

Apalachicola Bay Oysters



Draft Rule
July 22, 2020



Florida Fish and Wildlife Conservation Commission

Version 2

This presentation provides a summary of oyster ecology and management in Florida; the status of the oyster population and fishery in Apalachicola Bay (Bay); and an update on a recently funded, large-scale restoration project to promote the recovery of oysters in the Bay. This presentation also includes a proposal to temporarily suspend all wild oyster harvest from the Bay in order to support restoration efforts and recovery of the Bay's oyster population.

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Unless otherwise noted, images throughout the presentation are by FWC.
Cover photo courtesy of Shawn Waite.

Outline

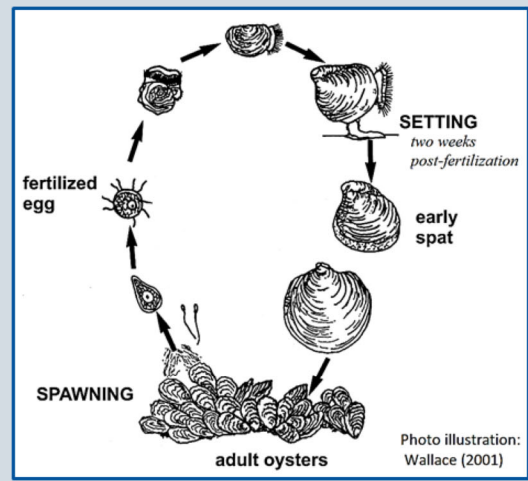
- Oysters
 - Biology and ecology
 - Fishery management
- Apalachicola Bay
 - Region description
 - History of Apalachicola
 - Collapse of the fishery
 - Restoration plan
- Draft rule proposal



This presentation briefly describes the biology and ecology of oysters, and provides brief background on Florida's oyster fishery and its management. The presentation then focuses on the Bay, the history and status of the Bay's oyster fishery, and a restoration plan for improving the status. Lastly, staff will provide a draft rule proposal for management changes to support restoration and conserve existing oysters and habitat.

Eastern Oysters

- Life cycle
 - Spawning peaks in fall
 - Young oysters (spat) settle on hard surfaces
 - Mature at 1-2 years
- Ecologically-important
 - Create habitat
 - Improve water quality
 - Stabilize sediments and shorelines



Eastern oysters are distributed along the east coast of North and South America, the Caribbean, and the Gulf of Mexico. They prefer shallow estuaries with moderately low salinities (15-25 ppt).

Oysters spawn by releasing eggs and sperm into the water column. Some spawning occurs throughout the spring and summer, with peak spawning occurring in the fall. Once fertilized, larvae spend about two weeks in the water column before settling on hard surfaces as small oysters, or “spat.” Although spat will settle on almost any hard surface, they have a higher tendency to settle on existing oyster shell/reefs. Once settled, the oyster will spend the remainder of its life attached. It takes about 1-2 years for an oyster to mature into a reproductively active adult, and 1-1½ years to grow to a legally-harvestable oyster (3 inches).

Oysters are ecologically important and provide a wide variety of ecosystem services (i.e., functions that promote healthy ecosystems). They are somewhat unique in that they create their own habitat. New generations of oyster settle on existing shell material, which results in a complex, three-dimensional natural structure that continues to expand as oysters grow or new generations recruit to the oyster reef. In doing so, they provide habitat for other organisms, such as mussels and barnacles, as well as nursery and foraging habitat for a number of important species, such as shrimp, flounder, red drum, spotted seatrout, crabs, groupers, and other small prey.

Oysters are filter feeders and it's estimated that an individual oyster can filter nearly two gallons of water per hour. Oysters have the ability to directly improve water quality by filtering algae and other suspended particles from the water. Indirectly, oysters can improve water quality by reducing wave energy and stabilizing soft sediments. This promotes the growth of other ecosystems such as seagrass. Wave reduction also reduces shoreline erosion.

Florida's Oyster Industry

- Statewide fishery, mostly in northwest Florida and Big Bend
- Primarily wild oyster harvest
 - Publicly-accessible reefs
 - Harvested by hand or tongs
- Aquaculture rapidly expanding
 - Oysters grown on leased parcels



The oyster fishery in Florida occurs throughout the state. However, most of the fishery is concentrated in estuaries or shallow coastal waters from Pensacola through Citrus County, in the Big Bend. Apalachicola Bay historically has been the premiere wild oyster harvesting area in the state.

