

# Oysters in Alabama

► The eastern oyster, *Crassostrea virginica*, is an important species both commercially and ecologically. Oyster harvests in the Gulf of America were 7.815 million pounds in 2023. Habitat loss, predation, and changing environmental conditions have contributed to significant declines in Alabama oyster landings from highs of the twentieth century.

Efforts to restore Alabama oysters are varied. Alabama Extension-led volunteer-based gardening efforts focus on educating participants in oyster ecology and producing advanced-sized oysters for direct plantings on restoration sites. The Alabama Department of Conservation and Natural Resources primarily leads the large plantings of habitat (cultch) materials, such as rock and oyster shells, suitable for oyster larvae to settle and attach to. Several projects led by Auburn University are actively working to understand better oyster reef ecology, water quality, and protection for brood stock (adult oysters) from predators to stabilize larval supplies. Farming efforts have developed in Alabama waters during the last 15 years. Premium oysters grown for the half-shell market are now produced on several farms and shipped throughout the United States. These markets can be profitable and provide alternative opportunities for people to make their living in a similar way to the traditional wild harvest of public oyster reefs.

## Biology

Oysters spawn from April through October when the water temperature is 72 degrees F or higher and salinity is above six parts per thousand (ppt). Eggs and sperm are released into the water for fertilization. Females release between 70 million and 170 million eggs in a spawn. The eggs are fertilized in the water column, and the resulting larvae are free-swimming. After several weeks, the developing shell of the larva becomes too heavy for swimming. This causes the larva to settle on the bottom. Larval oysters require a clean, hard bottom for attachment and can move around on the bottom seeking a good substrate. If a hard bottom is found, the larva secretes a fluid that cements them permanently to the substrate for the duration of their life. Larvae settling in soft mud or other unsuitable areas usually do not survive. Once



settled, the developing oysters (known as *spat*) can become sexually mature within a month but usually take longer. Interestingly, oysters sometimes change sex after spawning. Young males often become females as they grow large enough to support the energy requirements for egg production.

Oysters eat by filtering food from the surrounding water through their gills. Under ideal conditions, an oyster can pump 5 gallons of water an hour through its filtering apparatus; however, a more conservative estimate of 2 gallons per hour is generally used to calculate filtration capacity. For a visual demonstration, see the filtration video on the Alabama Extension YouTube channel at [www.aces.edu/go/OysterFiltration](http://www.aces.edu/go/OysterFiltration) or scan the QR code.



In the wild, Alabama oysters reach legal harvestable size (76.2 millimeters; 3 inches) in about 24 to 30 months. Farmers, however, can harvest their oysters at smaller sizes, if desired, with Alabama farmers typically harvesting oysters between 2½ and 3 inches (63 to 76 millimeters). Oysters held in grow-out gear can reach these sizes in 10 to 14 months, while some oyster restoration projects can produce about 2- to 3-inch (50 to 70 millimeter) oysters in as little as 5 months.

## Environment

Oysters are bound to one spot after they settle. When the water is too fresh (less than 10 PSU—practical salinity unit) for extended periods, oysters die. On the other hand, when salinity is high, oysters are likely to be devastated by oyster drills (snails), crabs, and a tiny parasite (*Perkinsus marinus*), resulting in the disease dermo. Oyster drills alone can kill 85 percent of the young oysters on a reef. Oysters can also be smothered by sand and silt from dredging operations or extremely heavy storms. Extended periods of low oxygen can also result in localized heavy oyster mortality as they cannot seek more favorable conditions.

## Management

Oyster management can be divided into two areas of concern—public health and conservation. The Alabama Department of Public Health (ADPH) Seafood Division and the Alabama Department of Conservation and Natural Resources (ADCNR) Marine Resources Division monitor the waters around oyster reefs. The ADPH, following the National Shellfish Sanitation Program standards, closes the reefs to harvesting when bacterial counts indicate that disease-causing organisms may exceed acceptable levels. These closures generally coincide with high river flow in winter and early spring, which carries increased pollution into the lower portion of Mobile Bay, and heavy localized rain events.

Oyster abundance within a harvest area is another factor considered by regulatory officials when opening or closing a particular area. The ADCNR Marine Resources Division conserves oysters by requiring licenses, enforcing a size limit of 3 inches (wild

caught), managing harvests by opening and closing productive reefs in grids, and allowing only hand or oyster tong harvest on public reefs. The Marine Resources Division also plants oyster shells or clamshells to provide new substrates for oyster larvae to settle on and grow. Large amounts of rock or other materials are often planted after natural disasters, and oyster shells are regularly planted to replace shells removed in the harvesting process. Significant opportunities remain for additional shell plantings as resources become available through the Alabama Oyster Shell Recycling Program or similar efforts.

