - Clams

Restoring clam habitat is vital to the health of shoreline environments. Preliminary research suggests that planting clams with seagrasses will improve seagrass out-planting success⁸. Clams offer better foraging habitats for fish and other animals located in the areas of these projects, helping to restore feeding grounds and the health of other species (**Figure 7**). River Breeze Park was selected as the case study for clam habitat restoration.

Using the Zhang (2020) assumption described in the previous section, the area of restoration is estimated at 500% of the initial clam restoration area for estimation of benefits. **NOAA research has found that adult clams filter about 40 gallons of water each day; with 1.0 million clams, this equates to about 280 million gallons of water cleaned every week**⁹. To generate this much water treatment through built infrastructure would require a water treatment plant capable of producing 40 MGD, which in current market conditions would likely cost more than \$200 million. As such, the benefits of this type of project are expected to substantially outweigh the costs, and the benefits that can be measured in dollars are likely to be the lower bound estimate.

In the base case, or status quo, continued degradation for the project area, of 14% annually in productivity is assumed, based on FWC published fisheries data for the Lagoon. In the base case, this continued decline is estimated using FEMA values for shellfish productivity of about \$41,500 in costs per year.

Benefits include reversal of the continued decline in shellfish food provision, as well as improvements to other ecosystem services. Based on expected capacity from plantings at maturity, economic values are estimated for benefits of water filtration, using FEMA values of about \$330,000 annually; enhanced

Figure 7. Seed clams being screened



Source: IRLNEP

⁸ Zhang (2020)

⁹ NOAA Fisheries. <https://www.fisheries.noaa.gov/feature-story/how-much-clam-worth-coastal-community#:~:text=An%20adult%20oyster%20can%20filter,they%20filter%20feed%20on%20algae>.

recreation at about \$250,000 annually, using FEMA values; public values for seagrass habitats of about \$376,000; and about \$160,000 in improved flood protection using FEMA values.

The analysis finds that benefits exceed costs by more than 29:1; results are shown in **Table 6**.

Table 6. Summary Benefit-Cost Analysis, River Breeze Park - Clams

Costs, relative to base case/status quo:	
Personnel	\$251,250
Equipment and Supplies	\$9,638
Contractual	\$125,620
Other	\$21,808
Total Costs (10-year period, in 2025 dollars) *	\$408,316
Benefits, relative to base case/status quo:	
Fishery Productivity	\$2,080,339
Flood Protection	\$1,130,263
Aesthetic Value	\$1,799,684
Recreation	\$1,773,475
Water Quality Improvements	\$2,356,626
Habitat WTP	\$2,642,740
Jobs	\$291,247
Total Benefits (10-year period, in 2025 dollars)	\$12,074,375
Benefit-cost ratio	29.6

Source: TBG Work Product

A partnership between Riverside Conservancy, Bethune-Cookman University, and the UF-Whitney lab will be leading the project. Riverside Conservancy will work with Bethune-Cookman University, one of four HBCUs in Florida. Student engagement will enhance awareness of coastal issues.

Additional benefits are expected to occur within priority communities, which the Riverside Conservancy describes as opportunities for students at Bethune-Cookman University. The student engagement will enhance awareness of coastal issues, and opportunities for employment and research in coastal resource management.

North Canaveral National Seashore (CANA) – Oyster Reefs

Oyster reefs are important habitats for marine species including mussels, barnacles, and sea anemones as well as for forage fish, invertebrates, and other species. Oyster reefs are also documented nurseries for commercially valuable species. Oyster reefs and oysters are crucial for marine ecosystem health, acting as filters that provide water quality improvements and also enhance coastal resilience. The reef restorations in the IRL watershed will be intertidal patch reefs for habitat and/or fringing reefs for wave attenuation along vulnerable shorelines. Site restoration sizes vary across the IRL watershed between 0.1 acres up to 5 acres. **Figure 8** shows an example from the proposed site.

The site selected for the case study BCA for the oyster reef habitat type is **Project Site 2a, North CANA** in Brevard County. This project will be undertaken by University of Central Florida project team. This site is described as installing 0.8 acres of oyster reef habitat and also includes seagrass and mangrove plantings. Other habitat activities include living shoreline and shoreline stabilization and water quality enhancements. **Benefits of the project will include improvements in seagrass recruitment, filtration of water, denitrification of sediments and water, essential species habitat, and coastal resilience including protection from erosion and storm surges.**

Figure 8. North CANA – Oyster Reefs



In the Base Case, continued losses in productivity of 14% annually are assumed, based on long-term FWC records for oyster productivity in similar impaired water bodies. This has an annual

cost of about \$1,250. In the Project scenario, costs include personnel and equipment one-time costs of \$338,000 and one-time indirect administrative costs of about \$87,952.

Benefits are recognized for improved productivity (\$8,400 annually based on FEMA values), water filtration (\$2,650 annually based on FEMA values), recreation \$1,100 annually based on FEMA values), and storm protection (\$8,419 annually for the area at maturity of the oyster reef placement. Storm protection, water filtration and improved habitat values for the seagrass/living shoreline areas, which are separate from the shellfish values, are recognized at the area of maturity for the combined mangrove/living shoreline area of approximately one acre (3,000 linear feet) and 1.05 acres of seagrass. Flood protection provides about \$6,250 annually per acre using FEMA values, water filtration about \$9,400 annually, and habitat about \$14,616 annually per acre, using FEMA values.

This project is also expected to create the equivalent of one full-time job, in an area with higher than average unemployment. As such, the average county wage is included as a recurring annual benefit for one additional worker.

Economic values estimated for this project are shown in **Table 7**. With relatively small site sizes, the estimated overall impact is still more than \$2.00 in benefits for each \$1.00 spent.

Table 7. Summary Benefit-Cost Analysis, North CANA – Oyster Reefs

Costs, relative to base case/status quo:	
Personnel	\$169,829
Equipment and Supplies	\$168,450
Indirect Costs	\$79,127
Total Costs (10-year period, in 2025 dollars)*	\$417,406
Benefits, relative to base case/status quo:	
Fishery Productivity	\$59,101
Flood Protection	\$102,984
Aesthetic Value	\$69,874
Recreation	\$76,706
Water Quality Improvements	\$84,673
Habitat WTP	\$102,606
Avoided Costs	\$8,826
Jobs	\$354,557
Total Benefits (10-year period, in 2025 dollars)	\$859,326
Benefit-cost ratio	2.1

Source: TBG Work Product

The North CANA project is also expected to provide **benefits to priority communities** as the project team has extensive experience working with schools, including some along the IRL coast to grow mangroves.

Eldora House – Living Shorelines

Living shorelines provide valuable habitats for several species while also stabilizing shorelines and reducing erosion. This approach enhances coastal resiliency for adjacent habitats and open spaces. The implementation of living shoreline projects is especially valuable for the areas that are vulnerable to the impacts of Sea Level Rise. **A major benefit of living shoreline sites is shoreline stabilization, as well as enhancements for coastal resilience.** Eldora House was selected as the case study site for living shorelines.

The project is estimated to **improve 1,500 linear feet of shoreline with a combination of mangroves and seagrasses.** The project is located in northern Brevard County and will be undertaken by the University of Central Florida project team (**Figure 9**).

In the Base Case, continued deterioration of water quality and fisheries productivity is assumed. Costs associated with this decline total less than \$1,000 annually, owing to the small project area. In the Project scenario, costs include personnel and equipment one-time costs of \$338,000 and one-time indirect administrative costs of about \$87,952. Grant costs were divided evenly with North CANA.

Benefits of the project include improved coastal protection, habitat, water filtration and recreational values. Combined planting areas are expected to expand over the first two years, based on past studies. Estimates are recognized for the area of improvement at maturity of about 2 acres.

Improved coastal protection for two acres at about \$2,400 annually is recognized, based on FEMA values. Water quality improvements are based on FEMA values at \$3,672 annually, and \$5,700 is recognized annually for improved habitat, based on FEMA values.

Figure 9. Eldora House



Source: IRLNEP

Importantly, permanent jobs will be created directly from this project and two adjacent projects. Recurring wages based on County averages are apportioned to this project for **one (1) Full Time employee as a project benefit.** As such, the average county wage is included as a recurring annual benefit for one additional worker.

Economic values estimated for this project are shown in **Table 8.** Despite the relatively small project area, benefits exceed costs by about 20%, with \$1.20 in benefits estimated for each \$1.00 spent.

Table 8. Summary Benefit-Cost Analysis, Eldora House – Living Shorelines

Costs, relative to base case/status quo:	
Personnel	\$169,829
Equipment and Supplies	\$168,450
Indirect Costs	\$87,952
Total Costs (10-year period, in 2025 dollars)*	\$426,231
Benefits, relative to base case/status quo:	
Flood Protection	\$17,125
Aesthetic Value	\$27,268
Recreation	\$26,871
Water Quality Improvements	\$25,779
Habitat WTP	\$40,042
Avoided Costs	\$6,316
Jobs	\$360,873
Total Benefits (10-year period, in 2025 dollars)	\$504,273
Benefit-cost ratio	1.2

Source: TBG Work Product

Additionally, **the project will provide volunteering opportunities including benefits to schools and priority communities.** University of Central Florida (UCF) works with dozens of schools, including some along the IRL coast to grow mangroves, which will be a priority community benefit.

Merritt Island National Wildlife Refuge/Kennedy Space Center (MINWR/KSC) – Coastal Wetlands

Coastal wetlands are a critical habitat for several species, and are particularly vulnerable to the impacts of Sea Level Rise. Wetland restoration with enhanced fish passage is proposed at two of the fifteen sites, which will **expand access for fisheries to a total of 2,125 acres of wetlands**. The MINWR site will be a permanent reconnection of the impounded wetland, featuring improved water flow connections and enhancing the movement of fish between wetland areas - a massive undertaking with transformative impacts expected. The MINWR and Moore Creek Wetland Reconnection and Fish Passage site at KSC was selected for the case study for coastal wetland restoration (**Figure 10**).

Figure 10. Coastal Wetland Reconnection at KSC



Source: IRLNEP

The project is led by the St. Johns River Water Management District (SJRWMD) in partnership with U.S. Fish and Wildlife Service, NASA, Brevard County Mosquito Control, Florida Fish and Wildlife Conservation Commission - Aquatic Habitat Conservation and Restoration, NOAA and Resilient Florida.

In the Base Case, continued deterioration of fish productivity is expected at Lagoon-wide rates of 2.2% annually which results in loss of about \$63,000 annually based on current FWC average price and landings data. The restoration is expected to halt this trend.

The project includes restoration of mangroves and salt marsh habitats consistent with the coastal wetland ecosystems. Flood and storm hazard reduction benefits are estimated for the restoration area, 136 acres, using FEMA values resulting in annual benefits of about \$165,000¹⁰. Direct water quality benefits via the mangrove and seagrass habitats are estimated at \$1.2 million annually, using FEMA values for restored area at maturity (680 acres). Benefits also include coastal resilience for the shoreline and wetland habitats as the permanent reconnection and removal of the dikes will allow for upland migration of wetlands. **Coastal wetlands that are at their full functionality are more resilient to sea level rise impacts, sequester carbon, and at this scale, provide material levels of storm protection.** Additional benefits of allowing for the upland migration of mangroves includes providing **sustainable habitat for fish and wildlife, including listed species, and reversing a trend of declining fish productivity.** Habitat improvements alone are estimated at \$1.9 million in annual benefits based on FEMA values for about 680 acres of restoration area. The IRL is known for world-class fishery opportunities, and recreation benefits may be expected. Recreational benefits are estimated at \$1.3 million annually, using FEMA values and acreage of restoration at maturity.

Cost efficiencies from improved excavation equipment and technologies used by SJRWMD contractors expanded the dike top restoration from the originally proposed 28,291 linear feet (2,125 acres) proposed in the original NOAA proposal to include an additional 46,120 linear feet of restoration. This addition was not included in the BCA, and as such, the analysis can be considered lower bound estimates for all benefits

Economic values estimated for this project are shown in **Table 9**. The benefits exceed costs by a factor of almost 60:1, consistent with the transformational impacts of this project.

Table 9. Summary Benefit-Cost Analysis, MINWR/KSC – Coastal Wetlands

Costs, relative to base case/status quo:	
Contractual	\$922,500
Total Costs (10-year period, in 2025 dollars)*	\$922,500
Benefits, relative to base case/status quo:	
Fishery Productivity	\$20,217,600
Flood Protection	\$1,164,513
Aesthetic Value	\$1,854,220
Recreation	\$9,136,085
Water Quality Improvements	\$8,764,791
Habitat WTP	\$13,614,117
Avoided Costs	\$444,787
Total Benefits (10-year period, in 2025 dollars)	\$55,196,114
Benefit-cost ratio	59.8

Source: TBG Work Product

¹⁰ Area of improved flood protection from coastal restoration area: 46,123 and 74,414 Lin Ft * 60-80' width, divided by 43,560 to convert to acres.

Big Slough – Seagrass

Seagrass serves a significant role in maintaining the health of the IRL. Seagrass loss is linked to an increase in harmful algal blooms and an increase in manatee deaths. Seagrasses have been ranked a Level 1 – Critical IRL health concern. Many species, such as dolphins, shellfish, turtles, winter pink shrimp, crabs, and many fish, depend on seagrasses as a food source and foraging location. Over 200 species of fish rely on seagrass meadows for habitat. Blue crab, shrimp fisheries, juvenile fish, and manatees are some notable animals that will benefit from the restoration of these seagrass habitats. Big Slough was selected as the case study for seagrass habitat (**Figure 11**).

This project will be conducted by Indian River County, in partnership with Sea & Shoreline LLC, in areas around Sebastian Inlet and Pelican Island National Wildlife Refuge. During the project, 22.8 acres of seagrass habitat will be restored. **Approximately 12.8 acres will be restored in Big Slough.** The seagrass planting units will be protected by exclusion devices.

In the Base Case, continued losses of 2.2% annually in fish productivity are assumed, based on long-term Lagoon-wide FWC trends. Annual costs are estimated at about \$2,028 for the project area, based on continued degradation.

In the project case, the restoration of seagrass meadows and salt marsh habitats will provide water quality benefits and enhance coastal resilience for the shorelines. Public values for habitat improvement for this ecosystem were estimated using FEMA values, totaling about \$36,000 annually. Water filtration benefits based on FEMA values are estimated at about \$117,000 annually. **Seagrass habitats are considered coastal wetlands that also sequester carbon. Additional benefits include providing sustainable habitat for fish and wildlife, including listed species.** The IRL is known for world-class fishery opportunities, and recreation benefits estimated at \$118,000 annually may be expected, based on FEMA values.

Figure 11. Seagrass Planting



Source: IRLNEP

This project is expected to create 3.8 full-time equivalent jobs. This benefit is estimated at County average wages, as a benefit totaling \$233,000 annually. Economic values estimated for this project are shown in **Table 10**. Benefits exceed costs by a factor of 8.3 to 1.

Table 10. Summary Benefit-Cost Analysis, Big Slough – Seagrass

Costs, relative to base case/status quo:	
Contractual	\$602,670
Total Costs (10-year period, in 2025 dollars)*	\$602,670
Benefits, relative to base case/status quo:	
Flood Protection	\$548,006
Aesthetic Value	\$872,574
Recreation	\$859,867
Water Quality Improvements	\$824,922
Habitat WTP	\$256,266
Avoided Costs	\$14,233
Jobs	\$1,636,839
Total Benefits (10-year period, in 2025 dollars)	\$5,012,707
Benefit-cost ratio	8.3

Source: TBG Work Product

The project benefits also include priority communities, which will benefit from Sea and Shoreline LLC processing seagrasses for planting and training restoration personnel at their facility in the underserved community of Lincoln Park in St. Lucie County (**Figure 12**).

Figure 12. Scobie Park Seagrass Planting



Source: IRLNEP

Bee Gum Point Marsh Impoundment – Fish Passage

Fish passage improvements often use culvert connections to allow for greater water exchanges between impoundments and the Lagoon. Water pumps are installed to moderate water levels and quality. **These improvements help increase the movement of fish between bodies of water and restore fish populations through increased habitat range, nursery habitats, seagrass beds, mangrove forests, and other wetland habitats.** Shoreline resilience practices are also implemented to **help protect fish passages and habitats from erosion and other threats.** Maintaining fish passage helps **improve fish populations, habitat health, shoreline protection, and water quality.**

The Bee Gum Point Impoundment is selected for the case study of fish passage restoration. This project will install two culverts, enhance existing culverts, and install living shoreline stabilization. The result is expected to include **125 acres of fish nursery habitat, comprised of 10 acres of seagrass beds, 115 acres of mangrove forest, and 100 linear feet with 33 red mangroves to include Spartan Fish Reef deployment.** Aeration systems, manatee excluder devices, and site monitoring will be used during the project. Monitoring for fish populations at the culverts will occur. The project is led by a partnership between Indian River Land Trust, Indian River County Mosquito Control, Harbor Branch Oceanographic Institution and the City of Vero Beach.