While recreational harvest of oysters does occur, Florida's oyster fishery is primarily commercial. Harvest methods vary regionally; however, wild-oyster harvesters collect oysters from publicly-accessible reefs and are limited to collecting by hand or with tongs. Tongs are two long poles attached at a pivot near the middle, with wide rakes attached to the end of each pole. Poles can be upwards of 12 feet long, depending on the depth of the water where they are used. To collect oysters with tongs, a harvester stands along the gunnel of the boat and scrapes the top of the reef using a scissoring motion with the tongs. This dislodges attached oysters and allows the harvester to bring them on board. Another harvester sorts out legal oysters and discards sublegal oyster back to the reef. This labor intensive process continues as the boat drifts along a reef.

In more recent years, the oyster aquaculture industry has rapidly expanded. Farm-raised oysters are grown in leased parcels of water, either on the seafloor or suspended in the water column in cages. Despite some wild harvesters transitioning to aquaculture, wild harvest continues to account for a significant portion of oyster harvest in Florida and has a long-standing cultural importance throughout the state.

Florida Oyster Management

FWC

- Wild oyster harvest
 - Licenses, seasons, harvest limits, closed areas
 - Statewide regulations with some unique regulations for Apalachicola Bay
- Provide law enforcement
- Monitor wild oyster populations and harvest



Florida Department of Agriculture and Consumer Services

- Administer aquaculture leasing programs
- Certify and inspect processing plants
- Monitor water quality for human health concerns related to shellfish



Oysters in Florida are managed jointly by FWC and the Florida Department of Agriculture and Consumer Services (FDACS). In general, FWC is responsible for managing wild oyster harvest. This is done through licensing requirements, seasons, minimum size limit, bag/vessel limits, and establishing areas open/closed to harvest. While FWC primarily manages wild oysters as a statewide fishery, there are some unique regulations for Apalachicola Bay. FWC also provides law enforcement for both wild harvest activities and some aquaculture activities. Research divers from FWC's Fish and Wildlife Research Institute (FWRI) monitor juvenile and adult oyster populations, while staff from FWRI's Fishery-Dependent program monitor commercial wild oyster harvest. Although oyster population monitoring occurs throughout much of the state, FWRI has an established long-term monitoring program largely focused on the Bay.

FDACS primarily deals with components of the aquaculture industry. They administer aquaculture leasing programs, certify and inspect oyster processing plants, and monitoring water quality for human health concerns related to shellfish consumption.

In Florida, there are overlapping management roles between FWC and FDACS. For example, FDACS has the authority to restrict harvest in areas where water quality isn't conducive to oyster consumption (e.g., near marinas, canals, or bayous), as well as the authority to temporarily close portions of harvest areas if poor water quality (e.g., fecal coliform or harmful algal blooms) may result in human health concerns related to shellfish consumption. Because oysters are filter feeders, water quality is directly associated with human consumption concerns. FDACS authority for this extends to both wild and aquaculture harvest.

Apalachicola Watershed and Bay

- Apalachicola-Chattahoochee-Flint River (ACF) basin
 - Important freshwater source for Apalachicola Bay
 - More than 12.8 million acres
 - Series of reservoirs and dams
- Apalachicola Bay
 - Volume of freshwater input important
 - Variety of ecologically, recreationally, and commercially important species
 - Oysters historically covered more than 10,600 acres



The Apalachicola-Chattahoochee-Flint River (ACF) basin is a large watershed that provides an important source of freshwater for Apalachicola Bay. This basin spans across three different states and covers more than 12.8 million acres (20,000 square miles). Water flowing through the Chattahoochee and Flint rivers joins with the Apalachicola River, which ends in the Bay. Along the path, there are a series of reservoirs and dams that alter freshwater flows into the Bay. Alteration of water flows has been a contentious topic between Florida, Georgia, Alabama, and the U.S. Army Corps of Engineers (agency responsible for maintaining flows) for decades.

The Bay is located in the central panhandle of Florida. It is bounded by a series of barrier islands that create a mixing zone of freshwater from the Apalachicola River and saltwater from the Gulf of Mexico. The volume of freshwater entering this system is important for maintaining the ecology of the Bay, which is home to a variety of ecologically, recreationally, and commercially important species.

