

The Florida Senate
BILL ANALYSIS AND FISCAL IMPACT STATEMENT

(This document is based on the provisions contained in the legislation as of the latest date listed below.)

Prepared By: The Professional Staff of the Appropriations Committee on Agriculture, Environment, and General Government

BILL: CS/SB 724

INTRODUCER: Environment and Natural Resources Committee and Senator Boyd

SUBJECT: Seagrass Restoration Technology Development Initiative

DATE: April 11, 2023

REVISED: _____

	ANALYST	STAFF DIRECTOR	REFERENCE	ACTION
1.	<u>Barriero</u>	<u>Rogers</u>	<u>EN</u>	<u>Fav/CS</u>
2.	<u>Reagan</u>	<u>Betta</u>	<u>AEG</u>	<u>Pre-meeting</u>
3.	_____	_____	<u>AP</u>	_____

Please see Section IX. for Additional Information:

COMMITTEE SUBSTITUTE - Technical Changes

I. Summary:

CS/SB 724 establishes the Seagrass Restoration Technical Development Initiative within the Department of Environmental Protection (DEP), in partnership with Mote Marine Laboratory (Mote) and the University of Florida (UF), to develop innovative and environmentally sustainable technologies needed to restore coastal seagrass ecosystems.

Mote and the UF are required to create a 10-year Florida Seagrass Restoration Plan to implement tools and technologies developed under the initiative.

The bill requires the initiative to submit an annual report with an overview of its accomplishments to date and priorities for subsequent years to the Governor, the Legislature, the Secretary of the DEP, and the executive director of the Fish and Wildlife Conservation Commission (FWC).

The bill also establishes the Initiative Technology Advisory Council (TAC) as part of the initiative and specifies the membership of the council. The TAC must meet at least twice a year.

The bill directs the DEP to award funds specifically appropriated by the Legislature to Mote, which will function as the initiative's lead administrative component. The initiative must leverage state-appropriated funds with additional funds from private and federal sources.

The DEP and the UF will incur indeterminate costs, subject to appropriations, related to the Seagrass Restoration Technology Development Initiative, including conducting research, creating a seagrass restoration plan, and preparing annual status reports. However, since there are no funds specifically appropriated by the Legislature, there is no fiscal impact to the state.

The section of law created in the bill expires on June 30, 2028.

The effective date of the bill is July 1, 2023.

II. Present Situation:

Seagrass

Seagrass is a grass-like flowering plant that lives completely submerged in marine and estuarine waters.¹ Approximately 52 species of seagrass exist worldwide, seven of which are found in Florida's marine waters.² There are more than two million acres of seagrass along the state's coastline and within its estuaries.³ Seagrass performs many important functions, including maintaining water clarity, stabilizing the bottom of aquatic habitats, and providing habitat for marine life and food for marine animals and water birds.⁴ Seagrass meadows also serve as important sinks in the global carbon cycle,⁵ prevent erosion by stabilizing sediments, and improve water quality by intercepting nutrients and organic matter carried by land runoff.⁶

Seagrass protects smaller marine animals, including juvenile sea bass, snappers, and grunts, from larger predators.⁷ Many marine animals consume seagrass as food, including manatees, urchins, conches, and sea turtles. Other animals derive nutrition from eating the algae and small animals living in seagrass leaves. Bottlenose dolphins and a variety of wading and diving birds also use seagrass beds as feeding grounds. Seagrass-based detritus formed by the microbial breakdown of leaves and roots is also an important food source.⁸

Seagrass Loss

Seagrass meadows are among the planet's most threatened habitats, with their known global areal extent having declined by 29 percent since the late 1800s and losses rapidly accelerating in

¹ Dep't of Environmental Protection (DEP), *Florida Seagrasses*, <https://floridadep.gov/rcp/seagrass> (last visited Mar. 9, 2023).

² *Id.* These species include Cuban shoal grass, turtle grass, manatee grass, star grass, paddle grass, Johnson's seagrass, and widgeon grass. Section 253.04(3)(a)1., F.S.

