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Mid-Season Pink Shrimp Update

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In color on the Web: <http://www.dfw.state.or.us/MRP/publications>



TO: OREGON SHRIMP INDUSTRY

FROM: Bob Hannah and Steve Jones

Subject: Impressive Eulachon Reduction Technique

Date: 11 August 2014

Eulachon Smelt



Big Breakthrough for Eulachon Smelt Reduction!

ODFW shrimp project and Pacific States Marine Fisheries Commission (PSMFC) staff recently identified a promising simple method for dramatically reducing eulachon smelt bycatch in the pink shrimp fishery (Figure 1). The work was funded through a NOAA Bycatch Reduction Engineering Program (BREP) grant administered through PSMFC. The technique involves attaching a series of LED lights to the fishing line of the trawl. Our test results from a July charter on the F.V. Miss Yvonne were so dramatic that we felt an immediate announcement was warranted. We encourage all shrimpers to start using and testing the technique or a variant ASAP. We believe that broad adoption of the technique (or something similar) can sharply reduce the overall take of threatened eulachon smelt in the pink shrimp fishery, perhaps reducing the chance of restrictive regulations in the future.



Figure 1. Photo of the divided hopper viewed from above with a typical catch from a tow during our study. Ten green lights on the fishing line were used on the starboard net (left side of hopper). No lights were used on the port side (right side of hopper). Most of the visible fish catch are eulachon smelt.

What We Tested;

Using heavy-duty zip-ties, we loosely attached ten green Lindgren-Pitman Electralume LED lights (developed for swordfish fishing) to the center third (approx. 25 ft) of the fishing line on one of the Miss Yvonne's two matched nets (Figures 2, 3 & 4). Each net was equipped with groundgear commonly referred to as "Newport Mud Gear" (Figure 5). The other side was fished without lights. The lights were spaced roughly four feet apart and pointed toward the center, adjacent to the droppers. The lights were switched between the port and starboard nets periodically and a total of 42 tows were evaluated under a variety of conditions. Catch from each side was kept separate using a divided hopper and each was processed separately, weighing everything.

What We Found;

A complete analysis of the data collected and publishing the results will take several months, but some impressive preliminary findings are listed below.

1. Eulachon were reduced by 90.4% (by weight).
2. Shrimp loss was 0.7% and was statistically non-significant, but variable.
3. Juvenile rockfish were reduced by 78.0% (by weight).
4. Combined flatfish (slender sole, rex, arrowtooth etc.) were reduced by 68.8% (by weight).

As an important note; we spent the first two days of the eight day Charter testing various placements of the lights around the grate (ahead, behind, bottom, top). **DON'T DO THIS!** Placing a light near the rigid-grate BRD actually increased our eulachon bycatch consistently by 100%!

Where Can I Get The Lights?

Lindgren-Pitman Electralume LED lights are available from the manufacturer, Lindgren-Pitman, Inc. in Florida (ph. (954) 943-4243; web site, <http://www.electralume.com/>). Some retail outlets may carry them as well. The listed price for a single-color green light is \$39.95.

What We Don't Know;

- The "Newport Mud Gear" groundgear configuration we tested (Figure 5) is currently widely used in the west coast pink shrimp fishery, but there are some other designs in use constructed with heavier groundlines and shorter drop chains (i.e. continuous doughnuts & rollers) that probably fish tighter to the bottom. With the "Newport Mud Gear" we tested, we believe that the fish utilized the added light to see and escape underneath the net, simply seeing obstacles and escape opportunities better. This "escape route" may be restricted and fish escapement reduced by using gear that fishes too tight to the bottom.
- We tested green Lindgren-Pitman lights only. Other colors may perform well too, but green and blue light is known to transmit through water better. The lights tested proved durable and no leaks or damage to the light occurred (depth rated to 328 fathoms) during our tests. There may be other similar products on the market too; we just tested this brand.
- We tested an array of 10 lights. It's unknown if more or fewer lights will perform as well, or if other placements along the fishing line would perform as well or better.
- Lindgren-Pitman lights use two AA batteries. Battery performance will undoubtedly vary by brand and type. We used Energizer Lithium Ion and Energizer Industrial AA's, changing batteries every two days as a precaution. Battery life can be conserved by using the pressure-switch setting on the light but the true life of the batteries is unknown, especially in the lower temperatures on the seafloor.