Oysters historically covered more than 10,600 acres (16.5 square miles), or 10%, of Apalachicola Bay's bottom, which provided a wide range of ecological benefits and helped support a diverse ecosystem as well as a number of fisheries.

History Of Apalachicola



- Founded on timber and seafood industries
- Oyster fishery dates back to mid-1800s
 - Supplied oysters nationwide



Photo courtesy of Florida Memory Project

Apalachicola is a small town located at the mouth of the Apalachicola River, bordering the northern portion of Apalachicola Bay. The town was founded in the early 1800s by timber and seafood industries. For over a century, the oyster fishery was one of Apalachicola's largest fisheries. Oysters harvested from the Bay were processed in fish houses where "shuckers" would remove the meat from the shell and can the oysters. The nutrient rich, shallow estuary provided a favorable habitat that supported the large fishery and supplied oysters nationwide. The middle and right images show large mounds of processed oyster shell, illustrating the scale and importance of oysters to Apalachicola in the latter part of the 1800s.

Apalachicola Bay Oysters

- Historically, Apalachicola Bay produced:
 - 90% of Florida's oysters
 - 10% of oysters harvested nationally
- Supported >2,500 jobs
- Culturally-important, iconic fishery

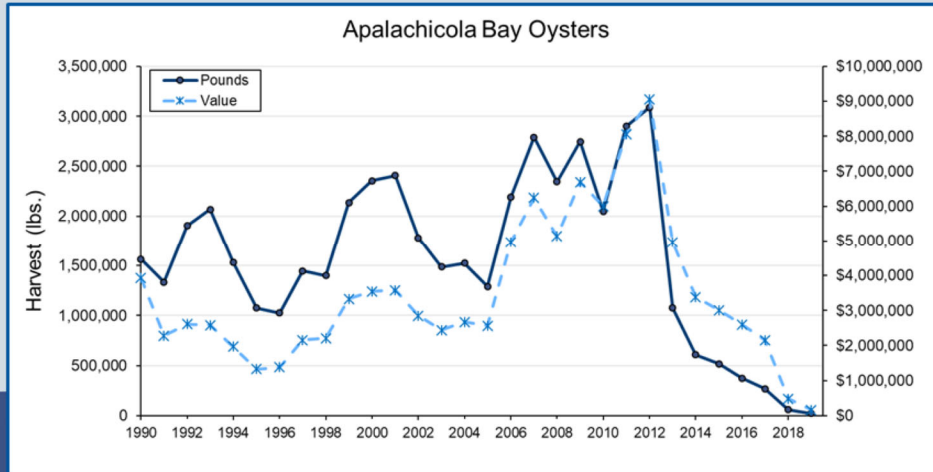


Photo courtesy of Florida Memory Project

Historically, nearly 90% of Florida's and 10% of the nation's wild oysters came from Apalachicola Bay. The industry supported more than 2,500 jobs and has long been a culturally-important activity that developed into an iconic fishery, known throughout the United States.

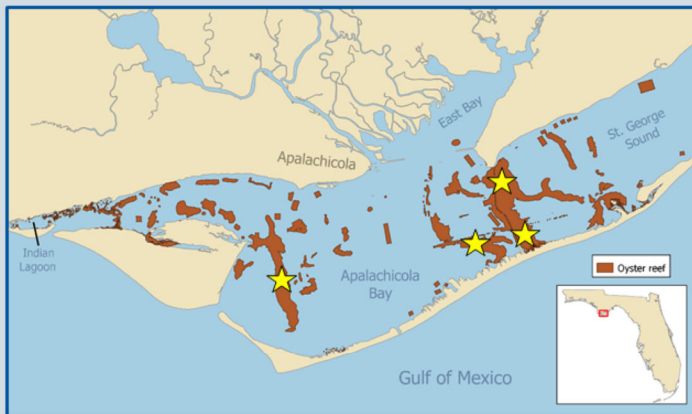
Collapse of the Oyster Fishery

- Harvest dropped dramatically in 2013
- 98% decline in dockside value since 2012
- Devastating to harvesters, processors, and community