In the Base Case, continued declines in fish productivity are assumed at Lagoon-wide long-term trends, based on FWC data. Costs associated with the decline are about \$20,000 annually. In the project case, one-time project costs total about \$560,000, with the majority used for permitting, culvert and pump installation, as well as plants, installation and monitoring. About \$70,000 of the cost is for personnel and equipment.

Benefits include reversal of the losses in fish productivity, and ecosystem services provided by the restored area at maturity, estimated at 625 acres in total. Flood and storm protection is valued at \$760,000 annually using FEMA values; recreational and aesthetic value at \$2.3 million annually based on FEMA values; and water quality improvements estimated at \$1.1 million annually using FEMA values. One part-time job is created directly as a result of the project, with wages estimated at the County average, resulting in annual benefit of \$6,100 in new wages.

This is another transformational project with far-reaching positive impacts. Benefits are estimated to exceed costs by 54 to 1. Economic values estimated for this project are shown in **Table 11.**

Table 11. Summary Benefit-Cost Analysis, Bee Gum Point Marsh Impoundment – Fish Passage

Costs, relative to base case/status quo:	
Personnel	\$12,464
Equipment and Supplies	\$18,762
Contractual	\$39,000
Other	\$492,141
Total Costs (10-year period, in 2025 dollars)*	\$562,367
Benefits, relative to base case/status quo:	
Flood Protection	\$5,351,624
Aesthetic Value	\$8,521,233
Recreation	\$8,397,137
Water Quality Improvements	\$8,055,874
Habitat WTP	\$256,266
Avoided Costs	\$138,996
Jobs	\$43,075
Total Benefits (10-year period, in 2025 dollars)	\$30,764,204
Cost-benefit ratio	54.7

Source: TBG Work Product

The project will provide benefits to the nearby underserved community of Gifford through popular recreational and subsistence fishing at Gifford Landing Park. Engagement of volunteers will be implemented along with conservation tours for the public.

Figure 13. Gamefish



Source: IRLNEP

Walton Scrub Preserve – Mangroves

Mangrove ecosystems provide an array of benefits including the protection of habitat and coastal resilience, especially in areas that are particularly vulnerable to the impacts of Sea Level Rise. Mangroves provide habitat for both upland and marine species at various stages of life (**Figure 14**).

Walton Scrub Preserve was selected as the case study site for mangrove restoration. The site is located in the Southern Indian River Lagoon, in St. Lucie County. The site has experienced severe erosion, at times exposing an adjacent roadway to flooding. The project will directly provide some protection from shoreline vulnerability, as well as provided habitat benefits including **1 acre of seagrasses, an acre of oyster reef, 2,015 linear feet of living shorelines, and 1,800 salt marsh plantings, for approximately 2.7 acres total, as part of the scope**. Published meta-analysis confirms that although ecosystem functions are slightly lower in restored mangrove stands, the restored mangroves still provide high ecosystem service functions (Su, 2021).

In the Base Case, erosion risks continue, and water quality continues to deteriorate, in line with long-term trends. Water filtration FEMA values were used as a proxy for erosion control in the base case, generating about \$14,000 in annual costs. In addition to continued water quality issues, there is potential roadway damage due to storm erosion. The roadway adjacent to the restoration failed in 2004 from storm erosion. Recent Florida Department of Transportation (FDOT) data shows emergency roadway repairs at approximately \$990/linear foot for each repair¹¹. If the area were to fail again, a lower bound estimate is about \$5.2 million in avoided costs. This cost was applied at 1-in-20-year probability, or about \$260,000 annually.

In the project case, costs include staff time related to the project totaling about \$230,000 as a one-time cost. Contractual costs for the material and plantings total about \$690,000 as a one-time cost. Benefits include improved water filtration from the oysters, estimated at about \$3,535 annually. Improved fish productivity from mangrove and salt marsh plantings are estimated at about \$18,000 annually, and recreational values are recognized as benefits of about \$16,000 annually. These estimates can be considered lower bounds, as the synergies between these benefits are not accounted for in these values.

The work will create 1.8 full-time equivalent positions, which are included as a benefit at the average county wage, contributing almost \$100,000 annually to local incomes.

Economic values estimated for this project are shown in **Table 12; benefits exceed costs by 3.6:1**.

¹¹ FDOT Bid Price Data, Construction Fast Response, projects on average .05 miles in length

Table 12. Summary Benefit-Cost Analysis, Walton Scrub Preserve - Mangroves

Costs, relative to base case/status quo:	
Personnel	\$231,961
Contractual	\$693,000
Total Costs (10-year period, in 2025 dollars)*	\$924,961
Benefits, relative to base case/status quo:	
Fishery Productivity	\$126,081
Flood Protection	\$65,932
Aesthetic Value	\$104,982
Recreation	\$113,918
Water Quality Improvements	\$124,067
Habitat WTP	\$154,160
Avoided Costs	\$1,924,448
Jobs	\$692,554
Total Benefits (10-year period, in 2025 dollars)	\$3,306,142
Benefit-cost ratio	3.57

Source: TBG Work Product

The site will provide public access for local communities below the poverty line who depend on the IRL as a food resource. Locally, a material number of households are considered subsistence, relying on natural resources for food provisioning.

Figure 14. Mangroves



Source: IRLNEP

Sensitivity Analysis

A key result of benefit-cost analyses is the benefit-cost ratio or BCR associated with each alternative strategy that indicates the relative cost-effectiveness of that strategy. BCRs are sensitive to the cost and benefit values used as inputs to the calculations, as well as the discount rates and time horizons. As described in the earlier sections of the report, all estimates have limitations.

Discount Rate

Discount rates convert future costs and benefits into current dollars. Higher discount rates will result in lower values for items that occur well in the future, resulting in a bias toward current generational impact. Lower discount rates treat future costs and benefits as values more similar to those experienced in current periods; this treatment has the effect of reflecting more impacts on future generations, depending on the timeline involved. Sensitivity analyses were conducted at discount rates of 3% and 10%, to identify differences in results based on different treatment.

Table 13 provides a summary of results.

In all cases, the discount rate does not result in a BCR below 1.0, meaning benefits exceed costs at all discount rates.

Table 13. Benefit Cost Ratios, at Various Discount Rates

Project	3%	7%	10%
1a. Caron Bay	8.84	7.28	6.37
1b. RC Center	25.71	21.16	18.51
1c. River Breeze Park	35.93	29.57	25.86
2a. North CANA	2.51	2.06	1.80
2b. Eldora House	1.44	1.18	1.03
5. MINWR	72.70	59.83	52.33
7a. Big Slough	10.11	8.32	7.27
8. Bee Gum Point Marsh	66.47	54.70	47.85
9. Walton Scrub Preserve	4.34	3.57	3.13

Source: TBG Work Product

Non-market Values

Non-market values were considered in this analysis. Non-market goods refer to things unable to be purchased in a store, such as water quality or healthy ecosystems. The non-market goods are quantified using published economic measures of the public's valuation for such items. FEMA values were the primary source of the measures chosen to consider specific benefits available in the IRL. FEMA values are derived from a meta-analysis of many studies of public willingness to pay (WTP). Habitat restoration benefits extend beyond the area of improvement, thus these benefits could impact areas larger than estimated. To check for robustness of results, the sensitivity analysis considered how results would change if the impact areas are smaller than

estimated, as such a 25% reduction in benefits were estimated across the projects. **Table 14** shows the results of a 25% reduction in benefits across the discount rates assessed in the sensitivity analysis. The test finds that all of the projects still maintain a positive BCR except for Eldora House and Walton Scrub. Eldora House shares costs with two other projects, which were arbitrarily divided between the projects, although the Eldora House project area is small; this treatment likely biased higher costs to Eldora House, impacting its BCR.

Table 14. Benefit Cost Ratios, Benefits Reduction at Various Discount Rates

Project	3%	7%	10%
1a. Caron Bay	6.81	5.60	4.90
1b. RC Center	19.46	16.02	14.01
1c. River Breeze Park	27.17	22.36	19.55
2a. North CANA	1.89	1.55	1.35
2b. Eldora House	1.08	0.89	0.78
5. MINWR	54.67	45.00	39.35
7a. Big Slough	7.59	6.24	5.46
8. Bee Gum Point Marsh	49.93	41.09	35.94
9. Walton Scrub Preserve	3.89	3.20	2.80

Source: TBG Work Product

ECOSYSTEM SERVICES

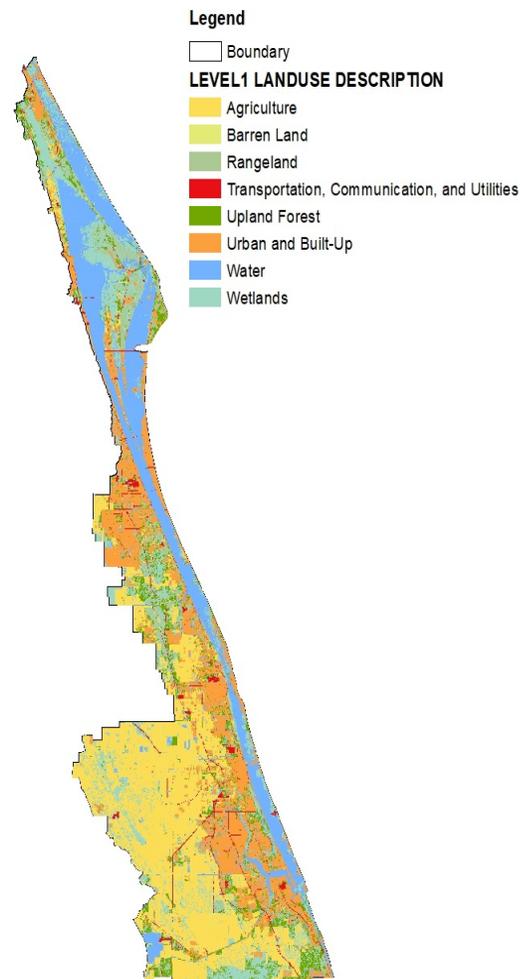
The IRL was recognized as an Estuary of National Significance in 1990. The system is a barrier island complex, 155 miles long with waters covering an area of more than 350 square miles, dominated by three distinct and connected water bodies – the Indian River, Banana River, and Mosquito Lagoon. The Lagoon, a micro-tidal estuary, produces diverse and important ecosystem services, including fishing and tourism that generate billions of dollars in economic activity to the region. The Lagoon is located along the Atlantic Flyway, a key biological highway for many migrating birds. Perhaps of even greater interest to the dense urban populations adjacent to the Lagoon on the inland side, and the burgeoning aerospace industry in the area, is the coastal protection provided by the Lagoon and its coastal ecosystems.

Environmentally sensitive coastal areas within the IRL are located in close proximity to densely developed urban areas and an extensive agricultural region. The Lagoon's ecosystem services have been impacted over many years by urbanization and agricultural land uses within the watershed that have had significant water quality impacts within the poorly-flushed system. **Figure 15**, shows the Land Use/Land Cover data for the IRL region.

Ecosystem services are often categorized into four main types of services. All have direct and indirect economic value:

- **Provisioning Services:** Products derived from ecosystems, such as food, fresh water, timber, fiber, and other resources that have direct economic value.
- **Regulating Services:** Benefits that arise from natural ecosystems and ecosystem processes, including air and water purification, flood control, coastal protection from storm surges, carbon sequestration, climate regulation, and plant pollination.

Figure 15. Land Use and Land Cover in the IRL region



Source: TBG Work product, FDEP LULC

- Supporting Services: Processes that support other beneficial services, such as providing habitats for species, protecting biological diversity, and facilitating nutrient cycling.
- Cultural Services: Benefits that ecosystems provide for recreation, tourism, aesthetic appreciation, quality of life, human health, and education.

TBG assessed the economic values of IRL ecosystem services to provide an improved understanding of the economic value of the natural resource-based industries and ecosystem services supported by the IRL. The analysis utilized information on the existing condition of ecosystem services within the IRL, supplemented with information on the expected results from the NOAA restoration efforts. This valuation complements the Benefit-Cost Analysis of selected restoration projects, providing helpful case studies to showcase the value of these investments. **Table 15** summarizes the results of the ecosystem services valuation.

Table 15. Ecosystem Services Valuation Summary

Ecosystem Service	2025 Economic Value (\$ per year)	Economic Value Added Based on Case Studies
Water Quality	\$529,860,000	\$21,094,320
Coastal Protection	\$250,291,000	\$8,438,573
Habitat Quality	\$1,000,917,000	\$17,226,363
Urban Flood Risk Mitigation	\$486,559,000	0
Commercial Fishing	\$3,700,000	\$24,563,460
Recreational Fishing, Boating & Shoreline Activity	\$6,792,750,300	\$20,400,804
Aesthetic Values – Property Value Premiums	\$1,295,000,000	\$13,249,835
Total Ecosystem Services	\$10,355,377,300	\$104,973,354

Source: TBG work product, FEMA.

Each is addressed in turn on the following pages.

Coastal Protection

Coastal Protection values consider the susceptibility of coastal areas to natural hazards like erosion, sea-level rise, and storm surges. These are influenced by geographic, environmental, and human factors. The likelihood and magnitude of damage can be reduced by intact oyster reefs and coastal vegetation, especially when those habitats fringe vulnerable communities and infrastructure. A national study found that “the number of people, poor families, elderly and total value of residential property that are most exposed to hazards can be reduced by half if existing coastal habitats remain fully intact”¹². The IRL watershed is heavily developed, and native habitats are not intact, however, several of the NOAA projects are designed to improve coastal resiliency.

Coastal protection was modeled using InVEST. The model calculates the difference in exposure to coastal hazards with and without natural protective processes intact¹³. Cooperative Land Cover (CLC) data was used to identify areas of salt marsh, maritime hammock, mangroves, and other coastal vegetation or structures providing mitigating effects to coastal hazards. Federal Emergency Management Agency (FEMA) provides ecosystem service values that were used to monetize the benefits of coastal protection provided by coastal ecosystems. **The analysis finds that coastal ecosystems provide roughly \$250 million annually in coastal protection.** As several projects are specifically intended to improve coastal vulnerability, through stabilization from living shorelines, to absorbing wave energy with reef restoration, the value of these projects can be estimated.

Table 16 summarizes the results of the coastal vulnerability analysis.

Table 16. Summary of Coastal Protection Ecosystem Service Values

	Estimated Acres – Existing Condition	Coastal Protection Ecosystem Services in \$ Millions	Projected Improvements from Projects in \$ Millions
Salt Marsh	17,959	\$ 77.1	
Mangrove	19,302	82.9	
Maritime Hammocks	12,553	\$59.1	
Other	2,703	\$29.8	
Total	52,518	\$250	\$8.4

Source: TBG work product, InVEST

¹² Arkema, et al. (2013)

¹³ Note that the model does not account for coastal processes that are unique to IRL, IRL-specific coastal engineering models, or future long- or short-term changes in shoreline position or configuration.

Figure 16 and Figure 17 provide maps showing the relative exposure and protection provided by natural processes. Details of model parameters are described in the Appendix.

Figure 16. Example habitats providing coastal protection services



Source: TBG Work Product

Figure 17. Example habitats providing coastal protection services



Source: TBG Work Product

Habitat Quality

Habitat Quality refers to the condition and suitability of an ecosystem to support wildlife and plant species, considering factors such as biodiversity, availability of resources, and environmental health. High-quality habitats support biodiversity and ecosystem services, like pollination and water purification. The Lagoon system is especially important for wildlife habitat, containing a large number of species relative to other estuaries in North America, with:

- 685 fish species
- 370 bird species
- 2,100 plant species
- 2,200 animal species¹⁴

Ocean beaches in the lagoon region attract some of the highest numbers of nesting sea turtles in the western hemisphere. The northern Lagoon is part of a broad transitional zone where mangrove-dominated wetlands and maritime hammocks give way to herbaceous salt marsh. The lagoon contains 27 percent of eastern Florida’s coastal salt marshes, an important habitat for juvenile fish.

