STAFF SUMMARY FOR FEBRUARY 8-9, 2023

26. EXPERIMENTAL FISHING PERMIT (EFP) APPLICATION

Today's Item **Information ☐** **Action ☒**

Receive, consider, and potentially act on an application submitted by Bart Chadwick, the Department's recommendations, and comments received for an EFP for the testing and commercial use of Sub Sea Sonics pup-up gear systems in conjunction with Longsoaker Fishing System Guardian line management system in the California Dungeness crab fishery.

Summary of Previous/Future Actions

- Department transmitted accepted EFP application to Commission — Nov 4, 2022
- Published notice of receipt of EFP application — Nov 14, 2022
- Department transmitted recommendation for EFP application to Commission — Dec 20, 2022
- Published notice of receipt of Department recommendation — Jan 6, 2023
- **Today discuss and consider approving EFP application** — **Feb 8-9, 2023**

Background

The California Fisheries Innovation Act of 2018 (Chapter 477, Statutes of 2018, primarily codified in California Fish and Game Code Section 1022) gives the Commission authority to approve EFPs for commercial or recreational marine fishing activities that would otherwise be prohibited, upon adopting regulations establishing an EFP program. Permits must be for one or more of the following purposes: research, education, limited testing, data collection, compensation fishing, conservation engineering, or exploratory fishing.

An EFP program consistent with the new law was established through regulations adopted by the Commission (Section 91, Title 14, California Code of Regulations) that became effective on April 1, 2022. The regulations establish an expeditious process for considering and issuing EFPs, including direct application to the Department, public notice, Department review and recommendation, and Commission receipt and potential approval of the EFP. The regulations define four tiers of permits based on the purpose of the EFP and the required level of Department oversight.

EFP Application Overview

On November 4, 2022, the Department received an EFP application (#2022-03) from Bart Chadwick, PhD (Exhibit 2). The Applicant seeks to test and potentially use timer release and acoustic release pop-up gear recovery systems developed by Sub Sea Sonics, in conjunction with a "Longsoaker Fishing System Guardian" line management system, in the California Dungeness crab fishery. Authorization of the gear would allow continued fishing during periods when the fishery is closed to traditional trap gear to prevent wildlife entanglements.

The applicant requests a Tier 2 EFP for the purpose of exploring innovative fishing gear and techniques to reduce interactions with protected species, with Department facilitation; the goal

is to collect information to inform future alternative gear certification under the Department's Risk Assessment and Mitigation Program (RAMP), with the following EFP details:

- *Location*: Commercial Dungeness crab fishing zones off the coast of California, in water depths up to 250 feet.
- *Authorized agents*: Between 3 to 10 participating fishers.
- *Gear*: Up to 50 units of the proposed systems per authorized agent, an option to allow authorized agents to fish single traps or string of up to 20 traps per line, and tracking and monitoring of pop-up gear systems using a virtual gear marking application (e.g., trap timer) and a Pelagic Data System solar logger.
- *Duration and season*: Anticipated span of four years, with testing occurring year-round.
- *Authorized take*: Dungeness crab (target species) retained and sold during the statutory open season only, and rock crab taken incidentally pursuant to current fishing regulations.

Application Processing

After receiving the application and associated fee, the Department conducted a review within 30 days of receipt to determine whether to accept or reject the application, as required by regulation. On November 4, 2022, the Department transmitted the accepted EFP application to the Commission via memo (exhibits 1 and 2). The Commission provided a notice of receipt to interested parties on November 14, 2022.

The Department concluded its technical review of the application and transmitted its recommendation to the Commission on December 20, 2022, including special conditions on form DFW 1103 (exhibits 3 and 4). If approved, the standard terms and special conditions are designed to ensure marine resources are protected, pursuant to California Fish and Game Code Section 1022, and to allow the Department to adequately enforce the EFP. The Commission provided a notice of receipt of the Department recommendation to interested parties on January 6, 2023.

Fee Reduction Allowance

The EFP regulations allow an applicant to receive a 50 percent reduction in the initial permit issuance fee and annual permit fee as a special condition, at the time of Commission approval, if identified and recommended by the Department as necessary to address a specific fishery management need or priority in several categories. The regulations require a pre-application consultation with the Department if the applicant wishes to be considered for a permit fee reduction; Mr. Chadwick met this requirement.

This EFP proposes to explore a management priority of testing innovative fishing gear and techniques to reduce incidental capture of and interactions with protected species. Therefore, the Department has identified this EFP for a 50 percent reduction in initial permit issuance fee and annual permit fee.

This EFP would also provide an opportunity to address questions regarding performance and enforceability that were previously identified by the Department as part of its process for authorizing alternative gear under RAMP by testing of the proposed pop-up gear systems

Today's Meeting

Today the Department will present an overview of the EFP application and its recommendations, including special conditions, for Commission consideration and potential approval (Exhibit 5).

Significant Public Comments

The applicant, Bart Chadwick, PhD, provides a short background of the company Sub Sea Sonics and its goal to provide low-cost technology for recovering equipment from the seafloor that was previously only available to select, high-budget projects and programs. Mr. Chadwick addresses some of the key criticisms his company has received about the potential for using its technologies in the Dungeness crab fishery (Exhibit 6).

Recommendation

Commission staff: Approve the EFP application with special conditions and a permit fee reduction, as recommended by the Department.

Department: Approve the EFP application with special conditions, as specified on form DFW 1103, for purposes of conservation engineering and data collection, and approve a permit fee reduction.

Exhibits

1. Department memo, received November 4, 2022
2. EFP Application #2022-03
3. Department memo transmitting recommendation, standard terms, and proposed special conditions, received December 20, 2022
4. Draft Form DFW 1103, including standard terms and proposed special conditions for the Chadwick EFP
5. Department presentation
6. Letter from Bart Chadwick, Owner, Sub Sea Sonics, received January 23, 2023

Motion

Moved by _____ and seconded by _____ that the Commission **approves** EFP Application #2022-03 for the testing and commercial use of Sub Sea Sonics timed, and acoustic release pop-up gear systems in conjunction with Longsoaker Fishing System Guardian line management system in the Dungeness crab fishery within California state waters, with a permit fee reduction and special conditions as recommended by the Department in Exhibit 4.

OR

Moved by _____ and seconded by _____ that the **Commission does not approve** EFP Application #2022-03 for the testing and commercial use of Sub Sea Sonics timed, and acoustic release pop-up gear systems in conjunction with Longsoaker Fishing System Guardian line management system in the Dungeness crab fishery within California state waters.

State of California
Department of Fish and Wildlife

Original on file,
received November 4, 2022

Memorandum

Date: November 4, 2022

To: Melissa Miller-Henson
Executive Director
California Fish and Game Commission

From: Craig Shuman
Marine Regional Manager

Subject: Transmittal of an Experimental Fishing Permit Application for Testing Pop-Up Gear in the California Dungeness Crab Fishery (Bart Chadwick)

The California Department of Fish and Wildlife (Department) has determined that the attached Experimental Fishing Permit (EFP) application from Bart Chadwick, received on October 5, 2022, is complete and therefore accepts the application for technical review. The applicant requests a Tier 2 EFP to test the commercial use of Sub Sea Sonics' timed- and acoustic release pop-up gear systems in conjunction with Longsoaker Fishing System's Guardian line management system in the Dungeness crab fishery to collect information to inform future alternative gear certification under the Department's Risk Assessment Mitigation Program (RAMP) (proposed project).

Also attached is a draft Notice of Receipt of Application, which includes a summary of the proposed project and a list of requested exemptions from the provisions of Fish and Game Code and Title 14 of the California Code of Regulations (CCR). The Fish and Game Commission (Commission), at its discretion, may finalize this document for use to comply with the public notice requirement prescribed in subsection 91(e)(1), Title 14, CCR.

Written comments submitted to the Department within the technical review period will be considered in the development of a recommendation to the Commission, including any proposed permit special conditions. Pursuant to subsection 91(d)(2), Title 14, CCR, the Department will transmit its recommendation to the Commission no later than 60 days from the date of this memo. If additional time is required for technical review, the Department will notify both the Commission and the applicant in writing of the reason for the time extension, pursuant to subsection 91(d)(3), Title 14, CCR.

If you have any questions regarding the EFP application or need additional information, please contact the EFP Coordinator at EFP@wildlife.ca.gov.

Attachments

ec: California Department of Fish and Wildlife

Eric Kord, Assistant Chief, Law Enforcement Division
Brent Chase, Captain, Law Enforcement Division

Joanna Grebel, Environmental Program Manager, Marine Region
Ryan Bartling, Senior Environmental Scientist Supervisor, Marine Region
Tom Mason, Senior Environmental Scientist Supervisor, Marine Region
Marina Som, Environmental Scientist, Marine Region

PROJECT TITLE: Testing of Pop-Up Gear in the California Dungeness Crab Fishery

A. CONTACT INFORMATION

Provide contact information for key participants, including the applicant and, if applicable, the entity administrator and any authorized agent(s). If any key participant does not have a Get Outdoors ID (GO ID) or commercial fishing license (CFL) number, they must provide information for CDFW to create a new customer profile pursuant to subsection 91(c)(2)(A)(1), Title 14, CCR.

1. Applicant

Name	Bart Chadwick
Title and Affiliation	Owner, Sub Sea Sonics
Mailing Address	**[Mailing address omitted]**
Email Address	**[Email address omitted]**
Telephone Number	**[Telephone number omitted]**
GOID or CFL Number	**[GOID/CFL number omitted]**
If no GOID or CFL number:	**Please provide the following information.**
Residence Address (if different from mailing)	
Date of Birth	
Height	
Eye Color	
Hair Color	
Weight	
Gender	
Personal Identification	A copy of DMV ID, passport, military ID, or other acceptable form of identification as listed in subsection 700.4(c), Title 14, CCR.

2. Entity Administrator (if applicable)

Name	Kim Sawicki
Title and Affiliation	President, Sustainable Seas Technology INC.
Mailing Address	**[Mailing address omitted]**
Email Address	**[Email address omitted]**
Telephone Number	**[Telephone number omitted]**
GOID or CFL Number	**[GOID/CFL number omitted]**
If no GOID or CFL number:	**Please provide the following information.**
Residence Address (if different from mailing)	
Date of Birth	**[Date of birth omitted]**
Height	**[Height omitted]**
Eye Color	**[Eye color omitted]**
Hair Color	**[Hair color omitted]**
Weight	**[Weight omitted]**
Gender	**[Gender omitted]**
Personal Identification	**[Personal identification omitted]**

3. Authorized Agent(s) (if applicable)

Using the table below, complete a separate entry for each authorized agent.

Name	Russ Mullins
Title and Affiliation	Owner, Longsoaker Fishing Systems LLC
Mailing Address	**[Mailing address omitted]**
Email Address	**[Email address omitted]**
Telephone Number	**[Telephone number omitted]**
GOID or CFL Number	**[GOID/CFL number omitted]**
If no GOID or CFL number:	**Please provide the following information.**
Residence Address (if different from mailing)	
Date of Birth	
Height	
Eye Color	
Hair Color	
Weight	
Gender	
Personal Identification	

Name	Marc Alley
Title and Affiliation	Owner/Operator, F/V Ronna Lynn
Mailing Address	**[Mailing address omitted]**
Email Address	**[Email address omitted]**
Telephone Number	**[Telephone number omitted]**
GOID or CFL Number	**[GOID/CFL number omitted]**
If no GOID or CFL number:	**Please provide the following information.**
Residence Address (if different from mailing)	
Date of Birth	
Height	
Eye Color	
Hair Color	
Weight	
Gender	
Personal Identification	A copy of DMV ID, passport, military ID, or other acceptable form of identification as listed in subsection 700.4(c), Title 14, CCR.

Name	Ed Tavasieff
Title and Affiliation	Owner/Operator, F/V Friendship
Mailing Address	**[Mailing address omitted]**
Email Address	**[Email address omitted]**
Telephone Number	**[Telephone number omitted]**
GOID or CFL Number	**[GOID/CFL number omitted]**
If no GOID or CFL number:	**Please provide the following information.**
Residence Address (if different from mailing)	
Date of Birth	
Height	
Eye Color	
Hair Color	
Weight	
Gender	
Personal Identification	A copy of DMV ID, passport, military ID, or other acceptable form of identification as listed in subsection 700.4(c), Title 14, CCR.

Name	Steven Melz
Title and Affiliation	Owner/operator F/V Sunrise
Mailing Address	**[Mailing address omitted]**
Email Address	**[Email address omitted]**
Telephone Number	**[Telephone number omitted]**
GOID or CFL Number	**[GOID/CFL number omitted]**
If no GOID or CFL number:	**Please provide the following information.**
Residence Address (if different from mailing)	
Date of Birth	
Height	
Eye Color	
Hair Color	
Weight	
Gender	
Personal Identification	A copy of DMV ID, passport, military ID, or other acceptable form of identification as listed in subsection 700.4(c), Title 14, CCR.

B. STATEMENT OF PURPOSE

1. Describe the purpose and goals of the proposed project, including how the project meets or is consistent with the policies of Fish and Game Code (FGC) Section 7050.

Purpose

The purpose of this Experimental Fishing Permit (EFP) is to allow for the additional testing necessary to support authorization of Sub Sea Sonics pop-up gear in conjunction with Longsoaker Fishing Systems' Guardian line management system in the California Dungeness Crab fishery under the Risk Assessment and Mitigation Program (RAMP). Authorization of the gear would allow continued fishing during periods when the fishery is closed to traditional gear to prevent wildlife entanglements. Recent regulations to prevent whale and sea turtle entanglements have resulted in time-area closures that have significantly shortened the commercial Dungeness crab fishing season. While this has reduced entanglements, it has delayed the season opener and impacted fishery participants that rely on a longer fishing season. The results of the testing will ultimately serve to enable decision making regarding authorization of alternative gear under the RAMP. Consistent with FGC Code 7050, this project aims to ensure the conservation of endangered marine species and the sustainability of the historic California Dungeness crab fishery through effective collaborations and a science-based process. Efforts included within this EFP promote scientific research to better inform fishery management decisions that recognize the importance of commercial fisheries while conserving the health and diversity of marine ecosystems.