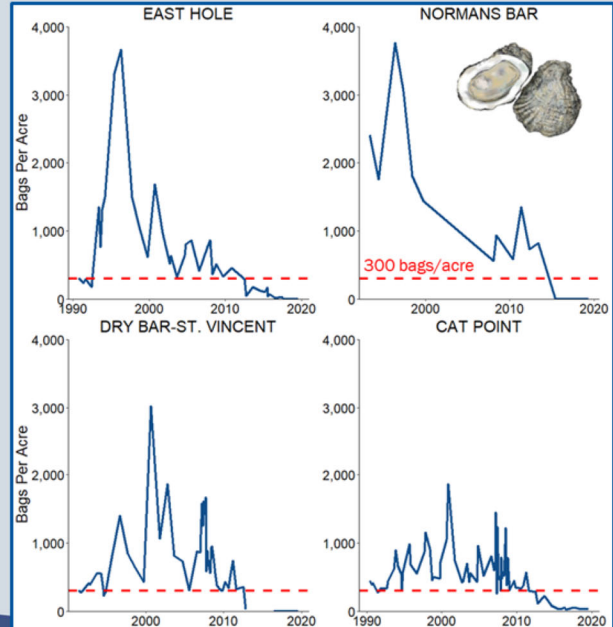


Oyster harvest in Apalachicola Bay dropped dramatically in 2013 following years of severe drought and low flow conditions throughout the ACF basin. Since then, harvest has continued to decline each year. Compared to the 5-year average prior to the collapse (2.6 million lbs.), a 99% decrease in harvest has occurred. In 2019, less than 21,000 pounds of oysters were harvested from Apalachicola Bay. Additionally the dockside value of wild oysters harvested from Apalachicola Bay has declined by 98% since 2012. This economic loss has had devastating impacts to Apalachicola oyster harvesters, seafood processors, and the community.

Collapse of Adult Oyster Populations



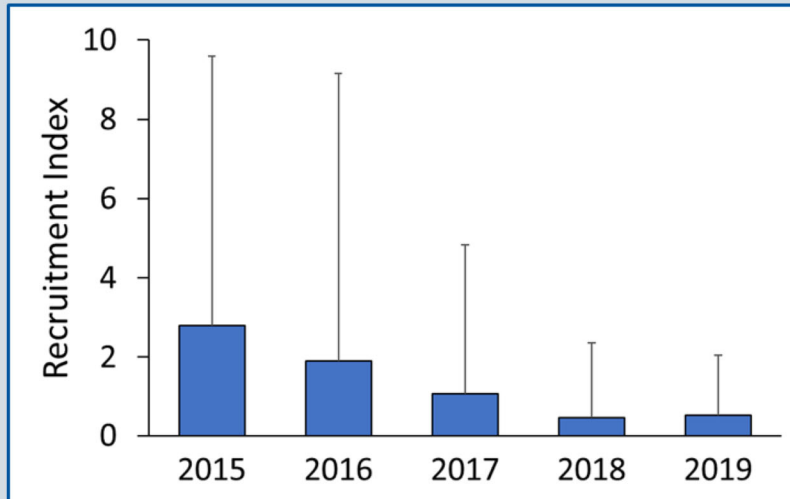
Drastic declines bay-wide



The graphs on the right show a time series of adult abundance monitoring data from the mid-1990's through 2019. Each panel represents an individual reef in the Bay (indicated by stars on the map). Although only four prominent oyster reefs (East Hole, Normans Bar, Dry Bar, and Cat Point) are illustrated here, similar trends have been observed on other reefs throughout the Apalachicola Bay system.

While oyster abundance historically varied year-to-year, drastic declines are apparent bay-wide. The red dashed line in the graphs illustrates a level of abundance (300 bags/acre) necessary for oyster reefs to support a limited harvest. Since 2017, all of the oyster reefs that FWRI monitors in Apalachicola Bay were below 200 bags/acre, and by 2019, only two reefs had harvestable-size (3-inch) oysters. Both of these reefs were significantly depleted, with only an estimated 34 and 57 bags per acre on each reef, respectively. More so, some historic reefs have become so degraded that there is little-to-no shell material left.

