

OREGON SURVEYS- COMPILATION (11 surveys)					
GEAR INNOVATION					
	Cost to Fishery (HIGH/LOW)	IS IT DOABLE?	LIKELY TO MAKE A DIFFERENCE TO WHALES? YES/NO/MAY BE	TESTABILITY (GOOD PROSPECT FOR TESTING?) YES/NO/MAY BE	Comments
Sinking or neutral lines	Moderate Low High Moderate High? Low High High Low*	Yes Yes ? Yes ? Yes Yes Yes Yes Yes Yes Yes	Maybe Maybe Maybe Maybe Yes Maybe Maybe Maybe Unknown	Yes No Maybe Yes Maybe ? Yes Yes, but* Yes	Already in use now Heard from lobster group that scientists day it doesn't work Many boats are already using this product *very hard to evaluate results. High cost but many already have this *over multiple seasons. Past year encounter rates the only true relative comparison in my mind.
Change length of trailer lines	Low Low Low Low Low Moderate Low	Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes	No Maybe Maybe Maybe Yes Maybe ? Doubtful	Maybe Yes ? Yes ? Yes Yes, but*	 * very hard to evaluate results. Only exceptionally long ones may be disposable Shortening may cause need for more buoys
Keep gear tighter	Low Low Low Low Low Low Extremely H Low Low	Yes Yes* Yes Yes Yes ? Yes Yes No Yes Yes	No Maybe Maybe Maybe Maybe ? Yes Maybe Maybe	Yes Yes ? Yes ? Yes Yes, but* No ?	*maybe do-able outside of the storm season *very hard to evaluate results. Very poor ideas as gear becomes inaccessible
Breakaway gear (weak links, "finger traps")	High High High High	No TBD No Yes No	No ? Maybe Maybe ?	 Yes Yes Yes	 We don't know if they work even now where they are used

	TBD V high* High High	Yes No No cumbersome	Maybe No No unknown	Maybe Yes, but* Maybe	* in terms of lost productivity. * Very hard to evaluate results. As breakaway gear exists today-no; needs new ideas Could cost high gear loss
Whale-friendly buoys	High TBD High High High High Moderate High High	No Yes Yes ? No Yes Yes* No	No Maybe ? Yes Yes Maybe ? No	Yes Yes Yes Yes Yes Yes, but* No	 * much labor, *very hard to evaluate results
Time-release line cutter tool	High High High High High High V. High High High	No *yes *Yes No ? ? Maybe Unlikely Yes	No Maybe ? Maybe Yes Maybe ? Yes	Yes Yes Yes Yes Yes Yes, but* Yes	*when technology improves * with modification so lighter and more flexible *very hard to evaluate results At this time extremely costly-low. Low on scale to test
Pool noodle deflection sleeve below buoy	Low Low Low Low Low ? TBD Low? Low High	No Yes Yes No Yes ? Maybe Likely No	No Maybe Maybe No Maybe ? Maybe ? No	Yes Yes Maybe Yes ? Maybe Yes, but* No	Can be used top or at pot to float rope and could be red or orange. Call it Hughoodle *very hard to evaluate results. Unclear on exact deployment/configuration
Line visibility Colored lines or lights	High High High Medium Low Low Low Mod-high Low Medium	Yes Yes Yes Yes Yes Yes Yes Likely Yes Probably	Maybe Yes Maybe Maybe Maybe ? Maybe Maybe ? Maybe	Yes Yes Yes Yes Yes Yes Yes Yes, but* Yes	 Needs more evaluation (by species, region, behavior) *very hard to evaluate results Ned to clarify type of whale; current research on right whales

Multiple traps on line (less vertical lines)	High High Low Low Low ? High Mod-high High Medium	No No Yes Yes Yes Yes No Yes Yes	Maybe Yes Maybe Maybe Yes Yes Maybe Maybe ? No	No Yes Yes Yes No Yes, but* Yes	Increases gear conflicts with mammals and other fisheries; heavy lift for regulatory change Could tangle worse Could make things worse for the whales *very hard to evaluate results. Only feasible in deep water, set parallel Seasonal use testing, not during peak. Perhaps season reduction of pots-spring/summer trawling up may increase diameter of line and increase fatalities when entangled Improve one possible problem/create another
Sampson line (stronger, thinner rope)	High High High High High High High High Very high	No Yes Yes No Yes No Yes No Not practical	No No No No No Not in a good way Maybe No No No	No No Yes Maybe No Yes Yes, but* No	Sounds like it would increase injuries Potentially more damaging to whales *very hard to evaluate results
Elimination, where possible, of lead and line splices	Moderate Low High Low Low High Low Low	Yes Yes Yes Yes Yes Yes Yes Yes	Maybe Maybe Maybe Maybe Maybe Possibly Maybe Not entanglement	Yes Yes Maybe Yes Yes Yes, but* No	 *very hard to evaluate result
Buoyless gear (line free gear, remote release)	High High High High High High ? High High High High	No No Yes No ? No ? No Yes No Not practical	Yes Yes Yes Maybe Maybe Yes Yes Yes Maybe Possibly	Yes Maybe No Yes Yes Maybe Yes Yes, but* No	Increases gear conflicts with mammals and with other fisheries *very hard to evaluate results