³ Florida Fish and Wildlife Conservation Commission (FWC), *Seagrass FAQ*, <https://myfwc.com/research/habitat/seagrasses/information/faq/> (last visited Jan. 11, 2022).

⁴ *Id.*

⁵ Matthew P.J. Oreska, et al., *The greenhouse gas offset potential from seagrass restoration*, 1 (2020), available at <https://link.springer.com/content/pdf/10.1038/s41598-020-64094-1.pdf>.

⁶ Nat'l Academy of Sciences, Engineering, and Medicine, *Effective Monitoring to Evaluate Ecological Restoration in the Gulf of Mexico*, 151 (2017), available at <https://doi.org/10.17226/23476>.

⁷ DEP, *Florida Seagrasses*.

⁸ *Id.*

the last two decades.⁹ In Florida, approximately 80 percent of the seagrass coverage in Tampa Bay has been lost, mainly due to human activities.¹⁰

Seagrass face several threats, including events that reduce water clarity and decrease the amount of light reaching the ecosystem, such as algae blooms, as well as physical damage, such as from dredging or boat propeller scarring.¹¹ Scarring occurs when boat propellers in shallow water impact seagrass roots, stems, and leaves, producing long, narrow furrows devoid of vegetation.¹² The damage caused by prop scars can take years to heal.¹³ Abandoned fishing gear can also impact seagrass, creating unique restoration needs.¹⁴ Grounded and derelict vessels can also impact seagrass ecosystems by shading, eroding, and scouring seagrass, and the process of removing these vessels can result in even further harm.¹⁵

In 2009, the Legislature tasked the Board of Trustees of the Internal Improvement Fund with preserving and regenerating seagrass.¹⁶ It also passed legislation providing that a person operating a vessel outside a lawfully marked channel in a careless manner that causes seagrass scarring within an aquatic preserve commits a noncriminal infraction.¹⁷ In addition, as of 2017, owners of private submerged lands that are adjacent to Outstanding Florida Waters or an aquatic preserve may request that the FWC establish boating-restricted areas to protect any seagrass within their property boundaries from scarring due to propeller dredging.¹⁸

Seagrass Restoration

The success of seagrass restoration depends on many factors, including the arrangement, genetic diversity, and density of the seagrass, proximity to established mangroves, coral reefs, or existing seagrass meadows, and inclusion of bivalves such as clams or mussels in the ecosystem.¹⁹ The use of donor beds is necessary for seagrass restoration, whether it is the relocation of an entire bed or the removal of random plugs from an existing bed.²⁰ In addition, because most seagrass species require high levels of light, water quality may limit the depth at which the seagrass can live.²¹

⁹ Nat'l Academy of Sciences, Engineering, and Medicine, *Effective Monitoring to Evaluate Ecological Restoration in the Gulf of Mexico* at 151.

¹⁰ FWC, *Seagrass Restoration*, <https://myfwc.com/research/habitat/seagrasses/projects/active/restoration/> (last visited Mar. 10, 2023).

¹¹ FWC, *Seagrass FAQ*.

¹² DEP, *Seagrass Restoration Efforts*, <https://floridadep.gov/rcp/rcp/content/seagrass-restoration-efforts> (last visited Mar. 9, 2023).

¹³ *Id.*

¹⁴ *Id.*

¹⁵ *Id.*

¹⁶ Ch. 2009-86, s. 3, Laws of Fla.

¹⁷ *Id.* This section is inapplicable to Lake Jackson, Oklawaha River, Wekiva River, and Rainbow Springs aquatic preserves.

¹⁸ Ch. 2017-163, s. 8, Laws of Fla.; section 327.46(1)(d), F.S.

¹⁹ Stephanie R. Valdez, et al., *Positive Ecological Interactions and the Success of Seagrass Restoration*, (2020), available at <https://www.frontiersin.org/articles/10.3389/fmars.2020.00091/full>.

²⁰ FWC, *Seagrass Restoration*, <https://myfwc.com/research/habitat/seagrasses/projects/active/restoration/> (last visited Mar. 10, 2023).

²¹ DEP, *Florida Seagrasses*, <https://floridadep.gov/rcp/seagrass> (last visited Mar. 9, 2023).