While InVEST offers a habitat quality model, Florida’s FWC CLC data offers very detailed habitat descriptions, which are current (June 2025) and provide geospatial datasets. For economic valuation, TBG applied dollar values per acre from FEMA Ecosystem Services (ES) values. The CLC categories were crosswalked to FEMA Ecosystem Services values for purposing of estimating the economic valuation. Appendix A includes the detailed crosswalk by CLC code and FEMA ES.

Table 17 summarizes the habitat quality valuation. **Total ecosystem services from public values for natural habitat exceed \$1 billion**, which is not far behind property values.

Table 17. Summary of Habitat Quality Ecosystem Service Values

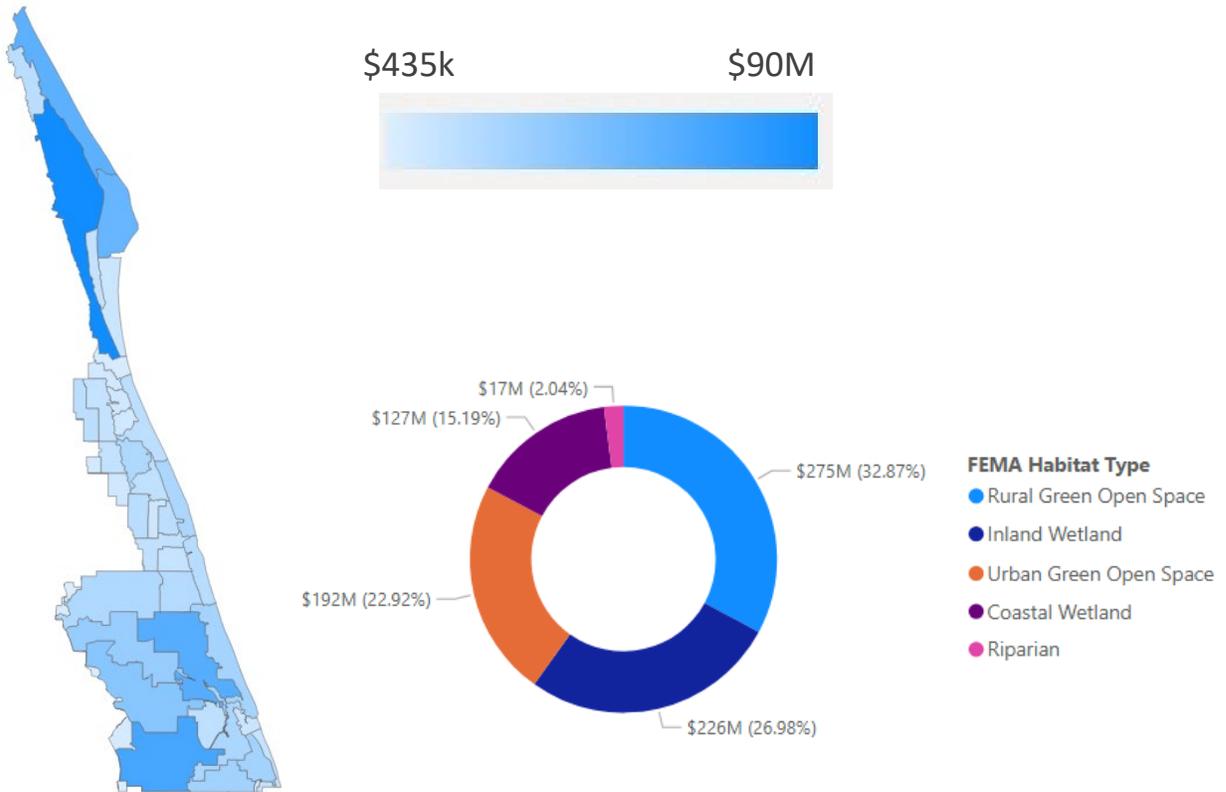
FEMA Habitat Type	FEMA ES Habitat \$/ac	IRL Acres	Total Habitat (ES)
Coastal Wetland	\$2,420	57,754	\$164,712,000
Inland Wetland	\$1,416	159,402	\$266,002,000
Riparian	\$2,547	6,703	\$20,121,000
Rural Green Open Space	\$2,021	136,067	\$324,077,000
Shellfish Reefs	\$ -	532	\$ -
Urban Green Open Space	\$5,890	32,559	\$226,007,000
Total Habitat ES Value			\$1,000,917,000

Source: TBG Work Product, FFWCC CLC

¹⁴ <https://www.sjrwmd.com/waterways/indian-river-lagoon/facts/>

Figure 18 provides spatial distribution of the habitat quality measures across the Lagoon region. Values are aggregated by HUC-12 basin; the totals by FEMA ES type are shown in sum for the entire IRL. Both the map and the circle chart add up to the \$1 billion total.

Figure 18. Habitat Quality Ecosystem Services by Basin and type



Source: TBG work product, from FWC CLC, FEMA Ecosystem Services data, USGS.

Water Quality

In natural condition, the environment provides water purification through nutrient retention in natural vegetation. Areas of natural pervious surfaces prevent polluted stormwater discharges from entering the waterways. This ecosystem service – nutrient retention - is essential to provide healthy water bodies for people and aquatic ecosystems, and is of particular interest for surface water quality issues, which are a key concern for the IRL. The IRL is considered impaired for both nitrogen and phosphorous. Water quality issues are in part due to the Lagoon’s micro-tidal nature, which results in less flushing and concentrates impacts from urban runoff.

The InVEST model Nutrient Delivery Ratio (NDR) calculates the balance between nutrient input (from sources like fertilizers) and nutrient output (like runoff into water bodies), affecting water quality and ecosystem health. The model computes a nutrient mass balance over a watershed, subtracting nutrient losses (conceptually represented by the ability of natural systems to retain and process the nutrients, rather than deliver the nutrients to the water body – the Lagoon), from the total nutrient sources. Extensive modeling of nutrient loads has been completed by SJRWMD, US EPA and others, owing to the Impaired status of the waterways. As reconciling differences in nutrient output geospatially is well beyond the scope of this project, FEMA Ecosystem Services values for detailed CLC habitat types were used to estimate water quality improvement values in the BCAs, and for overall ecosystem services valuation.

The results find that water filtration services provided by the Lagoon generate more than half a billion dollars annually.

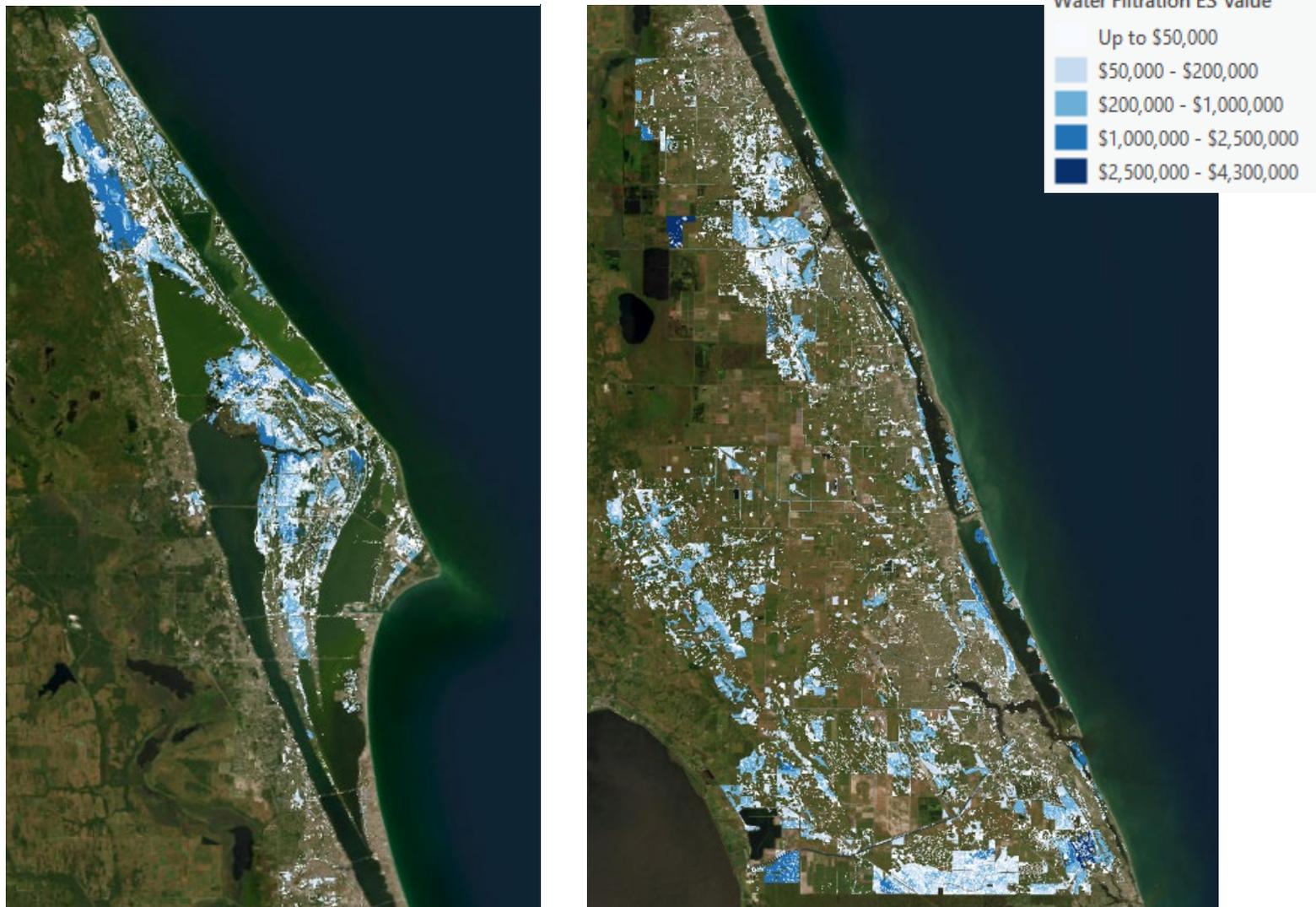
Table 18. Summary of Water Filtration Annual Ecosystem Service Values

Habitat Type	Estimated Acres – Existing Condition	Water Filtration Protection Ecosystem Services	Projected Improvements from Projects
Coastal Wetland	57,754	\$106,042,000	
Forest	149,410	\$76,595,000	
Inland Wetland	159,402	\$297,561,000	
Riparian	6,703	\$49,287,000	
Shellfish Reefs	532	\$376,000	
Total	368,565	\$529,860,000	

Source: TBG Work product, InVEST, FDEP data

Figure 19 shows the distribution of water purification ecosystem services across the Lagoon system.

Figure 19. Water Filtration Map



Source: TBG Work Product

Scenic or Aesthetic Quality

Scenic Quality covers the aesthetic value of a landscape, influenced by natural features, land use, and cultural significance, contributing to recreational opportunities and community identity. Aesthetically pleasing environments attract tourism and enhance property values, making scenic quality a critical component of economic development. Coastal areas are important economic assets that attracts visitors for tourism and recreation, contributing to the general quality of life for people living in these areas. There are potential economic benefits particularly to the priority communities that may be in proximity to the IRL projects.

Aesthetic quality in the IRL region was captured through hedonic modeling. In hedonic modeling, property transactions are statistically evaluated to tease out the effects of proximity to an amenity – in this case, the amenity is the Lagoon (See **Figure 20**). Statistical modeling was performed using certified tax roll data from recent property sales for the relevant counties, holding constant property characteristics that were not relative to the IRL – number of bedrooms, square footage, etc. – to estimate the value of proximity to the IRL.

Figure 20. Hedonic Modeling Explanation

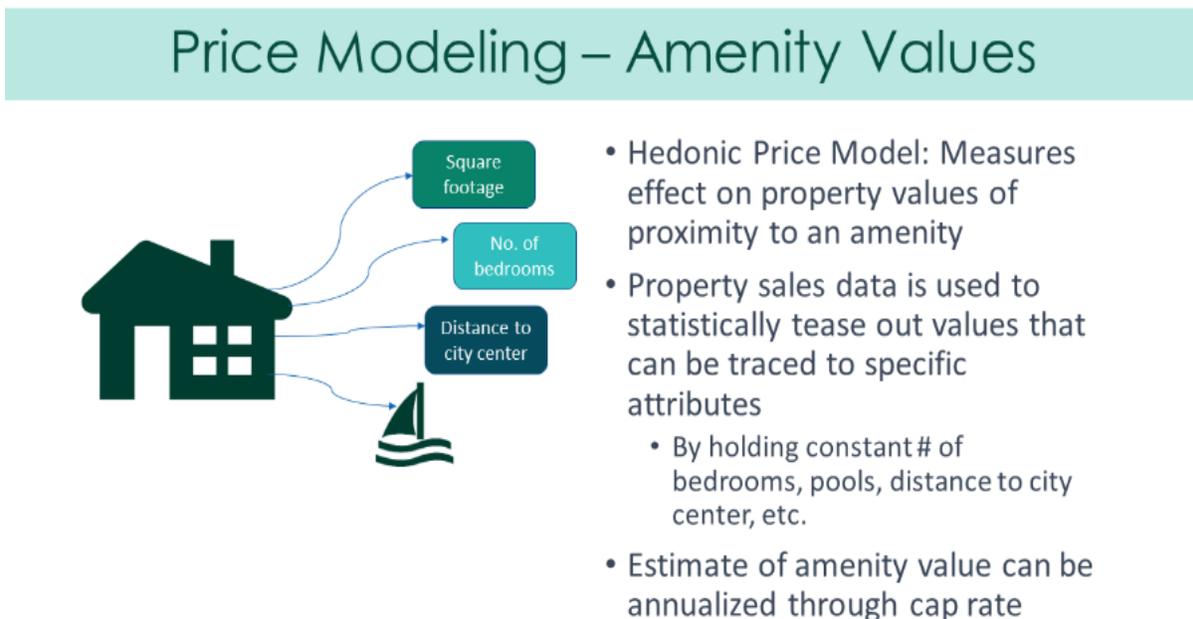


Table 19 summarizes the estimates by County. The results show that Brevard and Martin counties generate the most IRL-related property value premiums within the watershed. Martin County properties fronting the IRL average \$6 million in value, which is more than twice the average value in the rest of the lagoon area.