Previous Work

During 2021 and early 2022, Sub Sea Sonics and Longsoaker Fishing Systems conducted extensive reliability testing and refinement of the pop-up gear in accordance with specified requirements of the RAMP. The gear has also undergone significant testing in other fisheries including the California Spiney Lobster fishery and the Southeastern US Black Sea Bass fishery. Sub Sea Sonics submitted a gear authorization request to the California Department of Fish and Wildlife (CDFW or "the Department"). The gear authorization documented extensive successful reliability testing, gear marking technologies, line handling systems as well as specified methods for vessel monitoring.

The gear authorization was declined on the basis the Department believed that further work was required to test the gear at depths greater than 200 ft and under poor sea conditions, and that additional testing was required to ensure the gear could be properly enforced. The Department further recommended that this additional testing be carried out under the EFP process. Thus, this EFP application has focused goals to address the performance and enforceability questions identified by CDFW during our previous gear authorization request. These EFP goals are summarized below.

EFP Goals

Primary Goals

1. Provide necessary information, testing results, and protocols to establish the performance, and limitations of the Sub Sea Sonics timed-release and acoustic pop-up gears over the expected range of conditions for the fishery.
2. Work with CDFW Enforcement staff to establish and test alternative gear enforcement mechanisms and procedures and refine the gear and methods accordingly.
3. Evaluate the technologies in the context of risk reduction and fishing performance.

Secondary Goals

1. Provide experience with the gear and provide documented testing results to build confidence within the Dungeness crab fishery.
2. Work with other fisheries to ensure coordination and transparency about the location of pop-up gear testing efforts to reduce and prevent gear conflict.

2. Provide a list of proposed project activities that are prohibited under current state fishing laws or regulations (cite the specific section number(s), if known), and the reasons to justify authorization (exemption) of those activities under the EFP.

- *Fish and Game Code Section 9005: Every Dungeness crab trap placed in waters of the state to take Dungeness crab for commercial purposes shall be marked with a buoy.*
    - We are requesting an exemption to allow for the use of pop-up gear with the surface marker submerged during the majority of the deployment period. Along with a surface marker buoy with traditional markings (that will only be present after the pop-up event), traps fished with pop-up fishing gear under this EFP will also be identifiable to the associated fisher, other fishers, and enforcement virtually, via the gear marking app (i.e. Trap Timer) associated with the pop-up gear. This app will be accessible through a mobile device or computer (see Section 4 for a detailed description of the app and enforcement protocol).

- *California Code of Regulations § 132.6.(d): It is unlawful to leave any Dungeness crab buoys, lines, or traps in state waters after the end of the Dungeness crab fishing season. All Dungeness crab traps shall be removed from state waters by 11:59 pm on the last day of the season as set forth in sections 8276 and 8277 of the Fish and Game Code.*
    - We are requesting an exemption to allow for continued testing of the gear year-round. Retention and sale of crab is only requested during the statutory season. Testing out of season will focus on training aspects and will not allow for active fishing, retention or sale of crab. If whales are present during these out of season periods, then testing would only involve the use of pop-up gear. If whales are not present, we request authorization to use pop-up gear in conjunction with traditional vertical lines and buoys as back-up devices. During training events, small numbers of traps (up to 10) would only be deployed for short periods (~2 hours) and would remain within visual contact of the fishing vessel.

- *California Code of Regulations § 132.8. Risk Assessment Mitigation Program*
    - We are requesting exemption from regulations within the California Risk Assessment and Mitigation Program, including from triggers for management actions and the resulting management actions. Specifically, we are requesting to be permitted to use pop-up fishing gear within the statutory season with retention of crab, and outside the statutory season for training purposes only with no retention of crab.

- *Requirement of single trap per line.*
    - We are requesting an exemption from the prohibition on the use of multiple traps per line in the Dungeness crab fishery. While fishing under this EFP, participants may use strings of up to 20 traps connected by a ground line with a pop-up unit at one or both ends. The purpose is to test the operational feasibility of using multiple traps per line as a means to increase fishing efficiency and economic viability of pop-up units while also providing redundancy and an effective means of recovering lost gear via grappling.

C. STATEMENT OF QUALIFICATIONS

Respond to each of the following statements by providing relevant qualifications to demonstrate the ability of the applicant and, if applicable, other key participants to perform the necessary duties and responsibilities to carry out the proposed project. PLEASE NOTE: If any scientific or technical assistance is requested of CDFW, pre-application consultation is required.

1. Lead and provide supervisory oversight for all activities of the permit under the authorizations, standard terms, and special conditions.

Bart Chadwick with Sub Sea Sonics will lead and provide overall supervisory oversight for all activities of the permit under the authorizations, standard terms, and special conditions. Dr. Chadwick has a PhD in Oceanography from Scripps Institution of Oceanography, University of California, San Diego. He currently owns and operates Sub Sea Sonics, a small business focused on low-cost recovery of underwater equipment from the sea floor. He is also a principal partner in Coastal Monitoring Associates which focuses on technologies for assessment of coastal environments. He has extensive experience in research, development, and applied studies in technology development for underwater equipment, ropeless fishing, and coastal contaminant transport and fate processes. His experience includes 3 years as owner of Sub Sea Sonics, 18 years in private consulting with Coastal Monitoring and 30 years as a lead scientist and Technical Director at the Navy's Marine Environmental Quality Program in San Diego, California. His research and applied experience includes development and production of underwater timed and acoustic releases, coral reef restoration structures, underwater energy harvesting devices, contaminated sediment assessment and remediation, groundwater exchange with the marine environment, contaminant exchange at the sediment-water interface, sea level rise vulnerability, water security, mixing and exchange processes in bays and estuaries, fate and effects of copper, zinc, and petroleum hydrocarbons in the marine environment, real-time monitoring and mapping techniques and estuarine risk assessment methodologies. He has led the development of and holds patents for a number of new technologies for use in coastal environments.

Kim Sawicki with Sustainable Seas will collaborate on the project and provide oversight of training and field testing aspects under the permit. Ms. Sawicki is a research associate and PhD student at the University of Massachusetts-Dartmouth School for Marine Science and Technology and the President of Sustainable Seas Technology, Inc. She has dual degrees in Pathobiology & Veterinary Science and Allied Health Sciences. In these capacities, she has conducted extensive field research on alternative fishing gear methods around the world for over 10 years and is currently overseeing research for a similar experimental fishing permit in the South Atlantic Black Sea Bass pot fishery. Her work with Sustainable Seas focuses on empowering individuals, fishing communities, and conservationists to engage in productive and non-judgmental dialogue to help reduce cetacean mortalities. In this role, she provides access to innovative gear and training as a means to empower fishers to maintain their historical fisheries while reducing the threat of marine mammal entanglement.

Russ Mullins with Longsoaker Fishing Systems will collaborate with Dr. Chadwick on activities authorized under the permit related to the use of the Guardian line handling system. Mr. Mullins lives and works on the west coast of Washington State just south of the US/Canada border. He has a BS in Environmental Science and has spent time operating a 45'commercial crab vessel. Mr. Mullins recently retired as a Sergeant after a 28 year career with Washington Department of Fish and Wildlife Enforcement (WDFW). During this time, he supervised WDFW's Northern Puget Sound marine unit where commercial trap fishery regulation and enforcement was a primary task. Mr. Mullins has authored and managed consecutive NOAA Section 6 grant proposals that have provided WDFW with over $2m being awarded specifically for protection of ESA listed Southern Resident Killer Whales. Mr. Mullins currently owns and operates Longsoaker Fishing Systems which was formed in 2013 to market and promote gear innovations for crab and lobster trap fishing. The Guardian pop-up system was developed in 2018.

2. Experience in identification, methods, and protocols specific to the requested species listed under Section E.2. of this document.

The nature of this project does not require any special experience in identification, methods, and protocols specific to the requested species listed under Section E.2. of this document beyond what is required for normal fishing operations. Thus, these requirements will be carried out by the participating fishers during the normal course of their fishing operations. The fishers each have over 20 years of experience in identification of the target and potential bycatch species.

3. Obtain all appropriate authorizations and oversee quality control measures to assure conformance to the specified standards or requirements (e.g., take appropriate measures to ensure, promote, and facilitate compliance).

Bart Chadwick of Sub Sea Sonics will be responsible for obtaining all appropriate authorizations, and Kim Sawicki with Sustainable Seas will be responsible for day-to-day oversite of quality control measures to assure conformance to the specified standards or requirements Russ Mullins of Longsoaker Fishing Systems will be responsible for quality control measures and conformance with standards related to the use of the Guardian line handling system.

4. Train all persons operating under the permit.

Bart Chadwick of Sub Sea Sonics, Kim Sawicki of Sustainable Seas Technologies and Russ Mullins of Longsoaker Fishing Systems will be responsible for the initial training of all persons operating under the permit. Subsequently, once fishers have demonstrated proficiency with the gear, they will also be enlisted to help with training other fishers when and if needed. Chadwick, Sawicki and Mullins all have extensive experience with the gear and with training fishers in the use of the gear. This includes previous training and use of the gear in the California Dungeness Crab fishery.

5. Coordinate field activities and communicate field findings with CDFW Marine Region.

Bart Chadwick of Sub Sea Sonics will be responsible for coordinating field activities and communicate field findings with CDFW Marine Region. Dr. Chadwick has worked closely with CDFW over the past three years in the development and testing of the gear and is experienced and knowledgeable in these requirements.

6. Collect, analyze, and transmit data gathered under the EFP to CDFW Marine Region.

Bart Chadwick of Sub Sea Sonics and Kim Sawicki of Sustainable Seas Technologies will be responsible for the collection, analysis, and transmission of data gathered under the EFP to CDFW Marine Region. Both Chadwick and Sawicki have extensive experience with the collection, analysis and communication of data related to pop-up fishing gear including testing programs in the Dungeness Crab, Spiny Lobster and Black Sea Bass fisheries.

D. PERMIT APPLICATION TYPE

1. Select desired permit tier.

☐ Tier 1 (For purposes other than exploratory fishing)
☒ Tier 2 (For purposes other than exploratory fishing with assistance from CDFW)
☐ Tier 3 (For the purpose of exploratory fishing)
☐ Tier 4 (For the purpose of exploratory fishing with assistance from CDFW)

2. Request permit fee reduction option consideration.

☒ Yes ☐ No

3. Has pre-application consultation with CDFW taken place with respect to this proposal? (Required for a Tier 2 EFP, Tier 4 EFP, or permit fee reduction option)

☒ Yes ☐ No

If yes, attach a copy of the pre-application consultation summary letter or provide the name and contact information of CDFW staff with whom the applicant consulted:

Meeting #1: Friday, May 6 from 2:00 – 3:15 pm
Meeting #2: Friday, September 16, 2022 from 2:00 – 2:45 pm

E. PROJECT DESCRIPTION

Describe the proposal and any other relevant details, including:

1. A description of the experimental design and research plan, including specific procedures for data collection, storage, processing, and analysis; and a timeline for implementing the project, including, if applicable, when compensation fishing is expected to occur.

The experimental design of this EFP is comprised of a four-year phased approach to the testing and scaled-up implementation of pop-up gear in the California Dungeness crab fishery to inform the establishment of a clear pathway for authorization of alternative gears under the RAMP. It will support decisions regarding future authorization of the use of timed- and acoustic release pop-up gear systems that can be used with single traps or multiple traps (up to 20 connected by a ground line) (see Section 6 for further description of the gear).

This EFP seeks to address several research questions and follows a robust data collection and analysis procedure, described below. The phased approach will allow for the training, testing, and expansion of pop-up gear in a controlled environment.

Research Questions

This EFP is designed to meet the quantitative and qualitative goals defined previously by addressing the following specific research questions focused on authorizing pop-up gear under the RAMP and based on the specific issues identified by CDFW:

Goal 1: Establish the performance and limitations of selected timed and acoustic pop-up gear over the expected range of conditions for the fishery.

- What is the reliability of the gear over the expected range of depths and environmental conditions of the fishery?
- If the gear is designed for a specific range of conditions, what is the reliability over this range?
- What gear limitations should be specified for each system in a gear authorization to ensure it can reliably operate under anticipated conditions?

Goal 2: Work with CDFW Enforcement staff to create and test alternative gear enforcement mechanisms and procedures and refine the gear and methods accordingly.

- Are the virtual gear-marking system and data accessibility sufficient to allow for effective enforcement?
- Is the vessel tracking system and data availability sufficient to ensure pop-up gear is not placed in the absence of gear marking and/or in closed areas?
- What, if any, additional security and verification methods are required to allow effective enforcement?

Goal 3: Evaluate the technologies in the context of risk reduction and fishing performance.

- What is the relative risk reduction for entanglement achieved under potential implementation scenarios of the pop-up gear based on the testing data?
- How many gear trials does it take to fish gear reliably and efficiently?
- What is the average servicing time per trap with each of the pop-up systems compared to traditional gear?

Data Collection and Analysis

Data collected under the EFP will be utilized to determine the reliability, range of conditions, level of risk reduction, and efficiency of the pop-up gear. Data will be collection will be the responsibility of the research team in coordination with the participating fishers. A standard data collection sheet will be provided to ensure that uniform data is collected for each vessel and will routinely be collected and stored by Sub Sea Sonics. Required data includes:

- Environmental data (e.g., wind speed, current, depth, visibility)
- Time/location of deployment (GPS coordinates), programmed pop-up time (for timer gear), time of retrieval
- Electronic monitoring data (e.g., virtual gear marking app, vessel tracking logger)
- Retrieval, sorting and deployment time (comparison with traditional gear)
- Catch of legal-size crabs per trap

Data analysis will be conducted by Sub Sea Sonics and included in the annual reports. Analysis will be focused on demonstrating the reliability of the gear across a variety of fishing conditions (depth, current, swell, etc.) as well as comparing traditional fishing gear to pop-up fishing gear.