In Florida, several agencies are working to restore seagrass. The Office of Resilience and Coastal Protection (RCP) collaborates with other agencies to improve seagrass protection, augment habitat recovery through proven scientific restoration techniques, and increase public awareness of the importance of seagrass.²² The RCP has employed a variety of seagrass restoration methods throughout the state. For example, the RCP's St. Martins Marsh Aquatic Preserve has partnered with the UF's Institute of Food and Agricultural Sciences to stabilize and restore prop scars with sediment tubes. These restoration efforts will be monitored over a three-year period. The RCP has conducted other restoration projects in Charlotte Harbor, Indian River Lagoon, Biscayne Bay, the Big Bend, the Florida Keys, St. Joseph Bay, St. Andrews Bay, and Pensacola Bay—though results have been mixed. The RCP continues to monitor these projects and collaborate with other researchers to develop more effective restoration methods.²³

Other seagrass restoration efforts are ongoing throughout the state. For example, the Northwest Florida Aquatic Preserves has been utilizing salvaged seagrass cores from impacted areas from dock pilings in restoration areas.²⁴ The salvaged material is used to fill propeller scars as well as bare or declining areas and has proven quite successful in the Panhandle estuaries. There have also been efforts to remove derelict vessels from seagrass beds in the Lemon Bay Aquatic Preserve. Natural colonization of seagrass from adjacent beds has been successful. In addition, the RCP is removing derelict crab traps from seagrass meadows in the Big Bend Seagrasses Aquatic Preserve. Twenty-five sites within this area are being monitored as part of a three-year seagrass restoration grant project to assess natural seagrass regrowth within the impacted area.²⁵

The RCP is also working with the FWC to develop a restoration plan for the nation's only marine plant - Johnson's seagrass (*Halophila johnsonii*)—to be designated as a threatened species under the Endangered Species Act.²⁶ The RCP has identified several areas in Biscayne Bay as potential restoration sites for this species of seagrass. In addition, the FWC is developing a tissue-culture technique to seagrass restoration called micropropagation.²⁷ Micropropagation is a way to clone plants using buds collected from branches of mature plants. The buds are sterilized and placed in test tubes containing a specific nutrient medium. Compared to standard nursery techniques, micropropagation has the potential to produce more plants in less time. The FWC is also developing a new method for planting seagrass. Traditionally, seagrass has been planted by hand, but success with hand-planting has been variable. A new method using a boat with a planting wheel is being developed. This technique will reduce damage to the plantlets during transplantation, increase the planting rate, and cause less disturbance to sediment structure.²⁸

Federal studies for seagrass restoration have also been conducted. For example, in 2016, the National Fish and Wildlife Federation (NFWF) began its three-year Roadblocks to Seagrass

²² DEP, *Seagrass Restoration Efforts*.

²³ *Id.*

²⁴ *Id.*

²⁵ *Id.*

²⁶ DEP, *Seagrass Restoration Efforts*, <https://floridadep.gov/rcp/rcp/content/seagrass-restoration-efforts> (last visited Mar. 9, 2023).

²⁷ FWC, *Seagrass Restoration*, <https://myfwc.com/research/habitat/seagrasses/projects/active/restoration/> (last visited Mar. 10, 2023).

²⁸ *Id.*

Recovery project.²⁹ The project focused on the role of submerged aquatic vegetation (SAV) in the restoration, maintenance, and enhancement of the ecological integrity of coastal bays and estuaries in the Florida Panhandle and Big Bend regions.³⁰ The project evaluated seagrass in six estuaries—Perdido Bay, Pensacola Bay, Choctawhatchee Bay, Saint Andrew Bay, Saint Joseph Bay, and the Suwannee River Estuary—to assess the status and trends of seagrass, identify stressors preventing or slowing natural recovery of lost seagrass, and provide recommendations for the selection, design, and assessment of restoration projects to enhance seagrass recovery.³¹

Mote Marine Laboratory

Mote is a Florida nonprofit organization that was founded in 1955.³² Today, Mote includes a 10.5-acre campus and aquarium in Sarasota, Florida, with various facilities known as field stations in Key West, eastern Sarasota County, Summerland Key, and Charlotte Harbor.³³

