



DCTF: CDFW Line Marking

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Marine Region

California Department of Fish and Wildlife

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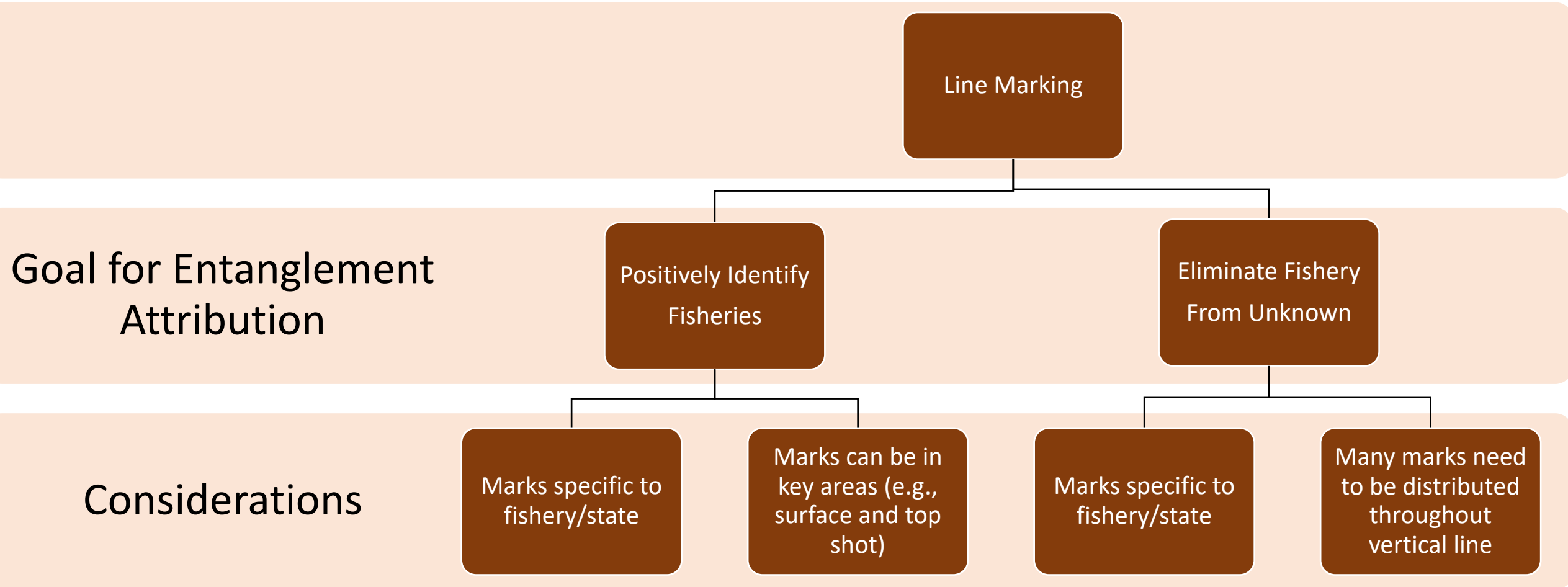
Outline

- Purpose
- Background: NMFS Line Marking Analysis Summary Report (2013-2020)
- Requirements in Other States
- Tri-State Coordination
- Discussion

Purpose of Line Marking

- Line marking is a tool that can help better identify entanglements to state and fishery origin.
- Could also be used to exclude or eliminate fisheries from confirmed unknown entanglements through a NMFS determination.
- Line marking may not always be fail-safe, but it could in time incrementally improve and reduce the likelihood of unknown entanglements being attributed to the fishery under RAMP.

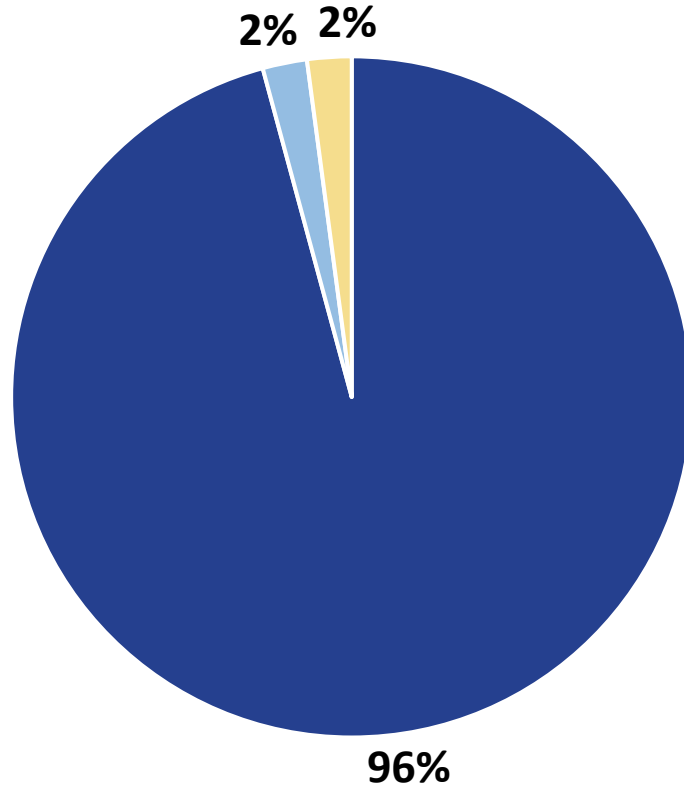
What are Goals for Gear Marking?