Timeline: Phased Approach

Phase 1 – Dockside Training Phase

During year one, we will conduct an installation and operational training workshop with the initial authorized agents (fishers). This will include an overview of the equipment and protocols involved in the EFP. Gear manufacturers and qualified trainers will demonstrate pier-side how to set-up, deploy, retrieve, and re-set the gear. Fishers will then practice deploying, retrieving, and resetting the gear and must demonstrate ability to conduct these activities independently before moving to Phase 2. We will also aim to include enforcement personnel participation to establish a baseline of understanding on the operation of the equipment. Additional workshops will be scheduled throughout years one through four if additional fishers are added to the EFP.

Phase 2 – At-sea Trial Phase

During years one through four, fishers will be provided with pop-up gear to be trialed at-sea. During the trials, data will be collected on environmental conditions, location, and virtual marking aspects as described above. Trials during this phase will follow the guidelines listed below:

- Fishers will conduct at least 50 successful consecutive trials with minimum 95% success rate

- Short pop-up times (<2 hours) with 10 or less units of gear
- Trials conducted with back-up buoy
- Trials limited to depths <250 feet and line lengths <300 ft
- Trials conducted in areas that minimize potential interference with other fishers

In addition to the testing by fishers, this phase will also aim to include the participation and training of enforcement personnel. Ideally, enforcement will practice using the gear and begin to consider and establish an enforcement and management regime in preparation for the authorization of pop-up gear under the RAMP. During this time, fishers will be permitted to retain and sell crab only if caught during the fishery season. If they are using pop-up gear while the statutory is closed, traps will be un-baited and closed to prevent the unintended catch. It is anticipated that use during the period when the fishery is closed would only be for training purposes (Phase 2 activities), or to evaluate specific aspects of the gear performance that are not related to fishing performance.

Phase 3 – Scaled-up Implementation
Upon completion of phases 1 and 2, fishers will be permitted to test the pop-up gear year-round at with an expanded number of traps. At least three vessels and no more than ten total vessels will be outfitted with up to pop-up units for up to 50 traps per vessel and the fishers will operate the gear independently for a period of at least one month during the statutory Dungeness crab season. Similar to Phase 2, fishers or other project participants will collect data on environmental conditions, location, and virtual marking aspects. During Phase 3, fishers will have the option to test with singles, or with multiple (up to 20) traps on a single line with either a single pop-up system at one end, or a pop-up system at each end. Testing and fishing efforts during this phase will also be limited to depths less than 250 ft and line lengths less than 300 ft.

During this time, fishers will be permitted to retain and sell crab only if caught during the statutory season. If possible, fishers may fish traditional gear concurrently with pop-up gear to compare efficiencies such as set-up and haul times and catch size. If they are using pop-up gear while the statutory season is closed, traps will be un-baited and closed to prevent the unintended catch. It is anticipated that use during the period when the fishery is closed would only be for training purposes (Phase 2 activities), or to evaluate specific aspects of the gear performance that are not related to fishing performance.

2. A list of target species expected to be harvested as samples or for compensation under the EFP, including anticipated amounts (weight or number) and proposed use (e.g., bait, sell, personal use, or other (e.g., research or tag and release)). Add rows to the table below as needed.

Species Name	Weight or Number	Proposed Use
Dungeness crab	Same as in traditional Dungeness crab fishery.	Retain and sell if caught during fishery season, release if caught out of season.

3. A list of species expected to be taken incidental to fishing conducted under the EFP, including anticipated amounts (weight or number), proposed use (e.g., bait, sell, personal use, discard, or other (e.g., research or tag and release)), and a description of any measures that will be used to reduce incidental catch mortality. Add rows to the table below as needed.

Species Name	Weight or Number	Proposed Use
Rock crab	Same as in traditional Dungeness crab fishery.	Retain and sell if caught during fishery season and if fisher holds permit. Otherwise release.

4. A description of the mechanisms that will be utilized to ensure that any proposed harvest limit for target and incidentally caught species are not exceeded and are accurately tracked or monitored (e.g., at sea fisheries observers, electronic monitoring, or other reporting method); and, if applicable, a description of the vessel's capacity to accommodate an onboard observer.

A combination of electronic monitoring, reporting, and trap set-up will be used to ensure limits are not exceeded and are accurately tracked or monitored.

Harvest Limits
The Dungeness crab fishery does not contain harvest limits – rather sustainability relies on limits on size, sex, and season. This EFP does not propose to alter any of these limits on harvest.

Electronic Monitoring
The primary purpose of electronic monitoring is to ensure enforcement, reliability, and gear marking to prevent gear conflicts in the absence of a surface buoy and vertical line. All vessels using the pop up gear and associated gear marking app will also have an operational vessel tracking system affixed to the vessel.

We propose to conduct vessel tracking using the Pelagic Data Systems solar vessel location data logger (solar logger) electronic monitoring systems affixed to the vessel (www.pelagicdata.com). The solar logger will continuously record the vessel location, course, and speed at a frequency of once per minute. CDFW will be provided access to the solar logger records on request so they can ensure that no gear is being deployed without marking the gear in the virtual gear marking app. Records will be maintained for at least 60 days after the end of the season, or for 60 days after the testing date for data collected for testing purposes outside of the season. Under this permit we may also test other vessel tracking systems that may be identified so long as they meet the requirements for frequency of tracking and ability to respond to data requests from CDFW in a timely manner.

5. A description of any potential impacts on existing fisheries, habitats, or possible incidental interactions with threatened, endangered, or protected species (e.g., sea turtles, marine mammals, and birds) that could occur as a result of the project.

The gear included within this EFP was designed to reduce marine species entanglement risk. The degree to which risk is reduced is based on the removal of the vertical line during the time between deployment and gear surfacing. The degree of risk reduction is a function of the percentage of time the system is in ropeless mode (i.e., the rope and buoy have not surfaced yet), which is determined by the return time of the fisher relative to the popup time (for timer systems). In general, these times can be very close and risk reduction for entanglement should be on the order of 90% or greater. For timed-release gear, we propose to service gear as soon as possible after gear surfaces and within a maximum 6 hours of gear surfacing under normal conditions. For a 2-day (54-hour) release delay, this would represent a minimum of 90% reduction in risk. In some instances, vessel breakdown or unanticipated weather events may extend the time it takes to recover the gear after popup, but these events are expected to be relatively rare. The percent of ropeless time is tracked within the Ropeless Regulatory Web Portal on a fishery-wide basis as well as down to the specific permit holder level, so that monitoring of the effectiveness of the system can be determined and adjustments made to operations if necessary. Risk Reduction for each ropeless trap is calculated using the following formula:

$$\%\ Risk\ Reduction = \frac{Deployment\ Time - Popup\ Time}{Deployment\ Time - Retrieval\ Time} \times 100$$

Thus, there is still potential for entanglement to occur with marine mammals and sea turtles, even with the 90% risk reduction. Note that the different types of pop-up gear (on-demand versus time) may achieve different levels of risk reduction.

6. The type and amount of gear to be used, including gear specifications and design, and, if applicable, a description of any measures and/or devices that will be used to reduce bycatch. If the project involves gear modifications or other gear innovations, the description must include the means by which CDFW staff can locate, retrieve, and inspect the proposed gear.

The gear included within this EFP includes the Sub Sea Sonics TR4RT Timed Release Pop-up System (TR4RT), the Sub Sea Sonics AR4RT Acoustic Release Pop-up System (AR4RT) and the Sub Sea Sonics and Longsoaker Guardian rope management systems. All pop-up gear systems will be used with a virtual gear marking application (e.g. Trap Timer), and a Pelagic Data System solar logger. Back-up systems will include rotten cotton, galvanized time releases (GTRs) and/or grappling. Descriptions of the gear types (including subsystems and operational methods), the amount of gear, how CDFW staff can locate, retrieve, and inspect the gear are provided below.

Gear Type: Sub Sea Sonics TR4RT Ropeless Trap Timer

The Sub Sea Sonics TR4RT Ropeless Trap Timer was developed specifically for application to low-cost ropeless trap fishing. The design of the system focused on addressing key inputs from the Dungeness crab fishing communities on the US west coast to provide a system that:

- Minimizes/eliminates exposure of whales and sea turtles to entanglement hazards in the water column;
- Has the potential to be capitalized and operated at costs that will not impose burden on fishers;
- Is simple enough to be easily integrated into the existing fishing process without undue impact to the time and effort required to deploy and retrieve the fishing gear;
- Is easily stowed within the footprint of the existing trap and allows stacking of traps;
- Is reliable and redundant to the degree that the amount of equipment loss is expected to be either the same or less when using the ropeless system compared to the traditional system;
- Provides comparable visibility on the surface to the traditional system when retrieving gear, and;
- Integrates a means to determine the location and identify the gear by fishers and enforcement agencies in the absence of surface buoys.

The system integrates three main components including the TR4RT release unit, the line handling system, and the gear marking capability. The concept of operation is that the ropeless trap is deployed including the trap, the timed-release with line and float (Figure 1).
The timed-release is preprogrammed so that the buoy will pop up just before the next visit, thus minimizing exposure and risk for entanglement of nearby whales. At the time of deployment, the real-time geolocation system is used to mark the location of the trap and transmit that location to a database that houses all the regional trap locations and other meta-data. The geolocation system is also used to display the locations of other nearby traps so that interference or gear conflicts among trap locations can be avoided. For turnaround/retrieval, the float is at the surface when the fisher arrives. The trap is then recovered using normal handling gear. The TR4RT is then re-set with the recoiled rope and buoys and the trap is re-deployed following the sequence described above. Details of the specific sub-systems are provided below.

Release Unit

The TR4RT release unit consists of an underwater housing, a rotating release and programming cam, and a release line retainer (Figure 2). The system works on the principle of “Time Until Release” (TUR). Using the cam, the user programs the unit with a specified TUR. The user then arms the system and deploys the equipment. After the specified TUR duration has elapsed, the cam rotates 180 degrees to activate the release. This releases a coil of line and float that are secured to the top of the trap; the float comes to the surface; and the equipment can then be retrieved. The system can also be disarmed using a cam rotation sequence. A small LCD screen on the unit provides user feedback on the command sequence and time setting. Figure 3 shows the typical command sequences that are used to program, arm, and disarm the system.

For simplicity, once the TUR is set in the unit, the system can be subsequently armed over and over if the same time setting is desired without having to reprogram the time for each deployment. Cam rotation is generally done using a small screwdriver to provide leverage. No other tools, deck units, or devices are needed for operating the system.

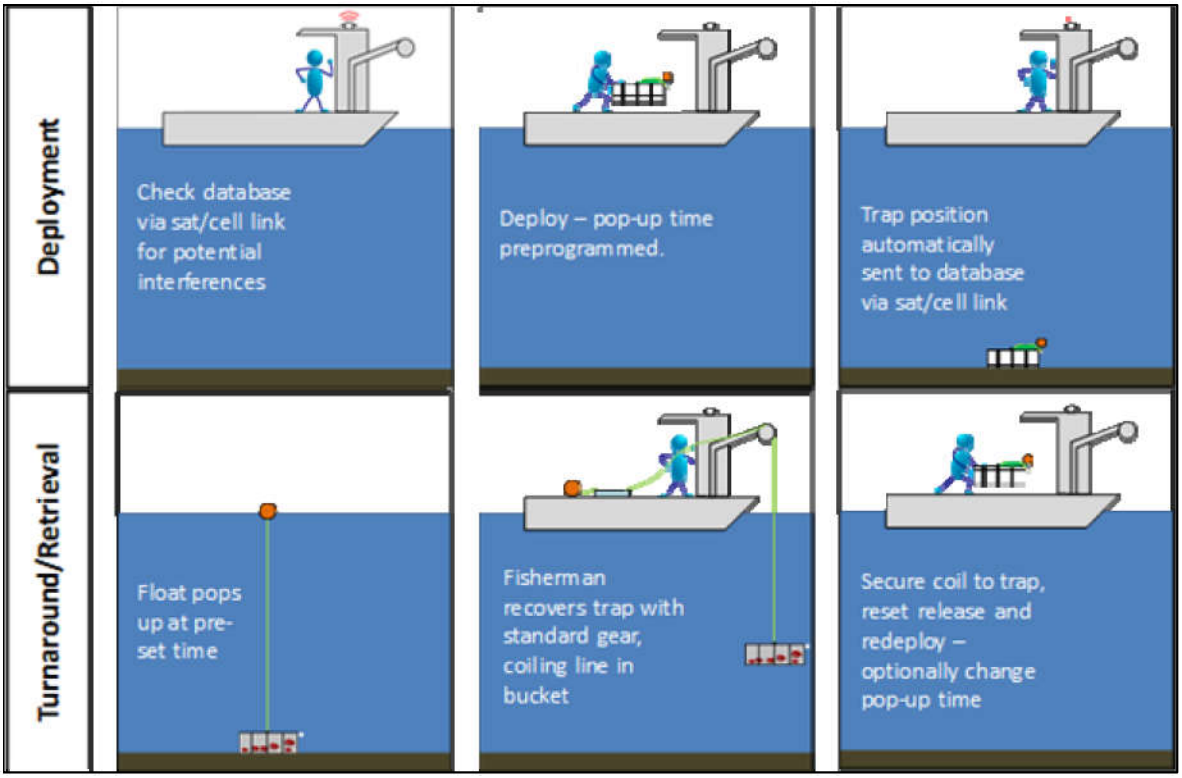


Figure 1. Concept of operations for the TR4RT Trap Timer ropeless fishing system.