Annualized, **these values contribute nearly \$1.4 billion to local economic activity.**

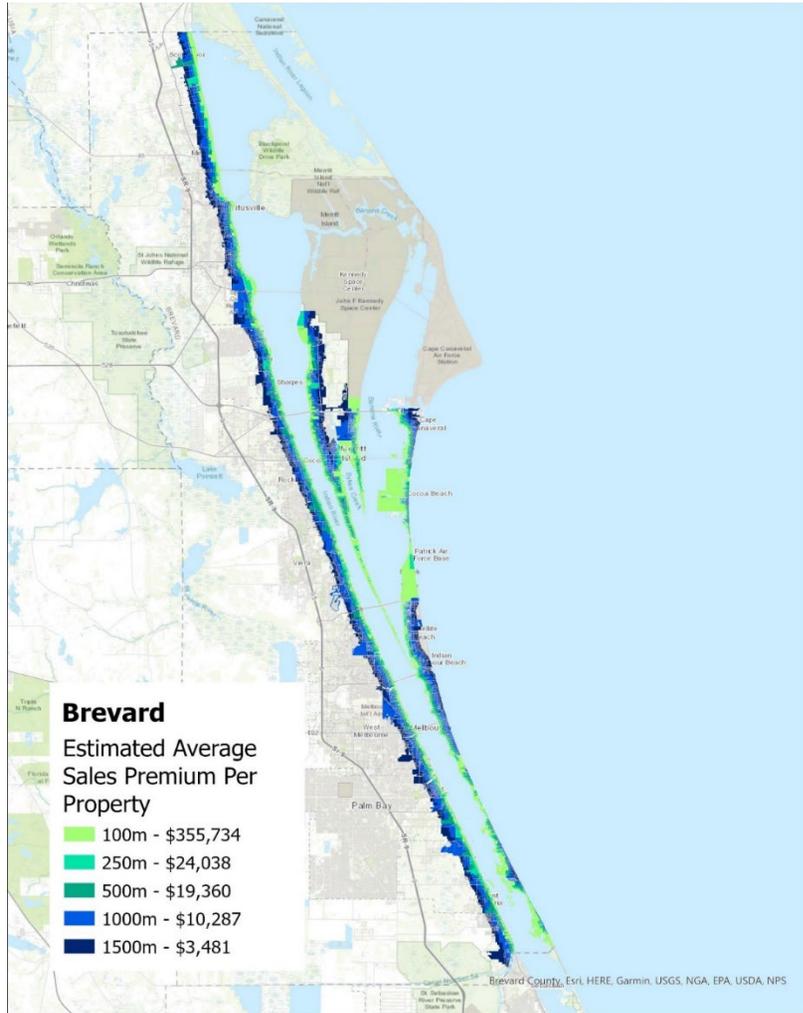
Table 19. IRL Property Value Premiums by County, 2025

Amenity Value in millions of dollars								
County	Waterfront	100m (Non-waterfront)	250m	500m	1,000m	1,500m	Canal front	Total
Brevard	\$3,582	\$111	\$251	\$324	\$255	\$66	\$1,568	\$6,156
Indian River	\$1,625	\$176	\$215	\$351	\$424	\$38	\$278	\$3,108
Martin	\$3,069	\$208	\$675	\$832	\$388	\$60	\$606	\$5,838
Palm Beach	\$1,015	\$510	\$706	\$412	\$535	\$180	\$1,723	\$5,082
St. Lucie	\$577	\$102	\$255	\$320	\$231	\$56	\$-	\$1,541
Volusia	\$443	\$36	\$167	\$362	\$217	\$5	\$0	\$1,230
Total	\$10,312	\$1,143	\$2,268	\$2,601	\$2,049	\$405	\$4,177	\$22,956

Source: TBG Work Product

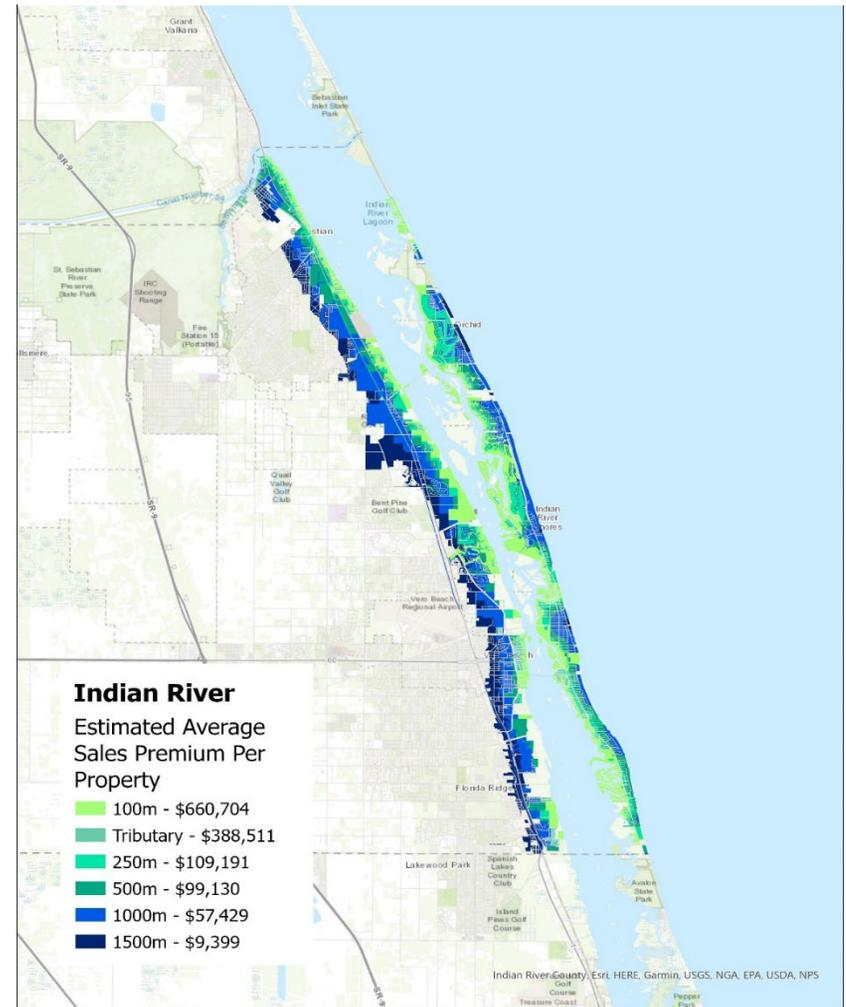
Figures 21-26 provide maps showing the value gradient across the counties, within the IRL region.

Figure 21. Brevard County Map



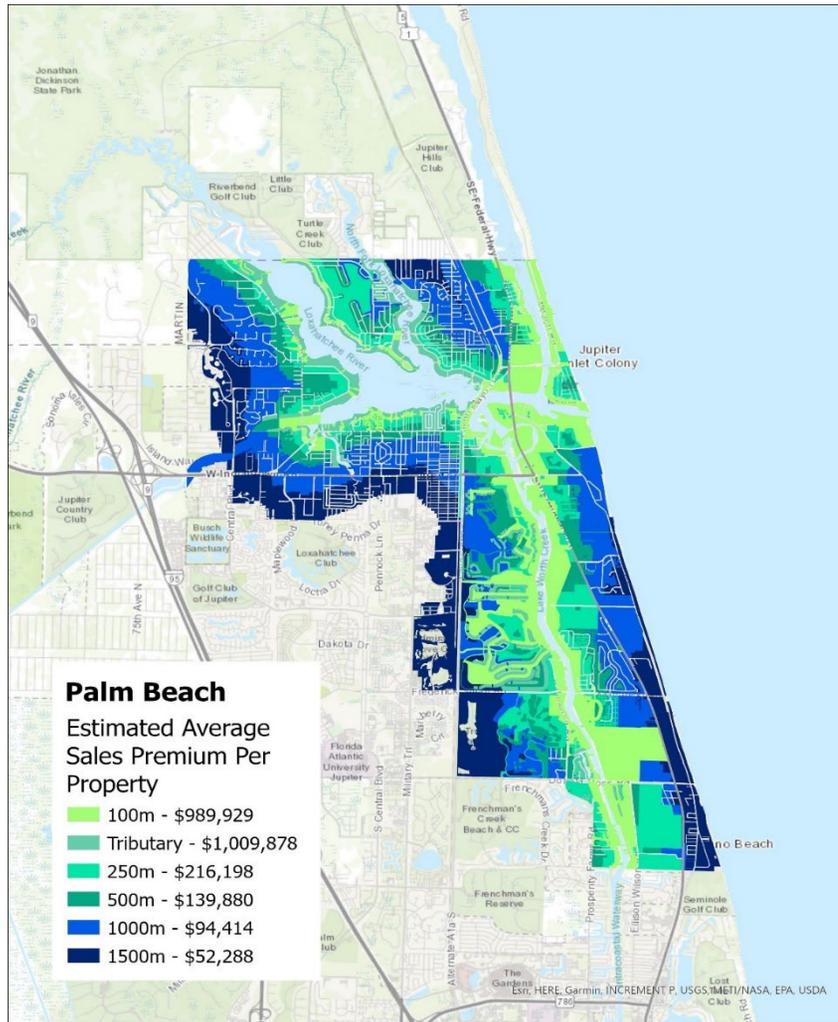
Source: TBG Work Product

Figure 22. Indian River County Map



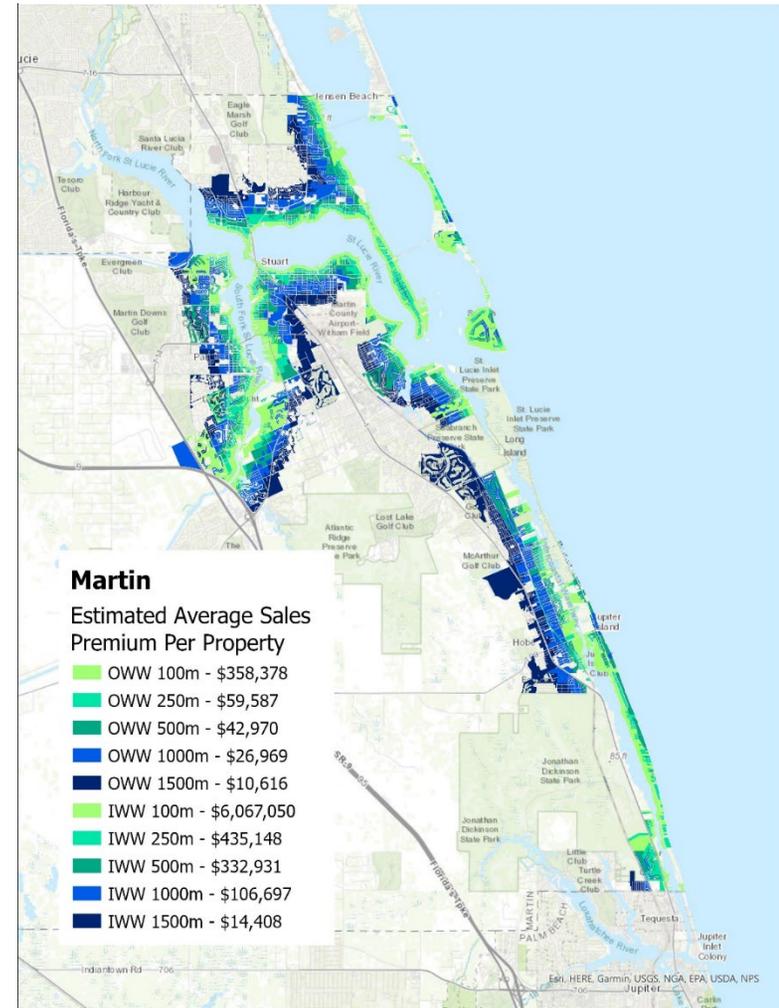
Source: TBG Work Product

Figure 24. Palm Beach County Map



Source: TBG Work Product

Figure 23. Martin County Map



Source: TBG Work Product

Figure 25. Volusia County Map

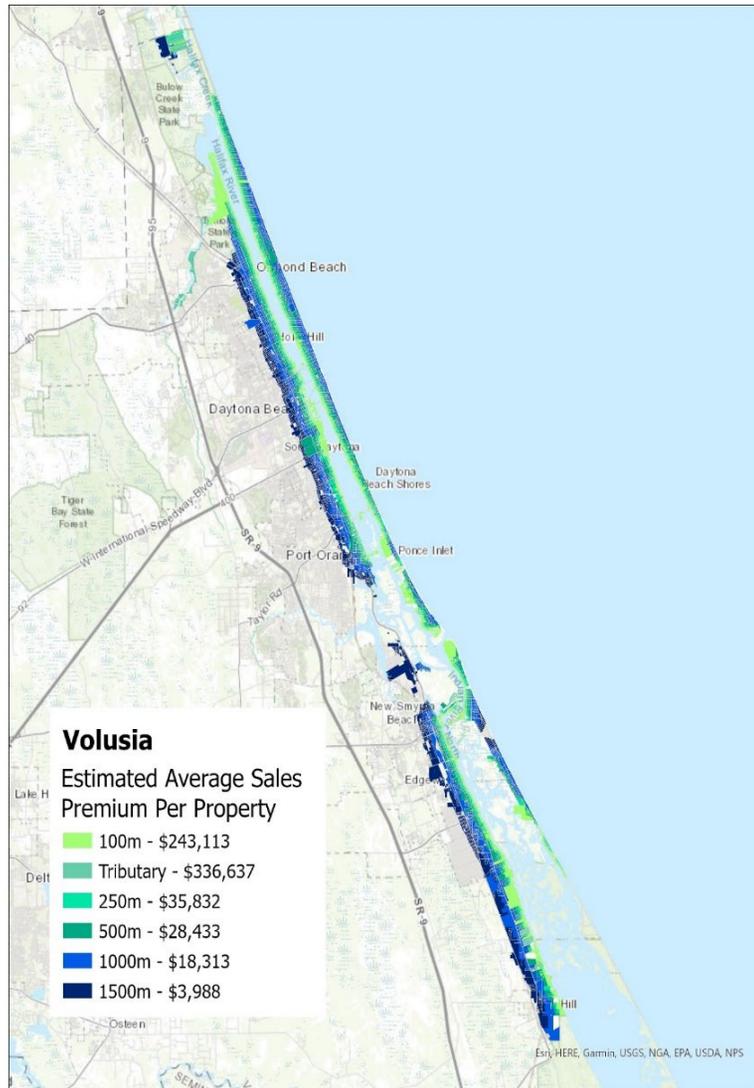
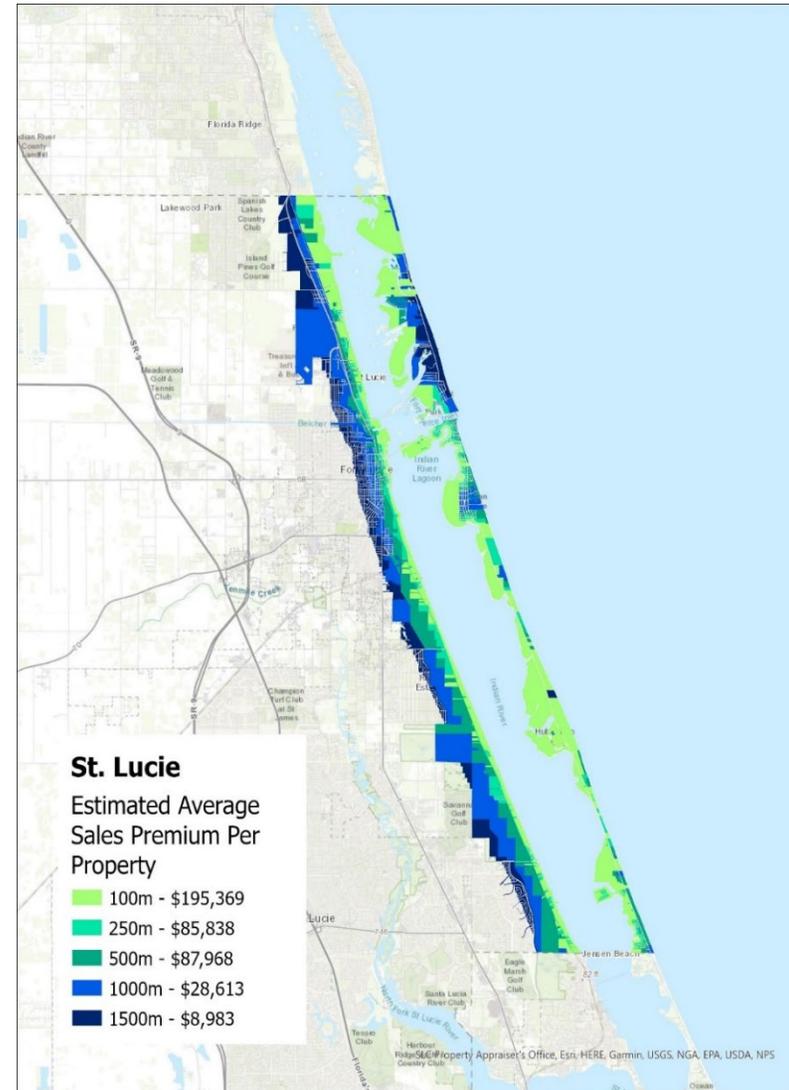


Figure 26. St. Lucie County Map



Recreation & Tourism

Florida is known for its tourism economy, and the IRL attracts significant numbers of seasonal visitors, tourists, particularly those interested in the world-class fishing opportunities the lagoon provides. VISIT FLORIDA Research, the State’s tourism tracking agency, cites the most popular activities for domestic visitors in 2024 as beach or waterfront activities, including fishing (34%), culinary/dining (23%), and shopping (23%). Overseas visitors in 2024 cited shopping (89%), sightseeing (72%), and amusement and theme parks (48%) as the most popular activities¹⁵. These visitors, whether day-trippers from adjacent counties, or international visitors on multi-day journeys, contribute to the local and regional economy through their spending, which in turn supports 1 out of every 8 jobs in the area¹⁶. Recent Bureau of Economic Analysis data finds that each dollar spent by tourists generates about \$0.97 in indirect economic activity, and adds about \$0.57 for each dollar of tourist spending to the local and regional economy, or GDP¹⁷. Visitors, including those who use boats and those engaging in shoreline activities such as fishing from jetties, paddling activities like kayaking, and other uses all contribute to the economic impact of the IRL.

TBG finds that spending by visitors across key recreational and tourism sectors generates an estimated **75 thousand jobs, \$3.1 million in labor income, \$5.5 million in value added and a total of \$10.5 million in economic output to the local and regional economy from the activity.** **Table 20** summarizes the data by category. Detailed analysis by spending category is provided in the Appendix.