## Oyster Measures

### Commercial Wild Catch

Unlike many other foods, wild caught oysters are harvested, processed, and sold based on volume rather than weight. Oyster harvesters catch tubs, sacks, and barrels of oysters. Oyster shuckers are paid by the gallon for meat shucked, and consumers buy sacks of whole oysters and gallons, half gallons, or pints of oyster meat.





The following are the approximate relationships among the different measures.

- A bushel basket or tub equals one sack.
- Four sacks equal one barrel.
- An average sack yields about 6 pints of oyster meat, depending on the time of year.
- If oysters are packed four sacks to a barrel, a sack should weigh about 60 pounds.

## Farm Raised Oysters (Aquaculture)

Alabama currently recognizes three categories of oyster culture: commercial (including under piers), oyster gardening (restoration), and personal consumption. Commercial oyster culture entails the production of oysters with the intent to sell, trade, or barter. For more information, visit the Alabama Oyster Aquaculture website. Oyster gardening is the nonconsumptive culture of oysters for habitat enhancement or ecological benefit. Oysters grown for personal consumption are strictly for the benefit of the individual grower.

Each category carries specific production and regulatory requirements related to oyster culture and harvest. It is important for you to know what these are before beginning any oyster production. More information is available on the Alabama Oyster Aquaculture website.



## Ecological Value

Oyster reefs are widely recognized for their ecological value as well as their economic value. Healthy reefs filter large amounts of water (adults average an estimated 2 gallons per hour), contribute to a reduction in excess nutrients, and provide food and shelter for an estimated 360 species of marine organisms. Highly valued game fish are often associated with oyster reefs. Reefs also serve as wave breaks, reducing shoreline erosion by dissipating energy rather than reflecting it.

## Economic Value

### Commercial Wild Catch

Following the drought years of 2006 through 2008, the Alabama wild catch of oysters collapsed, largely as a result of predation from oyster drills. During the period between 2010 and 2019, annual commercial wild oyster landings in Alabama ranged from 26,275 to 295,989 pounds of meat, averaging 107,622 pounds. Similarly, the value of landings (amount paid to fishermen) has varied from \$1.5 million to \$340,000, with an average of \$813,000. During this time, Alabama's oyster aquaculture (farm) industry has developed and contributed additional oysters (reported by the whole piece) and dollars to Alabama's overall oyster production.

### Commercial Farm Raised (Aquaculture)

Alabama's shellfish aquaculture industry currently produces oysters through off-bottom farming using an adjustable longline system and floating cages. Total values are from reports by the Alabama Marine Resources Division, the Alabama Department of Public Health, and the Alabama State Lands Division.

### Highlights for 2023

- The Alabama Department of Public Health reported 13 commercial oyster aquaculture operations in Alabama.
- Farm gate value for Alabama oyster commercial operations was at least \$3,200,000.
- Total number of single-market oysters sold in 2023 was estimated to be 5.2 million.

- Operators reported 34 full-time employees and 30 part-time employees.
- At least 100 acres were permitted for oyster aquaculture with at least 75 acres used in production.

For more information, see the Alabama Aquaculture Oyster website.

## Personal Consumption

Oysters, which are commonly eaten raw and whole, are very efficient at filtering water for food particles. This feeding practice results in the intake of other particles, including bacteria. Eating oysters with high concentrations of bacteria may pose a health risk to consumers.

In commercial operations, this risk is managed by allowing the harvest of oysters only from waters that the Alabama Department of Public Health (ADPH) has classified as “conditionally approved” through a nationally recognized sampling process. While this is not required for personal consumption, it is strongly recommended that people follow this guideline and grow oysters for personal consumption only in waters that are conditionally approved and open for harvest (e.g., not closed by ADPH due to high rainfall).

Consumers should also be aware of the risks associated with eating raw oysters, even when harvested from open, conditionally approved waters. Naturally occurring bacteria called *vibrios* may cause adverse health consequences, particularly for immune-compromised individuals. This risk is managed by ensuring that harvested oysters are chilled and kept cold within specific time frames to prevent the vibrios from multiplying and increasing the risk. It is strongly recommended that anyone harvesting oysters for personal consumption be aware of the risk and follow the requirements used for commercial harvest.



Before you begin to raise oysters for personal consumption, you should contact the ADPH to confirm the status of the growing waters where you are located. Additionally, become familiar with the time and temperature requirements for the commercial harvest of oysters for live, raw consumption.

## The Future

Oysters are a valuable natural resource in Alabama. The industry provides jobs and a large economic benefit to the state. Like all marine resources, oysters depend on good water quality for continued use by people. Good water quality can be maintained by preserving wetlands, careful planning of dredging activities, and controlling pollution both in Mobile Bay and in the tributaries that feed the bay.



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