









# Return on Conservation™ Index: Texas Chenier Plain Restoration

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Texas Chenier Plain Restoration is a coalition of partners working to address the upper coast's decline in ecosystem health. Within the Chenier Plain, there are numerous project opportunities that Ducks Unlimited, other non-profits, and government agencies are implementing to restore this critical system.

This ROC™ Index highlights 15 unique project opportunities that have a wide range of benefits. **Each sustainable development goal features one project (unless otherwise specified), a specific impact, and the economic value post-funding and implementation.** For all project details, a full list of benefits, and outlined funding opportunities, see the [2023 Texas Coastal Resiliency Master Plan](#).

<b>SUSTAINABLE DEVELOPMENT GOALS</b>	<b>Targets</b>	<b>Impact 2022-2023</b>	<b>Total Economic Value Annual</b>
<b>3</b> GOOD HEALTH AND WELL-BEING 	<p><b>3.4:</b> Promote mental health and well-being</p> <p><b>3.9:</b> Reduce deaths and illnesses from hazardous chemicals and air, water and soil pollution, and contamination</p>	<b>200,000 acres to be conserved or restored for public access across all 15 projects</b>	<b>\$250M</b> generated social and economic value for community health enhancements
<b>6</b> CLEAN WATER AND SANITATION 	<p><b>6.3:</b> Improve water quality by reducing pollution, eliminating dumping, and minimizing the release of hazardous chemicals and materials</p> <p><b>6.6:</b> Protect and restore water-related ecosystems</p>	<b>750 acres of marshlands filter chemical contaminants and reduce chronic erosion</b>	<b>\$1.70M</b> value of water filtration and supply
<b>9</b> INDUSTRY, INNOVATION AND INFRASTRUCTURE 	<b>9.1:</b> Develop sustainable and resilient infrastructure to support economic development and human well-being	<b>1.9M cubic yards of dredge material recycled across 4 beneficial use projects</b>	<b>\$325M</b> in savings from using recycled materials
<b>11</b> SUSTAINABLE CITIES AND COMMUNITIES 	<p><b>11.5:</b> Reduce the number of deaths and people affected by disasters</p> <p><b>11.7:</b> Provide universal access to safe, inclusive and accessible, green and public spaces</p>	<b>7,000 feet of living shoreline decreases the impact of storm surges</b>	<b>\$920K</b> in natural disaster savings
<b>13</b> CLIMATE ACTION 	<b>13.1:</b> Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters	<b>1,000 acres of wetland restoration sequesters 42,500 tons of carbon</b>	<b>\$5.5M</b> in carbon capture potential and carbon credit opportunities
<b>14</b> LIFE BELOW WATER 	<p><b>14.1:</b> Prevent and significantly reduce marine pollution of all kinds</p> <p><b>14.2:</b> Sustainably manage and protect marine and coastal ecosystems</p> <p><b>14.5:</b> Conserve coastal and marine areas</p>	<b>25,000 acres of coastal habitat protection for 11 endangered species</b>	<b>\$56M</b> inherent value by protecting biodiversity, habitat, and food provisioning
<b>15</b> LIFE ON LAND 	<p><b>15.1:</b> Ensure conservation, restoration, and sustainable use of terrestrial and inland freshwater ecosystems</p> <p><b>15.5:</b> Halt the loss of biodiversity and reduce degradation of natural habitats</p> <p><b>15.A:</b> Increase financial resources to conserve and sustainably use biodiversity and ecosystems</p>	<b>3,000 acres of habitat protection for 11 Endangered species and 18 migratory bird species</b>	<b>\$4.5M</b> in land capacity to shelter, promote growth of species, and maintain biological diversity
<b>17</b> PARTNERSHIPS FOR THE GOALS 	<b>17.19:</b> Develop measurements of progress on sustainable development that complement gross domestic product	<b>1 Return on Conservation™ Index</b>	<b>Not Yet Valued</b>

**Key Assumptions and Caveats:**

- Assumes the current level of degradation in severe and intensive restoration efforts is the primary way to ensure full functioning of the ecosystems in question
- Assumes any land acquired would have been otherwise lost to development or eventual degradation

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The Texas General Land Office has outlined objectives to improve coastal health and resiliency: Land Acquisition (LA) Marsh Habitat (MH), Shoreline Protection (SP). There are numerous projects within each goal that are awaiting investment and are categorized by the above objectives and corresponding project number. For all project details, a full list of benefits, and outlined funding opportunities, see pages 242-289 of the [2023 Texas Coastal Resiliency Master Plan](#).

