







# Return on Conservation™ Index: Caddo Lake Institute (CLI)

\*For more info on how to read this card and metadata associated with it, please visit [texanbynature.org/roc-index](https://texanbynature.org/roc-index)

CLI is a non-profit scientific and educational organization with the mission of protecting the unique treasure that is Caddo Lake. Caddo is a 26,000-acre lake comprised of wetland, bottomland hardwood forest, and open water. CLI addresses issues such as the need to return healthy flows of water to the lake, improve water quality in the watershed, control invasive species, and conserve significant lands.

This ROC™ Index is focused on CLI's Environmental [Flows Project](#), which seeks to ensure adequate instream flows to sustain the ecological, recreational, and economic values of Caddo Lake, its watershed, and the larger Cypress Basin.

SUSTAINABLE DEVELOPMENT GOALS	Targets	Impact 2022-2023	Total Economic Value Annual
<b>6</b> CLEAN WATER AND SANITATION 	<p><b>6.1:</b> Achieve Equitable access to safe and affordable drinking water</p> <p><b>6.3:</b> Improve water quality by reducing pollution, eliminating dumping, and minimizing release of hazardous chemicals and materials</p> <p><b>6.4:</b> Increase water-use efficiency and ensure sustainable withdrawals and supply of freshwater</p> <p><b>6.5:</b> Implement integrated water resources management at all levels</p> <p><b>6.6:</b> Protect and restore water-related ecosystems</p>	<p><b>26,000 acres of lake benefit from environmental flows that improve water quality</b></p>	<p><b>\$136M</b> value of pollution control and provision of water</p>
<b>8</b> DECENT WORK AND ECONOMIC GROWTH 	<p><b>8.6:</b> Reduce the proportion of youth not in employment, education or training</p> <p><b>8.9:</b> Devise and implement policies to promote sustainable tourism</p>	<p><b>3 university students doing research</b></p>	<p><b>\$27K</b> value of higher education research</p>
<b>11</b> SUSTAINABLE CITIES AND COMMUNITIES 	<p><b>11.4:</b> Strengthen efforts to protect world's cultural and natural heritage</p> <p><b>11.7:</b> Provide universal access to safe, inclusive and accessible, green and public spaces</p>	<p><b>18,000 acres under active conservation management</b></p>	<p><b>\$84M</b> value of regulating water flow and mitigating natural hazards</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>Flows restore 3,700 acres of bottomland hardwood forest</b></p>	<p><b>\$1M</b> social cost avoided by preserving carbon sequestration capacity of trees</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>15.2:</b> Promote sustainable management of all forests</p> <p><b>15.5:</b> Halt the loss of biodiversity and reduce degradation of natural habitats</p> <p><b>15.8:</b> Prevent and reduce the impact of invasive species on land and water ecosystems</p>	<p><b>14,300 acres of wetland habitat maintained</b></p>	<p><b>\$42M</b> value of invasive species control and biological diversity</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>1 Return on Conservation™ Index</b></p>	<p><b>Not Yet Valued</b></p>

Key Assumptions and Caveats:  
 - If not for the stewardship efforts of CLI, this natural feature would have been otherwise lost to development or eventual degradation.