Declines in Oyster Recruitment



This figure illustrates the average monthly recruitment (number of spat per shell) each year from May 2015 through December 2019. These data are collected by FWRI's fisheries-independent oyster monitoring program. Based on these observations, recruitment has continued to decline each year since 2015. Moreover, the variability of recruitment within a year, indicated by the height of the error bars (standard deviations), also continues to decline. An 86% decrease in peak recruitment has been observed since 2015.

Reasons for Collapse and Ongoing Decline

Growth and survival conditions changed

- Low freshwater flow from ACF basin
 - Higher salinities favorable for predators
- Fewer adults each year
- High juvenile mortality
- Natural degradation of existing reefs
- Removal of shell material through oyster harvest



Photo credit (top): Nicole Martin

Low freshwater flow from the ACF basin, coinciding with an extensive drought during 2010 through most of 2012, was most likely the tipping point for the oyster collapse. Oysters can survive high salinities for a brief period; however, a lack of freshwater input into the Bay created favorable conditions for oyster predator populations, particularly oyster drills, to rapidly expand. The top picture shows numerous oyster drills, a marine snail, and their eggs (yellow masses) colonizing a small concrete block. This block had been in the water to monitor spat settlement for only one month. Stress from both predators and high salinity likely resulted in mortality of oysters early on in the collapse of the fishery. Despite the reduction in oyster drill abundance in more recent years, it's possible that remnant populations of this predator have continued to suppress recovery. The picture on the bottom, taken in 2019 from the Bay, illustrates this.

As illustrated on previous slides, fisheries-independent monitoring has observed an alarming decrease in the number of subadult and adult oysters. Each year, the total number of adult oysters in the Bay continues to decline because of environmental stressors, predation, and some harvest. Spat monitoring suggests that reproduction has been occurring, although fewer spat have been observed each year as well. Despite successful spat settlement, many oysters do not survive long enough to reach maturity. This has continued to drive the oyster population down.

Natural degradation of existing reefs and removal of shell material, both of which are important for future spat to settle, has also likely reduced the long-term sustainability of oysters in the Bay.

FWC Response to Fishery Collapse Since 2013

- Federal fisheries disaster declared in 2013
- Meet monthly/bi-monthly with industry and community-based groups
- 20 Executive Orders to reduce harvest and conserve resources since 2013
- Research and small-scale restoration partnerships

Downward trend continues despite harvest reductions and previous restoration

Stakeholder feedback: Suspending harvest identified as highest priority

- Support from industry if reopening criteria established
 - Industry request: 300 bags/acre
- Requests for sunset provision for reopening



Since 2013, a number of steps have been taken in an attempt to help improve the status of Apalachicola Bay oysters. In 2013, the U.S. Secretary of Commerce declared a federal fisheries disaster for Florida's oyster industry. Staff began meeting monthly or bi-monthly with Apalachicola's Seafood Management Assistance Resource and Recovery Team (SMARRT), a group of local seafood industry workers. These meetings continued through 2018 until another community-based group was formed. Staff continues to meet with this group and former members of SMARRT. Additionally, FWC has issued 20 Executive Orders since 2013 to provide additional conservation measures including significantly reducing the bag limit from 20 to 2 bags (1 bag = 60lbs.) per person, creating "no harvest conservation areas," requiring all harvesters to report to FWC-managed check stations prior to delivering oysters to wholesale dealers, and reducing the number of days oysters can be harvested.

FWRI and other research entities also began conducting research to better understand components of the collapse (predation impacts, water quality concerns, oyster health, and fishery impacts) and investigate optimal restoration strategies. FWC also partnered with other state agencies, Florida Sea Grant, and local seafood workers to work cooperatively on small-scale restoration projects. Approximately 850 acres of shell material was spread throughout the Bay from 2013-2018. Despite significantly reducing harvest and conducting small-scale restoration, downward trends in oyster abundance have continued.

Staff has continued to work alongside the local oyster and seafood industries, the community, other state agencies, and research organizations to address concerns. In more recent years, stakeholders from each of these groups have indicated that suspending harvest of wild oysters in the Bay is the highest priority for oyster recovery. There has been overwhelming support from the oyster industry for suspending harvest as long as a criteria to re-open the Bay, such as 300 bags of adult oysters per acre, is established. Staff has also received requests for additional re-assurance that the fishery will reopen in the future, such as a sunset provision in rule.