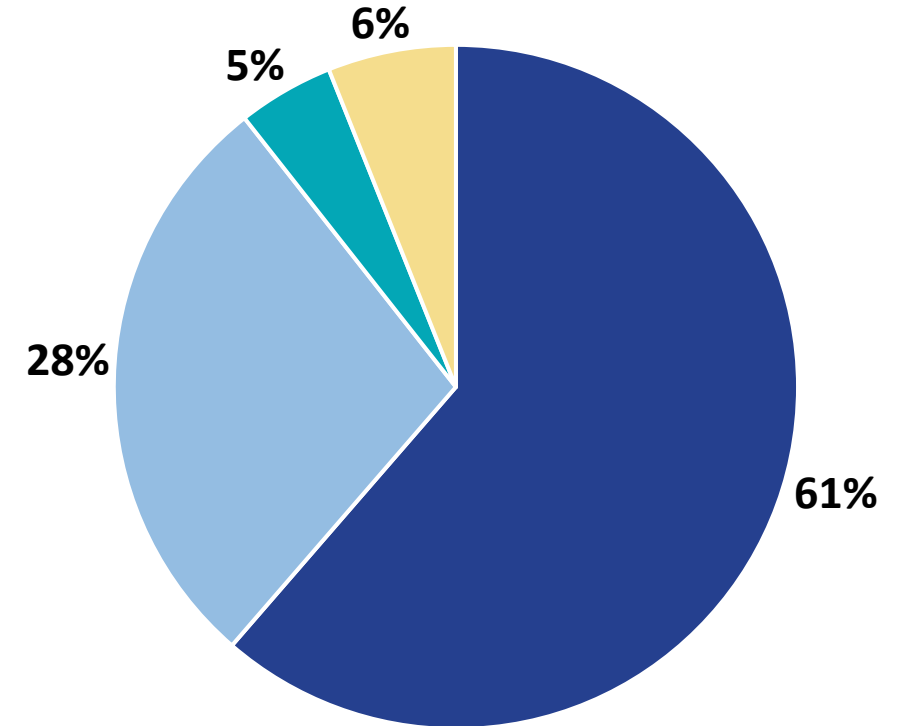
NMFS Line Marking Analysis Summary Report

NMFS Line Marking Analysis: Buoy Presence

Pot/trap gear
(n=95; 2013-2020)



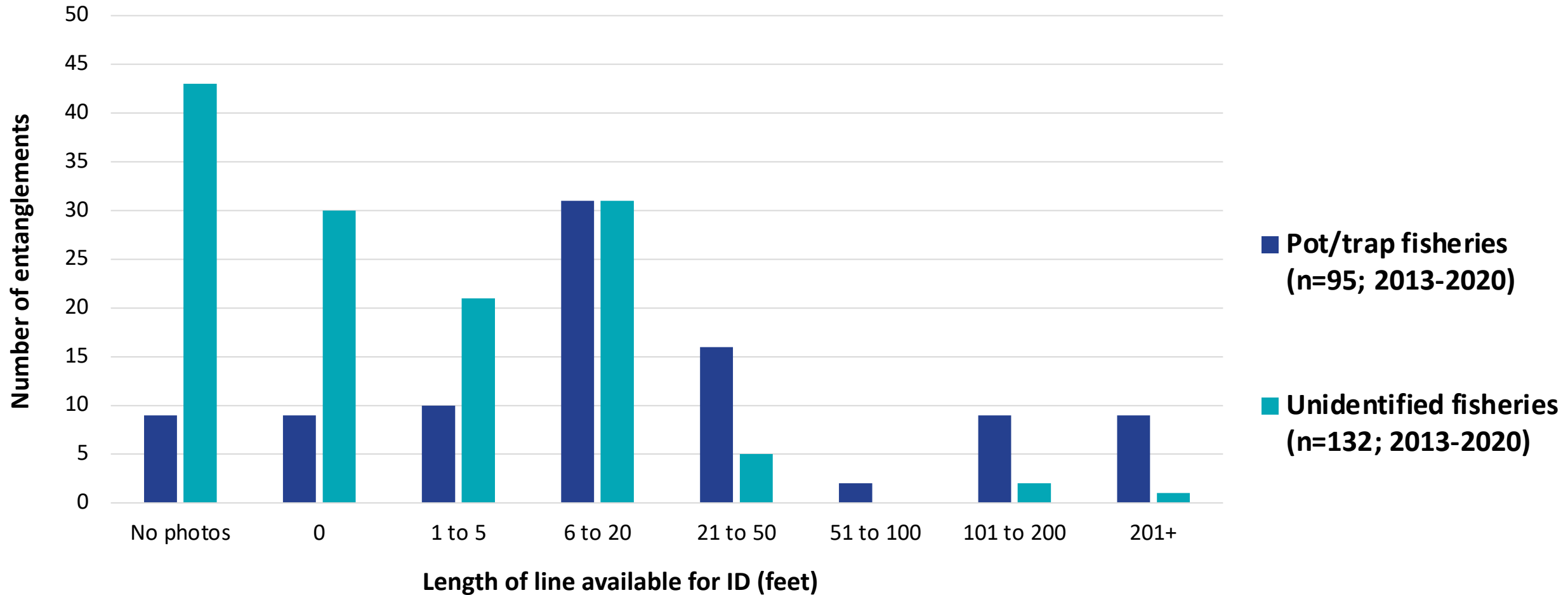
Unidentified gear
(n=132; 2013-2020)



