

WA/OR Survey COMPILATION (3 Surveys)					
GEAR INNOVATION					
	Cost to Fishery (HIGH/LOW)	IS IT DOABLE?	LIKELY TO MAKE A DIFFERENCE TO WHALES? YES/NO/MAYBE	TESTABILITY (GOOD PROSPECT FOR TESTING?) YES/NO/MAYBE	Comments
Sinking or neutral lines	Added cost ? Med	Yes Yes Possibly	Yes Maybe ?	Yes Yes	One of best practices was to not have slack line. Neutral line promotes slack in the water but not on the surface Don't know if it will make diff- so many factors like ocean currents
Change length of trailer lines	Low	Yes Yes	Possible No	Yes No	Pictures of entangled whales didn't show trailer lines to be a factor
Keep gear tighter	Low ?	Yes ? Too close now	Yes Maybe	Yes Yes	Collect data on recoveries & un-entanglements Many different ways to test this Very crowded already in most places
Breakaway gear (weak links, "finger traps")	Cost ?	Yes Yes	Possible ?	Yes No	Hard to quantify results No—we would lose a lot more gear
Whale-friendly buoys	High High	? No No	? Maybe	? No	Pictures of tangled whales showed buoys not really a factor. Line was knotted and buoys loose They don't seem to tangle on the buoy but on the rope
Time-release line cutter tool	High High Was lot of \$	No ? ?	? Maybe	No Maybe	Storms and moving gear in current could mimic a ride on a whale and trigger cutting You would need hundreds of thousands of them—lots of \$
Pool noodle deflection sleeve below buoy	No Low	No No	No No	No No	
Line visibility Colored lines or lights	High High Medium	Yes Yes Who will buy new rope?	Possible ? Test?	Yes Maybe Probably	The only way you'll know is to test—I know of 1 entanglement in fishing 30 years—it was a red rope.
Multiple traps on line (less vertical lines)	High High	No Yes No chance*	-- Maybe	No No	Could cause a lot of lost and tangled gear. Lower pot limits would be better. * this is a step backward—most gear cut off in a week!
Sampson line (stronger, thinner rope)	High High	No No	Yes Worse	No	More flesh cuts, not just chafe scars What is the goal of this? We use silver grey pacific—good rope--
Elimination, where possible, of lead and line splices	Low	Yes Yes	No Maybe	Yes Maybe	Removing leads is easy. Splices or knots are necessary to change depths with gear.
Buoyless gear (line free gear, remote release)	High High	No ? No chance	- Yes	No No	Too costly to consider Without knowing where gear is we will tangle a lot of gear by dumping on top of each other
Acoustic deterrence	High High	Yes No No	? ?	? No	Tested a lot in Alaska without good results You would need almosts 1 million a year

OTHER?

**LOST GEAR RETRIEVAL**

	Cost to Fishery (HIGH/LOW)	IS IT DOABLE	LIKELY TO MAKE A DIFFERENCE TO WHALES? YES/NO/MAYBE	TESTABILITY (GOOD PROSPECT FOR TESTING?) YES/NO/MAYBE	Comments
Expand/ change in-season gear retrieval program (e.g. allow for in-season or earlier gear recovery— e.g. in April)	Low	Yes	Yes	Yes	<ul style="list-style-type: none"> <li>Will result in less entanglement</li> <li>There are a lot of legal issues involved here. You are already allowed to bring in gear during the season in OR, but you can't keep it or sell it. Most people don't trust anyone out there retrieving pots during the open season</li> <li>Need to be able to retrieve lost gear (cut off) during the season-April-May- this is when deep gear is mostly on dock—You still have a crew-NW wind hasn't started to blow hard (less current). Last 5 years no one does enfor? stopped. Yet they could come down &amp; inspect &amp; tag those pots—the recovery person would be able to fish sell or trade these—you would get a lot of loose lines out of the water</li> </ul>
Expand/change in-season gear retrieval program	Low	Yes	Yes	Yes	

Other? Open season

**SEASONAL CHANGES**

	Cost to Fishery (HIGH/LOW)	IS IT DOABLE	LIKELY TO MAKE A DIFFERENCE TO WHALES? YES/NO/MAYBE	TESTABILITY (GOOD PROSPECT FOR TESTING?) YES/NO/MAYBE	Comments
Close or decrease fishing effort in spring (reduced pot limits, earlier closure, other mechanisms?) (requires state level action)	Possibly H Lower	Not a good choice Yes	Probably Yes	No Yes	<p>This is difficult, some people will be hurt. Example No salmon fishing 2017 CA-no income</p> <p>About June fishing very slow—most fishers already quit by June and few left leave gear out so if soft crab show up (usually by Aug 15) then they fish and more gear will come out—whales present—we usually drop boat limit to 2500 or 1250 a week. So almost not worth \$ to fish.—Save whales!</p> <p>Seasonal gear changes would be more preferable to closures. Once you close an area you will never get it back.If the season was delayed a long time for possible domoic acid, you could end up with no fishery unless you could put an evisceration order in place to be able to fish.</p>
Change contour lines in response to specific oceanographic		Maybe	Timing might matter		

conditions; prey type/ conditions; predicted whale presence					
Seasonal gear changes	High	Yes	Maybe	Maybe	
Start the season early if market sizes met in November	--	unlikely	probably	questionable	Meat recovery—dictates start. Don't crab on crappy crab—price goes in the toilet.

## RESEARCH QUESTIONS

Electronic logbooks is a good place to start to understand co-occurrence and where whales are on the coast each year
Line marking is too labor intensive to be practical, gear work time is already difficult; will discourage crew
Rope color?
Slow down summer fishery if really need
Definitively need a evisceration program—so not fishing main fleet in April-May the main whale time!
Whale behavior
Slack line—has the use of neutral buoyancy line actually caused more entanglements? We have taken the slack off the surface and put it into the midwater column.

## WHAT HAS ALREADY DONE? (what things have already been done that have helped to reduce entanglements)

Late year gear recovery, less vertical lines
Dec, January 100,000 pots; May and beyond 10,000 or less
Pickout rate 24% So. Cascade Head—move timing to avoid co-occurrence and lower impact timing of gear—once crab are caught most fishermen quit.
Slowed down our summer fishery (only about 10% of ? fish at whale times)
Move our fishery in shallow about April and May—hardly any gear outside 15-20 F
Hopefully we will get a good evisceration program in case of domoic acid—we need to run the fishery early while no whales or less are present.