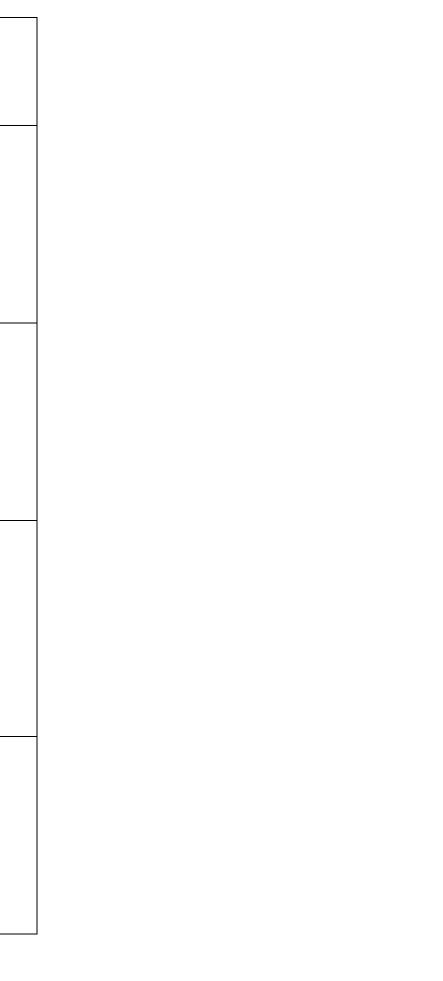
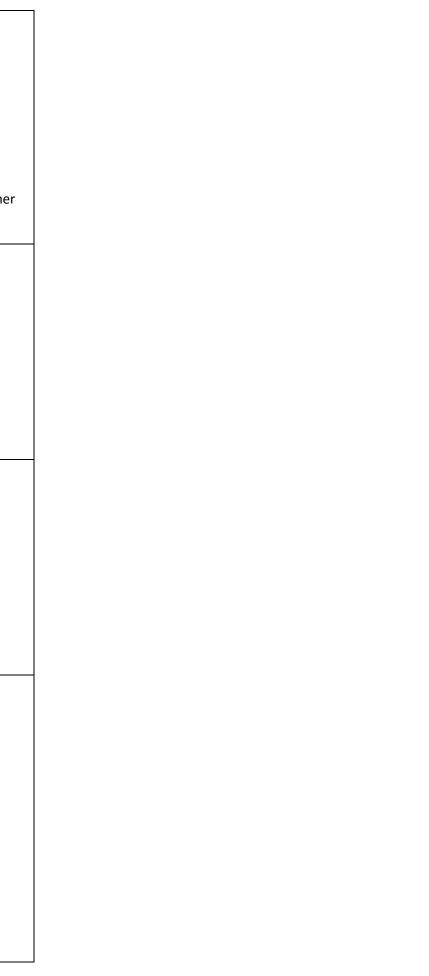
OREGON SURVE	EYS- COMPILATION (11 surveys)				
GEAR					
INNOVATI					
ON					
	Cost to Fishery (HIGH/LOW)	IS IT DOABLE?	LIKELY TO MAKE A DIFFERENCE TO WHALES? YES/NO/MAY BE	TESTABILITY (GOOD PROSPECT FOR TESTING?) YES/NO/MAY BE	Comments
Sinking or	Moderate	Yes	Maybe	Yes	
neutral lines	Low	Yes		No	Already in use now
	High	?	Maybe	Maybe	Heard from lobster group that scientists day it doesn't work
	Moderate	Yes	Maybe	Yes	Many boats are already using this product
	High?	?	Maybe	Maybe	
		Yes	Yes	2	
		Yes			
	Low	Yes	Maybe	Yes	
	High	Yes	Maybe	Yes, but*	*very hard to evaluate results. High cost but many already have this
	High	Yes	Maybe	Yes	very hard to evaluate results. Figh cost but many already have this
	Low*	Yes	Unknown	163	*over multiple seasons. Past year encounter rates the only true relative comparison in my
		163	OTIKITOWIT		mind.
Change length	Low	Yes	No		
of trailer lines	Low	Yes		Maybe	
or trailer lines	Low	Yes	Maybe	Yes	
	Low	Yes	Maybe	?	
	Low	Yes	Maybe	Yes	
		Yes	Yes	2	
		Yes	105	•	
	Low	Yes	Maybe	Yes	
	Moderate	Yes	2	Yes, but*	* very hard to evaluate results. Only exceptionally long ones may be disposable
	Low	Yes	: Doubtful		Shortening may cause need for more buoys
Keep gear	Low	Yes	No		
tighter	Low	Yes*	Maybe	Yes	*maybe do-able outside of the storm season
ugillei		Yes	Maybe	Yes	maybe do-able outside of the storm season
	Low Low	Yes	Maybe	?	
	Low	Yes	Maybe	r Yes	
		res	2	res ?	
		•	'		
		Yes	Voc	Voc	
	Low Extremely H	Yes	Yes	Yes	*vonubard to ovaluato results. Vonupoer ideas as goar basemas increasible
	Extremely H	No	Mayba	Yes, but*	*very hard to evaluate results. Very poor ideas as gear becomes inaccessible
	Low	Yes	Maybe	No 2	
Duesda	Low	Yes	Maybe	ſ	
Breakaway gear (weak	High	No	No		
links, "finger	High	TBD	?	Yes	We don't know if they work even now where they are used
traps")	High	No	Maybe	Yes	
	High	Yes	Maybe	Yes	
	High	No	?		