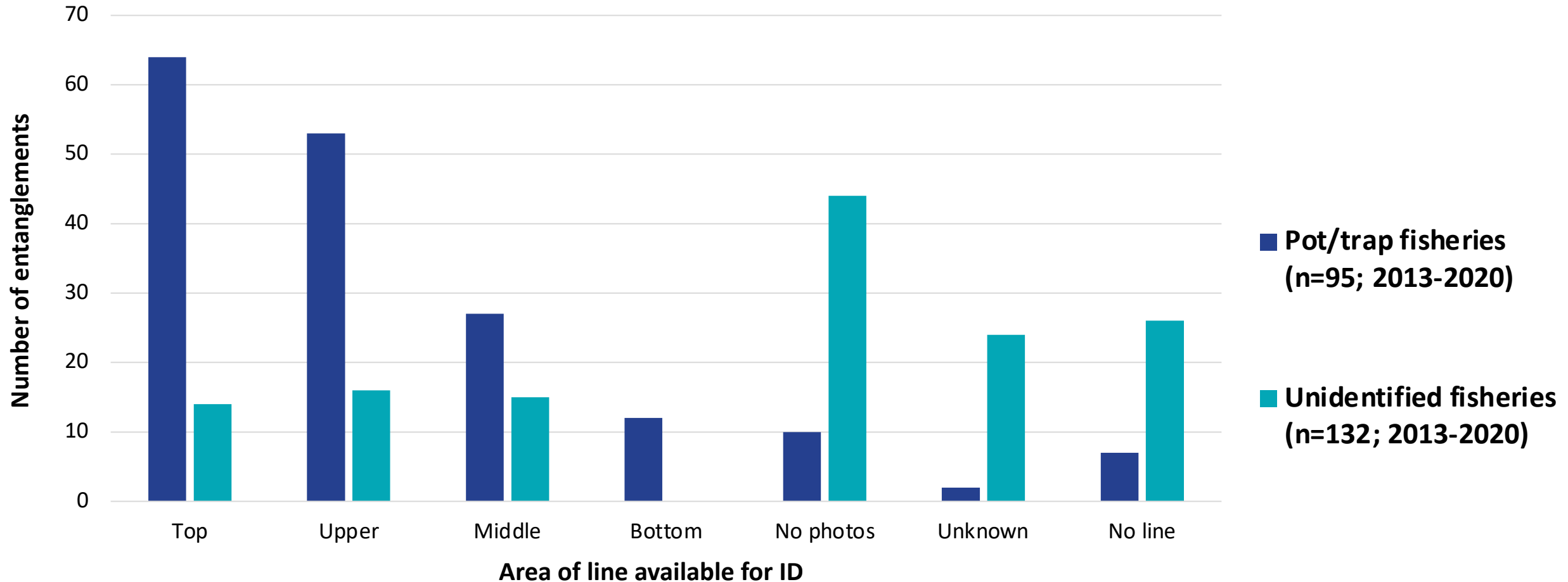
- ≥1 buoy
- Line only
- No buoys/line visible
- No photos/unknown

When buoys are not documented, NMFS current chances of successfully identifying the fishery are significantly reduced with current gear marking schemes. This includes entanglements with Dungeness crab gear.

NMFS Line Marking Analysis: Length of Line



NMFS Line Marking Analysis: Area of Line



Recent Tri- State Marking Requirements

California surface gear - standardized buoy letter marking for other trap fisheries

- 2020: No entanglements identified to an origin using new marks
- 2021: 3 humpback entanglements identified using new marks

Washington and Oregon Late-season tags

- 2020 and 2021: Summer tags present in all late-season entanglements (n=2 humpbacks in WA crab gear)
- All other WA and OR crab gear entanglements during this time involved gear set prior to implementation of regs

Washington line marking

- No line marks visible on the 2 WA crab gear entanglements confirmed since implementation of regs; no line visible in available photos

Line Color and Leatherback Entanglement Forensics

- Line colors documented from commercial Dungeness crab gear entanglements (n=77; 2013-2020)
 - 71% blue/green 27% red/orange
 - 23% “light” colored 5% yellow 10% unknown
- Leatherback entanglement forensic summary (n=3; 2013-2020)
 - All entanglements have been close to the buoys at/near the surface
 - ≥1 buoy present in all entanglements
 - Buoy marking used to identify fishery/gear owner in 2 out of 3 documented entanglements