Mote has more than 20 research programs and 30 Ph.D. scientists studying various aspects of marine science, including marine biogeochemistry and marine biomedical research.³⁴ Mote's research includes studies of human cancer using marine models, the effects of human-made and natural toxic substances on humans and on the environment, the health of wild fisheries, developing sustainable and successful fish restocking techniques and food production technologies, and the development of ocean technology to better understand the health of the environment.³⁵ Its programs also focus on understanding the population dynamics of manatees, dolphins, sea turtles, sharks, and coral reefs, and on conservation and restoration efforts related to these species and ecosystems.³⁶

Mote also conducts important research on seagrass, including the study of water quality and its impact on seagrass loss in Sarasota Bay and Florida Bay.³⁷ In 2021, Mote scientists co-authored a peer-reviewed research paper finding that changes in freshwater flows into Florida Bay appear to be associated with loss of seagrass and the rise of microscopic algae that compete with it.³⁸ The paper concludes that, given projected future climate conditions and anticipated cycles of drought and intensive storms, the likelihood of future seagrass die-offs and Pico cyanobacterial blooms is high.³⁹

²⁹ NFWF, *Roadblocks to Seagrass Recovery – Final Report*, (2020), available at <https://myfwc.com/media/24317/roadblocks-final-report.pdf>.

³⁰ *Id.* at 3.

³¹ *Id.*

³² Mote Marine Laboratory and Aquarium (Mote), *Research Programs*, <https://mote.org/research-programs> (last visited Mar. 11, 2023).

³³ Mote, *Mote Marine Laboratory and Aquarium*, <https://mote.org/locations/details/mote-marine-laboratory-aquarium> (last visited Mar. 11, 2023); Mote, *Mote Field Stations*, <https://mote.org/locations> (last visited Mar. 11, 2023).

³⁴ Mote, *Research Programs*.

³⁵ Mote, *About Us*, <https://mote.org/about-us> (last visited Mar. 11, 2023).

³⁶ *Id.*

³⁷ Mote, *Innovative Research*, <https://mote.org/pages/2021-annual-report-innovative-research-taking-the-pulse-of-our-marine-envir> (last visited Mar. 11, 2023).

³⁸ *Id.*; see Patricia M. Gilbert, et al., *Dissolved organic nutrients at the interface of fresh and marine waters: flow regime changes, biogeochemical cascades and Pico cyanobacterial blooms—the example of Florida Bay, USA*, 1, 20-21 (2021), available at <https://link.springer.com/content/pdf/10.1007/s10533-021-00760-4.pdf>.

³⁹ *Id.* at 1.

University of Florida and Seagrass Research

The UF's Institute of Food and Agricultural Sciences (UF/IFAS) is a federal-state-county partnership with a mission of developing knowledge in agriculture, human and natural resources, and the life sciences.⁴⁰ UF/IFAS employs more than 2,000 faculty and staff statewide and has offices in each of Florida's 67 counties.⁴¹

UF/IFAS's scientists are currently conducting research on seagrass restoration, including methods most likely to lead to successful restoration (genetic diversity, the presence of lucinid clams and small invertebrate herbivores, etc.).⁴² Scientists have also studied the use of certain fertilizers on seagrass regrowth.⁴³

Aquatic Preserve Program

In 1975, the Legislature enacted the Aquatic Preserve Act to ensure the continuation of aquatic preserves' natural conditions so their aesthetic, biological and scientific values may endure for the enjoyment of future generations.⁴⁴ The DEP's Office of Resilience and Coastal Protection oversees the management and protection of these aquatic preserves, which act as critical nurseries for fish and other aquatic life.⁴⁵ These areas also contain many archaeological sites and are important for recreation, as about two-thirds of Floridians live in counties that border an aquatic preserve.⁴⁶

⁴⁰ UF/IFAS, *About UF/IFAS*, <https://ifas.ufl.edu/about-us/> (last visited Mar. 11, 2023).