SUSTAINABLE DEVELOPMENT GOALS	Targets	Reporting Standards	How Ducks Unlimited and Partners Address Sustainable Development Goals
<b>3</b> GOOD HEALTH AND WELL-BEING 	<p><b>3.4:</b> Promote mental health and well-being</p> <p><b>3.9:</b> Reduce deaths and illnesses from hazardous chemicals and air, water and soil pollution, and contamination</p>	<p><b>WHO Global Health Observatory Indicator:</b> Policy or plan for mental health</p> <p><b>UN STATS 3.9.2:</b> Mortality and illness rate reduction attributed to unsafe water, sanitation, or hygiene</p>	<p>- All (LA), (MH), and (SP) projects will <b>enhance and increase public access and recreation in the Texas Chenier Plain</b>. Studies indicate a significant drop in blood pressure and increase in mood when around marine life and scenery.</p> <p>- All (MH) and (SP) efforts benefit water quality, which can <b>reduce mortality/illness rates due to water-borne pathogens</b>.</p>
<b>6</b> CLEAN WATER AND SANITATION 	<p><b>6.3:</b> Improve water quality by reducing pollution, eliminating dumping, and minimizing the release of hazardous chemicals and materials</p> <p><b>6.6:</b> Protect and restore water-related ecosystems</p>	<p><b>UN STATS 6.3.1:</b> Proportion of domestic and industrial wastewater flows safely treated</p> <p><b>GRI G4 Indicators G4-EN12:</b> Significant impacts on areas of high biodiversity, habitat protected or restored</p>	<p>- (MH) 1356: Texas Bayou Water Control Structure- safeguard <b>750 acres of marshlands</b> against petrochemical spills and chronic erosion caused by the wakes from ocean-going vessel traffic.</p> <p>- (SP) 9204: McFaddin National Wildlife Refuge- <b>3 miles of breakwaters and jetties</b> constructed along the Gulf shoreline. Gaps between the breakwaters will facilitate movement of organisms and allow sediment laden water behind the breakwater to restore the beachfront.</p>
<b>9</b> INDUSTRY, INNOVATION AND INFRASTRUCTURE 	<p><b>9.1:</b> Develop sustainable and resilient infrastructure to support economic development and human well-being</p>	<p><b>GRI G4-EC7:</b> Development and impact of infrastructure investments and services supported</p>	<p><i>Each year, hundreds of millions of cubic meters of dredged sediment from U.S. ports, harbors, and waterways are often discarded. The following projects redirect sediment for the "beneficial use of dredged material" (BUDM) to restore wetlands and marshes.</i></p> <p>- (MH) 1387: Lake Street Drive Beneficial Use- six restoration cells totaling 224 acres and requiring up to <b>400,000 cubic yards of BUDM</b>- offsetting documented wetland losses.</p> <p>- (MH) 1388: Texas Point Beneficial Use- three marsh cells, totaling 623 acres and requiring up to <b>1.5 million cubic yards of BUDM</b>.</p> <p>- (MH) 1389: Willow Lake Marsh Beneficial Use- 218-acre marsh restoration area and 7 miles of shoreline, requiring <b>466,000 cubic yards of BUDM</b>.</p> <p>- (MH) 1390: Anahuac National Wildlife Refuge Beneficial Use- restoring and enhancing 552 acres of deteriorated marsh and open water, requiring over <b>620,000 cubic yards of BUDM</b>.</p>
<b>11</b> SUSTAINABLE CITIES AND COMMUNITIES 	<p><b>11.5:</b> Reduce the number of deaths and people affected by disasters</p> <p><b>11.7:</b> Provide universal access to safe, inclusive and accessible, green and public spaces</p>	<p><b>UN STATS 11.5.1:</b> Direct economic loss and deaths, missing persons, and affected persons attributed to disasters</p> <p><b>Indicator 11.7; 70:</b> Area of public and green space as a proportion of total city space</p>	<p>- (SP) 320: Old River Cove Restoration- construct <b>7,000 feet of breakwaters</b> to establish a living shoreline to protect <b>300 acres of estuarine wetlands</b> and shallow-water habitat and <b>430 acres of freshwater wetlands or uplands</b> by decreased wave energy.</p> <p>- (LA) 10000: Anahuac National Wildlife Refuge- acquisition of <b>65,000 acres</b> of additional riverine, subtidal, freshwater, and marine habitats across Chambers, Jefferson, and Galveston counties.</p>