NMFS

Summary of Conclusions

- Line marking could improve ability to ID origin of entanglements
- Likelihood of detection increased by number of marks and size
- Top and upper portion of the gear is the most frequently documented during entanglements
- Best chance to detect a line marking and/or determine negative attribution would be marks placed every few fathoms, especially in the “top half” of the gear

Current Fishery Line Marking Requirements in other states

Atlantic Large Whale Take Reduction Plan: Line Marking

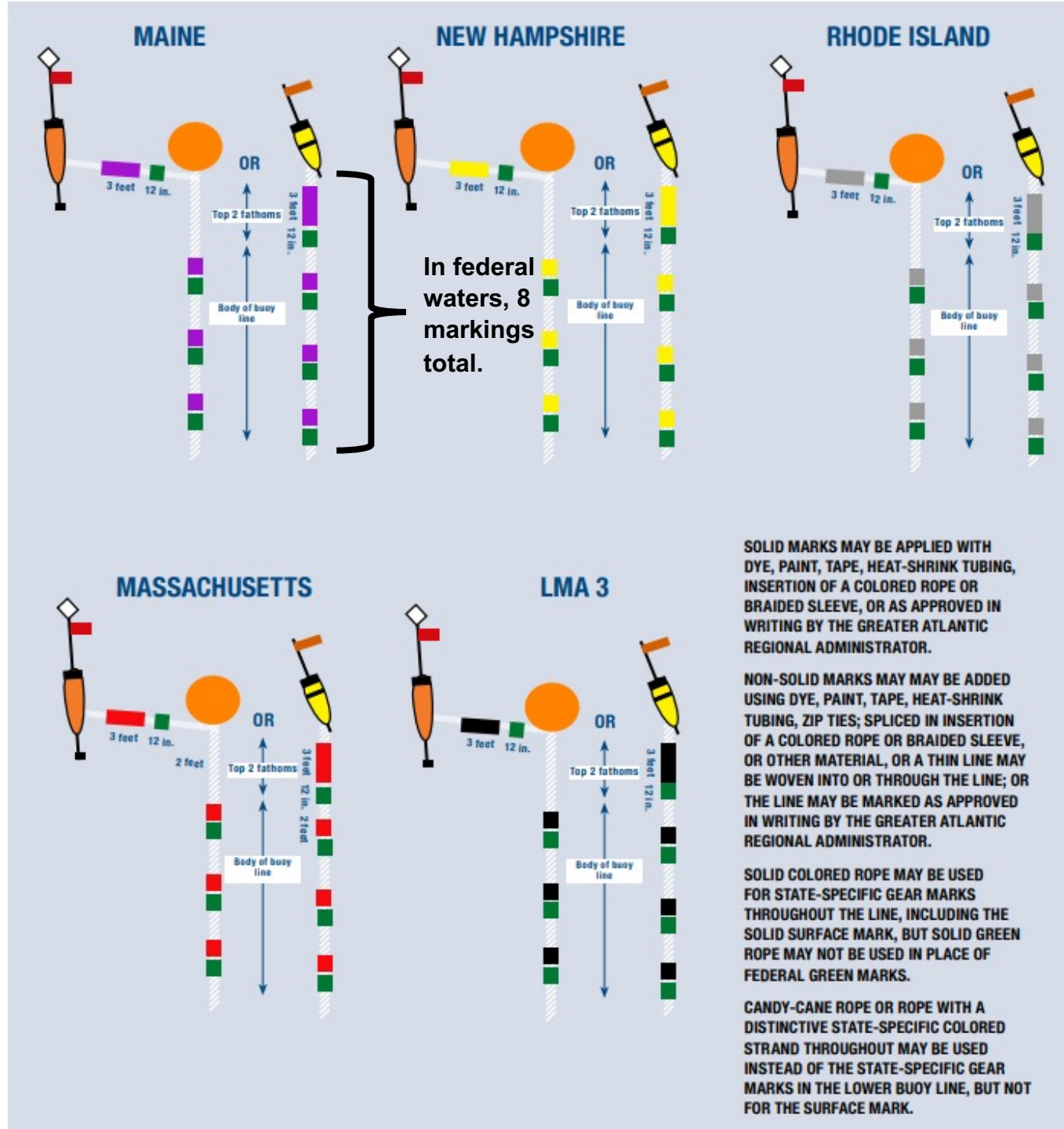
Mark specifications	Northeast lobster and Jonah crab, federal waters	Northeast lobster and Jonah crab, state waters
Color	Two colors – #1 identify state of origin and #2 fished in federal waters	One color identifies state of origin and state waters
Placement	One 3-ft solid mark (color #1) within 6 inches of one 12-in mark (color #2) in the top 2 fathoms of the surface buoy or line with surface buoys and highfliers; and one 12-in mark (color #1) within 6 inches of one 12-in mark (color #2) at the top, middle, and bottom of the body of the buoy line	One 3-ft solid mark within 2 fathoms of the surface buoy or system; and one 12-in mark in the top 50% of the body of the buoy line and one 12-in mark in the bottom 50% of the body of the buoy line
Size	3 feet 12 inches	3 feet 12 inches
Number	8	3 (MA – 5)
Marking technique/type	Marking techniques/materials are specified and distinct for 3-ft and 12-in marks (see slide 11)	Marking techniques/materials are specified and distinct for 3-ft and 12-in marks (see slide 12)