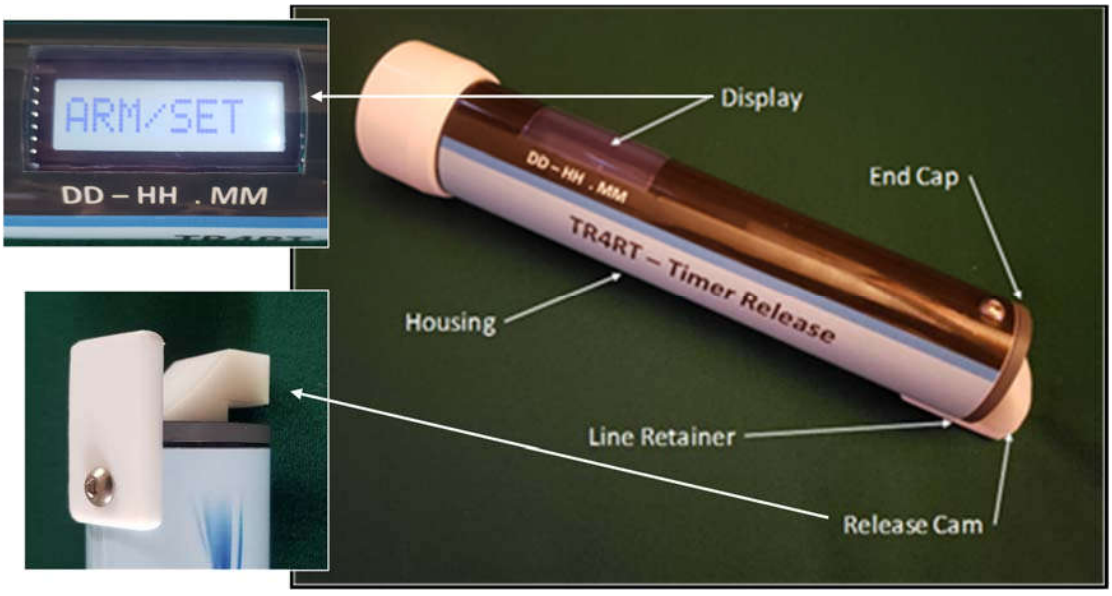


Figure 2. The TR4RT ropeless release unit.

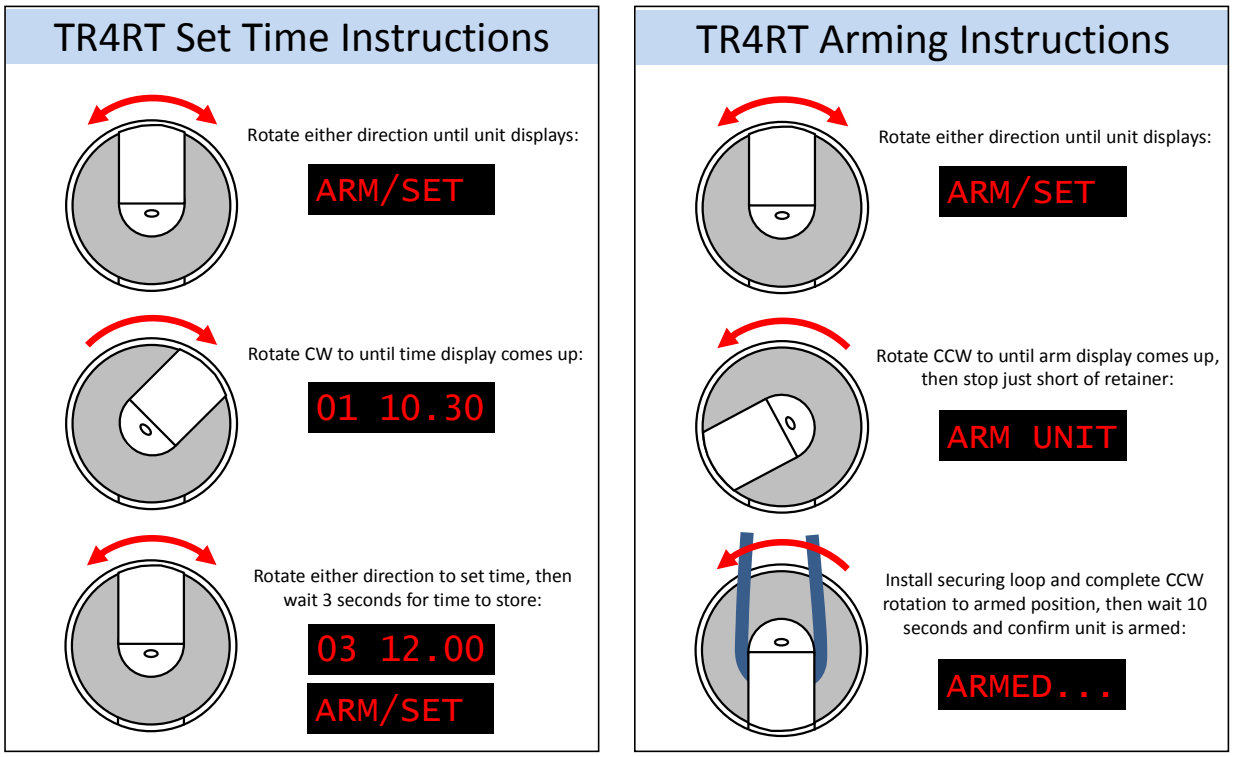


Figure 3. Typical command sequences for the TR4RT release unit.

Line Handling

We propose to allow for two options for line handling to be selected based on the preference of the fisher. The first line handling system is a bungee and release loop pin-down system that was developed by Sub Sea Sonics for the TR4RT and AR4RT systems in collaboration with West Coast lobster and crab fishers. The second line handling system (Guardian) is a drawstring mesh system that also pins the line and buoy to the top of the trap. This second system was developed by Longsoaker Fishing Systems (Russ Mullins) for use with GTR releases. Both systems have already undergone significant field testing and the Guardian line handling system has also been tested very successfully with the TR4RT release unit in the Southeast Black Sea Bass fishery.

Bungee/Release Loop System: The approach focuses on providing a reliable retrieval system while utilizing existing gear and handling systems as much as possible. The line used is the same type of line that is currently in use on the traps. Traditional foam buoys generally need to be replaced with hard floats for operations in greater than 100 feet of water depth. Various options for hard floats are available and have been tested. The preferred floats based on the testing are Polyform A-0 8” X 11.5” floats (main and trailer). These floats have proved to be very rugged, safe to handle, and effective for working at depth. Compared to hard floats they have the advantages of being much safer and also having lower buoyancy when the trap is on the bottom (thus less tendency for the traps to walk) and more buoyancy at the surface to resist current and wave drag. The line coil and floats are secured to the top of the trap using a three-

point tie down system that is formed using a bungee cord and the release line loop that goes to the release unit. There is a D-ring mounted at the center of the top of the trap to act as a guide for the release line (Figure 4). The release itself is generally secured to a vertical member of the trap using pipe clamps. As a backup, a cotton line is secured between the bungee and the release line so that if the release fails, the line and float will still release when the cotton degrades (Figure 5).

In operation, the line is coiled (either by hand or with a coiler) into a tub with the floats set to the side. The tub is then inverted, and the coiled line is placed on the top of the trap. The release unit is programmed, and the cam is rotated to a position close to the closed position but with sufficient gap for the release loop to be installed. The release loop is then fed through loops at the base of each float (main and trailer), then fed thru the D-ring, pulled in tension such that the bungee secured over the line coil, and then secured onto the release cam. The release cam is then rotated to its final armed position. Figure 6 shows the typical sequence.

During setup for the testing, the Department expressed concern that placing the line coil on the top of the trap has the potential to impede escape of crabs through the required escape rings and the "rotten cotton" biodegradable cords. To address this this, the rotten cotton sections are installed on the sides of the trap and the sections on the top of the trap are replaced with stainless steel wire. In addition, escape rings are installed on the side and are not impeded. Escape rings allow undersized crabs to exit the trap during fishing operations or if a trap is lost (Figure 7). Biodegradable "rotten cotton" allows larger crabs to escape if trap is lost, as it typically degrades in sea water within weeks.

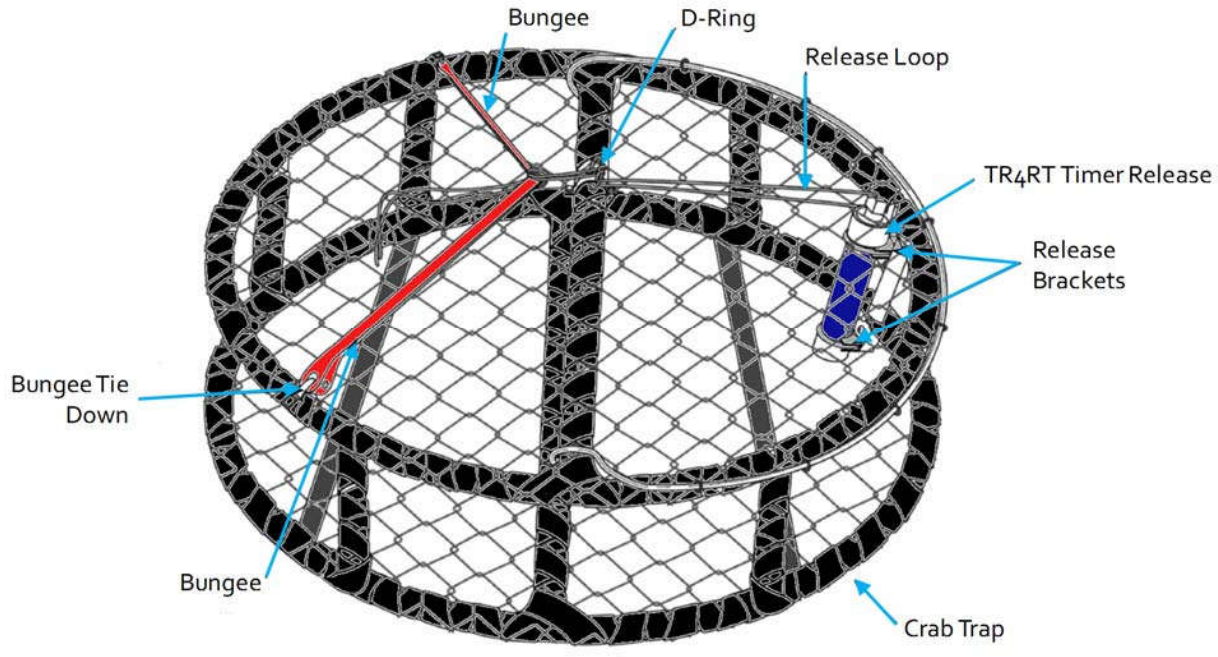


Figure 4. Line handling system for the TR4RT release installed on a Dungeness crab trap.

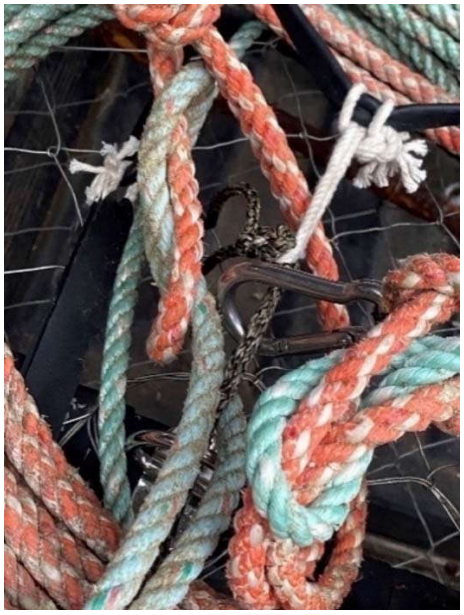


Figure 5. Rotten cotton connecting the release line to the bungee allows provides a backup release mechanism for the fishing line and floats if the primary release mechanism fails.

Figure 6. Typical rigging sequence for the TR4RT line handling system.

Figure 7. Configuration including degradable "rotten cotton" and steel escape ring installed on the side of the trap.

Guardian System: As with the first system, this approach also focuses on providing a reliable retrieval system while utilizing existing gear and handling systems as much as possible. The line used is the same type of line that is currently in use on the traps. Traditional foam buoys generally need to be replaced with hard floats for operations in greater than 100 feet of water depth. Various options for hard floats and poly floats are available and have been tested. The line coil and floats are secured to the top of the trap using an open-topped mesh that is sewn to the top of the trap. Around the top of the mesh, a drawstring is inserted using that can be pulled tight to secure the line and buoy to the top of the trap. The loop formed by the drawstring is then run through a loop on the buoy, and through a guide to the release cam (Figure 8). As with the first system, the release itself is generally secured to a vertical member of the trap using pipe clamps. As a backup, a cotton line can be inserted in the drawstring so that if the release fails, the line and float will still release when the cotton degrades.

In operation, the line is either free spooled or coiled into a tub with the floats set to the side. The tub is then inverted, and the coiled line is placed into the mesh on the top of the trap. The release unit is programmed, and the cam is rotated to a position close to the closed position but with sufficient gap for the release loop to be installed. The drawstring is then pulled tight and the loop is then fed through eyes at the base of each float (main and trailer), then fed thru the guide, pulled in tension, and then secured onto the release cam. The release cam is then rotated to its final armed position.

As with the first system, rotten cotton escape port sections will be installed on the sides of the trap and the sections on the top of the trap are replaced with stainless steel wire. In addition, escape rings are installed on the side and are not impeded. Escape rings allow undersized crabs to exit the trap during fishing operations or if a trap is lost. Biodegradable "rotten cotton" allows larger crabs to escape if trap is lost, as it typically degrades in sea water within weeks.

Figure 8. Longsoaker Guardian drawstring/mesh line handling system.

Gear Type: Sub Sea Sonics AR4RT Ropeless Trap Timer

The Sub Sea Sonics AR4RT Ropeless Acoustic system is essentially the same as the TR4RT time in form and function but is triggered using on-demand acoustics instead of a timer. The system integrates four main components including the AR4RT release unit, the line handling system, the deck unit/transducer, and the gear marking capability. The concept of operation is the same as for the TR4RT except that no release time is set, and the system retrieval is trigger through the Trap Timer app instead of by the timer. At the time of deployment, the Trap Timer app is used to identify the acoustic unit number of the system, mark the location of the trap and transmit that location to a database that houses all the regional trap locations and other meta-data. The geolocation system is also used to display the locations of other nearby traps so that interference or gear conflicts among trap locations can be avoided. For turnaround/retrieval, the fisher uses the app to trigger the acoustic release of the line and float. The trap is then recovered using normal handling gear. The AR4RT is then re-set with the recoiled rope and buoys and the trap is re-deployed following the sequence described above. Details of the specific sub-systems are provided below.