<b>13</b> CLIMATE ACTION 	<p><b>13.1:</b> Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters</p>	<p><b>G4-EN19:</b> Reduction of greenhouse gas emissions</p>	<p><i>Extensive research has demonstrated that marshes, wetlands, and coastal ecosystems play a crucial role in sequestering carbon. All proposed projects provide carbon benefits, but only one is highlighted below as an example.</i></p> <p>- MH 9025: Bessie Heights Wetland Restoration- restore up to 1,000 acres of a historical estuarine wetland with an existing capacity to sequester <b>42,500 tons of carbon</b>.</p>
<b>14</b> LIFE BELOW WATER 	<p><b>14.1:</b> Prevent and significantly reduce marine pollution of all kinds</p> <p><b>14.2:</b> Sustainably manage and protect marine and coastal ecosystems</p> <p><b>14.5:</b> Conserve coastal and marine areas</p>	<p><b>UN STATS 14.1.1:</b> (a) Index of coastal eutrophication; and (b) plastic debris density</p> <p><b>GRI G4-EN13:</b> Habitats protected or restored</p> <p><b>Indicator 14.5.1:</b> Coverage of protected areas in relation to marine areas</p>	<p>- (MH) 1356: Texas Bayou Water Control Structure- construction of a <b>water control structure</b> at Texas Bayou to <b>regulate saltwater intrusion</b>.</p> <p>- (MH) 9218: Keith Lake Fish Pass- Facilitate repairs on rock baffle to armor both banks of the fish pass, protecting <b>25,000 acres of coastal habitat for 11 Endangered Species</b>.</p> <p>- (MH) (SP) 9304: Hickory Cove Marsh Restoration- construct 14,000 linear feet of rock breakwater providing <b>protection of a 1,200-acre degrading wetland</b>. Project site impacting <b>5 Endangered Species</b>.</p>
<b>15</b> LIFE ON LAND 	<p><b>15.1:</b> Ensure conservation, restoration, and sustainable use of terrestrial and inland freshwater ecosystems</p> <p><b>15.5:</b> Halt the loss of biodiversity and reduce degradation of natural habitats</p> <p><b>15.A:</b> Increase financial resources to conserve and sustainably use biodiversity and ecosystems</p>	<p><b>GRI Standard 306-5:</b> Water bodies and related habitats that are significantly affected by water discharges and/or runoff</p> <p><b>GRI G4 Sustainability Reporting Guidelines:</b> Total number of IUCN Red List species and national conservation list species with habitats in areas affected by operations</p> <p><b>UN STATS 15.a.1 (a):</b> Official development assistance on conservation and sustainable use of biodiversity; and (b) revenue generated and finance mobilized from biodiversity-relevant economic instruments</p>	<p>- (SP) 1359: Sabine Neches Waterway and Oyster Habitat Creation- placement of rock materials protect <b>7,500 marsh habitat acres, reduce rates of land loss from erosion, and restore important habitats for 10 Endangered Species and 29 Migratory Bird Species</b>.</p> <p>- (SP) 1307: J.D. Murphree Wildlife Management Area- 3.7 miles of rock breakwater provide new submerged hard substrates for colonization by oyster larvae, reduce rates of land loss due to erosion. One mile of breakwater can provide benefits to approximately 500 to 1,000 acres of coastal habitats- project site impacts <b>11 Endangered Species and 18 Migratory Bird Species</b>.</p> <p>- (SP) 252: Bolivar Peninsula Beach and Dune Restoration- reconstruct severely eroded beaches and dunes along a 10-mile stretch of beach on the Bolivar Peninsula Gulf shoreline between the communities of High Island and Caplen. Texas General Land Office (GLO) and Galveston County, estimate <b>\$27.87M Building Replacement Value</b>.</p>
<b>17</b> PARTNERSHIPS FOR THE GOALS 	<p><b>17.19:</b> Develop measurements of progress on sustainable development that complement gross domestic product</p>	<p><b>GRI General Indicators:</b></p> <ul style="list-style-type: none"> <li>- Publicly disclosing sustainability information and increasing accountability and transparency</li> <li>- Advocating for the disclosure and use of sustainable development data</li> </ul>	<p>Ducks Unlimited, Texas Chenier Plain Restoration, and Texan by Nature worked together to report the environmental and economic return on investment of conservation efforts in Texas Chenier Plain to promote participation in and investment from private and public sectors. <b>Texan by Nature ROC™ Indexes are used to aid organizations in articulating the quantitative impact of their efforts, for standardized reporting, fundraising, development, and more.</b></p>