Atlantic Large Whale Take Reduction Plan

Northeast Lobster and Jonah Crab Gear Marking Requirements for Federal Waters



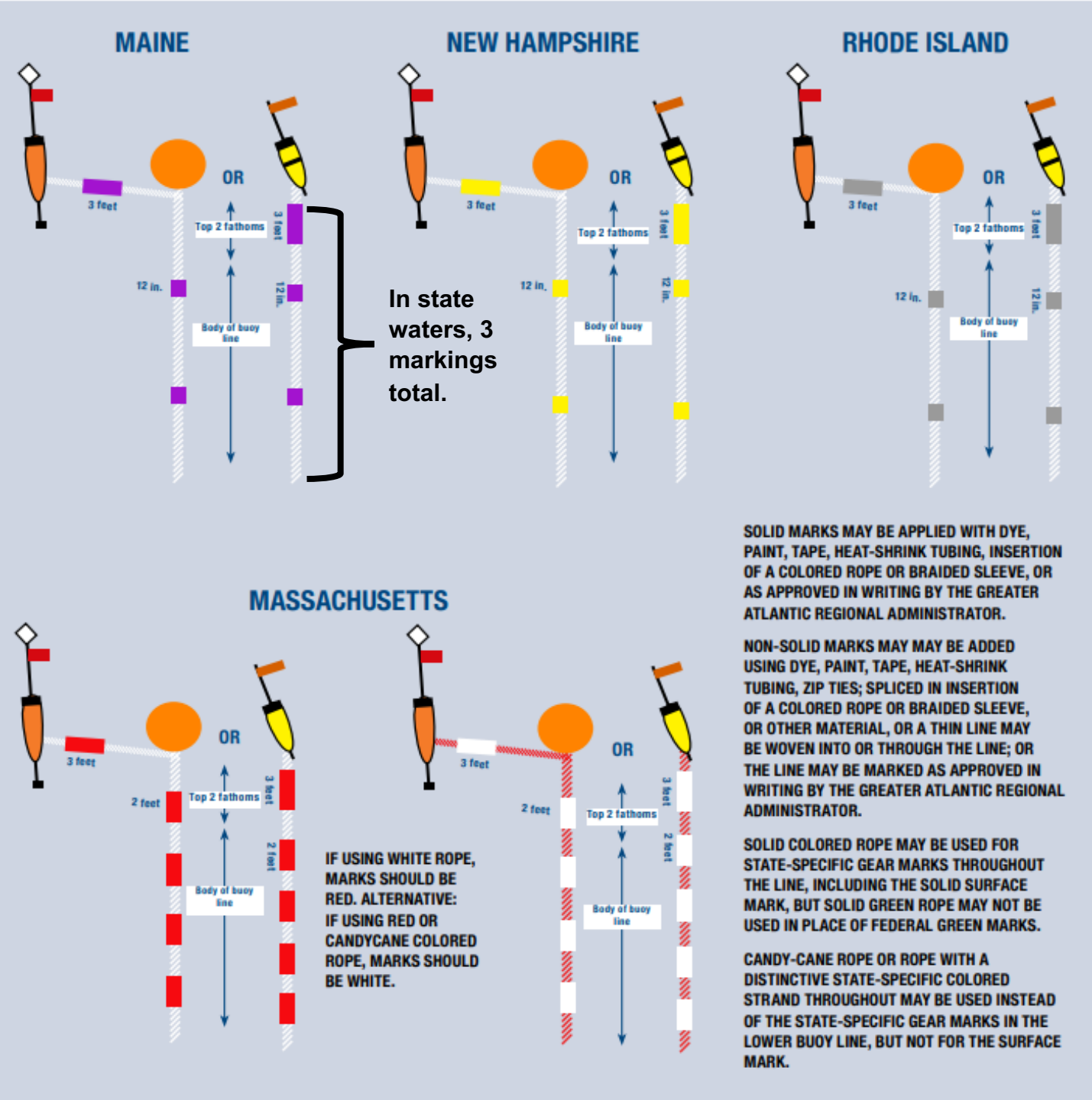
Example of surface system marks for federal waters by Maine-permitted fishermen.



