

Shellstring (Spatfall) Survey Step by Step Methods

Melissa Southworth, Virginia Institute of Marine Science
May 11, 2017

A shellstring survey is developed for a waterbody to provide an estimate of a particular area within the waterbody, or the waterbody as a whole's potential for receiving a "strike" or settlement (set) of oysters on the bottom. It can provide an estimate of larval supply in a given system and helps describe the timing of settlement events in a given year.

MATERIALS LIST

- Oyster shells (per shellstring; 12 shells between 2.5" - 4.5" SL)
- Drill (a drill press is preferable)
- 3/16" X 4" masonry drill bit
- Brace wire (per shellstring; ~20 inches of 12.5 gauge)
- Hand pliers/wirecutters
- Crabpot buoys (two per deployment site)
- Nylon crabpot line (#8 Captain Jack)
- Float line (#12 green braid, 3/8")
- Cinder block (one or two depending on current strength at deployment site)
- House bricks with 2-3 holes (one per deployment site)
- Dissecting microscope
- Waterproof tag
- Sharpie Marker
- Thermometer *
- Salinometer *
- Dissolved Oxygen Meter *

* Can use a YSI in place of all of these.

STEP 1 - Collect oyster shells from a shucking house, restaurant, or other such contact.



STEP 2 - Drill a hole through the center of each shell with a 3/16" masonry drill bit. You can use a hand drill, but a drill press is preferable.



STEP 3 - Add water to two pans. In the first pan, add 2 capfuls of bleach and scrub drilled oyster shell with a stiff bristle brush. Remove any large barnacles or debris with the back of brush. Rinse shells with fresh water and allow to dry in the sun.



STEP 4 - For each individual shellstring you will need a 20" piece (this does not have to be exact) of 12.5 gauge brace wire. Once you cut it, bend it straight and put a loop in one end using a pair of hand pliers to prevent the shells from falling off.



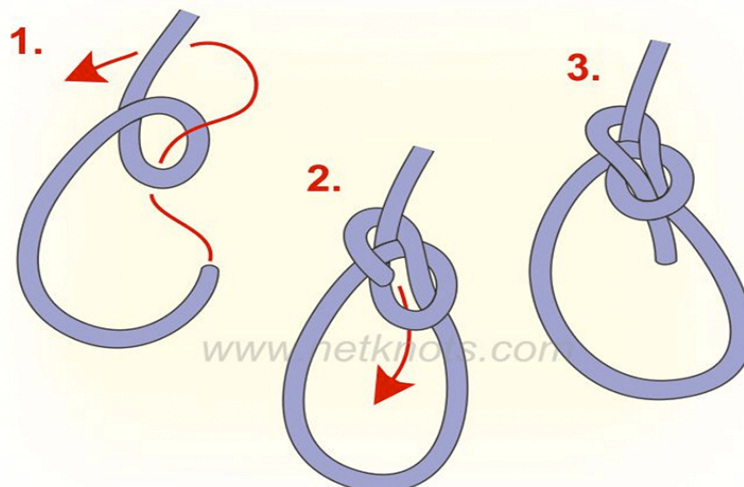
STEP 5 - For each shellstring, string 12 of the drilled, cleaned shells onto a wire with the smooth (cupped) side down toward the bottom hoop. Bend the wire that is not covered by shell in half to provide a "handle" for hanging. Each string should take approximately 8-10 minutes in total to assemble.