Release Unit

The AR4RT release unit consists of an underwater housing, a rotating release cam, and a release line retainer (Figure 9). The system works on the principle of acoustic on-demand triggering. Using the cam, the user arms the system and deploys the equipment. Cam rotation is generally done using a small screwdriver to provide leverage. When the acoustic on-demand signal is received, the cam rotates 180 degrees to activate the release. This releases the line retention device which sends the float to the surface where it can then be retrieved through traditional means

Figure 9. The AR4RT ropeless release unit.

Deck Unit
The AR4RT deck unit consists of a small, waterproof electronics box and a transducer. The electronics box communicates with the Trap Timer app via a Bluetooth connection. At the time of release, no action is required from the deck unit, but the app is used to mark the location and designate the acoustic ID number. At the time of retrieval, the app is used to select the trap and the app sends a Bluetooth command to the deck unit, which in turn sends the on-demand acoustic release command to the underwater unit.

Line Handling
The line handling systems for the AR4RT system are identical to the TR4RT system.

Virtual Gear Marking
In order to enable the use of ropeless fishing traps, there is a concurrent requirement for maintaining the ability to regulate and enforce the use of traps while preventing gear conflicts. Additionally, detectability by other fishers is imperative to reduce and prevent gear conflict. The TR4RT and AR4RT systems are supported by a tablet/cell-based app, a website, and a database to provide this capability. The app (Trap Timer) has versions that can be used onboard fishing boats, enforcement vessels and public vessels. The website is setup primarily for regulatory use. Access to the app is provided through an onboarding website that requires administrative approval by Sub Sea Sonics. Administrative approval includes verification of the user identity and role (fisher, enforcement, public). Once the user has been verified, the user is established in the database, and a private link to download the app from the app store is provided. For regulatory personnel, this process also provides access to the website. The app is free and available to the public.

Gear Marking App

Details of the Trap Timer app are described below. Other gear marking apps available to the project operate on a similar basis. For the fisher, the app is setup and operated on a cell phone or tablet (Android or iOS) with the following features:

- Map: A map display showing the location of the deployed traps overlaid on a nautical chart (Figure 10). This is the default screen. A symbol indicates the location of the boat on the screen. The deployed traps are color coded to indicate their popup status including green (up), yellow (down but coming up soon) and red (down). The map view displays all of the fisher's traps that are within the view window, along with other fishers' traps (as a different symbol) that are within ¼ nautical mile.
- Table: A table display that shows the latitude and longitude of the fisher's deployed traps and the expected popup time (Figure 10).
- Deploy: A button labeled "Deploy" that shows in both the Map and Table screens and activates a popup window that prompts the fisher for the TR4RT/AR4RT timer setting and warns the fisher if there is another fisher's trap within a pre-specified radius of the location (Figure 8). If the time setting is selected, a calculator/converter is available that automatically converts the release delay time into a calendar date and time. There is also a "Release" button that executes the deployment of the trap, recording the position and then returning to either the Map or Table screen.
- Retrieve: A button labeled "Retrieve" that shows in both the Map and Table screens and activates a popup window that indicates that the trap has been retrieved and the retrieval time. By default, the closest trap to the boat is selected. Alternatively, the user can click on a specific trap in either the map or table mode and the option to retrieve it will come up in a popup window (Figure 11). The retrieve action also allows the fisher to mark the trap as lost or left in the event that the trap cannot be retrieved.
- Synchronize: There is a Sync button on the main screen that synchronizes the app with the shoreside database. Synchronization to the database can occur when the user is within Wi-Fi or cellular range. The system has settings options to select manual, Wi-Fi only, or Wi-Fi and cellular. When this function is executed, the system sends all user data since the last successful sync and retrieves others' data (interference data) since last successful sync for the area covered by map.
- Settings: An item from the upper left menu that allows the fisher to specify a name, password, boat name, interference radius, synchronization option, and default release time setting.

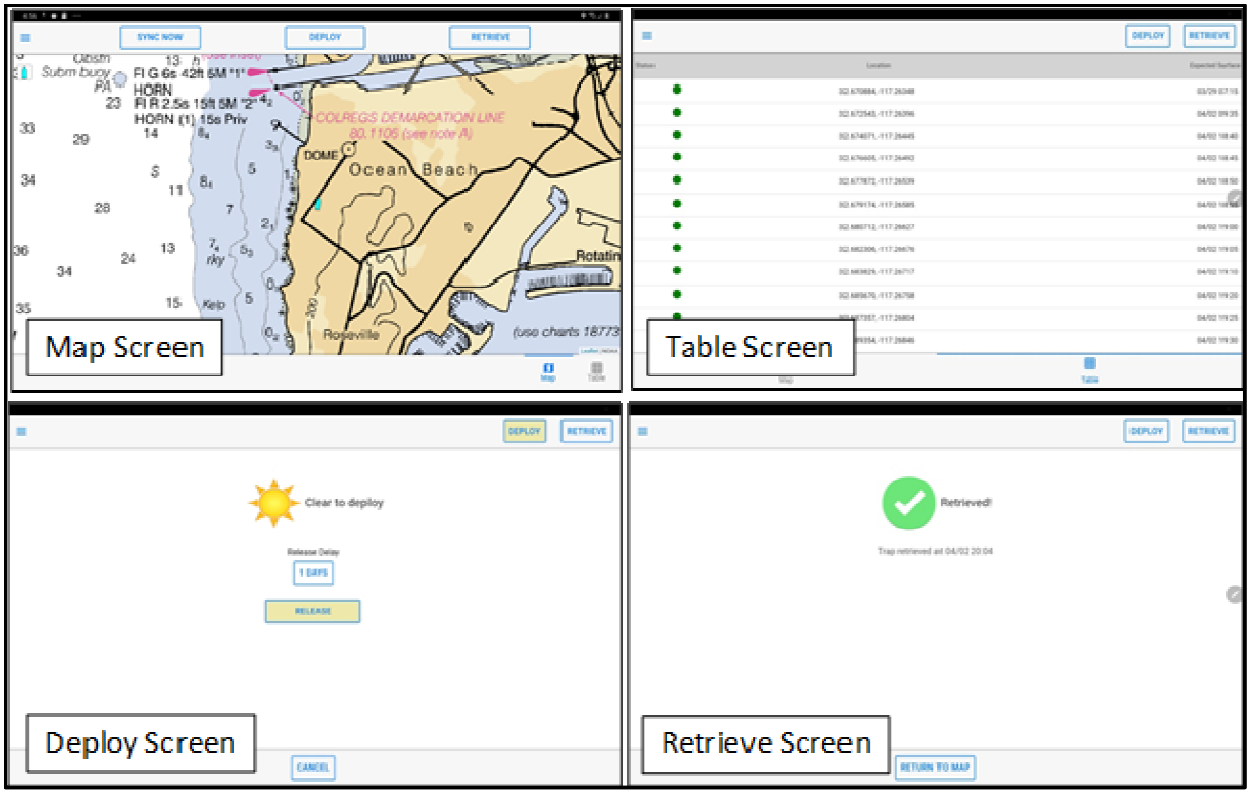


Figure 10. App screens for the Trap Timer app.

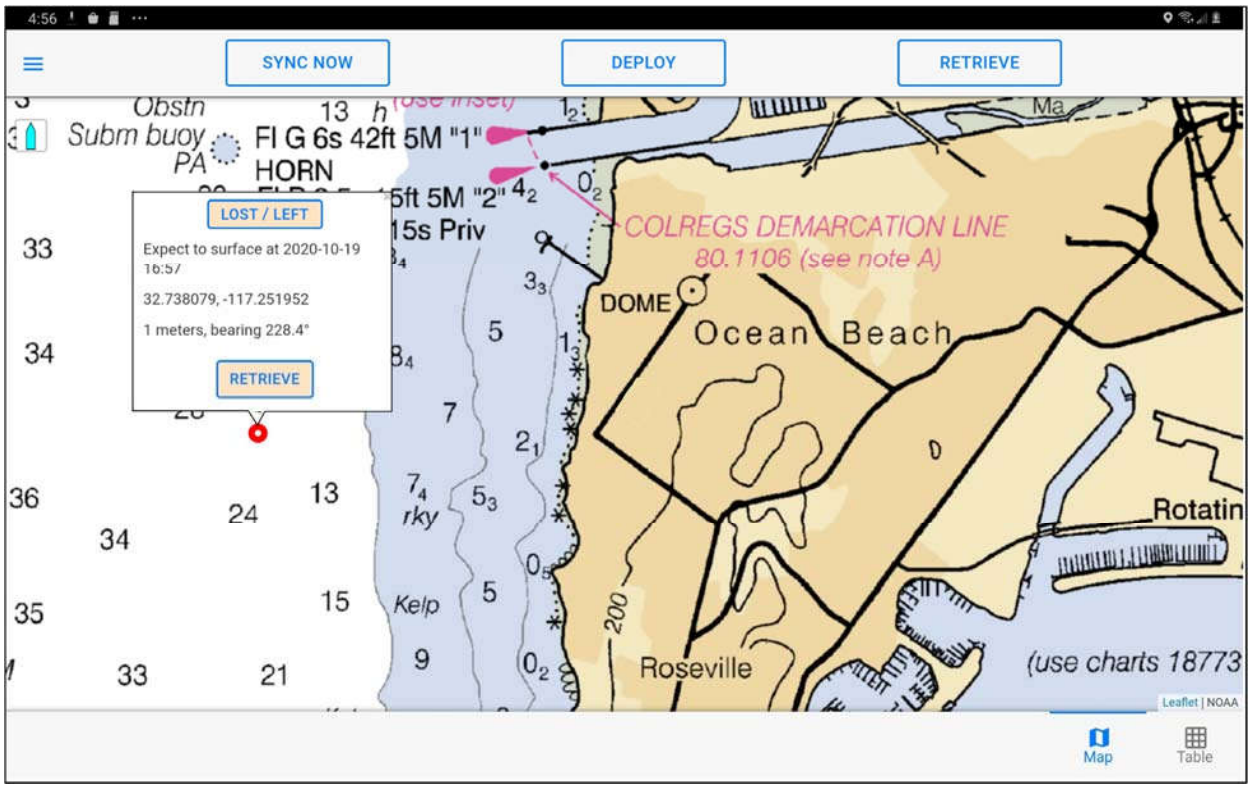


Figure 11. Popup window on the retrieve action.

The enforcement version of the app is the same as the fisher version except that traps for all fishers are displayed that are within ¼ nautical mile of the enforcement vessel. From within the map or table view, they can access information about the trap including location, deployment time, popup time, range, bearing and associated permit number.

The public version of the app is the same as the enforcement version except that they cannot access any information about the fisher, only have visibility of any traps that are within ¼ nautical mile.

Ropeless Regulatory Web Portal

The regulatory website (Ropeless Regulatory Portal) provides CDFW Law Enforcement and Marine Region Staff access to all data associated with users that are (or have been) actively fishing with ropeless gear. The website includes three main panels including a map view, a fisher table, and a data table (Figure 12). These views can all be filtered based on the data parameters of the database. In general, the data are first filtered in the fisher window by fishery, date, and then fishers within that fishery can be selected based on name, vessel name, or permit number. The filtered data are then displayed in the map view and the data view. The data view also provides multiple tabs to view general information, detailed information, and summary statistics associated with the filtered data.

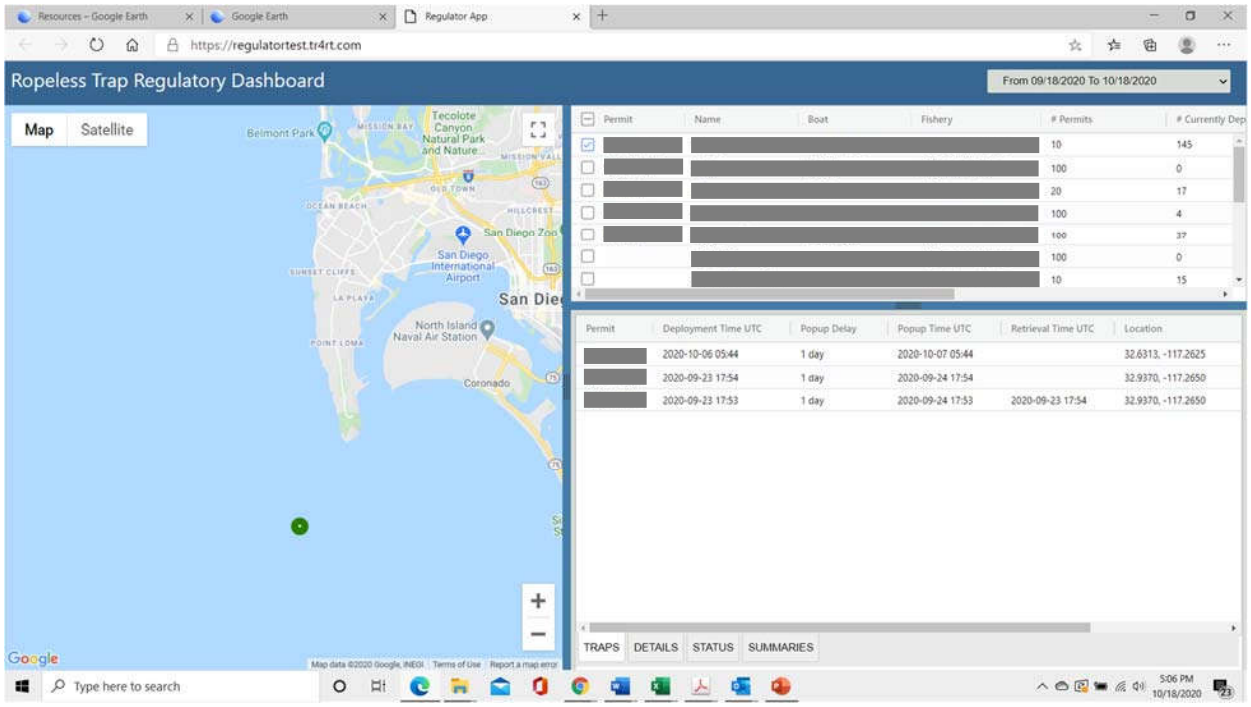


Figure 12. Screen shot from the Ropeless Regulatory Web Portal.