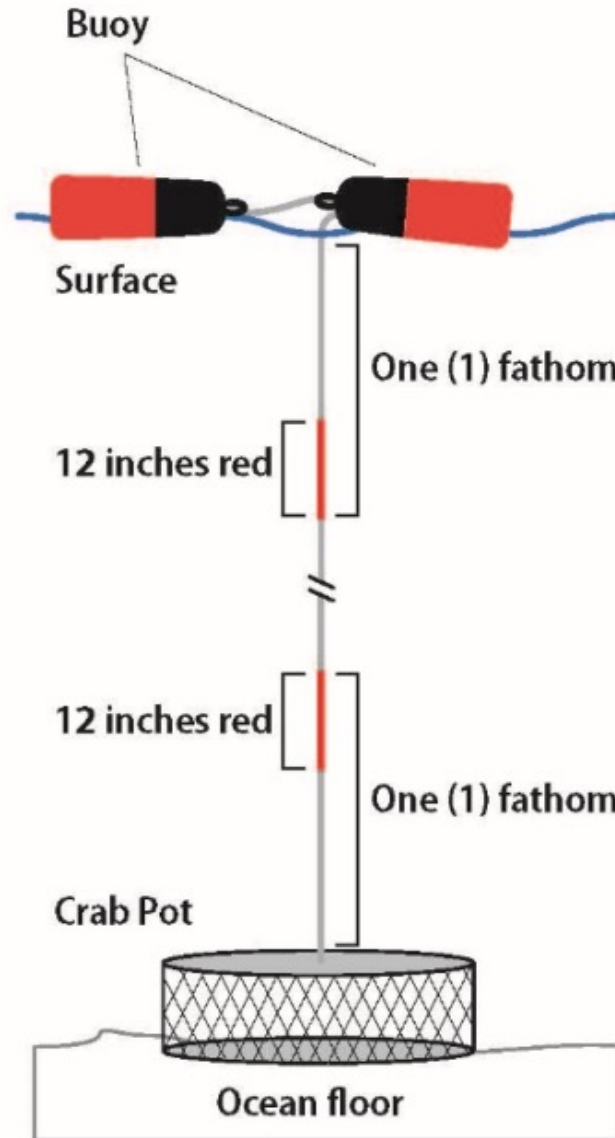
Atlantic Large whale Take Reduction Plan

Northeast Lobster and Jonah Crab Gear Marking Requirements for State Waters

In MA
state
waters, 5
markings
total.