	TBD	Yes	Maybe	Maybe	
	V high*	No	No	Yes, but*	* in terms of lost productivity. * Very hard to evaluate results.
	High	No	No	Maybe	As breakaway gear exists today-no; needs new ideas
	High	cumbers	unknown	- /	Could cost high gear loss
		ome			
Whale-friendly	High	No	No		
buoys					
	TBD	Yes	Maybe	Yes	
	High	Yes	?		
	High	?	Yes	Yes	
	High	No	Yes	Yes	
	High	Yes	Maybe	Yes	
	Moderate	Yes*	?	Yes, but*	* much labor, *very hard to evaluate results
	High	No	No	No	
	High		_	_	
Time-release	High	No	No		
line cutter tool	High	*yes	Maybe	Yes	*when technology improves
	High	*Yes			* with modification so lighter and more flexible
	High	No	?	Yes	
	High	?	Maybe	Yes	
	High	?	Yes	Yes	
	High	Maybe	Maybe	Yes	
	V. High	Unlikely	?	Yes, but*	*very hard to evaluate results
	High	Yes	Yes	Yes	At this time extremely costly-low. Low on scale to test
	High			100	
Pool noodle	Low	No	No		
deflection	Low	Yes	Maybe	Yes	
sleeve below	Low	Yes	Maybe	Yes	Can be used top or at pot to float rope and could be red or orange. Call it Hughoodle
buoy	Low	No	No	Maybe	
	Low	Yes	Maybe	Yes	
	?	?	?	?	
	TBD	Maybe	Maybe	Maybe	
	Low?	Likely	?	Yes, but*	*very hard to evaluate results. Unclear on exact deployment/configuration
	Low	No	No	No	
	High				
	llich	Vac	Marcha		
Line visibility	High	Yes	Maybe	Yes	
Colored	High	Yes	Yes	Yes	
lines or lights	High	Yes	Maybe	Yes	
	Medium	Yes	Maybe	Yes	
	Low	Yes	Maybe	Yes	Needs more evolution (by encodes, region, behavior)
	Low	Yes	?	Yes	Needs more evaluation (by species, region, behavior)
		Yes	Maybe	Yes	
	Low	Yes	Maybe	Yes	*very bard to evolute results
	Mod-high	Likely	r Marka	Yes, but*	*very hard to evaluate results
	Low	Yes	Maybe	Yes	Ned to clarify type of whale; current research on right whales
	Medium	Probably			



Multiple traps	High	No	Maybe	No	have a second state with a second state of the
on line (less	High	No	Yes	No	Increases gear conflicts with mammals and other fisheries; heavy lift for regulatory
vertical lines)	Low	Yes	Maybe	Yes	change
	Low	Yes	Maybe	Yes	Could tangle worse
	Low	Yes	Yes	Yes	
	?	Yes	Yes		Could make things worse for the whales
			Maybe		
	High	No	Maybe	No	
	Mod-high	Yes	?	Yes, but*	
	High	Yes	No	Yes	*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
	Medium	Probably	Mabye	Yes	trawling up may increase diameter of line and increase fatalities when entangled
					Improve one possible problem/create another
Sampson line	High	No	No	No	
(stronger,	High	Yes	No	No	Sounds like it would increase injuries
thinner rope)	High	Yes	No	Yes	
	High	No	No	Maybe	
	High	Yes	No	No	Potentially more damaging to whales
			Not in a good		
	High	No	way	Yes	
	High	Yes	Maybe	Yes, but*	*very hard to evaluate results
	High	No	No	No	
			No		
	Very high	Not			
		practical			
Elimination,	Moderate	Yes	Maybe	Yes	
where possible,					
of lead and line	Low	Yes	Maybe	Yes	
splices	High	Yes	Maybe	Maybe	
	Low	Yes	Maybe	Yes	
	Low	Yes	Maybe	Yes	
	High	Yes	Possibly	Yes, but*	*very hard to evaluate result
	Low	Yes	Maybe	No	
	Low	Yes	Not		
			entanglement		
Buoyless gear	High	No	Yes		
(line free gear,	High	No	Yes	Yes	Increases gear conflicts with mammals and with other fisheries
remote	High	Yes	Yes	Maybe	-
release)	High	No	Maybe	No	
,	High	?	Maybe	Yes	
	High	No	Yes	Yes	
	?	?	Yes	Maybe	
	High	No	Maybe	Yes	
	High	Yes	Possibly	Yes,but*	*very hard to evaluate results
	High	No	,	No	
		Not			
		practical			
		practical			
ĺ					