⁴¹ *Id.*

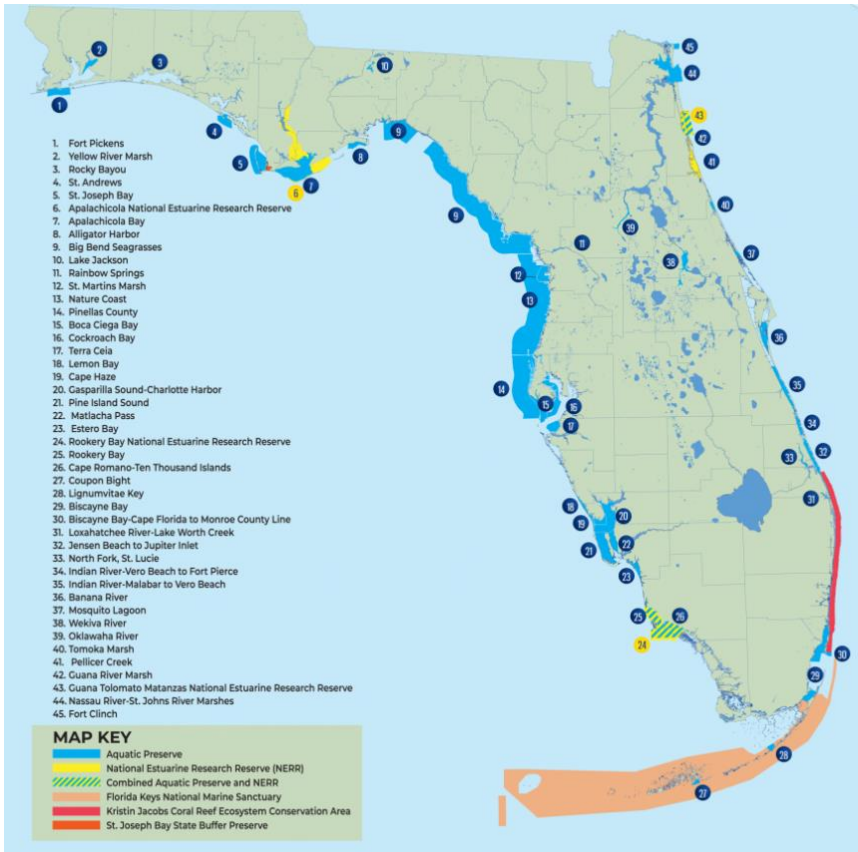
⁴² UF/IFAS, *Reynolds Coastal and Marine Ecology Lab: Research*, <https://soils.ifas.ufl.edu/coastal-and-marine-ecology-lab/research/> (last visited Mar. 11, 2023).

⁴³ UF/IFAS, *An efficient, sustainable fertilizer for seagrass*, <https://blogs.ifas.ufl.edu/swsdept/2022/05/19/an-efficient-sustainable-fertilizer-for-seagrass/> (last visited Mar. 11, 2023).

⁴⁴ Ch. 75-172, s. 1, Laws of Fla.; section 258.36, F.S.

⁴⁵ DEP, *Office of Resilience and Coastal Protection*, <https://floridadep.gov/RCP> (last visited Mar. 11, 2023); DEP, *Aquatic Preserve Program*, <https://floridadep.gov/rcp/aquatic-preserve#:~:text=Aquatic%20preserves%20protect%20Florida%27s%20living%20waters%20to%20ensure,window%20into%20the%20state%27s%20natural%20and%20cultural%20heritage> (last visited Mar. 11, 2023).

⁴⁶ *Id.*



III. Effect of Proposed Changes:

Section 1 creates s. 403.93344, F.S., to establish the Seagrass Restoration Technology Development Initiative and the Initiative Technology Advisory Council. The bill provides that it is the intent of the Legislature to establish a collaborative and coordinated effort among public and private research entities to develop restoration technologies and approaches to address the loss of seagrass and the cascading ecological and economic impacts that loss to communities in this state.

The bill establishes the Seagrass Restoration Technology Development Initiative within the DEP as a partnership between the DEP’s Aquatic Reserve Program, Mote, and the UF to develop innovative technologies needed to restore coastal seagrass ecosystems by building upon research and restoration efforts in the public and private sectors. The goal of the initiative is to develop, test, and implement innovative, effective, and environmentally sustainable technologies and approaches for restoring coastal seagrass ecosystems.

