

Building a Floating Longline System for Nursery Culture of Eastern Oysters



Photo credit: David Andrews

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Longline systems are commonly used in the northeast US and elsewhere, for the nursery culture of shellfish, usually Eastern oysters (*Crassostrea virginica*). However, oysters can be grown to market size in such a system, and other species can be reared. In addition, the system is scaleable, and be used by the small recreational grower as well as the commercial producer.

The following pages will cover the basic elements of a longline system, including materials, construction, installation and maintenance. However, readers - especially new growers, are strongly encouraged to consult with other growers, their local harbormaster, extension professionals, aquaculture association, or others prior to building and deploying their own longline system. Conditions vary strongly from location to location, knowing those conditions is important for personal safety and for abiding by local, state or federal regulations.

Finally, meeting your state contacts for marine aquaculture regulation is really a necessity for beginning marine shellfish culture, and we advise doing so early in the process.

The Main Elements of a Floating Longline System

Oyster longlines are fairly simple, with only a few main components. These are:

- Anchors
- Warp and Bridle
- Spreader Bars
- Main lines



This photo includes the main elements of an oyster longline.

Foreground:
Bridle and a spreader bar.

Midground:
Main lines

Background:
Spreader bar, marker float,
anchor

Note:
The bridle in the foreground is not attached to the warp and the anchor for that end - both ends of the longline must be anchored.

The following slides will show the elements in more detail.



Anchors come in many sizes and shapes, and some consultation with an expert is advised before you choose your anchor. Harbormasters, Power Squadrons, marine suppliers and mooring servicing companies can all help you choose the right kind of anchor and associated equipment.



In this application, we show a 75 lb. mushroom-type anchor. These anchors are effective only when laid-over, as in the top view. When upright (bottom view) their holding capacity is greatly reduced.

Note the use of an anchor chain, at the top of the anchor. Chain is used as a durable link to the warp, and to keep the anchor correctly oriented. It should be heavy enough to stand up to corrosion, and long enough to maximize the anchors' holding power.