Electronic Monitoring

All vessels using the Trap Timer system will have an operational vessel tracking systems affixed to the vessel that will record location at all times. We propose to conduct vessel tracking using the Pelagic Data Systems solar vessel location data logger (solar logger) electronic monitoring

systems affixed to the vessel (www.pelagicdata.com). The solar logger will continuously record the vessel location, course, and speed at a frequency of once per minute. CDFW will be provided access to the solar logger records on request so they can ensure that no gear is being deployed without marking the gear in the virtual gear marking app. Records will be maintained for at least 60 days after the end of the season, or for 60 days after the testing date for data collected for testing purposes outside of the season. Under this permit we may also test other vessel tracking systems that may be identified so long as they meet the requirements for frequency of tracking and ability to respond to data requests from CDFW in a timely manner.

Figure 11. Pelagic Data Systems Solar Logger unit (www.pelagicdata.com).

Lost Gear Recovery

The approach for lost gear recovery will be specific to the gear configuration as singles or longlines.

Gear Recovery for Singles

Each single trap will be configured with the primary release and the backup rotten cotton release. For singles, in the event that the release unit fails, the first back-up method will be the rotten cotton on the release loop. If the unit still cannot be retrieved, the second alternate recovery method will be grappling. Given that the gear is accurately marked using the app, and that the lost status is flagged in the database, this will provide a reliable search location for the grappling activity. We will also use high-resolution sounders (fish finder), that can be used to identify potential targets in the search area. During search and recovery operations, the app will also be used to update the status of any gear that is recovered. Finally, any unrecovered lost traps with pop-up gear will be reported to the coordinators of the Trap Gear Recovery Program to partner on recovery efforts.

Gear Recovery for Longlines

Each longline will be configured with the primary release and the backup rotten cotton release on an end trap. Optionally, a second electronic release or GTR can be installed on the other end

of the trap. For longlines, in the event that the release unit fails, the first back-up method will be the rotten cotton on the release loop. If the unit still cannot be retrieved, the second alternate recovery method will be the backup release on the other end trap. If the unit still cannot be retrieved, the third alternate recovery method will be grappling. Given that the gear is accurately marked using the app, and that the lost status is flagged in the database, this will provide a reliable search location for the grappling activity. We will also use high-resolution sounders (fish finder), that can be used to identify potential targets in the search area. During search and recovery operations, the app will also be used to update the status of any gear that is recovered. Finally, any unrecovered lost traps with pop-up gear will be reported to the coordinators of the Trap Gear Recovery Program to partner on recovery efforts.

Amount of Gear

The maximum amount of gear will not exceed pop up gear associated with up to 50 traps per fisher, with up to 10 fishers. Participating fishers will have the option to fish the pop-up systems with single traps or with a string of traps (up to 20 traps), but not to exceed their permitted number of traps. Each fisher will be permitted to use up to 20 traps per trawl with 1 or 2 units of pop-up gear located at the ends of the trawl string.

CDFW Considerations for Locating, Inspecting, and Retrieving the Gear

Enforcement officials will have access to the gear marking app and the Ropeless Regulatory Web Portal that provide information on trap locations, associated pop-up times, and permit holders. Enforcement can use the data to determine which pop-up gear they want to inspect and when it will be on the surface for retrieval.

To use the gear marking app to locate gear while at-sea, law enforcement will need an iOS or Android tablet with the Trap Timer app. If Law Enforcement does not already have tablets, inexpensive tablets are currently available in the range of $100-300. The gear marking app and portal are free. Access to the app is provided through an onboarding website that requires administrative approval by Sub Sea Sonics, and permissions will be granted to Law Enforcement to see the location of all deployed traps. Sub Sea Sonics will provide any needed guidance or training in the use of the website or app to Law Enforcement upon request. Proposed enforcement mechanisms specific to the TR4RT and AR4RT are included below.

Sub Sea Sonics TR4RT (Timed-release)

Law enforcement will be able to retrieve this gear using traditional methods at the time the buoy surfaces and will be able to re-deploy gear in the same manner as traditional gear. Timed-release gear cannot be accessed until it reaches its pre-programmed popup time which is set at the time of deployment, so this effectively prevents fishers from tampering with the gear. This will allow enforcement to continue to conduct random checks of the gear, while obviating the need for enforcement to use new equipment.

Enforcement can arrive at the marked location of the gear before it is scheduled to surface and retrieve the gear using traditional line haulers immediately after the gear surfaces (or thereafter). Enforcement can then re-deploy the gear as traditional gear with the line and

buoys released, as the fisher is required to retrieve and redeploy the ropeless system within hours of surfacing. Therefore, deployment by enforcement is the same as deploying a traditional crab trap. Enforcement will be able to be present, either aboard the fishing vessel (boarding) or close by aboard a patrol vessel, while the permitted fisher recovers the gear after the time of the scheduled release. This will allow for trap and catch inspection, virtual gear marking compliance, trap limit compliance, and verification of compliance with other provisions of this EFP.

Sub Sea Sonics AR4RT (Acoustic-release)
Retrieval and deployment of the AR4RT by enforcement can be done via an acoustic transducer. Once the float reaches the surface, the trap is recovered like traditional fishing gear with a float and line. After inspection, the AR4RT can be redeployed by coiling and stowing the line, stowing the float, and re-arming the release unit.

7. The location and timing of the project. The description must include trip specifications, such as fishing depth, anticipated number of trips, expected trip duration, and estimated number of hauls and average soak time (for fixed gear) or estimated number of tows/sets to be made per day, and estimated duration and speed per tow (for mobile gear). For project vessels listed in Section F. of this document, the description must also identify any fishing activity that is expected to occur on the same trip as the project for purposes other than those provided by the EFP (e.g., fishing before and/or after the EFP activities).

Location: The geographic area of the EFP will be limited to locations of interested fishers, rather than allow state-wide use. The areas will be selected to ensure access for participating fishers. Initial participation is expected from the ports of Santa Cruz, San Francisco, Moss Landing and Bodega Bay within Zones 3 and 4.

Timing: We are requesting a four-year EFP with authorization for gear deployment and testing. The retention and sale of crab will be limited to the statutory season. Otherwise, traps will be un-baited and disabled. Testing during the statutory season will not include the statutory portion of the season prior to the opening of the season if the opening of the season is delayed. Testing during this portion of the season may be considered through an addendum later in the permit period if there is support for it from the fleet.

Trip specifications:

- **Depth**: During all Phases, the depth will initially be restricted to no deeper than 250 ft. Based on testing results in this range and interest from participating fishers, we may request expanding the depth range to deeper water at a later date within the permit period.

- **Anticipated number of trips**: The maximum number of fishers participating in this EFP is 10 and each is required to meet the requirements of each phase (described in Section E). Phase 1 is expected to occur pier side and not include any trips. Fishers may complete the requirements for Phase 2 with a minimum of one trip depending on conditions and trial results. During Phase 3, the 10 fishers may conduct up to 100 trips each depending on availability and time authorized under the EFP.
- **Duration**: Trip durations are expected to last one day each, depending on the conditions and type of testing being conducted.
- **Hauls and average soak time**: Soak times will vary from 30 minutes to 96 hours. We estimate that up to 10 fishers will conduct a max number of 50 hauls each trip.

F. PROJECT VESSELS (IF APPLICABLE)

Provide vessel information. Using the table below, complete a separate entry for each project vessel to be authorized by the EFP. For any vessel that will be used in commercial fishing activity related to the permit, the commercial boat registration number issued pursuant to FGC Section 7881 is required. For any vessel that will not be used in commercial fishing activity related to the permit, the commercial boat registration number issued pursuant to FGC Section 7881 or a copy of the United States Coast Guard (USCG) Certificate of Documentation is required. If there is no Certificate of Documentation for the vessel, a copy of the vessel's state registration is required.

Vessel Name	F/V Ronna Lynn
Boat Registration Number or Documentation	**[Boat registration number omitted]**
Owner Name	Marc Alley
Owner Address	**[Owner address omitted]**
Owner Telephone Number	**[Owner telephone number omitted]**
Operator Name	Marc Alley
Operator Address	**[Operator address omitted]**
Operator Telephone Number	**[Operator telephone number omitted]**

Vessel Name	F/V Friendship
Boat Registration Number or Documentation	**[Boat registration number omitted]**
Owner Name	Ed Tavasieff
Owner Address	**[Owner address omitted]**
Owner Telephone Number	**[Owner telephone number omitted]**
Operator Name	Ed Tavasieff
Operator Address	**[Operator address omitted]**
Operator Telephone Number	**[Operator telephone number omitted]**

Vessel Name	F/V Sunrise
Boat Registration Number or Documentation	**[Boat registration number omitted]**
Owner Name	Steve Melz
Owner Address	**[Owner address omitted]**
Owner Telephone Number	**[Owner telephone number omitted]**
Operator Name	Steve Melz
Operator Address	**[Operator address omitted]**
Operator Telephone Number	**[Operator telephone number omitted]**

G. SIGNATURE

X  10/4/22

Signature of Applicant Date

H. APPLICATION FEE PAYMENT

Please see CDFW's EFP Program page for further information.

State of California
Department of Fish and Wildlife

Original on file,
received December 20, 2022

Memorandum

Date: December 15, 2022

To: Melissa Miller-Henson
Executive Director
California Fish and Game Commission

From: Charlton H. Bonham
Director

Subject: Transmittal of California Department of Fish and Wildlife Recommendation on Experimental Fishing Permit Application for Testing of Pop-Up Gear in the California Dungeness Crab Fishery

On November 4, 2022, the California Department of Fish and Wildlife (Department) accepted an experimental fishing permit (EFP) application submitted by Bart Chadwick for technical review, pursuant to subsection 91(d)(1)(B), Title 14, California Code of Regulations (CCR). Subsection 91(d)(2), Title 14, CCR requires the Department to develop and transmit a recommendation to the California Fish and Game Commission (Commission), including any permit special conditions, within 60 days from the date of application acceptance unless a time extension is needed pursuant to subsection 91(d)(3), Title 14, CCR.

Proposed EFP Project

The application requests a Tier 2 EFP to test the commercial use of Sub Sea Sonics timed- and acoustic release pop-up gear systems in conjunction with Longsoaker Fishing System Guardian line management system in the Dungeness crab fishery to collect information to inform future alternative gear certification under the Department's Risk Assessment Mitigation Program (RAMP) (proposed project). The proposed project would occur in commercial Dungeness crab fishing zones off the coast of California in water depths up to 250 feet. The proposed project would include between 3 to 10 participating fishers (authorized agents pursuant to subsection 91(b), Title 14, CCR). Each authorized agent would test up to 50 units of the proposed systems. The applicant requests the option to allow authorized agents to fish single traps or string up to 20 traps per line. The pop-up gear systems would be tracked and monitored using a virtual gear marking application (e.g., Trap Timer) and a Pelagic Data System solar logger.

The proposed project is anticipated span a total of four years. Testing would occur year-round; however, Dungeness crab (target species) would be retained/sold during the statutory open season only. Rock crab is proposed to be taken incidentally pursuant to current fishing rules and regulations.

The application also requests exemptions from the following provisions in Fish and Game Code (FGC) and Title 14, CCR:

- FGC Section 9005 (surface buoy marking requirement).
- FGC subdivision 9012(b) (single trap per line requirement).
- Subsection 132.6(d), Title 14, CCR (requirement for removal of gear at close of season); and
- Section 132.8, Title 14, CCR (RAMP prohibitions).

Department Review and Recommendation

The Department has reviewed the proposed fishing activities, in combination with the above requested exemptions, and determined that the proposed project must also be exempt from the following rules and regulations:

- FGC Section 8276 (requirement for removal of gear at close of season)
- FGC Section 8276.1(d) (prohibition on take and possession of Dungeness crab under RAMP)
- FGC Section 8276.5 and subsection 132.1(b), Title 14, CCR (requirement for buoy tags)

In completing its technical review, the Department recommends the Commission approve a Tier 2 EFP for purposes of conservation engineering and data collection with special conditions. The proposed special conditions of the EFP (specified on form DFW 1103) are attached for the Commission's consideration. The proposed special conditions (specific changes to the proposed project are marked with an asterisk ***** and are in ***bold italics***) include:

- General requirements for valid commercial licenses, permits, and vessel registration
- Maximum number of authorized agents and vessels that may participate in the proposed project
- Authorized species, take, and landing requirements ***(*authorized agents must record EFP number and catch information on landing receipts and notify the Department of any landings made with EFP fishing gear for management and enforcement purposes)***
- Allowable fishing area and time of year ***(*fishing activities shall only occur between the California /Oregon border (42° N. latitude) and Point Conception (37° 11' N. latitude) and no traps or gear shall be used seaward of the 100 fathoms line as defined in the Federal regulations and published in Title 50, Code of Federal Regulations Part 660 for purposes of research and the protection and conservation of the environment)***
- Gear allowances, specifications, and marking requirements ***(*authorized agents may fish single traps or string up to 5 traps per line for research and management purposes)***
- Vessel monitoring and tracking requirements
- ****Buoy line marking requirements when requested by the Department for research and enforcement purposes***

- ***Best practices for avoiding whale entanglement for conservation and management purposes***
- ***Data sharing requirements for research, management, and enforcement purposes***
- Lost gear recovery plan and reporting requirements
- Other requirements necessary for research purposes and the protection and conservation of marine resources and the environment in accordance with applicable laws and regulations

Any fishing activity conducted outside of the scoped of the proposed project would be prohibited.