Acoustic deterrence	High	No	No		Not presently cost effective Concerns with noise pollution on whales already, adding more noise to the ocean *very hard to evaluate results Too costly at this time
	High	Yes	Maybe	Yes	
	High	Yes	Yes	Yes	
	High	?	No	Yes	
	High	No	Yes	Yes	
	?	?	Maybe	Yes	
	High	?		Yes, but*	
	High	N	Maybe	N	
	High	Not practical			
OTHER? All gear testability relative to control					
LOST GEAR INITIATIVES					
	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	Oregon has in-season already. 25/day winter; 50/day; June-Aug. After season unlimited. Can keep crab as incentive to return gear OR has very liberal inseason lost gear recovery allowances already in place all year.. so I think could be rephrased as further incentivizing gear retrieval in-season. Good idea, add some incentives for fishermen. Already programs in place perhaps review or enhance existing programs
	N/A	N/A	N/A	N/A	
	Low	Yes	Yes	Yes	
	Low	Yes	Maybe	Yes	
	Benefit?	Yes	Yes		
	TBD	Maybe	Maybe	Yes	
	Low	Yes	Likely/Maybe	Yes	
	Low	Yes	V. little	Yes	
	?	Yes	Yes	No	
Low	With state approval	Reduce gear? yes			

Expand/change in-season gear retrieval program	Low	Yes	No	Yes	Already programs in place perhaps review or enhance existing programs
	Low	Yes	Yes	Yes	
	Benefit?	Yes	Yes	Yes	
	Low	Yes	Likely/maybe	Yes	
	Low	Yes	V. little	No	
	?	Yes	Maybe		
Other?					
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)	Low	Yes	Yes	Yes	Heavy lift regulatorily, Could take steps to control effort. High cost to a specific component of the fleet. We decrease already in Oregon. Reduced pots for spring and use whale resistant gear. Less gear in the spring should lower entanglement Potential for quick results compared to testing gear innovations Decrease pots don't close areas—area specific With regional limits/encounter triggers
	High	Yes	Yes	No	
	Medium	Yes	Yes	Yes	
	Low	Yes	Yes	Yes	
	Low	Yes	Yes	Yes	
	To some, High	Yes	Yes	Yes	
	Varies by participants	Yes	Maybe in	Yes	
	Some loss of income? How much?	Yes	some areas	Yes	
Change contour lines in response to specific oceanographic conditions; prey type/ conditions; predicted whale presence	Moderate	Yes	Yes	Yes	Not enough data More research needed on whale distribution and gear deployment, esp in OR and WA
	Low	Yes	Yes	Yes	
	High	Maybe	Maybe	Yes	
	?	No	No	No	
	Low-Med	Yes	Yes	Yes	
	Low	Yes	No	Yes	
	Low	Yes	Maybe	Yes	
	Likely would vary	Yes	?	Yes	
Seasonal gear changes	?	Yes	Maybe in	Yes	Depends on the gear change. Same cost to test but lower cost than full fleet implementation.
	High	Difficult	some areas	Yes	
	Low	No	Yes	Maybe	
			Maybe	No	

	Low High? TBD ? Low+	Yes Yes Yes Yes Yes Yes	Yes Maybe Yes Maybe Maybe Maybe Yes	Yes Yes Yes Maybe	Goes along with the closed or decreased limits in spring. If late in season Area specific
Start the season early if market sizes met in November	Low High (to manage) Low Low Could vary by shell condition of crab at start Low Low	Yes ? Yes Yes Yes Yes Yes Yes No	Yes No Yes Maybe Maybe Maybe Maybe Maybe	Yes No Yes Yes No No	High cost to management Management would suffer trying to implement Market size is good. If the meat fill is 25% we should start our season Would this extend the season or start early then close season early? Already existing rules in place for season openings

RESEARCH QUESTIONS

Need to measure improvement if season length changes
Research should be done with industry input and assistance to minimize operational changes. Management changes should reflect accurate research
Making lines with measured paint marks to help determine where on the line entanglements are happening
How do whales interact with gear? Response time/distance to gear? Look at by species, behavior, temporal patterns
Look at scaring and entanglement data to evaluate gear type, species, region, time period association patterns
Multi-species, multi-regional analysis of entanglement data, whale behavior around gear and necropsy reports
Whale behavior around pots
Identify effort of gear and whale migration
Work where density of whales and gear is highest
Identify how gear is fished-hand out sheets for fisherman to fill out gear diagrams

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

Using sinking line. Gear reduction in the spring in Oregon
Awareness—education in the industry
Common sense “Best practice guide” by California
Pot limits