Table 20. Summary of Recreation Impacts

Impact	Employment	Labor Income	Value Added	Output
Direct	50,690	\$1,939,655,000	\$3,365,841,000	\$6,412,876,000
Indirect	15,960	\$812,930,000	\$1,316,945,000	\$2,676,242,000
Induced	8,556	\$418,236,000	\$896,379,000	\$1,455,675,000
Total	75,206	\$3,170,821,000	\$5,579,165,000	\$10,544,793,000

Source: TBG work product.

¹⁵ ©VISIT Florida Research. <https://www.visitflorida.org/resources/research/research-faq/>

¹⁶ Space Coast EDC

¹⁷ U.S. Bureau of Economic Analysis

Ecosystem Services not included in TBG Analysis

Some ecosystem services were considered but not included for a variety of reasons.

Nutrient Delivery Ratio (NDR) calculates the balance between nutrient outputs from sources such as fertilizers and outputs that affect ecosystem health and water quality, such as stormwater runoff. The model computes a nutrient mass balance over a watershed, subtracting nutrient losses (conceptually represented by the ability of natural systems to retain and process the nutrients, rather than deliver the nutrients to the water body – the Lagoon), from the total nutrient sources. The NDR modeling was completed, using local factors for runoff coefficients and Event Mean Concentration. An interim output from the model provides kg/hectare/year of Total Nitrogen (TN) and Total Phosphorous (TP) for each area. Extensive modeling of nutrient loads has been completed by SJRWMD, US EPA and others, owing to the Impaired status of the waterways. As reconciling differences in nutrient output geospatially is well beyond the scope of this project, the detailed habitat maps from FWC, including CLC data, were only used for purposes of allocating water quality improvement values in the BCAs, and for overall ecosystem services valuation.

Sediment Delivery Ratio (SDR) or Sediment Retention is the ability of ecosystems, like wetlands or forests, to capture and hold sediments, which is crucial for maintaining soil quality, water clarity, and habitat stability. Sediment delivery in some ecosystems is the primary vehicle for delivery of phosphorous; however, in the IRL, this is arguably less important than direct discharge to the waterways. In any event, it is difficult to segregate monetized values for purposes of this analysis. Coupled with the region's lack of topography, this calculation was determined less informative for IRL ecosystem services and was excluded.

Urban Nature Access refers to the accessibility of natural spaces in urban environments, including parks and greenways, which promote recreational opportunities and enhance quality of life. This model was not recommended, since more suitable values for Florida-specific, nature-based recreation were available.

Urban Flood Mitigation is an ecosystem service that can be estimated by the InVEST flood risk mitigation model. The model estimates the ability of existing natural infrastructure to reduce the production of runoff, slow surface flows, and create spaces for receiving water, through floodplains for example, to reduce the impact of flooding in urban areas. The Flood Mitigation model may be most appropriate in areas where future ecosystem services are expected to be lost, such as in areas of Mims, Titusville in the North, and St. Lucie County in the South, where rapid development is displacing open land. With current conditions, most of the IRL has been heavily developed, and urban flood mitigation is highly engineered.

ECONOMIC IMPACT ANALYSIS

To estimate the overall economic impacts associated with the IRL, The Balmoral Group used IMPLAN®, an econometric modeling application that generates regional economic impact multipliers. The Balmoral Group understands the importance of explaining how economic impact multipliers are selected and applied.

IMPLAN® is an Input-Output model that estimates the flows of supply and demand between and within counties by industry sector, and converts this estimate of cash flows to economic impacts – measured through jobs, revenues, and personal income. An important element of input-output modeling is understanding these flows, and using appropriate data to determine economic impacts.

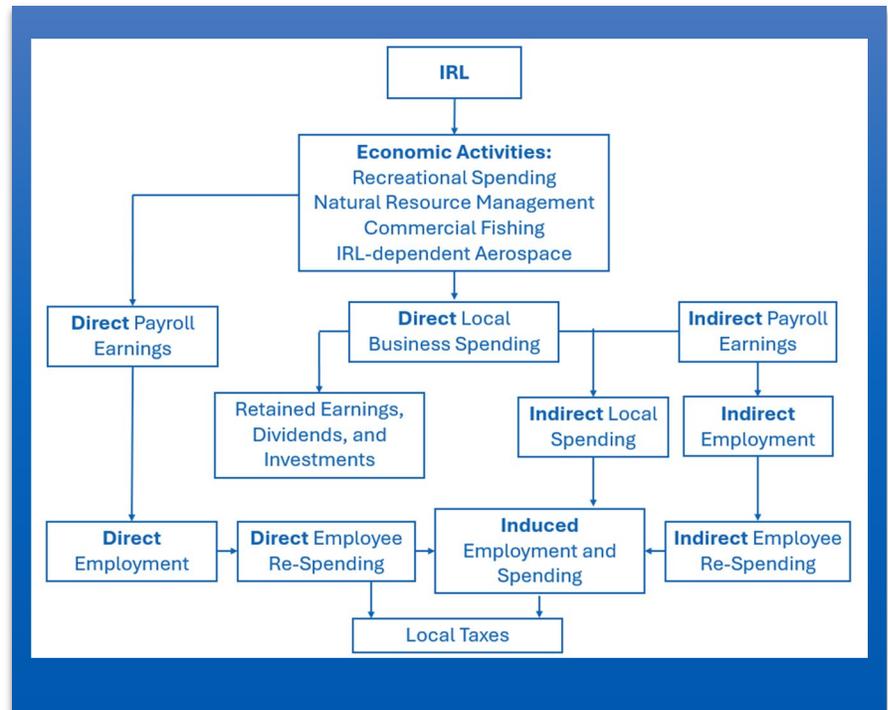
For example, purchases from a boat dealer generate direct and induced impacts within the county where the business is located. Purchases that leave the county, or those made in a different county, do not generate the same impacts. To the extent that purchases are a part of the underlying internal trade flows of a county’s economic activity, the direct spending generates indirect impacts, but does not attract induced impacts. The IMPLAN software calculates the specific margins based on data prepared by the Bureau of Economic Analysis. The spending associated with recreational boaters and tourists, commercial fisheries, natural resource management, and aerospace sectors provide direct inputs for IMPLAN modeling¹⁸.

Figure 27 describes how economic impact models, such as IMPLAN®, translate IRL-driven economic activity into business spending, employment, earnings, and taxes.

Four IMPLAN models were prepared for the baseline analysis:

1. Recreational spending by visitors and residents

Figure 27. Input- Output Model Description - IMPLAN



¹⁸ It should be noted that input values for all IMPLAN models except recreational spending appear to be lower than the 2016 valuation. This is due to methodology; in some cases, more conservative approaches were applied than those used in the 2016 report.

2. Commercial Fishing, which has declined markedly in the past decade
3. Aerospace, which is booming in the IRLNEP, located on the “Space Coast”, and
4. Natural Resource Management, which includes ecologists, scientists, resource managers and others managing projects similar to those in the NOAA grant.

Recreational Spending

As described in the recreational and tourism section, IRL-generated recreational and tourism activity is a major source of economic impact. Spending from recreation creates direct impacts, after “leakage” from sales is deducted. Leakage applies to items such as fuel, for example. The proceeds from a gallon of gas largely leave the local economy, because gasoline is not produced or refined in the area but is brought in from out of the area.

Both residents and visitors contribute to recreational spending that depends on a healthy Lagoon. Visitorship has increased dramatically since the last economic update in 2016; Visit Florida reports 143 million visitors to Florida in 2024, the most recent full year available. The five-county region accounts for approximately 18.4 million visitors.

Using Florida Department of Revenue (FDOR) and Visit Florida data, TBG calculated recreational spending across 14 categories of recreational spending, based on categories used by FDEP in surveys. Spending was estimated for food and beverage, transportation, fees like admission fees, and gear like fishing gear and bait, based on previous studies completed by TBG for FDEP. Details of spending categories, visitors by County, and average spending by category are included in Appendix A.

The results find that for the most recent full year, **recreational spending driven by the Lagoon supports more than 75,000 jobs, \$3 billion in payroll, and \$5.6 billion in Gross State Product (GSP) or value added to the regional economy. Total output from the sector exceeds \$10 billion.**

Table 21 provides total impacts.

Table 21. Total Economic Impacts, Recreational Spending

Recreation	Employment	Labor Income	Value Added	Output
Direct	50,690	\$ 1,939,655,000	\$ 3,365,841,000	\$ 6,412,876,000
Indirect	15,960	\$ 812,930,000	\$ 1,316,945,000	\$ 2,676,242,000
Induced	8,556	\$ 418,236,000	\$ 896,379,000	\$ 1,455,675,000
Total	75,206	\$ 3,170,821,000	\$ 5,579,165,000	\$ 10,544,793,000

Source: TBG work product, VISIT Florida, FDOR

Table 22 and **Table 23** provide results for Visitors and Residents. Further breakdowns by County can be found in Appendix C.

Table 22. Economic Impacts, Recreational Spending by Visitors

Visitors	Employment	Labor Income	Value Added	Output
Direct	47,493	\$1,818,916,000	\$3,153,865,000	\$6,008,611,000
Indirect	14,954	\$761,777,000	\$1,233,999,000	\$2,507,629,000
Induced	8,022	\$392,138,000	\$840,445,000	\$1,364,840,000
Total	70,469	\$2,972,830,000	\$5,228,309,000	\$9,881,080,000
*includes 22% of the value in Volusia, 0 in Palm Beach.				

Table 23. Economic Impacts, Recreational Spending by Residents

Residents	Employment	Labor Income	Value Added	Output
Direct	3,197	\$120,740,000	\$211,977,000	\$404,264,000
Indirect	1,006	\$51,153,000	\$82,946,000	\$168,613,000
Induced	534	\$26,098,000	\$55,934,000	\$90,835,000
Total	4,736	\$197,991,000	\$350,856,000	\$663,713,000
*includes 22% of the value in Volusia, 0 in Palm Beach.				

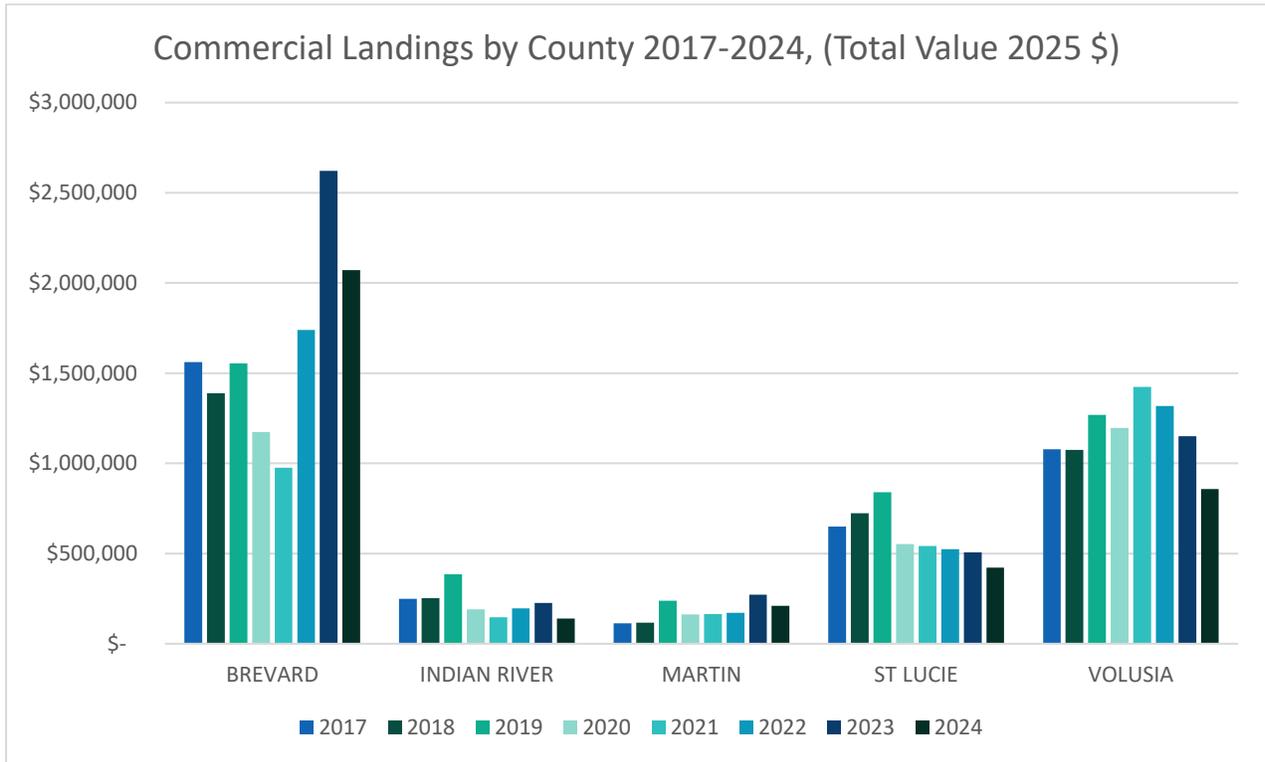
Commercial Fishing

Commercial fisheries impact the economic sector differently than other categories. Dominant commercial harvests in recent times have primarily been in shrimp, blue crab, clams and oysters, and mullet. The decline in fish population counts has shifted most finfish harvest to recreational fishing, and is a prime motivator for much of the restoration work currently contemplated. FWC data provides a breakdown of fish landings by site and species. Screening data to only those fish species resident within the Lagoon (versus offshore), FWC data shows commercial fishing generally declining, although Brevard County showed some recovery in 2023 and 2024. Commercial fishing has declined dramatically throughout the lagoon over the past decade. Declines of U.S. domestic commercial fisheries is a national concern.

FWC Commercial Landings data is limited in identifying species caught in the IRL versus the Atlantic Ocean. Given that nearly 75% of all commercially landed saltwater fish spend part of their lives in the IRL, the economic contribution of the commercial fisheries was conservatively estimated via selected species included in the commercial landings attributable to the lagoon. In 2024, the most recent year of complete data, selected species represented 17% of total landings recorded across the counties in the IRL-region.

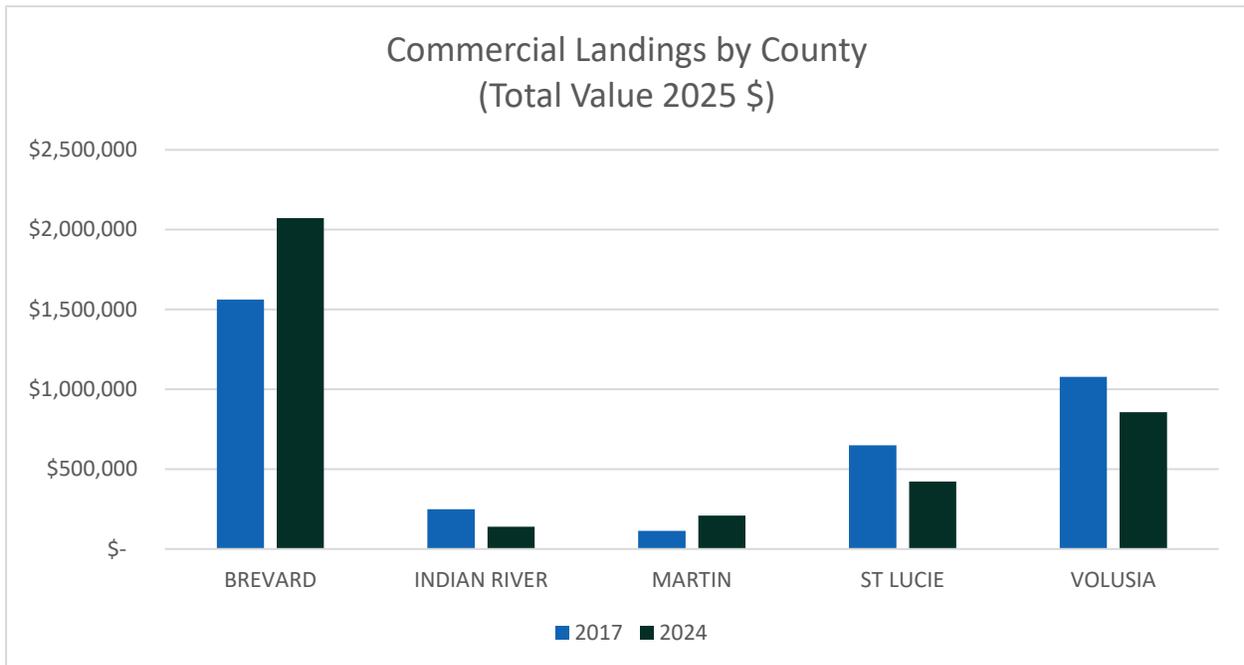
Figure 28 provides a summary of commercial fishing revenues by county, using the most recent data available. Fish landings are reported by location of landing; TBG used landing sites that were not located on the ocean-side, and the results can be considered conservative estimates.