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	Targets	Reporting Standards	How CLI Addresses Sustainable Development Goals
	<p><b>6.1:</b> Achieve Equitable access to safe and affordable drinking water</p> <p><b>6.3:</b> Improve water quality by reducing pollution, eliminating dumping, and minimizing release of hazardous chemicals and materials</p> <p><b>6.4:</b> Increase water-use efficiency and ensure sustainable withdrawals and supply of freshwater</p> <p><b>6.5:</b> Implement integrated water resources management at all levels</p> <p><b>6.6:</b> Protect and restore water-related ecosystems</p>	<p><b>Business Call to Action:</b> Estimated number of individuals who have improved access to an improved water source as a result of the initiative.</p> <p><b>UN STATS 6.3.1:</b> Proportion of domestic and industrial wastewater flows safely treated</p> <p><b>CEO Water Mandate’s Corporate Water Disclosure Guidelines:</b> Average water intensity in water-stressed or water-scarce areas</p> <p><b>UN STATS 6.5.1:</b> Degree of Integrated Water resources management</p> <p><b>GRI G4 Indicators G4-EN12:</b> Significant impacts on areas of high biodiversity, habitat protected or restored</p>	<ul style="list-style-type: none"> <li>- <b>55,536 people</b> get their water from Big Cypress Bayou and Caddo Lake and have improved access to this improved water source.</li> <li>- <b>12 sites</b> along Caddo Lake are monitored for water quality and pollution sources seasonally.</li> <li>- <b>Volumetric water benefit ranges from 2,000 to 10,208 acre-feet</b> per calendar year. CLI hydrologists monitor gauges and water levels and work with the U.S. Army Corps of Engineers to increase water availability in the reservoir.</li> <li>- <b>5 partners</b> in an agreement with the U.S. Army Corps of Engineers to ensure adequate flows from upstream Lake O’ the Pines.</li> <li>- Freshwater flows <b>reduce phosphorous by 40%</b> in the basin along with improved water quality in 140 miles of waterways.</li> </ul>
	<p><b>8.6:</b> Reduce the proportion of youth not in employment, education or training</p> <p><b>8.9:</b> Devise and implement policies to promote sustainable tourism</p>	<p><b>ILO EARN-7:</b> Employees with recent job training</p> <p><b>IN-B2.a:</b> Local residents are employed, including in management positions. Training and career opportunities are offered to local residents</p>	<ul style="list-style-type: none"> <li>- <b>3 university students</b> doing research at Caddo Lake through a partnership with University of Houston Clear Lake.</li> <li>- <b>\$1,429,536 value</b> added to the community from Caddo Lake State Park through tourism, visitor spending, and job creation.</li> </ul>
	<p><b>11.4:</b> Strengthen efforts to protect world’s cultural and natural heritage</p> <p><b>11.7:</b> Provide universal access to safe, inclusive and accessible, green and public spaces</p>	<p><b>UN STATS: 11.4.1:</b> Increasing investment to safeguard world’s cultural and natural heritage</p> <p><b>ICCROM:</b> Numbers of people accessing collecting institutions from different demographic groups, notably women, children, older people and persons with disabilities.</p>	<ul style="list-style-type: none"> <li>- <b>18,000 acres under conservation management.</b> Maintaining a healthy and not overly developed area around Caddo Lake allows this culturally significant region to remain somewhat as it was during the time of Caddo Nation, early American pioneer days, and early Texas history.</li> <li>- <b>63,000 visitors to Caddo Lake State Park annually</b> (State Park, Wildlife Management Area, and Wildlife Refuge all benefit from the flows project).</li> </ul>
	<p><b>13.1:</b> Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters</p>	<p><b>GRI G4 Indicators G4-EN19:</b> Reduction of greenhouse gases (GHG) emissions</p>	<ul style="list-style-type: none"> <li>- <b>3,702 acres of bottomland hardwood forest restored</b> through the addition of freshwater flows into the ecosystem.</li> </ul>
	<p><b>15.1:</b> Ensure conservation, restoration, and sustainable use of terrestrial and inland freshwater ecosystems</p> <p><b>15.2:</b> Promote sustainable management of all forests</p> <p><b>15.5:</b> Halt the loss of biodiversity and reduce degradation of natural habitats</p> <p><b>15.8:</b> Prevent and reduce the impact of invasive species on land and water ecosystems</p>	<p><b>GRI G4 Indicators G4-EN13:</b> Habitats protected or restored</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 Mining and Metals Sector Disclosures:</b> Amount of land (owned or leased, and managed for production activities or extractive use) disturbed or rehabilitated</p> <p><b>UN STATS: 15.8.1:</b> Resourcing the prevention or control of invasive alien species</p>	<ul style="list-style-type: none"> <li>- <b>973 species protected</b>, 13 of those being species of concern.</li> <li>- <b>7,990 acres of cypress swamp and 6,308 acres of bottomland hardwood forest.</b></li> <li>- <b>\$6,962,000 invested in conservation</b> to ensure sustainable use of water resources. This funding has contributed to scientifically defining the amount and type of water required for the conservation of inland freshwater ecosystems and monitoring to ensure pulses and baseflows are implemented.</li> <li>- <b>884 acres of invasive tallow removed</b> from land along Caddo waterways.</li> </ul>
	<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>CLI and Texan by Nature worked together to report the environmental and economic return on investment of conservation efforts in the Caddo Lake ecosystem 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>6</b> CLEAN WATER AND SANITATION 	Waste Treatment	\$/acre/year	Pollution control/detoxification	Wilson, S. (2008). Ontario's Wealth, Canada's Future: Appreciating the Value of the Greenbelt's Eco-Services.
	Water Supply	\$/acre/year	Provision of water by watersheds, reservoirs and aquifers	Costanza, R., et al (1997). The value of the world's ecosystem services and natural capital. Nature, 387(6630), 253-260.
<b>8</b> DECENT WORK AND ECONOMIC GROWTH 	Value of Research	\$/year	Value of higher education research	Texas in-state tuitions
	Local Economy & Tourism	\$/year	Value added to the community from Caddo Lake State Park through tourism, visitor spending, and job creation.	Jeong, JY and Crompton, J. (2019) "The Economic Contribution of Texas State Parks", Texas Parks and Wildlife.
<b>11</b> SUSTAINABLE CITIES AND COMMUNITIES 	Water Regulation	\$/acre/year	Regulating the rate of water flow through an environment	Costanza, R., et al (1997). The value of the world's ecosystem services and natural capital. Nature, 387(6630), 253-260.
	Flood Control	\$/acre/year	Preventing and mitigating natural hazards such as floods and hurricanes	Wilson, S. (2008). Ontario's Wealth, Canada's Future: Appreciating the Value of the Greenbelt's Eco-Services.
<b>13</b> CLIMATE ACTION 	Climate Regulation (stored & uptake)	\$/acre/year	Supporting a stable climate at global and local levels through carbon sequestration and other processes	Wilson, S. (2008). Ontario's Wealth, Canada's Future: Appreciating the Value of the Greenbelt's Eco-Services.
<b>15</b> LIFE ON LAND 	Biological Control	\$/acre/year	Providing pest, weed, invasive species and disease control	de Groot, R., et al. (2012) Global estimates of the value of ecosystems and their services in monetary units. Ecosystem Services, 1(1), 50-61.
	Habitat & Biodiversity	\$/acre/year	Providing shelter, promoting growth of species, and maintaining biological diversity. Includes genetic resources	Wilson, S. (2008). Ontario's Wealth, Canada's Future: Appreciating the Value of the Greenbelt's Eco-Services.

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