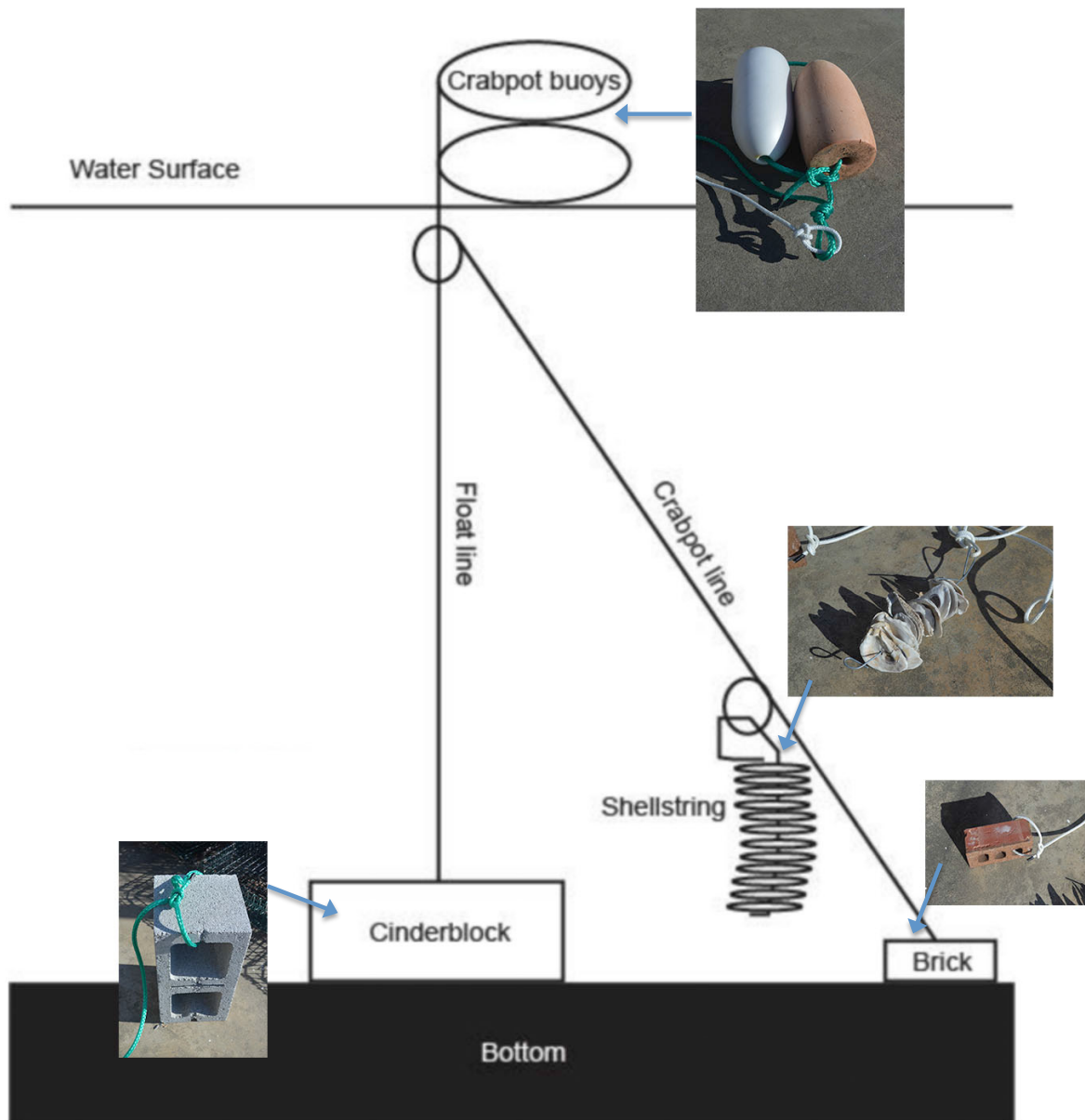
STEP 6 - Prepare the shellstring for deployment (see diagram/pictures below). Crabpot line and float line should be cut around 2 to 3 ft greater than the depth in which you plan to deploy the shellstring. Thread one end of the float line through two buoys and tie together. Attach the other end to a standard cinderblock. Just below the buoys, make a loop in the float line and tie one end of the crabpot line through the loop. Attach the other end to a 2 or 3 holed house brick. Make a loop in the crabpot line approximately 2 ft up from the brick. String the shellstring wire through the loop and twist to secure the shellstring to the line. Note: for all knots I prefer a bowline (http://www.netknots.com/rope_knots/bowline), but you can use whatever knot you feel is most secure.



BOWLINE



STEP 7 – Deploy the shellstring (if the lines are cut the correct length, the shellstring should hang approximately 0.5 m (18 inches) off the bottom).



STEP 8 - Shellstrings are typically left in place for 7 days and replaced weekly. If replacing multiple shellstrings in a day, be sure to put an ID tag (preferably waterproof) on each string upon retrieval so you know what site they came from. On the first retrieval day if you notice that the shellstring has mud on it or if the buoys are “sinking”/underwater then the length of your lines may need to be adjusted.

STEP 9 - Once brought back to the lab, allow the shellstring to fully dry.

STEP 10 – Using a dissecting microscope count the number of spat that have settled on the smooth (cupped) under surface of the shell of the middle 10 oyster shells on the shellstring (discard the top and bottom shell, these are not counted). To obtain an estimate of the number of spat per shell, divide the total number of spat by the number of shells examined (typically should be 10).



Spat per shell values can be categorized for comparison purposes as follows:
0.10-1.00, light
1.01-10.00, moderate
10.01 to 100.0, heavy
100.01 or more, extremely heavy

For more detailed explanations of spat per shell values see reports at: http://www.vims.edu/research/units/labgroups/molluscan_ecology/publications/topic/annual_reports/index.php



STEP 11 - In addition to shellstrings, water temperature and salinity should be measured on a weekly basis 0.5 m off the bottom (at the approximate depth of the shellstring). If hypoxia is potentially an issue at a particular site, DO should also be monitored on a weekly basis (if possible).