



**Natural Resources Conservation Service**  
**CONSERVATION PRACTICE STANDARD**  
**BIVALVE AQUACULTURE GEAR AND BIOFOULING CONTROL**

**CODE 400**

**(ac)**

**DEFINITION**

Actions that reduce, clean, or remove biofouling organisms and other waste from bivalve production areas while minimizing environmental risk and risk to species of concern.

**PURPOSE**

This practice is used to accomplish one or more of the following purposes:

- Reduce adverse impacts of shellfish aquaculture operations and gear on water, plant, animal, and human resources.
- Improve dependable water quantity and quality to support shellfish production.
- Improve adequate food quantity and quality to support shellfish production.

**CONDITIONS WHERE PRACTICE APPLIES**

Near-shore, intertidal, and subtidal areas where bivalve aquaculture occurs.

**CRITERIA**

**General Criteria Applicable to All Purposes**

Locate bivalve shellfish aquaculture production sites and associated activities in accordance with regulatory guidance, including marking and recording requirements.

Minimize the impact of sediment manipulation on adjacent and offsite areas.

Maintain adequate water flow through the production area by using husbandry practices including, but not limited to, the following:

- Monitor containment gear and other equipment regularly for biofouling.
- Minimize or avoid detrimental build-up of fouling organisms through such practices as periodic flipping of bottom or surface culture gear, net/screen removal prior to algae fouling season, and/or timing of gear deployment to miss barnacle and other fouling organism recruitment.
- Clean and remove biofouling organisms frequently to facilitate shellfish health and growth, replacing containment gear with new and/or biofoul-free equipment when necessary.
- Cycle off-bottom containment gear used for epifaunal culture with redundant gear for collection, transport, and treatment of biofouling.
- Clean gear on-shore when biofouling includes aquatic nuisance species (ANS) that cannot be cleaned in a lethal and environmentally responsible manner onsite, or when biofouling will result in excessive organic loading.
- Avoid the return of fouling organisms and macro algae into surface waters in a manner or volume

that may cause local environmental degradation.

- Use only environmentally appropriate biofoul control methods, including, but not limited to—
  - air drying,
  - brine dip,
  - vinegar dip,
  - fresh water dip,
  - sweeping, or
  - power washing.
- Collect, transport, and dispose of waste gear on-shore, in a manner that is timely and does not cause environmental degradation.

Manage the risk of accidental loss of and/or damage to aquaculture gear within the environment due to inadequate securing, excessive fouling, and ice or hazardous weather damage by adopting the following actions:

- Secure and effectively maintain shellfish containment systems on a regular basis, and especially before hazardous weather.
- Monitor weather conditions (i.e., severe storms, ice masses, very low and high water and air temperatures) to allow proper scheduling of equipment removal, relocation, or other alternative measures as appropriate.
- Collect and dispose of waste gear outside of the marine environment as soon as practical after removal from production areas, and especially before hazardous weather.
- Keep records of gear cycling, replacement, removal, and movement to monitor losses that may pose an environmental or navigational hazard.

## **CONSIDERATIONS**

Design gear layout and placement to minimize impact on the natural function of the ecosystem, while allowing for normal aquaculture activities of the producer.

Include buffer zones around and within growing areas to reduce disease transmission and provide corridors for wildlife.

Be aware of locally important, State, Federal and Tribal listed species that may be encountered in the area. Consider using a wildlife identification field guide and keeping a journal to log interactions of protected wildlife species with the aquaculture operation.

Be aware of and acquire all required permits and licenses for beach access to aquaculture production sites and follow specific area regulations regarding driving in tidal zones.

Follow all Federal, State, and local boating regulations and acquire all required permits and licenses for operation of a boat for a shellfish operation.

Consider using associated shellfish aquaculture practices to address additional concerns, including but not limited to NRCS Conservation Practice Standards (CPSs) Combustion System Improvement (Code 372), Access Control (Code 472), Integrated Pest Management (Code 595), and Heavy Use Area Protection (Code 651).

## **PLANS AND SPECIFICATIONS**

Provide site-specific plans and specifications for bivalve aquaculture gear and biofouling control that describe the requirements needed to achieve its intended purpose.

At a minimum, include the following items:

- Plan map designating production site boundaries with a polygon, buoy coordinates, important buffer zones, and any required access points.
- A subaqueous soils map of the site with soil interpretations, if available.
- Identification and location of environmentally sensitive areas.
- Location of priority fish and wildlife habitat, State species of concern, and protected wildlife species that may be found in the area.
- Recommendations for actions to take or avoid when protected species are observed or expected in the area and contact information for responsible agency in the event that stranded, injured, or otherwise distressed wildlife are sighted.
- Plan narrative, describing conservation practices associated with achieving the purposes and criteria of this standard.
- Conservation plan schedule of operations.
- Guidance documents necessary to aid the grower in implementation of the conservation practice.

## **OPERATION AND MAINTENANCE**

Prepare a plan for the inspection and operation and maintenance of all items and practices described in the conservation plan for each site, including, but not limited to, the following:

- Do not exceed the local elevation limit on structures placed on the site.
- Remove all unused or unnecessary equipment from production sites and securely store it in approved areas.
- Mark predominant containment gear left on the production site with distinctive marks for identification (i.e., name and permit number), and secure it properly to minimize risk of offsite movement.
- Inspect growing areas regularly, especially following storm events. Repair any damage to prevent loss of equipment to the environment.
- Dispose of waste/spent gear on-shore, in a manner that is timely and does not cause environmental degradation.
- Monitor and keep records of—
  - Notifications filed with local harbor masters and other regulatory authorities.
  - Containment gear replacement cycles.
  - Tracking of labor hours and specific tasks.
  - Potentially harmful interaction events with protected wildlife species, and corrective actions taken.
  - Invasive species on or adjacent to growing areas.

In geographic areas where ice is an issue, perform weather-related maintenance, including—

- Monitoring and keeping records of water temperatures and weather conditions.
- Positioning intertidal equipment and materials flush with the sediment surface.
- Carefully securing all gear to the substrate with supplemental attachment devices during winter, or removing materials offsite to an upland or deep water licensed shellfish growing site.
- Ensuring that any gear left on the associated production areas during the winter is free from fouling to reduce the potential for attachment of ice.
- Replacing delineation marker buoys onsite with winter sticks or other marking devices approved by the appropriate authority to minimize the risk of movement by ice.

## REFERENCES

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