



## PNW Spotter Mooring Deployment and Recovery Guidelines

V1.2: January 8, 2024



### Overview

Here we outline general guidelines for both the deployment and recovery of the Pacific Northwest Sofar Spotter mooring design (Fig. below). This design is based on the Sofar mooring guidelines using just one surface “decoupling” float in addition to the Spotter, but has some changes made to further minimize entanglement, increase visibility, facilitate easier recovery, and ensure mooring survival in the harsh conditions of the Pacific Northwest winters, which see waves in excess of 6 meters and currents over 3 knots in ~30-40 m of water. This mooring is also designed for locations with clay/silt/sandy or small gravel bottom types where a fluke-type anchor will provide extra holding power (up to a factor of 10). This is the case for much of the Washington shelf. Lastly, as this mooring has significant scope to allow the pull on the anchor to be lateral \*and\* to assist with recovery, it is not a design that will work in narrow channels or enclosed locations where watch circles with a diameter on the order of 60 m is too large. As the anchor will need to be set by pulling on it laterally, make sure the mooring site is clear of seabed cables (look on charts), crab pots, or other items that could get

entangled in the mooring or anchor. Both deployment and recovery require two people to handle mooring gear and one to drive the boat. If well-coordinated and the weather conditions cooperative, it might be possible to carry this out safely with only two people.

## **Deployment**

The deployment is a straightforward sequence with Spotter-first, anchor last. Prior to lowering any mooring component overboard, make sure all mooring lines are tangle-free and will pay out cleanly. Figure-eighting the line and chain on the deck starting at the anchor is a good approach. Another option is to coil the line in large line tubs. The entire mooring should be pre-assembled, double-checking all connections and cotter pins. If screw-pin shackles are used, these should be tightened with a wrench and seized with 316 stainless seizing wire or seiners twine. It's probably a good idea to secure the mooring anchor until it is ready to go overboard.

When paying out the mooring components it will be helpful if there is either a moderate current or the boat is moving slowly so that the floats and line moves away from the boat when put overboard. If the boat is drifting or slowly maneuvers instead of holding position over the deployment site, then this deployment should start upwind/current of the planned anchor location. The distance should be based on how fast the boat is drifting considering that the deployment will take less than about 10 minutes. About 200 yards is sufficient for  $\frac{1}{2}$  knot of drift. Take care to keep lines clear of the propeller. If the seas are cooperative, backing down slowly towards the deployment site will allow bow-deployment with the line well away from the propeller(s).

1. Deploy the Spotter first, lowering it into the water then paying out the 20 m of weighted line connected to the swivel junction.
2. Lower the swivel junction into the water until the ~4 m of slack is taken up to the Polyform float (which is still on deck) , keeping the Polyform float line and the main line separated.
3. Lower in the Polyform using the attached lift strap or holding onto the PVC pipe at the top of the float.

4. Continue paying out the main line keeping feet clear of any bights in the line.
5. Pay out the chain hand-over-hand until only the anchor remains on deck.
6. If the Spotter and the Polyform are streaming well away from the vessel and the vessel is still moving through the water (or there is some current), toss the anchor overboard when at the drop point. Although the anchor will swing a bit towards the Spotter as it falls due to line/buoy drag, this will only be a few meters and may be offset by any ambient current.
7. Set the anchor! As this is a fluke-type anchor, drive the vessel around to the Polyform float, slip a line through the lift loop, and with the vessel pull on the anchor line downwind/current until there is significant resistance. This will dig the flukes into the bottom to set the anchor. If the anchor does not set initially, then the boat may need to circle around the drop point until it does OR this isn't the correct type of anchor for the bottom type.

## **Recovery**

Recovery is accomplished by using a crab-pot puller and/or a powered windlass/capstan and some brute strength. The puller/davit arm should be rated for at least 300 lbs. Several stopper lines (~5-10 m each) should be ready on deck. Cleats or points to which these lines can be secured near the davit arm would be very helpful. Knowing and plotting (on vessel chart plotter) the position of the anchor would be helpful. Using the Spotter position data can be helpful in determining the anchor position. A good guess is a distance that is the water depth+15 m (e.g. 45 m in 30 m of water) laterally away from the Spotter up-current when the currents are moderate to strong (>0.5 kts). If using a crab pot puller then the sheave will need to be sized correctly to jam the ¼" line using for the mooring. If only sheaves for larger lines are available (e.g. ½" line), then this line diameter can increase tho it will significantly add to mooring drag and might require a larger anchor.