WDFW- Commercial Dungeness Crab Line Marking



**2 red markings
total; methods
of marking not
specified**

WDFC- Commercial Dungeness Crab Line Marking Options



Dipped Paint



Spray Paint

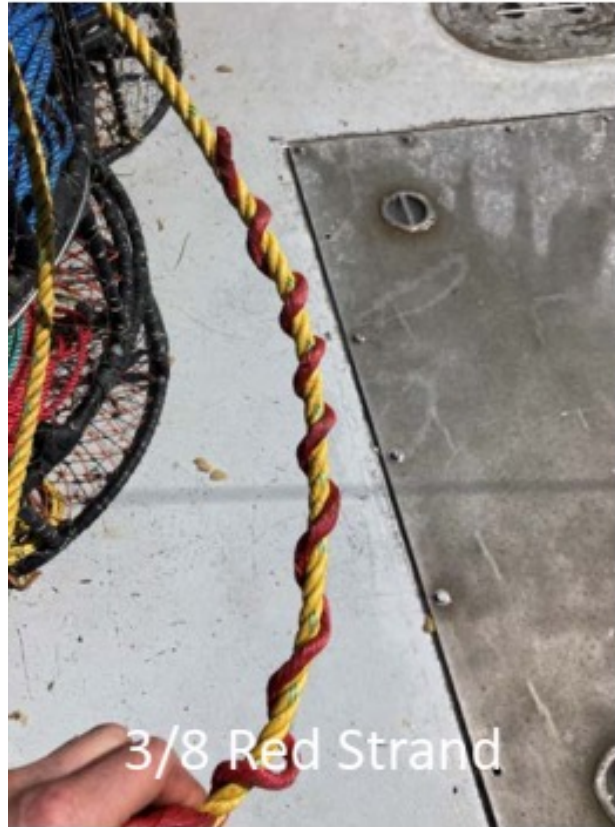


Electrical Tape



Braided Twine

WDFW- Commercial Dungeness Crab Line Marking Options Cont'd



3/8 Red Strand



Duct Tape



Short Top Strap



Surgical Tubing

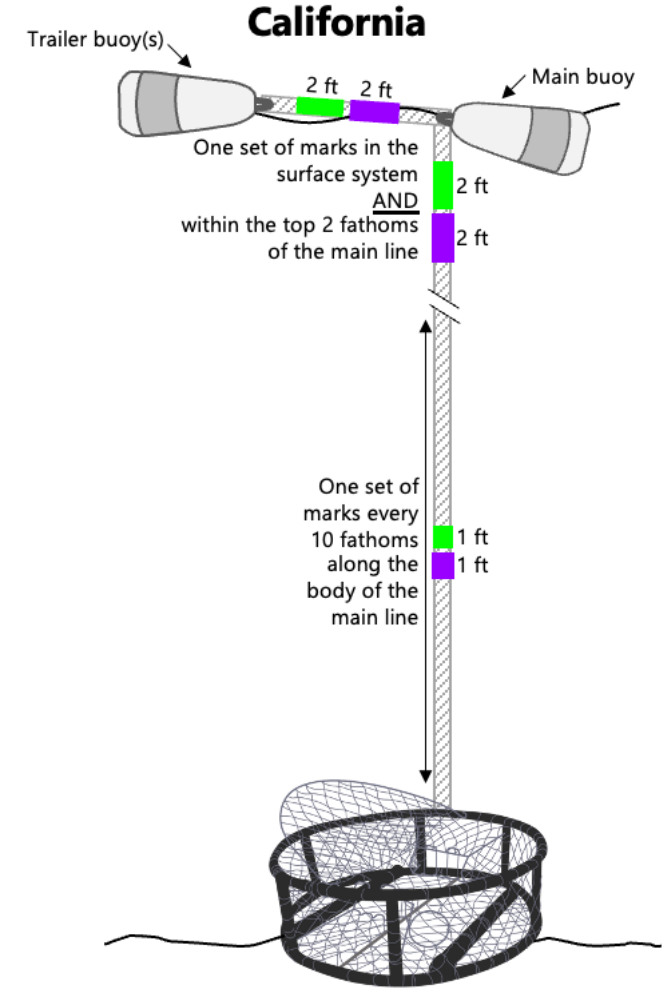
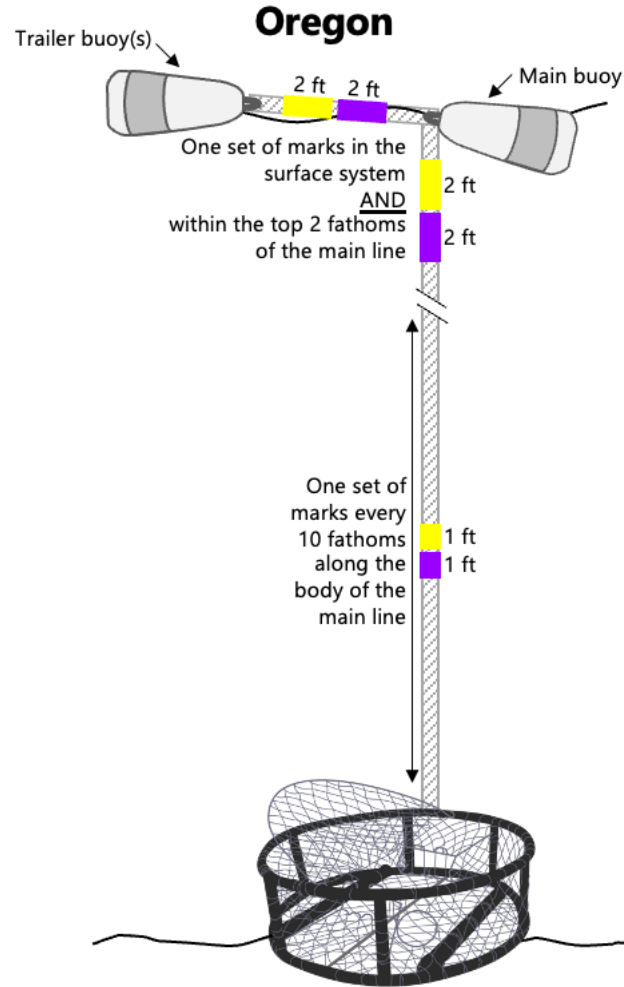
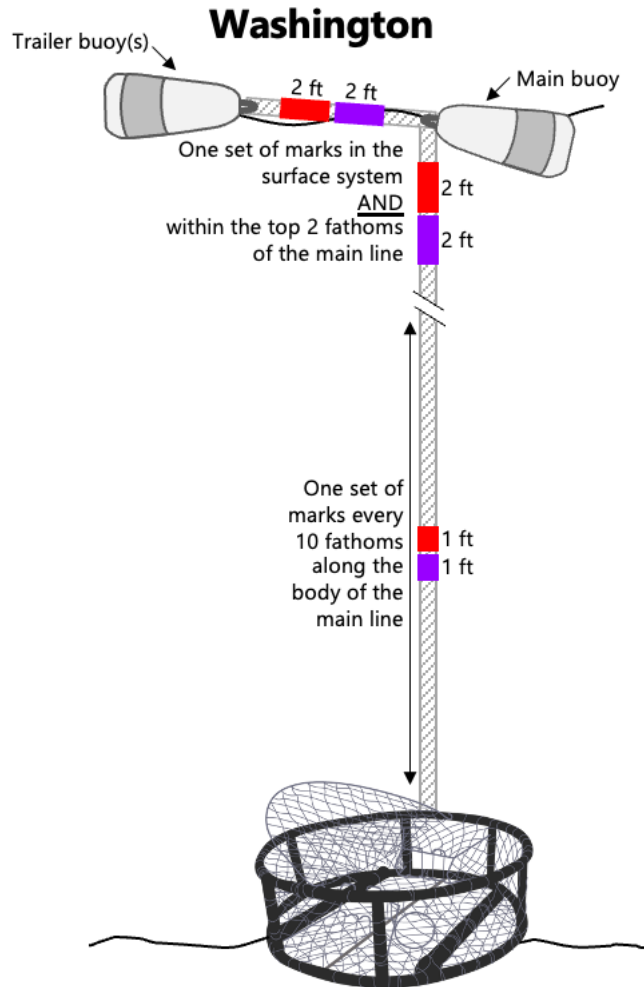
Tri-State Coordination and Discussion

Tri-State: Current Line Marking Requirements

Mark specifications	Washington	Oregon	California
Color	Red	TBD	TBD
Placement	≤1 fathom from main buoy & ≤1 fathom from pot	TBD	TBD
Size (12in, 18in, 36in, etc.)	≥12 inches	TBD	TBD
Number (1, 2, 3, etc.)	2	TBD	TBD
Marking technique/type	Not specified	Not specified	TBD