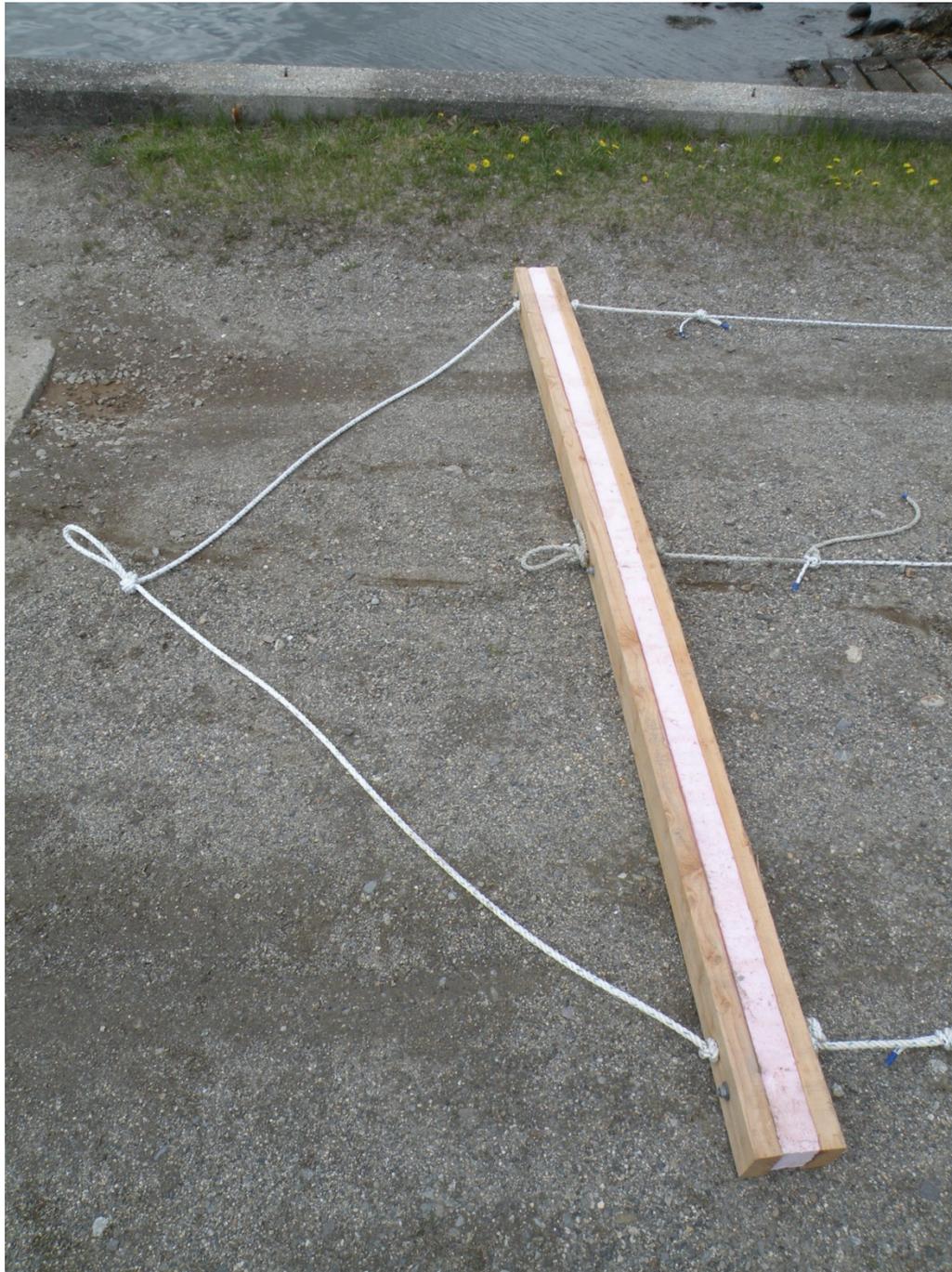


A shackle, matched to the chain size and strength needs, is used to connect the anchor chain to the anchor. Note that the shackle bolt should have a hole on the non-threaded end. This is to accept **mousing** - used to prevent the shackle from backing its way out. In this case, heavy twine is used for mousing, but copper or stainless steel wire is also commonly used. Coating the shackle threads with an anti-seizing compound is advised. 5/16" galvanized chain is used in this example.



You'll need to connect your anchor chain to your warp line, which will lead up to the surface. In this case, a **clove hitch** knot is used to connect the 1/2" line to the chain. The bitter end of the warp line is also run back through the lay of the warp, to keep the knot from loosening. Depending on the depth, exposure of the site, tide and other factors, length of the warp may be anywhere from three to seven times the water depth. A good video to learn how to tie a clove hitch can be found at:

http://www.knotpro.com/members/boating_knot_clove_hitch.htm



Spreader Bars

A spreader bar is used on each end of the longline, to maintain a set distance for the mainlines and for buoyancy. Untreated 2"x4"x8' studs work well. In between is sandwiched a section of rigid foam insulation, 2" thick; this provides extra buoyancy.

Three carriage bolts hold the unit together, or several stainless steel screws.

Just be sure that the fasteners are long enough to do the job.

Three additional holes are drilled through, to accept the bridle and the third mainline, in the middle of the spreader bar.



Here is a close-up of the end of a spreader bar. Note the carriage bolt, and the knots on either side of bridge. These overhand knots help to keep the bridge stationary within the spreader bar, and limits abrasion to the line.



This photo shows the extra piece of line inserted into the center of the spreader bar, which the middle longline is tied to. Note the stopper knots on either side of the spreader bar, to keep the line from working back and forth excessively. Using a separate piece of line instead of tying the middle mainline into the spreader bar, allows for a mid-season change if necessary in case of chafing, without having to swap out the entire middle mainline, or shortening all the mainlines.



This is called a 'true lover's knot', a 'blood knot' or sometimes a 'fisherman's knot'. It is very useful in joining the ends of lines together, even if the lines are of different type or diameter.

A good video for tying the lover's knot can be found at:
http://www.knotpro.com/members/fishing_knots_true_lovers_knot.htm



So, now you have your lines built, and ready to connect to one another:

- Anchors to anchor chains
- Anchor chains to warps
- Warps to bridles
- Marker buoys to warps
- Bridles to spreader bars
- Longlines to spreader bars

You are ready to deploy the longline.

Note:
Foreground bridle is not attached to warp line in this photo



Good luck in growing your oysters!