The bill requires the DEP to award funds specifically appropriated by the Legislature to Mote, which will function as the lead administrative component to achieve the initiative’s goals. Mote may, with the DEP’s approval, use a portion of these funds to facilitate additional engagement with other marine science and technology development organizations to pursue applied research and technology for successful restoration of seagrass ecosystems. Mote may not use more than five percent of its awarded funds for direct annual initiative administration and coordination

costs. The initiative must leverage state-appropriated funds with additional funds from private and federal sources.

Mote and the UF are required to create a ten-year Florida Seagrass Restoration Plan to implement tools and technologies developed under the initiative.

The bill provides that, beginning January 15, 2014, and each January thereafter, the initiative must submit a report containing an overview of its accomplishments to date and priorities for subsequent years to the Governor, the Legislature, the Secretary of the DEP and the executive director of the FWC.

The bill also establishes the Initiative Technology Advisory Council (TAC) as part of the initiative.⁴⁷ The TAC's membership must include marine science, technology development, and natural resource management representatives from this state's aquatic preserves, private organizations, and public or private research institutions. The TAC must meet at least twice a year. The TAC must be co-chaired by the president and chief executive officer of Mote and a representative from the UF. The other members must include:

- One member from a private commercial enterprise, appointed by the Governor;
- One member from a public or private university in Florida, appointed by the President of the Senate;
- One member from a non-university public or private marine environmental organization, appointed by the Speaker of the House of Representatives;
- One member from the DEP's Aquatic Reserve Program who has expertise in seagrass ecosystems, appointed by the Secretary of the DEP; and
- One member from the Fish and Wildlife Research Institute who has expertise in seagrass, appointed by the executive director of the FWC.

The bill provides that the TAC members must serve staggered two-year terms and may be reappointed. The TAC members will not receive compensation; each organization represented must cover all expenses of its respective representative. The section of law created in the bill expires on June 30, 2028.

Section 2 provides an effective date of July 1, 2023.

IV. Constitutional Issues:

A. Municipality/County Mandates Restrictions:

None.

B. Public Records/Open Meetings Issues:

None.

⁴⁷ See s. 20.03, F.S., defining advisory council as an advisory body created by specific statutory enactment and appointed to function on a continuing basis for the study of the problems arising in a specified functional or program area of state government and to provide recommendations and policy alternatives.

C. Trust Funds Restrictions:

None.

D. State Tax or Fee Increases:

None.

E. Other Constitutional Issues:

None.

V. Fiscal Impact Statement:

A. Tax/Fee Issues:

None.

B. Private Sector Impact:

If funds are specifically appropriated by the Legislature, Mote Marine Laboratory may have a positive fiscal impact as a result of receiving funding to serve as the lead entity for the Seagrass Restoration Technical Development Initiative.

C. Government Sector Impact:

The DEP and the UF will incur costs, subject to appropriations, related to the Seagrass Restoration Technology Development Initiative, including conducting research, creating a seagrass restoration plan, and preparing annual status reports. The UF may also incur costs related to co-chairing the Initiative Technology Advisory Council. Such costs may be offset by the bill's authorization that Mote Marine Laboratory may use funds provided as part of the program to engage other marine science organizations.

VI. Technical Deficiencies:

The provisions of this bill may be inconsistent with s. 20.052, F.S., which provides requirements for the establishment of advisory bodies.

VII. Related Issues:

None.

VIII. Statutes Affected:

This bill creates section 403.93344 of the Florida Statutes.

IX. Additional Information:

- A. **Committee Substitute – Statement of Changes:**
(Summarizing differences between the Committee Substitute and the prior version of the bill.)

CS by Environment and Natural Resources on March 14, 2023:

Changed the section number created by this bill from
s. 379.2274, F.S., to s. 403.93344, F.S.

- B. **Amendments:**

None.

This Senate Bill Analysis does not reflect the intent or official position of the bill's introducer or the Florida Senate.
