

Example JARPA Language: Near-Bottom Culture

Activity	Description
Timing	<p>Culture activities are generally tide-dependent but can occur year-round. During low tides, farm crews may be on the farm site for 3 to 6 hours before the tide re-floods the area. Activities may also occur at high tide when there is enough tidal inundation for a vessel to access farm sites and may last up to 9 hours.</p>
Access	<p>Culture beds are accessed via work vessel or on foot at high and low tide. Work vessels that are used to transport farm crews, materials, and equipment to the farm site for low-tide work may either be anchored in a channel or deep areas during low tide or allowed to go aground. Once farm crews arrive at the farm site, culture beds within the site are typically accessed on foot.</p> <p>In limited areas, farm crews may access beds with an ATV. ATVs may be used to transport materials to and from the farm site from an upland location, as well as to conduct bed preparation and maintenance activities.</p>
Bed Preparation and Enhancement	<p>Generally, the substrate is not disturbed prior to planting near-bottom culture and depends on site-specific conditions. In some instances, the substrate is smoothed to reduce irregular features that may impede near-bottom culture activities prior to planting and to prevent uneven sediment accumulation. Substrate disturbance is site-specific and may occur manually or mechanically up to a depth of 6 inches. Manual substrate disturbance entails farm crews accessing targeted areas on foot at low tide to reduce irregular surfaces by hand or with a hand tool such as a rake. Manual substrate disturbance may occur to a depth of 3 inches. Mechanical substrate disturbance involves towing a farm implement behind a vessel when the bed is submerged.</p>
Predator and Invasive Species Control	<p>Near-bottom culture that suspends crops off the bottom helps to minimize pressure from predators that access on-bottom crops. Containment gear (such as marine grade, UV-resistant plastic mesh net containers or other types of gear) is used and is secured to the substrate. Thus, predator and invasive species control is minimal or unnecessary for this culture method.</p>
Seeding	<p>Gear installation in the substrate is typically required for near-bottom culture methods. Some near-bottom culture systems require structural support posts incrementally installed in the substrate along the line. Posts are installed at intervals of 18 inches to 6 feet depending on the type of near-bottom culture and local environmental conditions. Gear is typically secured in the substrate 1 to 3 feet deep but may be secured up to 5 feet deep in certain areas. Gear installation typically occurs at low tide.</p> <p>Intertidal longlines may be seeded at an upland location or on the farm site at low tide. Seed for flip- and float-container operations is manually placed in UV-resistant, reusable containment gear (such as plastic mesh net containers or bags). Seed is pre-loaded into</p>

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	<p>containers on the deck of the vessel and transported to the farm site by vessel during low tide. Farm crews secure containers to ropes during low tide. Alternatively, farm crews may bring seed with them onto the farm site at low tide and directly load the containers on-site.</p>
Maintenance	<p>Crops may be thinned or transplanted during their growth. Thinning and transplanting for longline culture occurs by hand on the farm site at low tide. Thinning and transplanting for flip-container culture typically involves harvesting oysters, processing them on the deck of a work vessel or at an upland site, and redeploying containers. Thinning and transplanting for float-bag shellfish typically occurs at high tide at the farm site or at a subtidal location. A vessel equipped with a hoist system may raise the containers onto a work platform so that farm crews may thin or re-seed containers.</p> <p>Near-bottom culture also requires regular maintenance at low tide. Lines are inspected by farm crews walking the culture area assessing gear integrity. Components are inspected and repaired as needed. Gear may be cleaned or replaced if it becomes overly fouled. Containment gear replacement is described in the Harvest subsection below. Float-container lines are turned at high tide to avoid fouling. Material that washes onto the farm site such as coarse wood or unrooted algae may be relocated outside the farm site.</p>
Harvest	<p>Longline shellfish may be harvested manually at low tide or mechanically at high tide using a work vessel. Prior to manual harvest, a work vessel transports harvest tubs to the farm site at high tide. Tub s are equipped with buoys for retrieval at high tide. Farm crews manually harvest shellfish at low tide by cutting shellfish off lines and placing shellfish in harvest tubs or containers. Substrate disturbance is minimal and limited to farm crews walking on the farm site. At high tide, harvest tubs are retrieved by a work vessel equipped with a crane or hydraulic hoist.</p> <p>Mechanical harvest of intertidal longlines involves farm crews attaching buoys at the end of a line. At high tide, farm crews use a reel mounted to a work vessel to pull lines onto the vessel. Shellfish clusters are cut from the lines on the deck. Shellfish that fall off the lines may be subsequently harvested either manually or mechanically. Longline posts may be removed after harvest at low tide, or they may remain in-place for multiple culture cycles.</p> <p>Prior to harvest of flip containers, at low tide, farm crews remove containers from lines, and attach a buoy line to the bundles. This activity may be conducted when the bed is completely dry or when there is 1 to 3 feet of water over the farm site. The bundles are then harvested at high tide using a vessel with a boom crane or hydraulic hoist. Farm crews may also remove containers from lines and load them directly onto work vessels manually. Shellfish may then be sorted on a work platform on the farm site immediately after harvest. Additionally, farm crews may also transport harvest tubs to the farm site at high tide before harvesting, and place containers or contents directly into harvest tubs at low tide. Harvest tubs are then collected by a vessel with a crane at high tide. Empty containers and buoys may be stored securely on a work platform nearby. Substrate disturbance is minimal and limited to farm crews walking on the farm site.</p>

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Float-container harvest typically occurs at high tide. A vessel equipped with a hoist system raises the containers onto a work platform so that farm crews may harvest crops. Farm crews may either move their work vessel along the float container line or may anchor in-place and release the float bag line so that it moves through a processing system. Farm crews avoid substrate disturbance since this form of harvest activity occurs exclusively at high tide.