Acoustic deterrence	High	No	No		
	High	Yes	Maybe	Yes	Not presently cost effective
	High	Yes	Yes	Yes	
	High	?	No	Yes	
	High	No	Yes	Yes	
	?	?	Maybe	Yes	Concerns with noise pollution on whales already, adding more noise to the ocean
	High	?		Yes, but*	*very hard to evaluate results
	High	Ν	Maybe	Ν	Too costly at this time
	High	Not			
		practical			

OTHER?

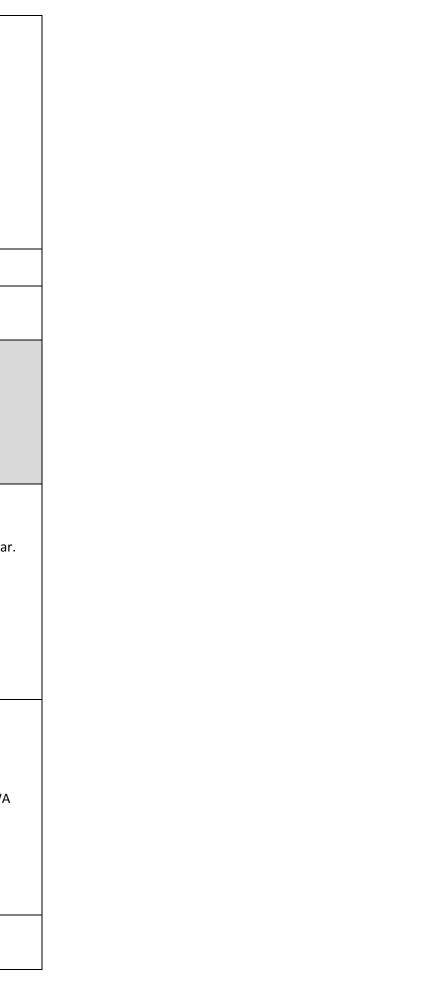
All gear testability relative to control

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/	Low	Yes	Yes	Yes	
change in- season gear retrieval	N/A	N/A	N/A	N/A	Oregon has in-season already. 25/day winter; 50/day; June-Aug. After season unlimited Can keep crab as incentive to return gear
program (e.g.	Low	Yes	Yes	Yes	
allow for in-	Low	Yes	Maybe	Yes	
season or	Benefit?	Yes	Yes		
earlier gear recovery—e.g.	TBD	Maybe	Maybe	Yes	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.
in April)	Low	Yes	Likely/Maybe	Yes	Good idea, add some incentives for fishermen.
	Low	Yes	V. little	Yes	
	?	Yes	Yes	No	Already programs in place perhaps review or enhance existing programs
	Low	With	Reduce gear?		
		state	yes		
		approval			



