



Techniques for Making Weak Links and Marking Buoy Lines

How to Comply with the Atlantic Large Whale Take Reduction Plan

October 2003

Techniques for Making Weak Links at Buoys

The intent of the Weak Link requirement is to allow the release of buoys from the buoyline in a way that when they release, the buoyline connected to the gear on the bottom will not have a knot on its end. An eye left on the buoy line made by splicing, tucking or hog rings is acceptable. Note: Weak links must be placed as close as operationally feasible to each individual buoy.

Hog Rings

Hog rings can be used to form an eye in the end of a buoy line that will function as a weak link. Up to 7 may be used to create a 600 pound weak link and up to 5 for a 500 pound weak link. No significant variation was noted between wet and dry tests. Also, the length over which the hog rings were distributed (from 6" to 12") didn't significantly affect the strength.



A variation of this technique is to fashion a weak link from a short length of line. The

line is formed into a loop with its ends overlapped and hog ringed to each other. Five hog rings form a suitable 600 pound link while 4 are sufficient for a 500 pound link. **For this weak link to function properly, the loop must move freely where it attaches to both the buoy and the buoy line.** *Unacceptable* attachment methods include, but are not limited to: sheet bend, clove hitch, cow hitch (e.g.: formed by dipping - passing the eye in the end of a buoy line through the weak link and over the buoy).



A buoy line may also be passed through a plastic swivel two times, **not forming a knot**, and hog ringed back on itself with up to 3 hog rings.



Off the Shelf Weak Links

Off the shelf weak links are available in a variety of styles and configurations to meet different strength requirements. The weak link end of the device goes toward the gear.



Modified Swivels

Some swivels can be modified to conform to the weak link requirement by compromising their strength where the buoy line attaches. However, they must be tested by the NMFS Gear Research Team to ensure that they will release in the proper fashion and within the required limits. Lukian swivels with a 9/32" diameter hole and SeaSide swivels with a 3/16" diameter hole satisfy the 600 pound requirement.



Rope of Appropriate Breaking Strength

Another weak link technique is a spliced jumper. The jumper is selected based on breaking strength data from the manufacturer.



A length of rope or a jumper of appropriate breaking strength may be tied into the buoy, thus creating a weak link, as long as the failure results in a knotless bitter end on the buoy line. Testing by the Gear Research Team can make this determination.



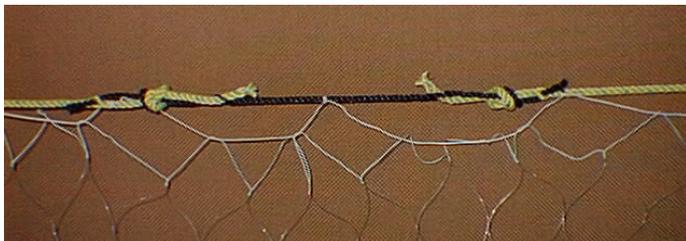
Stapling to a Buoy Stick

Another type of weak link can be created by stapling a rope to a wooden buoy stick to form an eye for the buoy line attachment. However, these must be tested by the NMFS Gear Research Team to ensure that they will release in the proper fashion and within the required limits. When using this method, the buoy line can only be attached by passing the end of it through the eye on the buoy stick once and bringing it back and splicing, tucking or hog ringing to form an eye.



Techniques for Making Weak Links on Gillnet Float Rope

Shown at the right are 2 methods of incorporating weak links into a gill net float rope. The top one shows a weak link jumper spliced into the float rope. The overhand knot in the jumper reduces its strength to about 60% of its original strength. For example, putting an overhand knot in a piece of 5/16" polypropylene that has an original tensile strength of 1710 pounds will make the rope fail with a load of about 1025 pounds. The bottom picture shows a weak link tied into the float rope with fisherman's knots. These knots also reduce the strength of the rope to about 60% of its original strength. A third alternative would be to incorporate an off the shelf weak link in the float rope.



Techniques for Marking Buoy Lines

Buoy lines can be marked in a variety of ways. Shown are three simple methods that were tested and found to work satisfactorily under normal conditions. At the top, colored twine is seized around the line and woven between the strands. In the center the line was spray painted; this method requires that the rope be dry. At the bottom, colored electrical tape was wrapped in one direction and then back over itself to form two layers.