Figure 28. Commercial Landings by County, 2025



Source: FWC

Figure 29. Commercial Landings by County, 2017-2024



Source: FWC

Figure 30 shows the species that were included.

Figure 30. Commercial Landings – Species included in analysis

Catfish	Ladyfish	Mullet
Pompano	Seatrout, Spotted	Sheepshead
Clams	Crab	Oysters

Source: TBG Work Product, FWC data

Total Commercial Fishing Output in the IRL is estimated at just over \$3 million annually in 2025.

This is a dramatic decline from the 2016 estimate of \$37 million. Value added from the effort contributes almost the entire \$4 million to local and regional GDP.

Table 24. Economic Impacts, Commercial Fishing

Commercial Fishing	Employment	Labor Income	Value Added	Output
Direct	29	\$129,500	\$3,015,700	\$3,031,300
Indirect	0	\$21,700	\$30,400	\$62,700
Induced	1	\$25,000	\$53,300	\$85,800
Total	30	\$176,200	\$3,099,400	\$3,179,800

Source: TBG Work Product, IMPLAN

Aerospace Industry

The IRL forms the heart of the Aerospace industry for Florida, and earned its “Space Coast” moniker over decades of history-making pioneers and the workforce behind their legacy¹⁹.

Florida's "Space Coast," located along the Indian River Lagoon (IRL), is a major hub for the aerospace industry. Home to the Kennedy Space Center and Cape Canaveral Space Force Station, the region has evolved from a simple launch site into a global model for successful aerospace operations. Major companies like Boeing, Lockheed Martin, Northrop Grumman, and L3Harris have significant presences there, alongside newer pioneers like Blue Origin and SpaceX. The area's appeal lies in its unique geography, which includes undeveloped open spaces, access to the IRL and Atlantic Ocean, and its proximity to the equator—all crucial for rocket launches. The Lagoon offers a high quality of life, which is a key factor for recruiting and retaining top talent in the industry.

The location of real estate, transportation capability, and the ability to launch rockets are paramount considerations for these companies. This has been the case since the 1950's, when the defense and aerospace industry began scouting ideal locations in the United States where space exploration operations could be best established. Aerospace industry representatives, the national space program, and the military were especially attracted to the northern IRL region for its undeveloped open spaces, location abutting wide-water bodies of the IRL and Atlantic Ocean, and its close proximity to the equator²⁰.

Spending driven by this sector tops \$10.2 billion annually, and supports more than 50,000 jobs, generating \$15 billion total output and \$8.1billion in Value Added. Table 25 provides summarizes the economic impacts from this sector.

Table 25. Economic Impacts, Aerospace Sector

	Employment	Labor Income	Value Added	Output
Direct	19,806	\$3,117,173,000	\$4,970,155,000	\$10,297,783,000
Indirect	16,657	\$1,150,696,000	\$1,606,033,000	\$2,966,650,000
Induced	14,216	\$715,047,000	\$1,527,000,000	\$2,445,110,000
Total	50,679	\$4,982,917,000	\$8,103,188,000	\$15,709,543,000

Source: TBG work product, IMPLAN, QCEW data

¹⁹ Space Coast EDC, Industry Profile

²⁰ From

Natural Resource Management

Natural Resource Managers support the ongoing health of the Lagoon. Through oversight of restoration projects, monitoring of Lagoon water quality, vegetation, habitat, and weather events, ecologists, scientists and technical professionals provide a broad range of services that generate economic activity. As with many environmental activities, our knowledge in 2025 of the impacts of our human activities is very different than 50 or 70 years ago, when many of the decisions were made that altered natural resources and hydrology. Much of the current work of this sector, in IRL and throughout Florida, is focused on restoring or countering decades of past environmental impairment. **Figure 31** provides a photo of the IRL shoreline, pre-development, showing an example of the stark difference in natural processes from what is intact in 2025.

The Natural Resource Management sectors drive a supply chain more related to research and scientific efforts than activities like recreation or fishing, and therefore different categories of spending.

Figure 31. Photo, IRL Shoreline, Circa 1843-1942



Source: William Henry Jackson, provided by IRLNEP

Budget and spending data was obtained from IRLNEP, Brevard County’s Save Our Indian River Lagoon (SOIRL) program, Indian River Lagoon Protection Program (IRLPP) data, and other state and federal grants. **Estimated annual spending of approximately \$118 million was identified and used as input.**

Table 26 provides the results, showing that **450 funded positions produce almost 600 additional jobs, and add about \$1.00 in additional GDP (Value Added) for every dollar funded.**

Table 26. Economic Impacts, Natural Resource Management

IRL Activities	Employment	Labor Income	Value Added	Output
Direct	449	\$42,459,000	\$54,945,000	\$118,616,000
Indirect	390	\$24,810,000	\$36,219,000	\$68,510,000
Induced	202	\$10,021,000	\$21,289,000	\$34,464,000
Total	1,041	\$77,289,000	\$112,454,000	\$221,589,000

Source: TBG work product, using IMPLAN, FDOR, QCEW, SOIRL, IRLPP, IRLNEP data

Boat Building and Services

The Lagoon provides an ideal setting for boat building and major servicing operations, given proximity to, but protection from, ocean waters. From an economic impact perspective, boat building relies on and generates a supply chain that is separate and distinct from that of recreational boaters. Recreational boaters can purchase their boats anywhere, from any manufacturer, regardless of the manufacturer’s location. Boat builders, on the other hand, rely on local workforces, logistics and transport to provide the goods and services needed for a manufacturing, or in some cases heavy servicing, operation that is outside the processes that would be at a common marina. In many cases, local residents may be unaware of the boat building operations are in their community.

Figure 32. Major Boat Servicing Operation



Source: Photo Credit, Safe Harbor Yachts

In the case of IRL, four of the seven counties house substantial boat building operations that specifically impact the Lagoon. **Table 27** provides a summary of the boat building sectors present in the counties bordering the IRL. Not all activities in each county can be attributed to the IRL, as some are coastal activities dependent only on ocean access. TBG separated data in each county to ensure that only IRL-dependent activities were included in economic impact estimates.

Table 27. Specialty Sectors by County

County	Yachts, Boat Building, Servicing, etc.
Volusia	X
Brevard	X
Indian River	X
St. Lucie	X
Okeechobee	
Palm Beach	X
Martin	X

Source: TBG work product, FWC, FDOR, QCEW

Economic impact analysis finds that this sector supports almost 1,500 jobs and adds about \$165 million in GDP (Value Added) to the local economy; see **Table 28**. These jobs tend to be stable positions, paying more than the average wage. Payroll data support average earnings of about \$88,000 supported by this sector.

Table 28. Economic Impacts, Boat Building & Services

Sales	Employment	Labor Income	Value Added	Output
Direct	715	\$63,313,000	\$79,449,000	\$277,831,000
Indirect	455	\$33,831,000	\$56,467,000	\$105,710,000
Induced	275	\$13,940,000	\$29,602,000	\$47,662,000
Total	1,445	\$111,084,000	\$165,519,000	\$431,202,000

Source: TBG work product, IMPLAN, using data from FDEP, QCEW, FDOR

Tax Revenues

IRL-driven economic activity generates substantial tax revenues for local, state and federal governments. **Table 29** provides estimated local, state, and federal tax revenues generated by the Lagoon counties.

Table 29. Tax Revenues Generated by IRL Counties

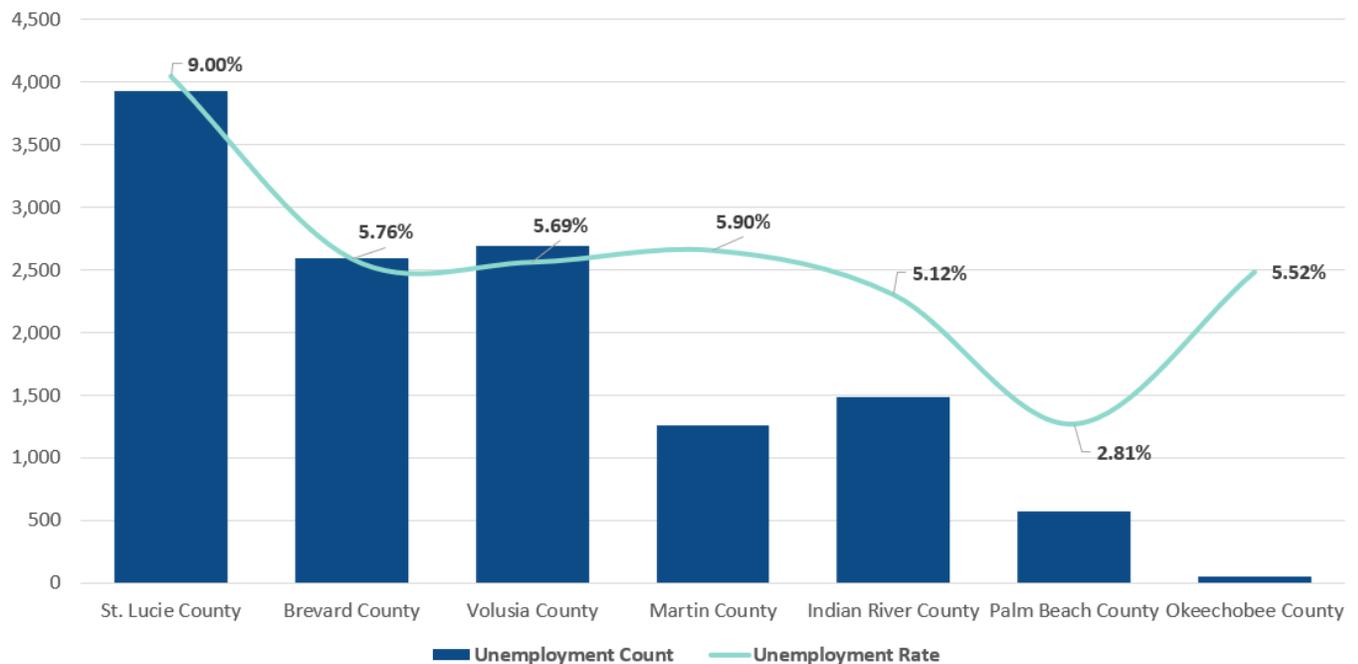
County	Local	State	Federal	Total
Volusia	\$25,481,000	\$28,439,000	\$67,888,000	\$121,808,000
Brevard	\$296,705,000	\$340,440,000	\$1,587,925,000	\$2,225,069,000
Indian River	\$37,164,000	\$36,149,000	\$95,910,000	\$169,224,000
St. Lucie	\$82,685,000	\$61,345,000	\$168,572,000	\$312,602,000
Martin	\$65,864,000	\$58,631,000	\$175,950,000	\$300,445,000
Okeechobee	\$88,000	\$86,000	\$392,000	\$566,000
Palm Beach	\$60,000	\$34,522,000	\$320,173,000	\$354,755,000
Total	\$508,047,000	\$559,612,000	\$2,416,810,000	\$3,484,468,000

Source: TBG work product.

PRIORITY COMMUNITIES

As noted in the socioeconomic profile, unemployment rates vary widely across the priority communities identified within each County. National and Florida unemployment rates as of July 2025, the most recent data available, are 4.2% and 3.7% respectively. The rates across IRL priority communities are substantially higher, with the exception of Palm Beach County. As such, jobs created within priority communities are considered a benefit of each project, where applicable, and able to be credibly estimated, if the unemployment rate is currently higher than state averages. To the extent that unemployment rates are not higher than average, the job would be considered a transfer, meaning a worker currently in another job would simply switch jobs, resulting in no net new jobs. **Figure 33** provides a snapshot of unemployment rates for each IRL priority community by County.

Figure 33. Unemployment Rates and Counts for Priority Community by County



Source: IRL NEP, U.S. EPA

Based on the data collected for the BCAs, TBG estimates that 18.3 jobs are reasonably estimated to be created. Their distribution across counties is shown in **Table 30**, along with average wage rates, for purposes of estimating economic impacts. In addition, the length or duration of the employment is estimated based on discussion with the project P.I.s, which is used to calibrate the economic impact.

Table 30. Jobs Analysis, Priority Communities

County	No. Jobs created/ Permanent or FTE equivalent	County average weekly wage rate	Net new wages (annualized)
St. Lucie	1.4	\$1,054	\$79,050
Brevard	2.8	\$1,327	\$191,619
Volusia	6.5	\$1,068	\$360,450
Indian River	7.6	\$1,180	\$465,953
Total	18.3		\$1,097,071

Source: TBG Work Product, Census, BLS,

Accordingly, the benefits to Priority Communities can be estimated. At a minimum, the wages created offer new economic opportunity.

SUMMARY

The IRL provides important economic and ecosystem value to the region and state. The valuation finds that direct spending by economic activities that depend on the Lagoon, ecosystem services provided by the Lagoon’s remaining natural areas, and specialty sectors all contribute to the total economic value of the IRL.

Economic Impact

Traditional economic impact analysis finds that direct spending across key sectors, including recreation, boating, and real estate, contribute over \$26 billion annually to the local and regional economies. **Table 31** provides a breakdown by sector and **Table 32** provides a breakdown by county.

Table 31. Economic Impacts by Sector

Impact Type	Employment	Labor Income	Value Added	Output
Recreation	75,206	\$3,171	\$5,579	\$10,545
Natural Resource Management	1,041	\$77	\$112	\$222
Specialized Sectors	52,154	\$5,094	\$8,272	\$16,144
Property Value Impacts, Annualized*				\$1,377
Total Annual Impacts	128,400	\$8,342	\$13,963	\$28,288

Table 32. Economic Impacts by County and Type

	Employment	Value Added	Output	Annual Property	Total
Volusia	6,297	\$459.2 M	\$879.6 M	\$73.8 M	\$953.4 M
Brevard	81,115	\$10.2 B	\$19.7 B	\$369.4 M	\$20 B
Indian River	8,604	\$692.1 M	\$1.3 B	\$186.5 M	\$1.5 B
St. Lucie	17,006	\$1.2 B	\$2.3 B	\$92.5 M	\$2.4 B
Martin	15,348	\$1.4 B	\$2.8 B	\$350.3 M	\$3.1 B
Okeechobee	14	\$1.1 M	\$3.1 M	N/A	\$3.1 M
Palm Beach	17	\$2.2 M	\$4 M	\$304.9 M	\$308.9 M
Totals	128,400	\$14 B	\$26.9 B	\$1.4 B	\$28.3 B

Source: TBG work product.

Combined, these sectors add \$14 billion in Value Added Gross Domestic Product (GDP) to the local, regional and state economy, supporting more than 128,000 jobs annually. Importantly, the average wage is higher than other regions of Florida, meaning that each additional job contributes greater GDP than a typical Florida job. These activities, in turn generate substantial tax revenues, shown in **Table 33** by county and **Table 34** by sector.

Table 33. Tax Revenues Generated by IRL Economic impacts

County	Local	State	Federal	Total
Volusia	\$25.5 M	\$28.4 M	\$67.9 M	\$121.8 M
Brevard	\$296.7 M	\$340.4 M	\$1.59 B	\$2.23 B
Indian River	\$37.2 M	\$36.1 M	\$95.9 M	\$169.2 M
St. Lucie	\$82.7 M	\$61.3 M	\$168.6 M	\$312.6 M
Martin	\$65.9 M	\$58.6 M	\$175.9 M	\$300.4 M
Okeechobee	\$0.1 M	\$0.1 M	\$0.4 M	\$0.6 M
Palm Beach	\$0.1 M	\$34.5 M	\$320.2 M	\$354.8 M
Total	\$508 M	\$559.6 M	\$2.42 B	\$3.48 B

Source: TBG Work Product.

Table 34. Tax Revenues by Sector

Impact Type	State & Local	Federal	Total
	(In millions \$)		
Recreation	\$639	\$791	\$1,430
Natural Resource Management	\$7	\$19	\$25
Commercial Fishing	\$0	\$0	\$0
Boat Dealers	\$12	\$24	\$36
Aerospace	\$410	\$1,583	\$1,992
Total Annual Impacts	\$1,068	\$2,417	\$3,484

Source: TBG Work Product.