Examples for West Coast Commercial Crab Fisheries

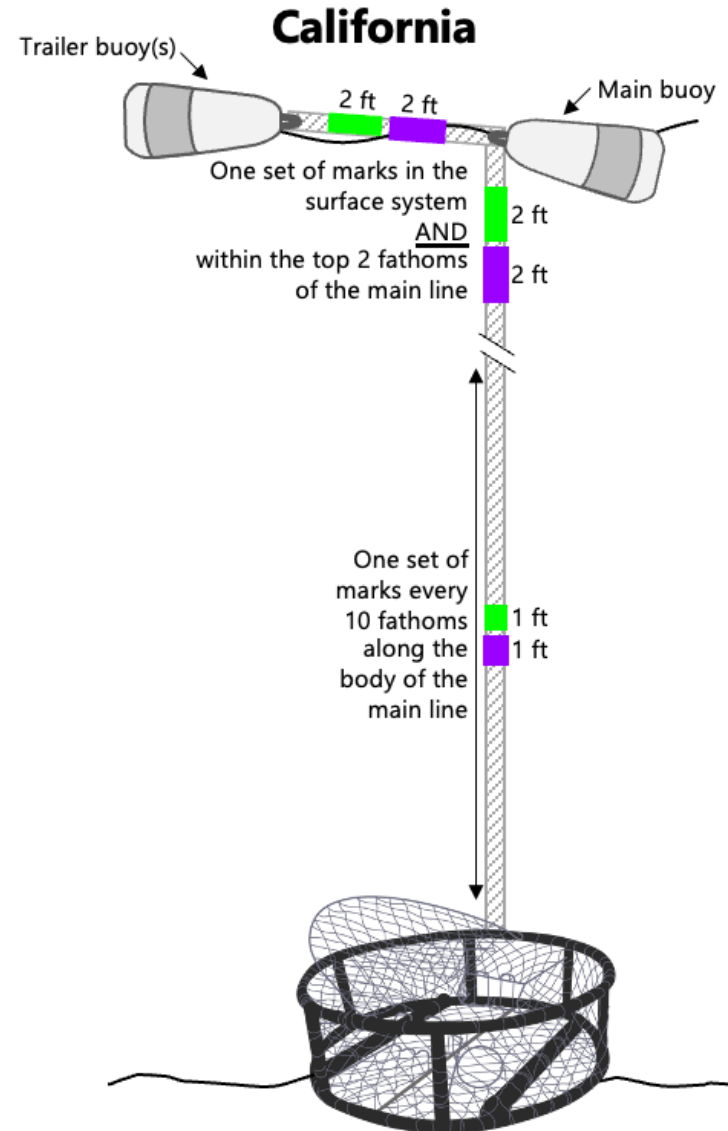
Just to get the discussion started...



*Space between different colored marks should be ≤ 6 in within each set

California

Option to Target the Top and Upper Portion of Gear



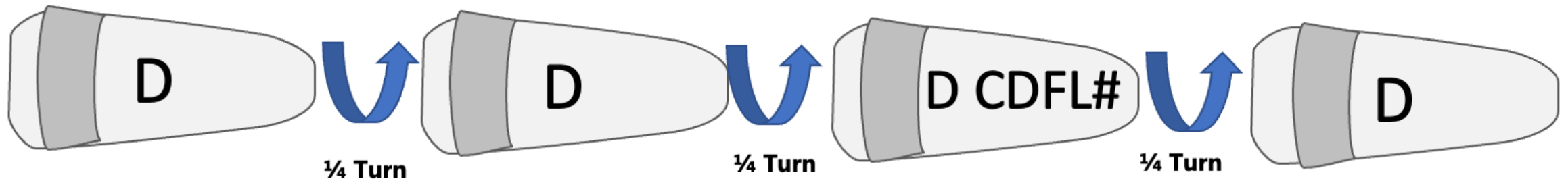
*Space between different colored marks should be ≤ 6 in within each set

What do we want for line marking in the CA Dungeness Crab fishery?

Considerations	California
What color(s)? (Tri-State interested in dual color system)	<i>Color #1 – State of California (unique to all CA trap fisheries) and Color #2 – Dungeness Crab fishery (same across all three states)</i>
What area of line are marks placed?	(e.g., Surface – 2 fathoms, Upper- 5 fathoms, Middle, Bottom)
How large are marks?	(e.g., 12 in, 24 in, 36 in)
Frequency of marks or number of marks?	(e.g., every: 1 fathom, 5 fathoms, 10 fathoms, etc.)
Do we want to specify Marking technique/type?	(e.g, allow for solid marks or any marking type)

California – Surface Gear Marking

Option to Improve Buoy Gear Marking



Buoys are ≥ 4 inches in diameter – Marked on 4 sides

Next Steps

- Coordinate w/industry & Tri-State
- Contact Information:
 - Email: Christy.Juhasz@wildlife.ca.gov
 - Cell: (707) 292-2480