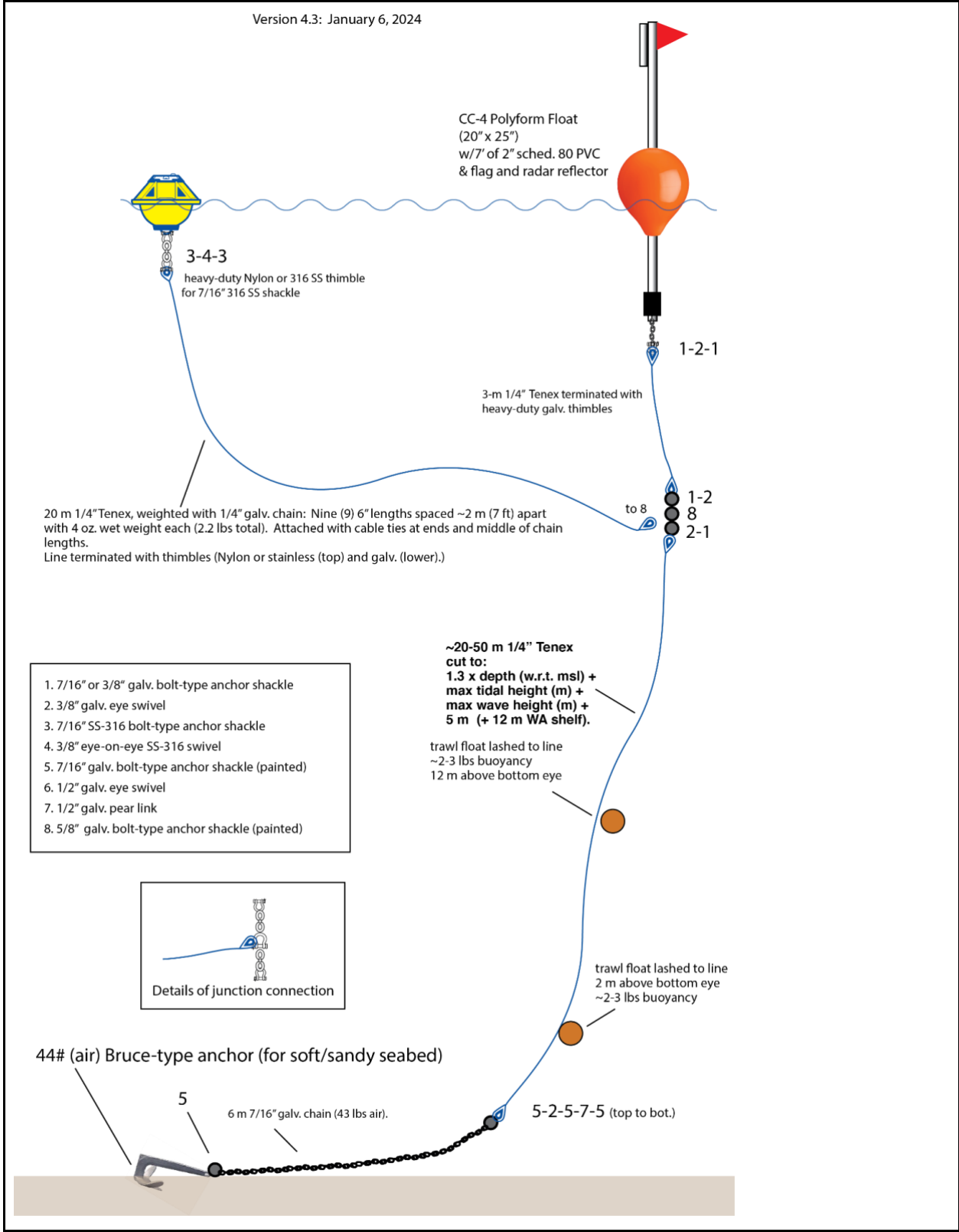
Recovery sequence:

1. Note the direction of the wind/waves/currents and the position of the Spotter and Polyform floats with respect to the anchor. This will be important to minimize the effort to pull up the anchor.
2. Recover the Polyform using the lift loop, slowly driving the boat up-current/wind TOWARD the anchor site. Do not overshoot the anchor site.
3. Pull up the Polyform line until the primary junction is at the deck edge or on deck. Run a stopper line through the largest ( $\frac{5}{8}$ " ) shackle at this junction and secure the stopper line back to a cleat. This line should be tied off to a hard point on one end and cleated on the other. This can be attached to the same cleat. If no cleats are available, then a \*sturdy\* rail, bit or other hard-point might do. This is simply a safety line to prevent the Polyform from being dragged back overboard – though there should be little tension on this line if the vessel is positioned over the anchor.
4. Pull in the Spotter line and Spotter by hand. Coil the line on the deck or in a tub/bucket to keep the deck clear.
5. Place the main anchor line (below the junction) in the crab pot puller sheave and begin to haul in this line. As the line is hauled in, have one person that coils the line on deck or into a separate tub.
6. When small floats are reached, carefully cut/snip them off the main line, taking care not to cut the main line.
7. When the junction to the chain is above the water or at the rail, stop off in the pear link at this junction with a second stopper line. At this point the wet-weight of the anchor and chain will be on this line (~70 lbs).
8. Remove the main line from the pot-puller.
9. Two people haul in the anchor chain hand-over-hand, then haul the anchor aboard. Go slowly and methodically here unless it comes in easily. Keep feet and hands clear of any bights in the chain or line. Passing a line from a cleat through a chain link over the side and then back to the boat will give some mechanical advantage for pulling. Use a stopper line for safety when needed,

passing a separate line through a chain link and then back to a cleat or secure tie point. A safe sequence would be:

- Stop off the chain just inside the rail with a line (tie or a slip line).  
Make sure you have lines that will fit through these links – or use a shackle.
- Run a pulling line from a hardpoint, through a link overboard and then back to the boat– hauling as much chain aboard as possible.
- Reset the stopper line (now lower on the chain).
- Repeat this sequence until the anchor is at the water's edge.

**OR**– Using a separate working line over the pot-puller , pull in short lengths of chain using the pot-puller. Stopping off as noted above.



Latest version of the mooring diagram (v4.3). The minor change from the earlier version was changing the two pieces of chain above the anchor to a single length of 7/16" chain.



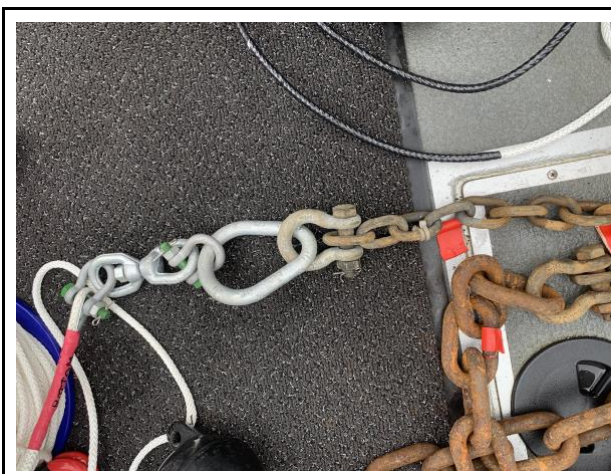
Fully assemble the mooring on deck. The Spotter, the Polyform float/marker and the anchor are all shown here. Double-check all connections.



Spotter connection showing 316 SS swivel and Nylon (or SS) thimble. The screw-pin shackle will be seized before deployment.



The primary junction connection. The line to the left goes to the Spotter, the line to the top runs to the Polyform, and the lower end of the junction goes to the anchor. **NOTE, ALL 5 COTTER PINS HERE SHOULD BE TAPED.** To do this use a high-grade electrical tape (e.g. 3M Super 88, or 33+) wrapping 4 or so layers around the shackle nut, over the sharp ends of the cotter pins. This will prevent the Spotter Tenex line from catching on these pins, getting tangled or damaging the braid on the line.



Connection to the anchor chain. In the latest version of the mooring diagram (4.2) the heavier  $\frac{5}{8}$ " chain is \*above\* the  $\frac{3}{8}$ " chain. **All the cotter pins below the line should be double-bend (bend each side in the opposite direction) to prevent the shackle from coming apart. Also, these shackles should be wrench-tightened to a reasonable level of human-strength torque.**