Moving Forward: Oyster Restoration

- \$20 million grant for large-scale restoration
 - Leverages recent research
 - Cultching
 - Monitoring
 - Developing adaptive management plan
 - Apalachicola Bay
 - Suwannee Sound



In early 2020, FWC received a \$20 million commitment from the National Fish and Wildlife Foundation's Gulf Environmental Benefits Fund to conduct large-scale restoration of oyster habitat in the Bay. The project goals leverage data collected from previous smaller-scale restoration and research efforts to fill in knowledge gaps to improve restoration success in light of changing bay conditions; identify where, what material, and at what density to "cultch" (the introduction of oyster shell or material for oyster spat to settle on); include monitoring of restoration efforts; and developing a stakeholder-informed, adaptive management plan to improve future management of the wild oyster harvest fishery. Since the collapse of the oyster fishery in the Bay, many oyster harvesters have shifted their effort to other parts of the state. To address shifting effort and spatial management concerns, adaptive management plans will be developed for both the Bay and the nearby Suwannee Sound area.

Staff recognizes environmental conditions in the Bay have changed and the fishery may not be able to support the level of harvest it did historically; however, staff believes that this project could be a significant step toward increasing wild oyster abundance and developing management options that adapt to current and future conditions of the Bay.

Project Timeline



This graphic shows the project timeline for FWC’s large-scale restoration project. This 5-year project is made of multiple components. In the early phases, FWC and project partners are focusing on filling in knowledge gaps to help improve restoration success. We will also focus on developing a stakeholder-informed oyster fishery management plan that will guide future management options. The largest portion of funding (nearly \$17 million) will go directly toward cultching 1,000 acres of oyster reef habitat. These efforts are anticipated to begin in mid-2022 and will be directly informed by earlier phases of the project and past restoration experiences.

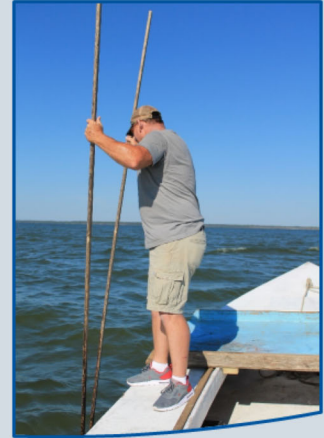
In addition to individual restoration and management components, FWC has committed to monitoring the successes of cultching efforts through 2025.

Proposed Draft Rules



- Suspend commercial and recreational harvest of wild oysters from Apalachicola Bay
- Prohibit on-the-water possession of wild oyster harvesting equipment (i.e., tongs)
- Sunset rules on Dec. 31, 2025

Would not apply to aquaculture operations



Given ongoing declines in oyster abundance despite management actions, conserving existing oysters and oyster habitat in the Bay is of high importance. Additionally, harvesting oysters in the midst of large-scale restoration is counterproductive to restoration efforts. The proposed draft rules would suspend commercial and recreational harvest of wild oysters in Apalachicola Bay and prohibit on-the-water possession of wild oyster harvesting equipment, such as hand tongs, through Dec. 31, 2025.

The proposed draft rules only apply to wild oysters and would not apply to oyster aquaculture operations.

Staff Recommendation



Approve the proposed draft rules to support restoration by conserving existing shell and adult oysters in Apalachicola Bay

- Suspend all wild oyster harvest from Apalachicola Bay
- Prohibit on-the-water possession of wild oyster harvesting equipment
- Sunset on Dec. 31, 2025

Return for update prior to sunset, or if a 300 bags/acre threshold is met

If approved and directed, return for a final public hearing at the October Commission meeting



Proactively implement by EO, effective Aug. 1

Staff recommends the Commission approve the proposed draft rules to support restoration by conserving existing oyster shell and adult oysters in the Bay. Specifically, staff recommends suspending all harvest of wild oysters from the Bay and prohibiting on-the-water possession of wild oyster harvesting equipment through Dec. 31, 2025.

Staff also recommends the Commission proactively implement these conservation measures by Executive Order, effective Aug. 1, 2020.

If approved and directed, staff will return for a final public hearing at the October Commission meeting.

We anticipate these conservation measures will need to be in place for 5 years or more. Staff will return to the Commission for an update prior to the December 31, 2025, sunset or when 300 bags per acre can be found on a significant number of oyster reefs.