Ecosystem Services

Ecosystem services provided by the Lagoon, over and above the direct spending generated from Lagoon-related activities, provides an additional \$10 billion annually. A breakdown of ecosystem services, which are mutually exclusive and able to be added, is provided in **Table 35**.

Table 35. Ecosystem Services Summary

Ecosystem Services	2025 Economic Value (\$ per year)
Water Quality	\$529,860,000
Coastal Protection	\$250,291,000
Habitat Quality	\$1,000,917,000
Urban Flood Risk Mitigation	\$486,559,000
Commercial Fishing	\$3,700,000
Recreational Fishing, Boating and Shoreline Activity	\$6,792,750,300
Aesthetic Values – Property Value Premiums	\$1,295,000,000
Total Ecosystem Services	\$10,355,377,300

Source: TBG work product, InVEST, FDOR, FWC, FDEP

Project Benefits

The NOAA restoration projects are expected to further enhance the ecosystem services provided by the Lagoon. The analysis finds that additional ecosystem services values of \$104 million are projected from successful completion of the projects.

Benefit-Cost Analysis finds that benefits outweigh costs by a factor of approximately 24:1. This is a high number, driven largely by the MINWR and Bee Gum projects, which will restore areas dramatically altered for mosquito impoundments decades ago. Renewing fish passageways and improving hydrologic connectivity, seagrass migration capacity, and general lagoon habitat circulation will provide massive benefits from these transformational projects. **Average benefit cost ratios (BCRs) excluding these two projects are 10.5:1.**

Project progress will be monitored for the life of the grant, for tracking actual outcomes against projections. The results will provide real-time checking of expectations, and lay a foundation for continued investments in the Lagoon for decades to come. The NOAA restoration projects are expected to further enhance the ecosystem services provided by the lagoon. In addition, the habitat restoration community of practice that the IRLNEP has supported with NOAA grant funds, represents the emergence of a diverse community of public agencies, academic institutions, non-profit organizations, and industry practitioners that represent a significant ecosystem restoration workforce that contribute to Florida’s ocean, coastal, and innovation economy.

DATA COLLECTION

In Phase 1 of the project, key data points were identified for tracking throughout the life of the NOAA project. During Phase 2, the data was collected from organizations working on the projects and from published data. In addition, ecosystem services benefit measures were identified and associated data needs were collected in Phase 2.

Table 36 provides a summary of the status of each Socioeconomic Performance Metric.

Table 36. Socioeconomic Performance Metrics

Metric	Relevance & Monitoring	Status
Job creation	Several projects anticipate job creation as part of the benefits; both number of jobs and wage improvements will be tracked.	Updated jobs projections collected for each project; will be used for monitoring.
Educational opportunities	Several projects expect to incorporate student learning opportunities; number of student opportunities will be tracked.	Updated student projections collected for each project; will be used for monitoring.
Public values for ecosystem improvements	All projects anticipate improved ecosystems, with services ranging from improved water quality to coastal resilience including protection from erosion and storm surges.	Data collected for baseline ecosystem services; included herein.
Property impacts	Improved lagoon conditions can positively impact property values, which will be tracked.	Baseline property value premiums assessed and included herein.
Priority community impacts	Several projects describe specific efforts geared toward benefits for priority communities; each will be tracked.	Updated projections of priority community impacts collected for each project; will be used for monitoring.

Source: TBG Work Product

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APPENDIX A – MODEL PARAMETERS FOR INVEST

Coastal Vulnerability

Table 37 summarizes the model parameters for the InVEST Coastal Vulnerability model.

Table 37. InVEST Coastal Vulnerability Model Parameters

InVEST Model	Parameter	Format
Coastal Vulnerability	Area of Interest	Vector (polygon)
Coastal Vulnerability	Model Resolution - 10m	number (meters)
Coastal Vulnerability	Landmasses	Vector
Coastal Vulnerability	Bathymetry	Raster
Coastal Vulnerability	Maximum Fetch Distance - 10,000m	number (meters)
Coastal Vulnerability	Habitats Table	CSV

Habitat Quality

Table 38 summarizes the crosswalk for Land Use/Land Cover, FEGN/FNAI and FEMA Ecosystem Services values. This crosswalk was used to estimate ecosystem services relating to habitat quality for both ecosystem valuation and for BCA allocation purposes.

Table 38. Crosswalk of Land Use/Land Cover/FEGN to FEMA Ecosystem Categories

NAME_SITE	NAME_STATE	FREQUENCY	FEMA categories
Abandoned Mining Lands	Extractive	2	
Alluvial Forest	Freshwater Forested Wetlands	258	Riparian
Alluvial Stream	Alluvial Stream	121	Riparian
Aquacultural Ponds	Cultural-Lacustrine	383	
Artificial Impoundment - Reservoir	Cultural-Lacustrine	74215	
Artificial/Farm Pond	Cultural-Lacustrine	5293	
Atlantic White Cedar	Other Coniferous Wetlands	19	Inland Wetland
Australian Pine	Exotic Plants	874	
Ballfields	Low Intensity Urban	419	Urban Green Open Space
Bare Soil	Barren, Sinkhole, and Outcrop Communities	123	Rural Green Open Space
Bare Soil/Clear Cut	Bare Soil/Clear Cut	2201	
Basin Marsh	Isolated Freshwater Marsh	3873	Inland Wetland
Basin Swamp	Basin Swamp	6871	Inland Wetland
Bay Swamp	Baygall	2412	Coastal Wetland
Baygall	Baygall	3048	Inland Wetland
Beach Dune	Coastal Uplands	795	Beaches and Dunes

Blackwater Stream	Alluvial Stream	420	Riparian
Bottomland Forest	Freshwater Forested Wetlands	1574	Inland Wetland
Brazilian Pepper	Exotic Plants	1733	
Buttonwood Forest	Mangrove Swamp	2	Inland Wetland
Cabbage Palm	Mesic Hammock	1237	Forest
Cabbage Palm Flatwoods	Wet Flatwoods	34	Forest
Cabbage Palm Hammock	Hydric Hammock	1016	Forest
Canal	Cultural-Riverine	5184	Riparian
Cemeteries	Low Intensity Urban	2066	Urban Green Open Space
Citrus	Orchards/Groves	3886	
Clastic Upland Lake	Natural Lakes and Ponds	105	Inland Wetland
Clearcut Wetland	Cultural-Palustrine	21	Inland Wetland
Coastal Berm	Coastal Uplands	219	
Coastal Dune Lake	Natural Lakes and Ponds	61	Coastal Wetland
Coastal Grassland	Coastal Uplands	212	Beaches and Dunes
Coastal Hydric Hammock	Hydric Hammock	229	Coastal Wetland
Coastal Interdunal Swale	Marshes	500	Coastal Wetland
Coastal Rockland Lake	Natural Lakes and Ponds	57	Coastal Wetland
Coastal Scrub	Coastal Scrub	1423	Beaches and Dunes
Coastal Strand	Coastal Strand	336	Beaches and Dunes
Coastal Uplands	Coastal Uplands	217	Beaches and Dunes
Commercial and Services	High Intensity Urban	64176	
Communication	Communication	1484	
Community rec. facilities	Low Intensity Urban	2104	Urban Green Open Space
Coniferous Plantations	Tree Plantations	89449	Forest
Cultural - Estuarine	Cultural-Estuarine	350	Coastal Wetland
Cultural - Lacustrine	Cultural-Lacustrine	4819	Inland Wetland
Cultural - Palustrine	Cultural-Palustrine	88	Inland Wetland
Cultural - Riverine	Cultural-Riverine	158	Riparian
Cultural - Terrestrial	Cultural - Terrestrial	793	
Cutthroat Grass Flatwoods	Wet Flatwoods	106	Inland Wetland
Cutthroat Seep	Prairies and Bogs	129	Inland Wetland
Cypress	Cypress	51600	Forest
Cypress/Hardwood Swamps	Freshwater Forested Wetlands	139	Inland Wetland
Cypress/Pine/Cabbage Palm	Freshwater Forested Wetlands	2002	Inland Wetland
Cypress/Tupelo (including mixed Cypress/Tupelo)	Cypress/Tupelo (including mixed Cypress/Tupelo)	2809	Forest
Depression Marsh	Isolated Freshwater Marsh	22460	Inland Wetland
Ditch/Artificial Intermittent Stream	Cultural-Riverine	384	Riparian

Dome Swamp	Dome Swamp	13918	Inland Wetland
Dry Flatwoods	Dry Flatwoods	106	Forest
Dry Prairie	Dry Prairie	2201	Rural Green Open Space
Dry Upland Hardwood Forest	Upland Hardwood Forest	10	Forest
Duck Weed	Freshwater Non-Forested Wetlands	2	Inland Wetland
Estuarine	Estuarine	10581	Coastal Wetland
Estuarine Artificial Impoundment	Cultural-Estuarine	190	Coastal Wetland
Estuarine Ditch/Channel	Cultural-Estuarine	1919	Riparian
Exotic Plants	Exotic Plants	1228	
Exotic Wetland Hardwoods	Exotic Plants	947	
Exposed Limestone	Estuarine	1	
Exposed Rock	Barren, Sinkhole, and Outcrop Communities	1	
Extractive	Extractive	3315	
Fallow Cropland	Cropland/Pasture	1817	Rural Green Open Space
Fallow Orchards	Orchards/Groves	800	Rural Green Open Space
Feeding Operations	Other Agriculture	800	
Field Crops	Cropland/Pasture	13882	Rural Green Open Space
Flatwoods/Prairie/Marsh Lake	Natural Lakes and Ponds	768	Inland Wetland
Floating/Emergent Aquatic Vegetation	Freshwater Non-Forested Wetlands	15283	Inland Wetland
Floodplain Marsh	Floodplain Marsh	1354	Inland Wetland
Floodplain Swamp	Floodplain Swamp	3739	Inland Wetland
Floriculture	Vineyard and Nurseries	4	Rural Green Open Space
Freshwater Tidal Marsh	Floodplain Marsh	16	Inland Wetland
Freshwater Tidal Swamp	Floodplain Swamp	19	Inland Wetland
Fruit Orchards	Orchards/Groves	13	Forest
Glades Marsh	Marshes	5361	Inland Wetland
Golf courses	Low Intensity Urban	6863	Urban Green Open Space
Grass	Low Intensity Urban	999	Urban Green Open Space
Grazed Wetlands	Cultural-Palustrine	881	Inland Wetland
Gum Pond	Dome Swamp	1369	Inland Wetland
Hardwood Plantations	Tree Plantations	4	Forest
High Intensity Urban	High Intensity Urban	3450	
Highway Rights of Way	Cultural - Terrestrial	422	
Hydric Hammock	Hydric Hammock	5313	Inland Wetland
Hydric Pine Flatwoods	Wet Flatwoods	37750	Inland Wetland
Hydric Pine Savanna	Wet Flatwoods	35	Inland Wetland
Impounded Marsh	Cultural-Palustrine	190	Inland Wetland
Impounded Swamp	Cultural-Palustrine	8	Inland Wetland

Improved Pasture	Improved Pasture	44177	Rural Green Open Space
Industrial	High Intensity Urban	7190	
Industrial Cooling Pond	Cultural-Lacustrine	609	
Institutional	High Intensity Urban	19511	
Intertidal	Estuarine	13	Coastal Wetland
Irrigated Field Crops	Sugarcane	296	
Irrigated Row Crops	Cropland/Pasture	2385	
Isolated Freshwater Marsh	Isolated Freshwater Marsh	15116	Inland Wetland
Isolated Freshwater Swamp	Isolated Freshwater Swamp	11368	Inland Wetland
Keys Cactus Barren	Barren, Sinkhole, and Outcrop Communities	2	
Keys Tidal Rock Barren	Keys Tidal Rock Barren	835	Coastal Wetland
Lacustrine	Lacustrine	5173	Inland Wetland
Limestone Outcrop	Barren, Sinkhole, and Outcrop Communities	6	
Limnetic	Natural Lakes and Ponds	6	Inland Wetland
Littoral	Natural Lakes and Ponds	1	Inland Wetland
Live Oak	Mesic Hammock	1145	Forest
Low Intensity Urban	Low Intensity Urban	4296	
Maidencane	Marshes	1	Inland Wetland
Major Springs	Alluvial Stream	41	Riparian
Mangrove Swamp	Mangrove Swamp	17120	Coastal Wetland
Marine	Marine	123	
Maritime Hammock	Maritime Hammock	2498	Coastal Wetland
Marl Prairie	Prairies and Bogs	488	Inland Wetland
Marshes	Marshes	81952	Inland Wetland
Melaleuca	Exotic Plants	607	
Mesic Flatwoods	Mesic Flatwoods	52318	Forest
Mesic Hammock	Mesic Hammock	5601	Forest
Mixed Hardwood-Coniferous	Mixed Hardwood-Coniferous	80315	Forest
Mixed Hardwood-Coniferous Swamps	Freshwater Forested Wetlands	92763	Forest
Mixed Hardwoods	Upland Hardwood Forest	36	Forest
Mixed Scrub-Shrub Wetland	Prairies and Bogs	91184	Inland Wetland
Mixed Wetland Hardwoods	Freshwater Forested Wetlands	58752	Inland Wetland
Mowed Grass	Cultural - Terrestrial	812	Urban Green Open Space
Mud	Tidal Flat	7	Coastal Wetland
Natural Lakes and Ponds	Natural Lakes and Ponds	3764	Inland Wetland

Natural Rivers and Streams	Alluvial Stream	970	Inland Wetland
Non-vegetated	Estuarine	66	Coastal Wetland
Non-vegetated Wetland	Non-vegetated Wetland	1542	Inland Wetland
Oak - Cabbage Palm Forests	Rural	764	Forest
Oak Scrub	Scrub	135	Forest
Oil & Gas Fields	Extractive	129	
Orchards/Groves	Orchards/Groves	4921	Forest
Ornamentals	Vineyard and Nurseries	2899	
Other Agriculture	Other Agriculture	535	Rural Green Open Space
Other Coniferous Wetlands	Other Coniferous Wetlands	1699	Inland Wetland
Other Hardwood Wetlands	Other Hardwood Wetlands	1573	Inland Wetland
Other Open Lands - Rural	Cropland/Pasture	153	Rural Green Open Space
Other Shrubs and Brush	Shrub and Brushland	7	Rural Green Open Space
Oyster Bar	Estuarine	22891	Shellfish Reefs
Palmetto Prairie	Palmetto Prairie	1301	Forest
Parks and Zoos	Low Intensity Urban	3531	Urban Green Open Space
Pecan	Orchards/Groves	389	Forest
Pine - Mesic Oak	Mesic Hammock	110	Forest
Pine Rockland	Pine Rockland	630	Forest
Pond Pine	Other Coniferous Wetlands	94	Inland Wetland
Prairie Hydric Hammock	Hydric Hammock	3705	Forest
Prairie Mesic Hammock	Mesic Hammock	254	Forest
Quarry Pond	Cultural-Lacustrine	1173	Inland Wetland
Rails	Transportation	22	
Reclaimed Lands	Extractive	42	
Residential, High Density > 5 Dwelling Units/AC	High Intensity Urban	104881	
Residential, Low Density	Low Intensity Urban	90023	
Residential, Med. Density - 2-5 Dwelling Units/AC	High Intensity Urban	188434	
River Floodplain Lake/Swamp Lake	Natural Lakes and Ponds	175	Riparian
Riverine	Riverine	1680	Riparian
Riverine Sandbar	Alluvial Stream	198	Riparian
Roads	Transportation	87	
Rock Quarries	Extractive	192	
Rockland Hammock	Rockland Hammock	2086	Forest
Rosemary Scrub	Scrub	1	Forest
Row Crops	Cropland/Pasture	6741	