Expand/change	Low	Yes	No	Yes	
in-season gear					
retrieval					
program	Low	Yes	Yes	Yes	
	Benefit?	Yes	Yes	Yes	
	Low	Yes	Likely/maybe	Yes	
	Low	Yes	V. little	No	
Oth and	?	Yes	Maybe		Already programs in place perhaps review or enhance existing programs
Other?					
SEASONAL CH	HANGES				
	Cost to Fishery (HIGH/LOW)	IS IT	LIKELY TO	TESTABILITY	Comments
	,	DOABLE	MAKE A		
			DIFFERENCE	(GOOD	
			TO WHALES?	PROSPECT	
			YES/NO/	FOR	
			MAYBE	TESTING?)	
				YES/NO/	
				MAYBE	
Close or	Low	Yes	Yes	Yes	
decrease	High	Yes	Yes	No	Heavy lift regulatorily, Could take steps to control effort. High cost to a specific
fishing effort in					component of the fleet.
spring (reduced	Medium	Yes	Yes	Yes	We decrease already in Oregon. Reduced pots for spring and use whale resistant gear.
pot limits,	Low	Yes	Yes	Yes	Less gear in the spring should lower entanglement
earlier closure,	Low	Yes	Yes	Yes	
other	To some, High	Yes	Yes	Yes	
mechanisms?)	Varies by participants	Yes	Maybe in	Yes	
(requires state	Some loss of income? How much?	Yes	some areas	Yes	Potential for quick results compared to testing gear innovations
level action)	Moderate	Yes	Yes	Yes	Decrease pots don't close areas—area specific
		Yes	Yes	Yes	Lierrease nots don't close areas—area specific
	Low				
Change	Low High	Maybe	Maybe	No	With regional limits/encounter triggers
Change			Maybe No	No	
contour lines in	High ?	Maybe No	No		With regional limits/encounter triggers
contour lines in response to	High ? Low-Med	Maybe No Yes	No Yes	Yes	With regional limits/encounter triggers
contour lines in response to specific	High ? Low-Med Low	Maybe No Yes Yes	No Yes No	Yes Yes	With regional limits/encounter triggers
contour lines in response to specific oceanographic	High ? Low-Med	Maybe No Yes Yes Yes	No Yes No Maybe	Yes Yes Yes	With regional limits/encounter triggers Not enough data
contour lines in response to specific oceanographic conditions;	High ? Low-Med Low Low	Maybe No Yes Yes Yes Yes	No Yes No Maybe ?	Yes Yes Yes Yes	With regional limits/encounter triggers
contour lines in response to specific oceanographic conditions; prey type/	High ? Low-Med Low	Maybe No Yes Yes Yes	No Yes No Maybe ? Maybe in	Yes Yes Yes	With regional limits/encounter triggers Not enough data
contour lines in response to specific oceanographic conditions; prey type/ conditions;	High ? Low-Med Low Low Likely would vary	Maybe No Yes Yes Yes Yes Yes	No Yes No Maybe ? Maybe in some areas	Yes Yes Yes Yes Yes	With regional limits/encounter triggers Not enough data
contour lines in response to specific oceanographic conditions; prey type/ conditions; predicted	High ? Low-Med Low Low Likely would vary ?	Maybe No Yes Yes Yes Yes Yes Yes	No Yes No Maybe ? Maybe in some areas Yes	Yes Yes Yes Yes Yes	With regional limits/encounter triggers Not enough data
contour lines in response to specific oceanographic conditions; prey type/ conditions;	High ? Low-Med Low Low Likely would vary	Maybe No Yes Yes Yes Yes Yes	No Yes No Maybe ? Maybe in some areas	Yes Yes Yes Yes Yes	With regional limits/encounter triggers Not enough data
contour lines in response to specific oceanographic conditions; prey type/ conditions; predicted whale	High ? Low-Med Low Low Likely would vary ? High	Maybe No Yes Yes Yes Yes Yes Yes Difficult	No Yes No Maybe ? Maybe in some areas Yes Maybe	Yes Yes Yes Yes Yes Yes Maybe	With regional limits/encounter triggers Not enough data
contour lines in response to specific oceanographic conditions; prey type/ conditions; predicted whale presence	High ? Low-Med Low Low Low Likely would vary ? High Low	Maybe No Yes Yes Yes Yes Yes Difficult No	No Yes No Maybe ? Maybe in some areas Yes Maybe Maybe	Yes Yes Yes Yes Yes Maybe No	With regional limits/encounter triggers Not enough data



			1		
	Low High?	Yes Yes Yes	Yes Maybe Yes	Yes Yes	Goes along with the closed or decreased limits in spring.
	TBD	Yes	Maybe	Yes	
	?	Yes	Maybe		
	Low+		Maybe	Maybe	If late in season
		Yes	Yes		Area specific
Start the	Low	Yes	Yes	Yes	
season early if		163	163	165	High cost to management
market sizes	High (to manage)	?	No	No	Management would suffer trying to implement
met in	Low	Yes	Yes	Yes	Market size is good. If the meat fill is 25% we should start our season
November	Low	Yes	Maybe	Yes	
	Could vary by shell condition of crab at start	Yes	Maybe	No	
		Yes	Maybe		Would this extend the season or start early then close season early?
	Low	Yes	Maybe		
	Low	No	Maybe	No	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

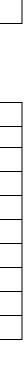
Multi-species, multi-regional analysis of entanglement data, whale behavior around gear and necropsy reports

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

0