The following slides are considered backup material and are not anticipated to be part of the actual presentation



FWC Oyster Regulations

	Apalachicola Bay	Elsewhere
Seasons	Summer: Jun. 1 – Aug. 31 Winter: Sept. 1 – May 31	Wakulla, Dixie, Levy counties: Sept. 1 – May 31 Remaining counties: Oct. 1 – Jun. 30
Monitoring closure	<300 bags per acre: closed Fri-Sun	NA
Commercial licenses	SPL, Bay License	SPL, Shellfish endorsement
Recreational license	Saltwater fishing license	
Bag limit (1 bag = 60 lbs.)	Commercial: 20 bags Recreational: 2 bags	
Minimum size limit	3" (undersized tolerance: 15% attached, 5% unattached)	
Allowable gear	Tongs or by hand	
FDACS training	Commercial: Shellfish Harvester & Aquaculture Training Course	
FDACS closures	Harvest subject to daily closures for seafood safety concerns	
FDACS processing	Oysters must be delivered to certified dealer by certain times. Varies seasonally.	



Apalachicola Bay: conservation/harvest areas, seasons, and bag limit modified by EO in recent years

While FWC primarily manages wild oysters as a statewide fishery, there are some unique regulations specific to Apalachicola Bay. The following table illustrates the current regulations for wild oysters in Florida.

To accommodate year-round oyster harvesting in Apalachicola Bay, portions of the Bay are seasonally-rotated which allows certain areas to only be open during a summer or winter harvest season.

If monitoring indicates adult populations have declined below 300 bags per acre, harvest from Apalachicola Bay is prohibited on Friday-Sunday.

Additionally, oystermen who are harvesting oysters from Apalachicola Bay are required to purchase an Apalachicola Bay Oyster Harvesting License (ABOHL). Harvesters who have a valid saltwater products license (SPL) and ABOHL are exempt from needing a shellfish endorsement. Purchase of this license is not limited to any individual based on state or local residency.

In recent years, FWC as issued 20 EO's to reduce harvest in Apalachicola Bay and further conserve oyster resources. These actions range from significant bag limit reductions, establishing "no harvest conservation areas," reducing the number of days harvesting can occur, and requiring all harvesters to report to FWC-managed "check stations" prior to delivering oysters to wholesale dealers.

FDACS Refrigeration Requirements

Oysters				
<small>(Times listed in the table are when oysters must be placed in a cooler at a certified shellfish processing facility)</small>				
Month	Traditional Cooling¹	Rapid Cooling²	On-board Cooling with Ice Slurry³	Restricted Use Only⁴ (Green Tag)
November	5:00 p.m.	5:00 p.m.	5:00 p.m.	5:00 p.m.
December	5:00 p.m.	5:00 p.m.	5:00 p.m.	5:00 p.m.
January	5:00 p.m.	5:00 p.m.	5:00 p.m.	5:00 p.m.
February	5:00 p.m.	5:00 p.m.	5:00 p.m.	5:00 p.m.
March	5:00 p.m.	5:00 p.m.	5:00 p.m.	5:00 p.m.
April	11:00 a.m.	1:00 p.m.	3:00 p.m.	4:00 p.m.
May	Not permitted	11:00 a.m.	3:00 p.m.	4:00 p.m.
June	Not permitted	11:00 a.m.	3:00 p.m.	4:00 p.m.
July	Not permitted	11:00 a.m.	3:00 p.m.	4:00 p.m.
August	Not permitted	11:00 a.m.	3:00 p.m.	4:00 p.m.
September	Not permitted	11:00 a.m.	3:00 p.m.	4:00 p.m.
October	11:00 a.m.	1:00 p.m.	3:00 p.m.	4:00 p.m.



Traditional Cooling - Oysters must be in the cooler of a certified facility by time specified the day of harvest and at or below 55°F in 8 hours.

Rapid Cooling - Oysters must be in the cooler of a certified facility by time specified the day of harvest and at or below 55°F in 2 hours.

On-board Cooling with Ice Slurry - Oysters cooled on boat with ice slurry dip within 1 hour of harvest and stored under mechanical refrigeration or in a cooler surrounded by ice. Oysters must be in the cooler of a certified facility.