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# Return on Conservation™ Index: Economic Proxy Use

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UN SDG GOAL	Proxies Used	Unit of Measure	Proxy Explainer	Citation
<b>3</b> GOOD HEALTH AND WELL-BEING 	Cultural & Aesthetic Value	\$/acre/year	The non-material benefits people obtain from ecosystems through spiritual enrichment, cognitive development, reflection, and aesthetic experience	de Groot, R., et al. (2012). Global estimates of the value of ecosystems and their services in monetary units. <i>Ecosystem Services</i> , 1(1), 50–61.
	Recreation & Tourism	\$/acre/year	Experiencing the natural world and enjoying outdoor activities	Federal Emergency Management Agency (2022). FEMA Ecosystem Service Value.
<b>6</b> CLEAN WATER AND SANITATION 	Water Filtration	\$/acre/year	Removing water pollutants via soil filtration and transformation by vegetation and microbial communities	Federal Emergency Management Agency (2022). FEMA Ecosystem Service Value.
	Water Supply	\$/acre/year	Provision of water by watersheds, reservoirs and aquifers	Federal Emergency Management Agency (2022). FEMA Ecosystem Service Value.
<b>9</b> INDUSTRY, INNOVATION AND INFRASTRUCTURE 	Dredging Materials Value	\$/cubic yard	Economic value associated with the beneficial use of dredged material	The Texas General Land Office (2023). Texas Coastal Resiliency Master Plan Technical Report.
<b>11</b> SUSTAINABLE CITIES AND COMMUNITIES 	Erosion Prevention	\$/acre/year	Retaining arable land, slope stability, and coastal integrity	de Groot, R., et al. (2012). Global estimates of the value of ecosystems and their services in monetary units. <i>Ecosystem Services</i> , 1(1), 50–61.
	Flood & Storm Protection	\$/acre/year	Preventing and mitigating natural hazards such as floods and hurricanes	Federal Emergency Management Agency (2022). FEMA Ecosystem Service Value.
<b>13</b> CLIMATE ACTION 	Market Value - Carbon	\$/ton	Opportunity market value of carbon credits based on average carbon floor prices per ton	Burden, A.. et al. (2019) "Effect of restoration on saltmarsh carbon accumulation in Eastern England". <i>Biology Letters</i> , 15(1).
	Social Value - Carbon	\$/ton	Social cost of carbon avoided by preserving annual carbon sequestration capacity of wetlands	Interagency Working Group on Social Cost of Greenhouse Gases, United States Government. (2021).
<b>14</b> LIFE BELOW WATER 	Habitat & Biodiversity	\$/acre/year	Providing shelter, promoting growth of species, and maintaining biological diversity. Includes genetic resources	de Groot, R., et al. (2012). Global estimates of the value of ecosystems and their services in monetary units. <i>Ecosystem Services</i> , 1(1), 50–61.
	Food Provisioning	\$/acre/year	Capacity of the land or water ecosystem to produce crops, fish, game, and fruits	Federal Emergency Management Agency (2022). FEMA Ecosystem Service Value.
<b>15</b> LIFE ON LAND 	Habitat & Biodiversity	\$/acre/year	Providing shelter, promoting growth of species, and maintaining biological diversity. Includes genetic resources	Federal Emergency Management Agency (2022). FEMA Ecosystem Service Value.

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