Figure 2. Photo of a single green Lindgren-Pitman Electralume light zip-tied to the fishing line of a shrimp trawl. We found that looser zip-ties worked better to avoid torquing the light.



Figure 3. The same light shown in Figure 2 showing its relative position to the chain droppers and doughnut-covered groundline. While fishing, the fishing line was about 15 inches above the groundline on each net.



Figure 4. Photo of the starboard-side net on-deck with ten green lights attached to the fishing line (as tested). The rigid-grate BRD is shown leaning at the stern. The lights proved durable after the nets were dragged on-board at least twice a day, for 8 days.

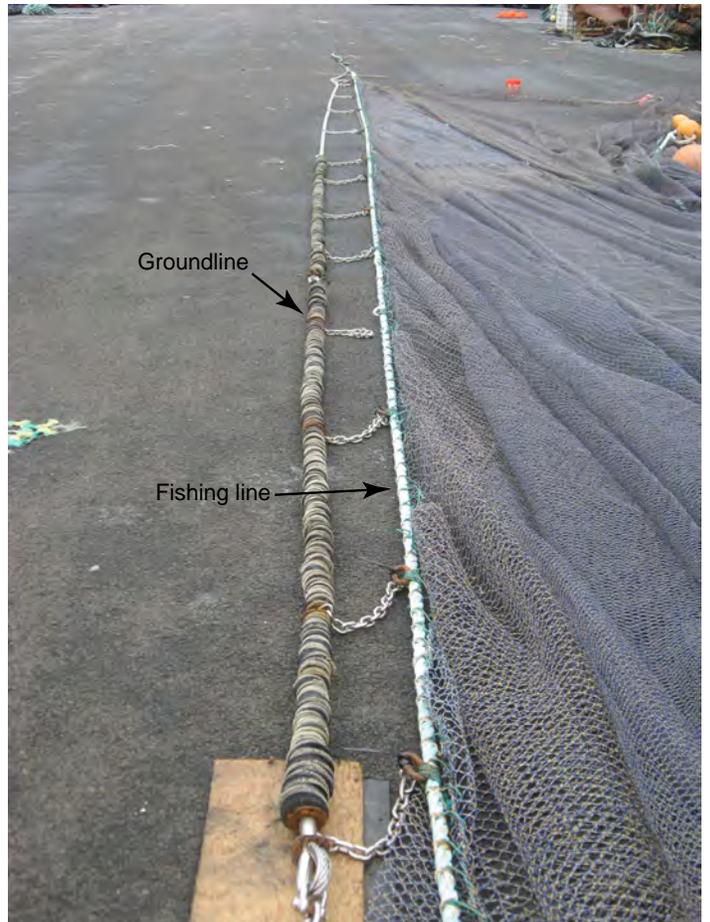


Figure 5. Photo of one of the Miss Yvonne's nets stretched out for maintenance, with the fishing line and groundline highlighted. The configuration is commonly referred to as "Newport Mud Gear".

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We Need your Input!

We encourage all west coast shrimpers to start using and testing a lighted fishing line to reduce bycatch. The arrangement we tested works amazingly well, but we know that shrimpers will try other light arrangements, colors (some have already purchased blue & multicolored) and perhaps other brands. Some shrimpers will probably have different experiences with other groundgear configurations and variable fishing conditions. We'd like to get all the input we can back from the fleet regarding their experiences testing the lights so we can identify an optimal arrangement for maximizing bycatch reduction (particularly eulachon smelt).

Please take notes in your logbook comment section regarding your use of lights, briefly describing information such as number of lights, color used, light placement etc. You can also call us directly at 541 867-4741.