If approved, the proposed special conditions together with the standard terms will ensure the protection of marine resources and allow the Department to adequately enforce the EFP. The applicant may request modifications to the EFP during the duration of the proposed project (subsection 91(k), Title 14, CCR). Minor amendments may be granted by the Department if they do not exceed the allowances (subsection 91(k)(1), Title 14, CCR) placed on the permit by the Commission and are deemed essential to facilitate completion of the proposed project and have minimal impacts that do not change the scope of the initially approved permit.

In addition, the Department recommends approval of a permit fee reduction pursuant to subsection 91(m)(3), Title 14, CCR. The Department had recommended testing of Sub Sea Sonics pop-up gear and technology via the EFP Program. If approved, this option would allow testing to address the performance and enforceability questions previously identified by the Department during the alternative gear certification process under RAMP pursuant to subsection 132.8(h), Title 14, CCR.

Next Steps

Pursuant to subsection 91(f), Title 14, CCR, the Department requests the Commission provide notice of receipt of the recommendation and schedule the application and any proposed permit special conditions for consideration no sooner than 30 days after public notice is given.

If you have any questions on this item, please contact Dr. Craig Shuman, Marine Regional Manager, at [redacted] or by email at R7RegionalMgr@wildlife.ca.gov.

Attachments

- EFP application (confidential information omitted)
- Standard terms and proposed special conditions (DFW 1103)
- Public notice of Department recommendation
- CEQA Overview Memo and Draft Notice of Exemption

ec: Chad Dibble, Deputy Director
Wildlife and Fisheries Division

Craig Shuman, D. Env. Regional Manager
Marine Region

Eric Kord, Assistant Chief
Law Enforcement Division

Garrett Wheeler, Attorney
Office of General Counsel

Joanna Grebel, Env. Program Manager
Marine Region

Ryan Bartling, Sr. Environmental Scientist Supervisor
Marine Region

Tom Mason, Sr. Environmental Scientist Supervisor
Marine Region

Marina Som, Acting EFP Coordinator
Marine Region

DRAFT DOCUMENT

Experimental Fishing Permit No.

Revision Date:

MARINE FISHERIES: EXPERIMENTAL FISHING PERMIT TERMS AND CONDITIONS

Pursuant to California Fish and Game Code (FGC) Section 1022 and Section 91, Title 14, California Code of Regulations (CCR), the Experimental Fishing Permit (EFP) holder is authorized to conduct experimental fishing activities according to the requirements of the EFP approved by the Fish and Game Commission (Commission) and issued by the California Department of Fish and Wildlife (Department).

EFP Holder/Entity Administrator Name: **Bart Chadwick (EFP Holder)**

Kim Sawicki (Entity Administrator)

EFP Holder/Entity Administrator Address: **[address omitted]**

Authorized Agent Name: **See authorized agent list on Page 3**

Authorized Agent Address: **See authorized agent list on Page 3**

Vessel Name and ID #: **See authorized vessel list on Page 3**

Description of authorized activity:

Testing and commercial use of Sub Sea Sonics timed- and acoustic- release pop-up gear systems in conjunction with Longsoaker Fishing System Guardian line management system in the California Dungeness crab fishery. The experimental fishing activities may only be conducted under the following conditions:

STANDARD TERMS

These standard terms shall apply to all persons or vessels conducting authorized activities under the EFP.

1. The permit shall be operated only on the vessels named on this form, if applicable. Either the EFP holder or the authorized agent must be aboard the vessel when activities are being conducted under this permit, and both are responsible and accountable for meeting the requirements and limits of this permit.

2. Pursuant to FGC Section 7857(d), the EFP holder or authorized agent shall have a valid copy of the Department issued EFP attached to a signed copy of this form in possession when activities are being conducted under this permit.

3. All persons conducting activities under an EFP must comply with all appropriate state and federal fishing laws and regulations, including but not limited to those relating to protected species, minimum size limits, and seasons or areas closed to fishing that are not otherwise exempted by the permit (see special conditions).

4. The EFP holder and authorized agent shall cooperate with the Department by allowing personnel designated by the Department to board the fishing vessel on any fishing trip (if

applicable) or enter a place of business operated by the EFP holder or authorized agent under this permit, to retrieve, observe, or inspect any logbook, records, data, equipment, procedures, or catch throughout the duration of the permit.

5. The EFP holder or authorized agent shall provide Department staff with a 24-hour notice prior to every fishing trip. The contact information for Department staff will be provided for this purpose at the time of permit issuance.

SPECIAL CONDITIONS

As set forth in subsection 91(i), Title 14, CCR, special conditions may be placed on this permit for research purposes and the conservation and management of marine resources and the environment (see following page).

As set forth in subsection 91(k), Title 14, CCR, special conditions may be amended or repealed as necessary for research purposes and the conservation and management of marine resources and the environment.

RECEIPT AND ACKNOWLEDGEMENT

The permit is not valid until the EFP holder has certified by their signature below that they have: 1) read and understand the standard terms and special conditions of the permit; 2) unless otherwise specified in special conditions, paid the appropriate fees specified in Section 704, Title 14, CCR; and 3) returned a signed copy of this form to the Department.

I have read, understand and agree to abide by all standard terms and special conditions of this permit.

_____ _____
EFP Holder Signature Date

Received by License and Revenue Branch (LRB)

Fee $_____ Experimental Fishing Permit No. _____

Revision Date _____

_____ _____
By: LRB Date

Experimental Fishing Permit No.
Revision Date:

Authorization and Special Conditions

List of approved special conditions, names and addresses of any additional authorized agents, and/or names and identification number of any additional authorized vessels.

Authorized Agents and Vessels

1. This EFP is valid only for the authorized agents and vessels named below. The Department may allow up to a maximum of 10 authorized agents and 10 vessels for this EFP, as it deems necessary for research purposes.

    a. Authorized Agent Name and Address
    1. Russ Mullins [address omitted]
    2. Marc Alley [address omitted]
    3. Ed Tavasieff [address omitted]
    4. Stephen Melz [address omitted]

    b. Authorized Project Vessel
    1. F/V Ronna Lynn [vessel ID omitted]
    2. F/V Friendship [vessel ID omitted]
    3. F/V Sunrise [vessel ID omitted]

2. All parties (as specified in 1, above) operating under the authority of this permit must be informed of and agree to abide by all standard terms and special conditions of this permit.

General

3. The authorized agent and any person who assists the authorized agent shall possess a valid commercial fishing license issued pursuant to FGC Sections 7850, 8280.1, and Section 125, Title 14 CCR, prior to engaging in any commercial fishing operations authorized by this permit.
4. The authorized agent and any person who assists the authorized agent shall possess a valid general trap permit issued pursuant to FGC Section 9001, prior to engaging in any fishing operations authorized by this permit.
5. The authorized agent shall possess a valid commercial boat registration issued pursuant to FGC Section 7881, for the vessel named above and display the Department Boat Registration numbers in plain sight on each side of the vessel.
6. All authorized agents shall only participate in one EFP per fishing trip when participating in multiple EFPs.
7. No other EFP or commercial fishing activities shall take place on the same trip as this EFP, unless specifically authorized by this EFP.

Authorized Species, Take, and Landing Requirements

8. Authorized agents may fish for Dungeness crab and rock crab within the same trip if the authorized agent holds valid permits for those species. Unless specifically exempted by this EFP, adherence to all other regulations regarding the take of these species is required.

9. All landing receipts must have the state EFP number recorded in the "State Permit #" field, the number of individual crabs recorded under the "# of Fish" field, and species of crab specified in the "Notes".

10. All authorized agents shall notify the Department Law Enforcement Division (LEDMarineNotifications@wildlife.ca.gov) of any landings of Dungeness crab made with EFP fishing gear during a fishery closure due to RAMP. The notification shall include the date, port of landing, number of pounds landed, electronic fish ticket number, and the full name of the receiver.

Allowable Fishing Area and Time of Year

11. Fishing activities shall only occur between the California /Oregon border (42° N. latitude) and Point Conception (37° 11' N. latitude) and no traps or gear shall be used seaward of the 100 fathoms line as defined in the Federal regulations and published in Title 50, Code of Federal Regulations Part 660.

12. Dungeness crab may only be taken or possessed during the statutory season and subject to domoic acid and quality take restrictions pursuant to FGC Sections 5523, 8276, Section 8276.1(d), and 8276.2.

13. If requested by the Department, the authorized agents must suspend fishing operations or move fishing gear in response to circumstances including elevated entanglement risk or in the event of entanglement report in the fishing or testing location.

14. Fishing operations shall abide by all applicable Essential Fish Habitat closures for bottom contact gear as described in Federal Regulations (Title 50, Part 660, Subpart F).

15. Fishing activities shall not occur in any state Marine Protected Areas pursuant to Section 632, Title 14, CCR.

Gear Allowances, Specifications and Marking Requirements

16. Authorized agents shall be exempted from buoy tag requirements as defined in subsection132.1(b), Title 14, CCR and FGC Section 8276.5.

17. A maximum of 50 units of timed- and acoustic release pop-up gear per vessel may be deployed per fishing period.

18. A maximum of 50 traps per vessel may be deployed per trip with the unit limitations as specified in 17.

19. All authorized agents must comply with the following requirements with respect to deployment of the authorized pop-up gear fishing systems.

    a. When fishing single traps, each trap shall be marked by a single line and buoy.
    b. When fishing a string of traps ("trawl"), a maximum of up to five traps may be deployed and the terminal traps shall be marked with a single line and buoy.

20. All traps must comply with the requirements specified in FGC Section 9011 for Dungeness crab or rock crab. All traps used or deployed must have at least one destruct device pursuant to FGC Section 9003.

21. The permittee shall provide the Department access to the gear marking web-based application (Trap Timer app) and the Ropeless Regulatory Web Portal, as identified in the EFP application for data sharing and enforcement purposes.

22. The main buoy and any trailer buoys shall be marked with the operator's commercial fishing license identification number. All identification numbers shall be at least one and one-half (1.5) inches in height and drawn with a line no less than 1/4 (0.25) inch thick.

23. Buoy markings shall comply with requirements specified in Section 180.5, Title 14, CCR. Every buoy shall be marked exclusively with the Identification Letter "E" with at least one buoy marked with the operator's commercial fishing license identification number followed by the Identification Letter "E".

    a. Buoys that are 4 inches in diameter or greater shall have Identification Letters marked on four opposing sides.
    b. Buoys that are smaller than 4 inches in diameter shall have Identification Letters marked on two opposing sides.
    c. The commercial fishing license identification number shall be at least 1.5 inches in height and drawn with a line no less than 0.25 inch thick.
    d. The Identification Letters "E" shall be at least 3 inches in height and drawn with a line no less than 0.25 inch thick.
    e. All Identification Numbers and Identification Letters on a buoy shall be clearly and distinctly marked, and in a color that contrasts with the buoy; the numbers and letters shall be applied and maintained so that they are visible and legible.

24. Buoy Line Marking Requirements. The authorized agents will test and report on the efficacy and durability of marking lines when requested by the Department.

25. Pursuant to FGC Section 9004, authorized agents shall service their traps at intervals no more than 96 hours unless otherwise authorized in writing by the Department. Exceptions may be made for weather.

Other Requirements

26. No testing or fishing for crab may take place unless a functioning electronic monitoring system is installed and used as specified by the Department. The electronic monitoring device must be capable of recording vessel location at a frequency of at least once per minute with an active subscription service when the vessel is engaged in fishing operations covered under this EFP, including transiting to and from fishing areas. Authorized agents shall grant Department access to all data upon request.

27. 24 hours prior to commencing a fishing trip during which EFP activity is expected to be conducted, notice of vessel name, anticipated fishing dates, port of departure, and expected landing port shall be made via email to the Department's Law Enforcement Division (LEDMarineNotifications@wildlife.ca.gov) and Marine Region (WhaleSafeFisheries@wildlife.ca.gov).

28. The permittee shall follow the best practices for avoiding whale entanglement described in the attached guide. This includes fishing gear and incident reporting requirements.

29. The permittee shall provide training to CDFW personnel on any aspect of the permitted project on request.

30. The permittee shall comply with data reporting requirements as described in Attachment A.

31. The vessel shall be capable of safely carrying an observer when requested by the Department and provide that observer with accommodations equivalent to those provided to the captain and crew for both single and multi-day trips if multi-day trips are conducted.

32. The permittee shall adhere to the gear recovery plan as described in the EFP application. The permittee will further document all lost gear, including traps, buoys and other equipment and submit annually to the Department. Failure to keep or submit required information may result in revocation or suspension (including non-renewal) of the permit.

33. Unless otherwise specified by the Department, the permittee shall submit reports pursuant to subsection 91(l), Title 14, CCR to the EFP Coordinator (EFP@wildlife.ca.gov) no later than 60 days after the permit expiration date.

Attachment A: Data Reporting Requirements

1. Deployment Data. Permittee or authorized agent shall provide to the Department as soon as practical, but no more than 12 hours after deployment, the following data for each crab trap deployed:

    a. The latitude and longitude of each trap, given to the highest precision allowed by onboard instrumentation ("location"). If multiple traps are deployed on a single line ("trawl"), the number of traps in the trawl, and the location of the first and last traps of the trawl.
    b. The name and vessel ID of the vessel the trap was deployed from.
    c. The experimental fishing permit number the trap is deployed under.
    d. The time and date of deployment.
    e. The time and date the release mechanism is programmed to allow the marker buoy to surface.

2. Recovery Data. Permittee or authorized agent shall provide to the Department as soon as practical, but no more than 12 hours after recovery or attempted recovery, the following data for each crab trap deployed:

    a. The time and date of recovery.
    b. The location the gear was recovered.
    c. The distance between the location where the gear was deployed and recovered.
    d. The time elapsed between the programmed release time and recovery.
    e. The location of any unrecovered traps.