Rural Open	Rural	93578	Rural Green Open Space
Rural Open Forested	Rural	6326	Rural Green Open Space
Rural Open Pine	Rural	1139	Rural Green Open Space
Rural Structures	Rural	45876	
Salt Flat	Salt Marsh	95	Coastal Wetland
Salt Marsh	Salt Marsh	26044	Coastal Wetland
Sand	Tidal Flat	7	Beaches and Dunes
Sand and Gravel Pits	Extractive	564	
Sand Beach (Dry)	Sand Beach (Dry)	929	Beaches and Dunes
Sand Pine Scrub	Sand Pine Scrub	1411	Forest
Sandhill	Sandhill	21412	Forest
Sandhill Lake	Natural Lakes and Ponds	431	Inland Wetland
Sawgrass	Marshes	2428	Inland Wetland
Scrub	Scrub	8664	Rural Green Open Space
Scrub Mangrove	Scrub Mangrove	222	Coastal Wetland
Scrubby Flatwoods	Scrubby Flatwoods	7305	Rural Green Open Space
Seepage Slope	Prairies and Bogs	777	Inland Wetland
Seepage Stream	Alluvial Stream	71	Riparian
Sewage Treatment Pond	Cultural-Lacustrine	563	
Shell Mound	Coastal Uplands	62	
Shrub and Brushland	Shrub and Brushland	23275	Rural Green Open Space
Shrub Bog	Prairies and Bogs	1600	Inland Wetland
Sinkhole	Barren, Sinkhole, and Outcrop Communities	120	
Sinkhole Lake	Natural Lakes and Ponds	56	Inland Wetland
Slope Forest	Slope Forest	52	Forest
Slough	Freshwater Non-Forested Wetlands	213	Inland Wetland
Slough Marsh	Marshes	142	Inland Wetland
Sod Farms	Vineyard and Nurseries	204	Rural Green Open Space
Solar Farms	Utilities	1194	
South Florida Bayhead	Baygall	3639	Inland Wetland
Specialty Farms	Other Agriculture	3606	Rural Green Open Space
Spoil Area	Extractive	401	
Spring-run Stream	Alluvial Stream	55	Riparian
Stormwater Treatment Areas	Cultural-Lacustrine	7589	Inland Wetland
Strand Swamp	Strand Swamp	1559	Inland Wetland
Strip Mines	Extractive	76	
Submergent Aquatic Vegetation	Freshwater Non-Forested Wetlands	25	Coastal Wetland
Subtidal	Estuarine	5	Coastal Wetland
Successional Hardwood Forest	Mixed Hardwood-Coniferous	3723	Forest

Surf Zone	Marine	10	Coastal Wetland
Thorn Scrub	Rockland Hammock	3	Rural Green Open Space
Tidal Flat	Tidal Flat	2599	Beaches and Dunes
Tidally-influenced Stream	Alluvial Stream	118	Riparian
Titi Swamp	Other Hardwood Wetlands	580	Inland Wetland
Transportation	Transportation	11188	
Tree Nurseries	Vineyard and Nurseries	1594	
Tupelo	Cypress/Tupelo (including mixed Cypress/Tupelo)	18	Forest
Unconsolidated Substrate	Unconsolidated substrate	1016	
Unimproved/Woodland Pasture	Rural	31141	Rural Green Open Space
Upland Coniferous	High Pine and Scrub	15750	Forest
Upland Glade	Upland Glade	33	Forest
Upland Hardwood Forest	Upland Hardwood Forest	18371	Forest
Upland Mixed Woodland	High Pine and Scrub	163	Forest
Upland Pine	Upland Pine	2509	Forest
Urban Open Forested	Low Intensity Urban	5940	Urban Green Open Space
Urban Open Land	Low Intensity Urban	25177	Urban Green Open Space
Urban Open Pine	Low Intensity Urban	720	Urban Green Open Space
Utilities	Utilities	12227	
Vegetative Berm	Cultural - Terrestrial	169	
Vineyard and Nurseries	Vineyard and Nurseries	1010	Rural Green Open Space
Vineyards	Vineyard and Nurseries	3	Rural Green Open Space
Water Lettuce	Freshwater Non-Forested Wetlands	1	Inland Wetland
Water Lily	Freshwater Non-Forested Wetlands	21	Inland Wetland
Wet Coniferous Plantations	Tree Plantations	20508	Forest
Wet Flatwoods	Wet Flatwoods	16660	Inland Wetland
Wet Prairie	Prairies and Bogs	49075	Inland Wetland
Wiregrass Savanna	Prairies and Bogs	246	Inland Wetland
Xeric Hammock	Xeric Hammock	1779	Forest

Source: TBG Work Product, FLUCCS, FEGN/FNAI data

Scenic or Aesthetic Quality

Proximity premiums were assessed for properties within 1,500 meters of the IRL shoreline, based on most recent data available. For context, **Table 39** shows total Just Value, per Department of Revenue data as of July 2025, for each County – meaning all properties in the County, not just those with proximity to the IRL.

Table 39. Total Just Value by County, July 2025

County	2025
Brevard	\$127,205,883,600
Indian River	\$50,699,830,900
Martin	\$61,733,376,900
Okeechobee	\$10,959,622,800
Palm Beach	\$528,779,763,500
Saint Lucie	\$74,419,809,900
Volusia	\$108,502,451,400
Total	\$962,300,739,000

Source: Florida Department of Revenue

Table 40 summarizes hedonic modeling results by county, at various distances to IRL. Annualized, these values contribute nearly \$23 billion to local economic activity.

Table 40. Hedonic Modeling Results by County

County	Amenity Value in Millions of Dollars							Total
	Waterfront	100m (Non-waterfront)	250m	500m	1,000m	1,500m	Canal front	
Brevard	\$3,582	\$111	\$251	\$324	\$255	\$66	\$1,568	\$6,156
Indian River	\$1,625	\$176	\$215	\$351	\$424	\$38	\$278	\$3,108
Martin	\$3,069	\$208	\$675	\$832	\$388	\$60	\$606	\$5,838
Palm Beach	\$1,015	\$510	\$706	\$412	\$535	\$180	\$1,723	\$5,082
St. Lucie	\$577	\$102	\$255	\$320	\$231	\$56	\$0	\$1,541
Volusia	\$443	\$36	\$167	\$362	\$217	\$5	\$0	\$1,230
Total	\$10,312	\$1,143	\$2,268	\$2,601	\$2,049	\$405	\$4,177	\$22,956

Source: TBG Work product, based on data from FDOR, U.S. Census Bureau, County Property Appraisers, ESRI

Recreation & Tourism

Economic values for recreational and tourism spending (**Table 41**) driven by the IRL are estimated by spending category from original research conducted by The Balmoral Group in the IRL. The detailed analysis by spending category is provided in the Appendix.

Table 41. Estimated spending

	Residents	Visitors
Food & Beverages	\$546	\$705
Transportation & Accommodation	\$569	\$776
Fees & Recurring Costs	\$331	\$559
Gear & Other	\$302	\$363
Total	\$1,747	\$2,403

Source: TBG work product, from 2023 surveys²¹

²¹ The Balmoral Group, 2023. Economic Analysis of the Sebastian Inlet District. The Balmoral Group, Winter Park, FL.

APPENDIX B

IMPLAN results by County

Table 42. Brevard County Economic Impacts, Recreation

Impact	Employment	Labor Income	Value Added	Output
1 - Direct	20,761	\$816,988,351	\$1,369,227,990	\$2,588,294,272
2 - Indirect	5,618	\$288,473,033	\$464,286,191	\$937,221,794
3 - Induced	3,733	\$187,139,945	\$400,239,197	\$641,198,623
Total	30,111	\$1,292,601,329	\$2,233,753,379	\$4,166,714,689

Table 43. Martin County Economic Impacts, Recreation

Impact	Employment	Labor Income	Value Added	Output
1 - Direct	7,302	\$287,403,771	\$503,460,717	\$959,809,964
2 - Indirect	2,600	\$156,069,837	\$248,165,671	\$481,302,224
3 - Induced	1,168	\$59,559,395	\$126,366,283	\$203,520,923
Total	11,071	\$503,033,003	\$877,992,671	\$1,644,633,111

Table 44. St. Lucie County Economic Impacts, Recreation

Impact	Employment	Labor Income	Value Added	Output
1 - Direct	10,176	\$349,928,758	\$624,076,240	\$1,250,800,467
2 - Indirect	3,841	\$172,990,393	\$286,250,238	\$610,669,823
3 - Induced	1,639	\$71,777,373	\$162,188,133	\$271,939,987
Total	15,657	\$594,696,524	\$1,072,514,612	\$2,133,410,277

Table 45. Volusia County Economic Impacts, Recreation

Impact	Employment	Labor Income	Value Added	Output
1 - Direct	3,891	\$144,416,889	\$258,551,625	\$487,858,976
2 - Indirect	1,136	\$51,275,006	\$84,309,360	\$177,213,297
3 - Induced	681	\$32,585,286	\$68,889,978	\$113,156,942
Total	5,709	\$228,277,181	\$411,750,963	\$778,229,215

Table 46. Indian River County Economic Impacts, Recreation

Impact	Employment	Labor Income	Value Added	Output
1 - Direct	5,362	\$220,177,906	\$398,547,946	\$721,847,494
2 - Indirect	1,759	\$92,968,516	\$150,987,772	\$301,222,077
3 - Induced	800	\$41,075,743	\$82,761,750	\$135,023,511
Total	7,922	\$354,222,166	\$632,297,469	\$1,158,093,081

Table 47. Brevard County Economic Impacts, Boat Sales

Impact	Employment	Labor Income	Value Added	Output
1 - Direct	177	\$14,613,105	\$18,395,374	\$67,554,968
2 - Indirect	90	\$5,992,040	\$10,247,319	\$19,751,564
3 - Induced	69	\$3,463,787	\$7,399,907	\$11,850,656
Total	336	\$24,068,932	\$36,042,600	\$99,157,187

Table 48. Martin County Economic Impacts, Boat Sales

Impact	Employment	Labor Income	Value Added	Output
1 - Direct	472	\$43,796,195	\$54,849,040	\$185,975,471
2 - Indirect	325	\$25,506,799	\$42,174,749	\$77,779,032
3 - Induced	183	\$9,388,676	\$19,844,025	\$31,909,774
Total	980	\$78,691,670	\$116,867,815	\$295,664,277

Table 49. St. Lucie County Economic Impacts, Boat Sales

Impact	Employment	Labor Income	Value Added	Output
1 - Direct	29	\$2,180,916	\$2,759,275	\$10,788,136
2 - Indirect	22	\$1,249,636	\$2,182,176	\$4,424,557
3 - Induced	10	\$467,412	\$1,047,205	\$1,747,685
Total	61	\$3,897,964	\$5,988,656	\$16,960,378

Table 50. Volusia County Economic Impacts, Boat Sales

Impact	Employment	Labor Income	Value Added	Output
1 - Direct	36	\$2,722,369	\$3,445,732	\$13,512,023
2 - Indirect	19	\$1,082,634	\$1,862,826	\$3,754,837
3 - Induced	13	\$620,090	\$1,311,165	\$2,153,513
Total	68	\$4,425,093	\$6,619,723	\$19,420,373

Table 51. Brevard County Economic Impacts, Commercial Fishing

Impact	Employment	Labor Income	Value Added	Output
1 - Direct	6	\$91,861	\$2,065,784	\$2,071,779
2 - Indirect	0	\$676	\$1,521	\$2,843
3 - Induced	0	\$15,565	\$33,345	\$53,432
Total	7	\$108,103	\$2,100,650	\$2,128,055

Table 52. Martin County Economic Impacts, Commercial Fishing

Impact	Employment	Labor Income	Value Added	Output
1 - Direct	5	\$8,200	\$209,290	\$209,665
2 - Indirect	0	\$28	\$63	\$121
3 - Induced	0	\$1,046	\$2,260	\$3,675
Total	5	\$9,274	\$211,613	\$213,461

Table 53. St. Lucie County Economic Impacts, Commercial Fishing

Impact	Employment	Labor Income	Value Added	Output
1 - Direct	14	\$14,353	\$413,897	\$422,211
2 - Indirect	0	\$766	\$1,824	\$3,604
3 - Induced	0	\$1,981	\$4,521	\$7,628
Total	14	\$17,100	\$420,242	\$433,443

Table 54. Volusia County Economic Impacts, Commercial Fishing

Impact	Employment	Labor Income	Value Added	Output
1 - Direct	3	\$9,063	\$188,177	\$188,723
2 - Indirect	0	\$20,206	\$26,922	\$56,042
3 - Induced	0	\$5,654	\$11,564	\$18,464
Total	3	\$34,923	\$226,663	\$263,230

Table 55. Indian River County Economic Impacts, Commercial Fishing

Impact	Employment	Labor Income	Value Added	Output
1 - Direct	1	\$6,039	\$138,546	\$138,948
2 - Indirect	0	\$33	\$75	\$127
3 - Induced	0	\$776	\$1,562	\$2,551
Total	1	\$6,848	\$140,183	\$141,627

Table 56. Brevard County Economic Impacts, Aerospace

Impact	Employment	Labor Income	Value Added	Output
1 - Direct	18,937	\$3,018,734,421	\$4,808,119,666	\$9,888,053,792
2 - Indirect	15,599	\$1,072,002,744	\$1,495,282,373	\$2,770,459,787
3 - Induced	13,744	\$690,691,026	\$1,475,667,292	\$2,362,674,381
Total	48,280	\$4,781,428,191	\$7,779,069,331	\$15,021,187,960

Table 57. Martin County Economic Impacts, Aerospace

Impact	Employment	Labor Income	Value Added	Output
1 - Direct	852	\$96,466,152	\$158,778,294	\$401,582,260
2 - Indirect	1,043	\$77,813,921	\$109,536,340	\$193,793,180
3 - Induced	462	\$23,889,943	\$50,347,120	\$80,818,858
Total	2,357	\$198,170,015	\$318,661,755	\$676,194,298

Table 58. Volusia County Economic Impacts, Aerospace

Impact	Employment	Labor Income	Value Added	Output
1 - Direct	17	\$1,972,759	\$3,257,062	\$8,147,340
2 - Indirect	15	\$879,118	\$1,214,382	\$2,396,966
3 - Induced	10	\$466,466	\$985,621	\$1,616,747
Total	42	\$3,318,343	\$5,457,065	\$12,161,052

Table 59. Brevard County Economic Impacts, Natural Resources

Impact	Employment	Labor Income	Value Added	Output
1 - Direct	152	\$18,247,932	\$23,925,547	\$45,450,763
2 - Indirect	117	\$8,093,422	\$11,729,089	\$21,586,346
3 - Induced	89	\$4,450,649	\$9,511,512	\$15,233,375
Total	358	\$30,792,004	\$45,166,148	\$82,270,484

Table 60. Martin County Economic Impacts, Natural Resources

Impact	Employment	Labor Income	Value Added	Output
1 - Direct	81	\$6,936,610	\$8,911,716	\$20,338,842
2 - Indirect	78	\$5,264,061	\$7,631,887	\$14,174,981
3 - Induced	32	\$1,646,180	\$3,483,136	\$5,599,598
Total	191	\$13,846,850	\$20,026,739	\$40,113,422

Table 61. Palm Beach County Economic Impacts, Natural Resources

Impact	Employment	Labor Income	Value Added	Output
1 - Direct	8	\$868,289	\$1,120,480	\$2,265,597
2 - Indirect	6	\$444,481	\$655,951	\$1,107,190
3 - Induced	3	\$193,030	\$379,307	\$585,237
Total	17	\$1,505,801	\$2,155,738	\$3,958,024

Table 62. St. Lucie County Economic Impacts, Natural Resources

Impact	Employment	Labor Income	Value Added	Output
1 - Direct	92	\$5,900,074	\$7,862,868	\$20,826,975
2 - Indirect	97	\$5,303,855	\$7,873,864	\$15,707,736
3 - Induced	35	\$1,550,554	\$3,460,973	\$5,763,933
Total	223	\$12,754,483	\$19,197,704	\$42,298,645

Table 63. Volusia County Economic Impacts, Natural Resources

Impact	Employment	Labor Income	Value Added	Output
1 - Direct	41	\$2,532,279	\$3,391,692	\$9,202,683
2 - Indirect	35	\$1,714,448	\$2,627,281	\$5,550,964
3 - Induced	15	\$703,978	\$1,488,366	\$2,444,542
Total	91	\$4,950,705	\$7,507,338	\$17,198,189

Table 64. Indian River County Economic Impacts, Natural Resources

Impact	Employment	Labor Income	Value Added	Output
1 - Direct	63	\$7,201,351	\$8,681,531	\$17,554,613
2 - Indirect	56	\$3,934,718	\$5,631,228	\$10,260,933
3 - Induced	28	\$1,467,329	\$2,946,471	\$4,805,794
Total	148	\$12,603,398	\$17,259,229	\$32,621,340

Table 65. Okeechobee County Economic Impacts, Natural Resources

Impact	Employment	Labor Income	Value Added	Output
1 - Direct	14	\$772,137	\$1,051,203	\$2,976,351
2 - Indirect	1	\$54,541	\$70,122	\$121,788
3 - Induced	0	\$9,086	\$19,510	\$31,234
Total	14	\$835,764	\$1,140,835	\$3,129,373