Restricted Use (green tag) - Oysters that do not meet the Rapid Cool or On-Board Cooling requirements must be tagged for shucking only by a certified dealer or for Post Harvest Processing (PHP) only.

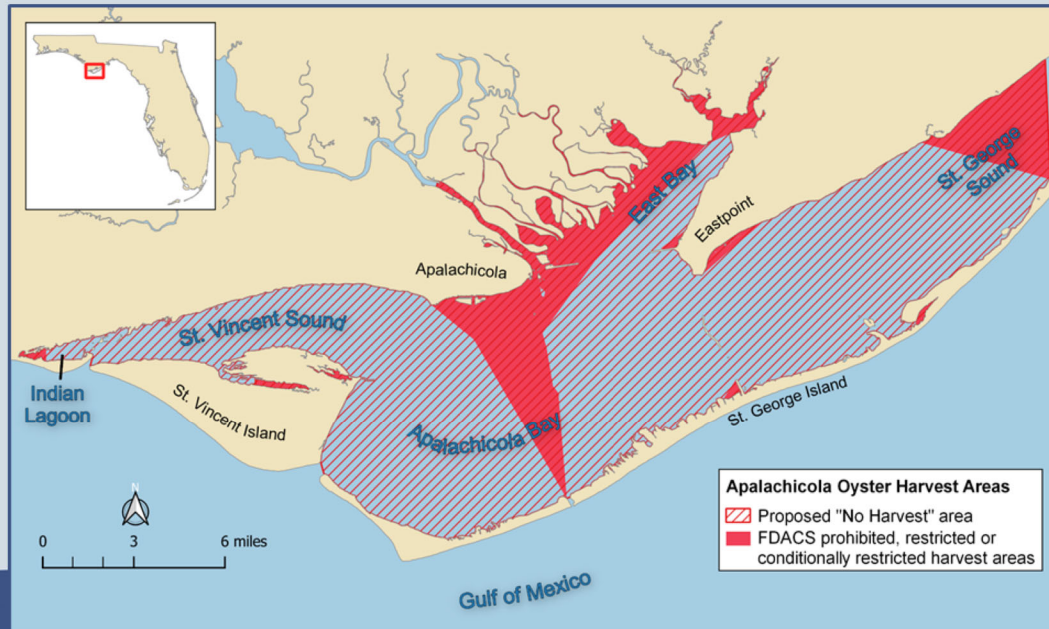
Apalachicola Bay Oyster Harvesting License

- Required if harvesting oysters from Apalachicola Bay system
- Renewed annually
 - Requires proof of FDACS Shellfish Harvester Education training
 - Credit applied towards SPL fee

	Amount	Application Period
Florida resident	\$100	May 17 – June 30
Non-resident	\$500	May 17 – June 30
Late fees	\$500	To purchase or renew after June 30 OR for failure to pay annual fee within required application period



Proposed Area



The proposed "no harvest" area includes all FDACS-defined Shellfish Harvest Area (SHA) for Indian Lagoon (SHA #15) and the Apalachicola Bay system (SHA #16).

FWC Oyster Monitoring



Fishery-dependent: harvest data

Fishery-independent

- Adult oyster abundance
 - Status criteria (bags/acre):
 - >400: Healthy
 - >300: Capable of sustaining limited harvest
 - <200: Below level necessary for harvest
 - <100: Depleted
- Spat settlement



FWRI monitors wild oyster populations throughout portions of the state. Fisheries-dependent data, is data collected directed from the fisheries. These types of data include harvest location, harvest amount (e.g., pounds of oysters), and effort expended. Fisheries-independent data, are collected by FWRI staff in the field. Divers conduct routine monitoring to estimate adult oyster abundance in a given estuary. They observe and record sizes of live oysters, numbers of live and dead oysters, and collect samples for parasite and disease analysis. A widely-accepted criteria has been developed to determine the status and health of oyster reefs based on the number of adult oysters. Estimates of more than 400 bags (1 bag = 60lb) of adult oysters per acre indicates a healthy oyster abundance. Estimates below 200 bags per acre suggest reefs are below levels necessary to maintain harvest whereas estimates below 100 bags per acre indicates oysters are depleted.

Staff also monitor spat settlement to evaluate reproductive success and recruitment of new generations of oysters to the reef.