3. Gear Location Marking. The permittee or authorized agent shall make fishing locations publicly available to other fishers and the public subject to direction of the Department. Communication of fishing location may include notification to local harbor districts and to the Department web pages, and/or other publicly accessible web pages. Via the Trap Timer gear marking app the permittee or authorized agent shall make available the following information for the purpose of avoiding gear conflict:

    a. The location of deployed traps.
    b. The location of the first and last traps in a trawl, as well as an indication that they are part of a trawl.

4. In addition to the requirements of subsection 91(l), Title 14, CCR, annual and final reports shall include:

    a. A table or other database containing deployment and recovery data (requirements 1 and 2 of this attachment) for each trip conducted under the authority of this permit.
    b. A summary of landing data including the number of each crab species landed at each port by each vessel.
    c. The number of trips conducted by each vessel participating in the EFP, the total number of trap deployments, and the number of unsuccessful recoveries.
    d. A summary of the efforts taken to recover lost gear, and the outcome of those efforts.

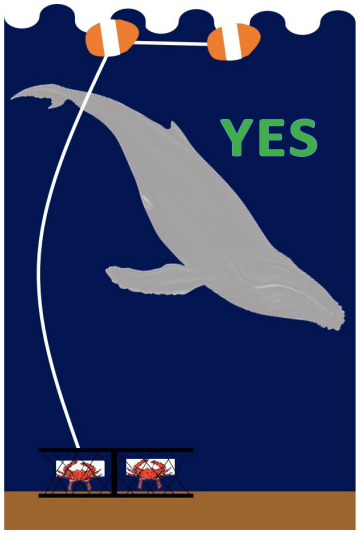
BEST PRACTICES GUIDE
FOR MINIMIZING MARINE LIFE ENTANGLEMENT

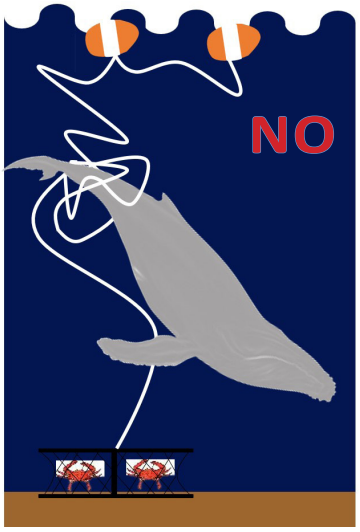
Last updated September 2021

Whale and sea turtle entanglements are a concern for fishermen, the public, California Department of Fish and Wildlife (CDFW), Ocean Protection Council and the National Marine Fisheries Service (NMFS). CDFW developed this guide in collaboration with the California Dungeness Crab Fishing Gear Working Group as part of a proactive and comprehensive approach to addressing entanglements in Dungeness crab gear. Taking these important steps will help maintain the fleet's access to this valuable resource.

BEST PRACTICES

- **ADJUST** trap line length when changing set location across depths by maintaining optimal scope.
- **MINIMIZE** knots, leads and scope when compensating for tides, currents, and weather.
- **ELIMINATE** excess lines floating at the surface. Floating line should only be used between the main buoy and the trailer.
- **REDUCE** slack surface line.
- **KEEP** vertical lines taut.
- **AVOID** setting gear in the vicinity of whales and sea turtles.
- **COMMUNICATE** locations of high whale activity to other fishing boats.
- **REMOVE** fishing gear prior to the end of the season.
- **PROMPTLY** remove gear not being actively fished.
- **MARK** gear consistent with regulations.
- **MAINTAIN** gear to ensure lines and buoys are in good working condition so they do not break and get lost.
- **RETRIEVE** lost or abandoned commercial Dungeness crab traps as authorized in Title 14, CCR Section 132.2 and 132.7.





KEEP LINE BETWEEN POT AND MAIN BUOY TAUT AND VERTICAL

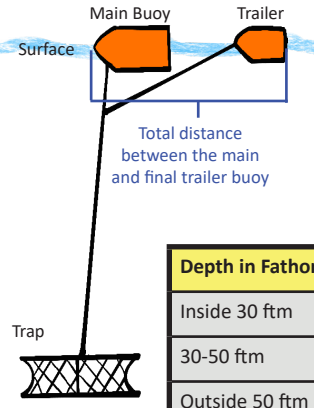
NEW RECREATIONAL REGULATIONS

Attention Sport Crab Fishermen

- The season opening and closing date may be modified due to entanglement risk for Dungeness crab. Season Updates provided at: wildlife.ca.gov/Conservation/Marine/Whale-Safe-Fisheries
- Any person who uses crab traps is required to purchase an annual trap validation.
- All traps must have a main buoy that is at least 5” in diameter and 11” in length attached to a red marker buoy that is 3” in diameter and 5” in length, attached to main buoy with 3’ of line or less.
- All traps must be raised, cleaned and emptied (serviced) at least every 9 days.
- 10 trap limit and fishermen may service up to 10 more traps with written permission from the operator of the traps.

COMMERCIAL BUOY SETUPS

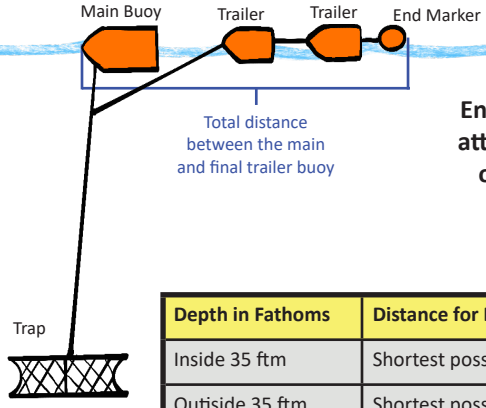
Best Practices (Recommended)



Minimize # of buoys- No more than 1 trailer buoy inside 30 fathoms.

Depth in Fathoms	Distance for Buoy Setup
Inside 30 ftm	Shortest possible - 3 ftm Max (18 ft)
30-50 ftm	Shortest possible - 4 ftm Max (24 ft)
Outside 50 ftm	Shortest possible - 5 ftm Max (30 ft)

Regulation



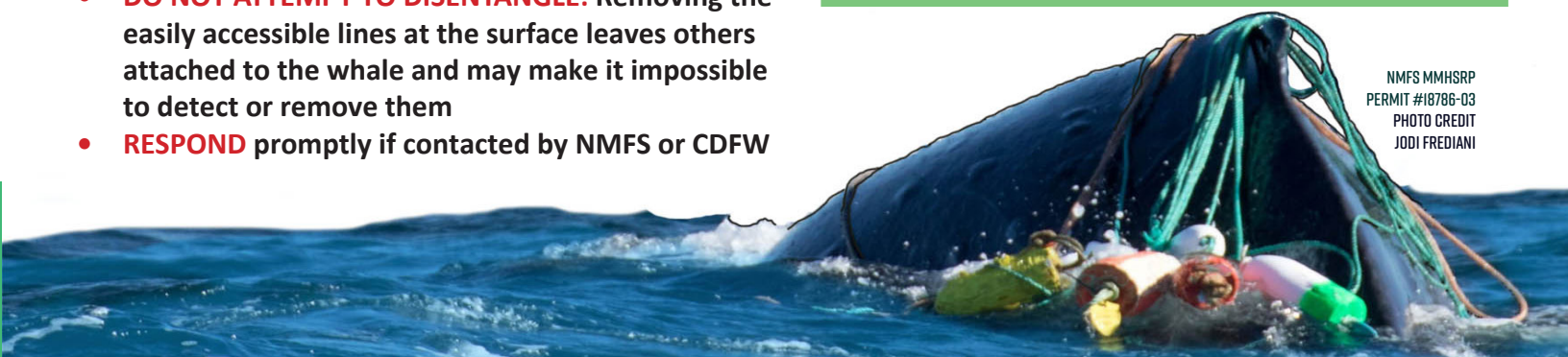
End Marker Buoy attached to 3 feet of line or less.

Depth in Fathoms	Distance for Buoy Setup
Inside 35 ftm	Shortest possible - 4 ftm Max (24 ft)
Outiside 35 ftm	Shortest possible - 6 ftm Max (36 ft)

IMMEDIATELY REPORT ENTANGLEMENTS

- **CALL NMFS RESPONSE HOTLINE:** 1-877-SOS-WHALE
- **HAIL THE COAST GUARD:** CHANNEL 16
- **NOTE** date, time, location and take a photo
- **STAND BY** for responders
- **MAINTAIN A DISTANCE OF 100 YARDS** for the safety of you and the whale
- **DO NOT ATTEMPT TO DISENTANGLE:** Removing the easily accessible lines at the surface leaves others attached to the whale and may make it impossible to detect or remove them
- **RESPOND** promptly if contacted by NMFS or CDFW

If you have suggestions for reducing entanglements in fishing gear, contact Dan Lawson at the NMFS Protected Resources Division: Dan.Lawson@noaa.gov or Ryan Bartling at CDFW: Ryan.Bartling@wildlife.ca.gov For other related inquiries or questions about this Best Practices Guide: WhaleSafeFisheries@wildlife.ca.gov More information at: wildlife.ca.gov/Conservation/Marine/Whale-Safe-Fisheries



NMFS MMHSRP PERMIT #18786-03 PHOTO CREDIT JODI FREDIANI

Experimental Fishing Permit (EFP) Application

February 9, 2023

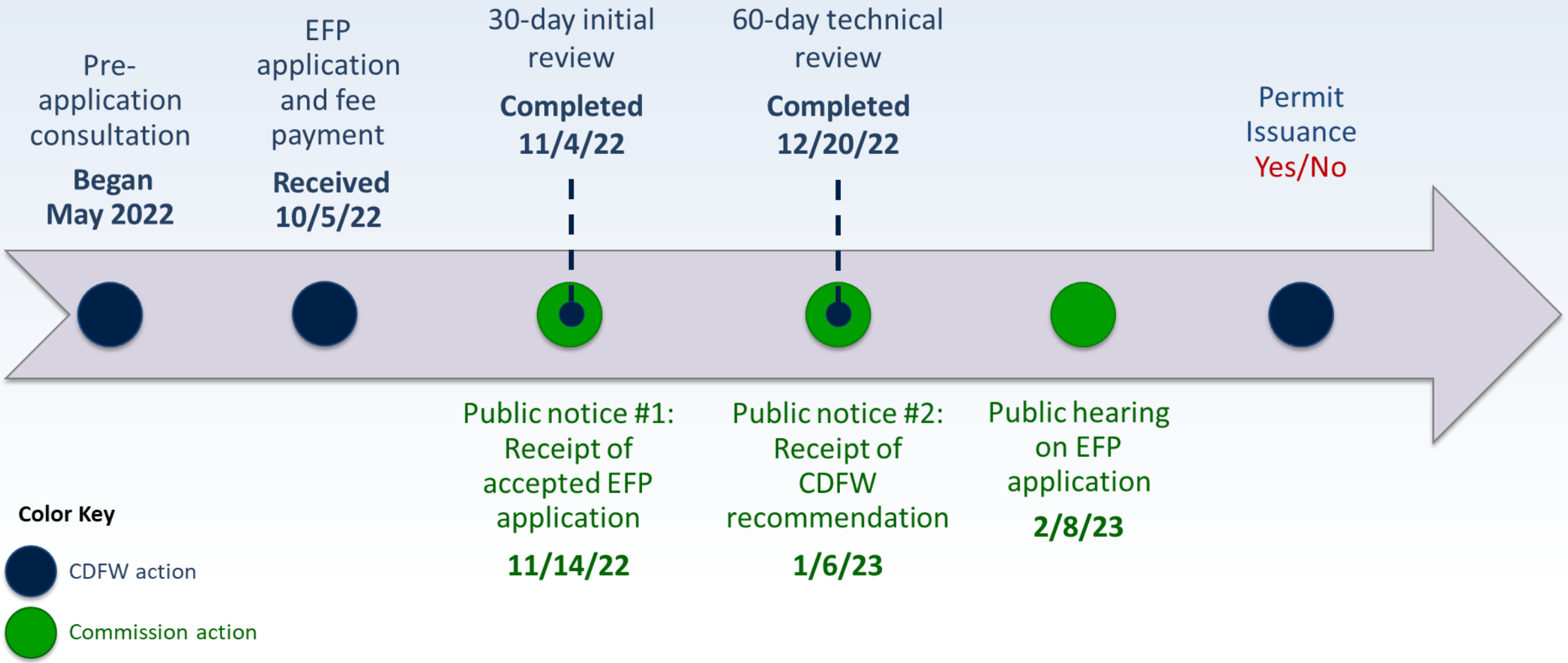
Presented to:

California Fish and Game Commission

Presented by:

Ryan Bartling
Senior Environmental Scientist Supervisor
Marine Region

EFP Application Review Timeline



Sub Sea Sonics EFP Application

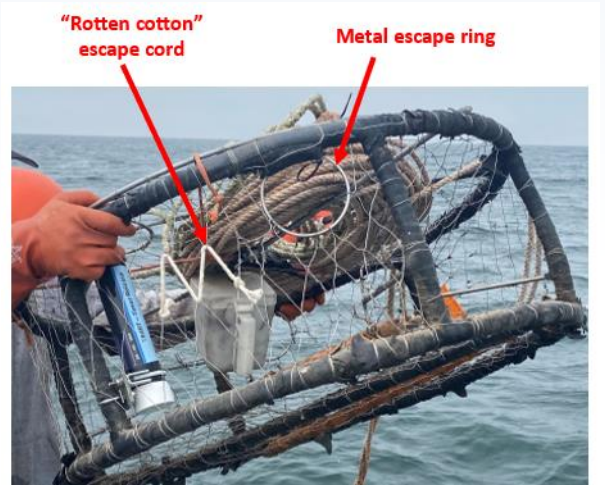
- EFP application requests:
  - Use of ropeless fishing systems (pop-up) in the commercial Dungeness crab fishery
  - Allow fishing during any fishery closures under the Risk Assessment Mitigation Program
  - Allow testing of pop-up system outside of the statutory closure
  - Up to 20 traps per line
  - Up to 10 authorized agents
  - Requests a permit fee reduction

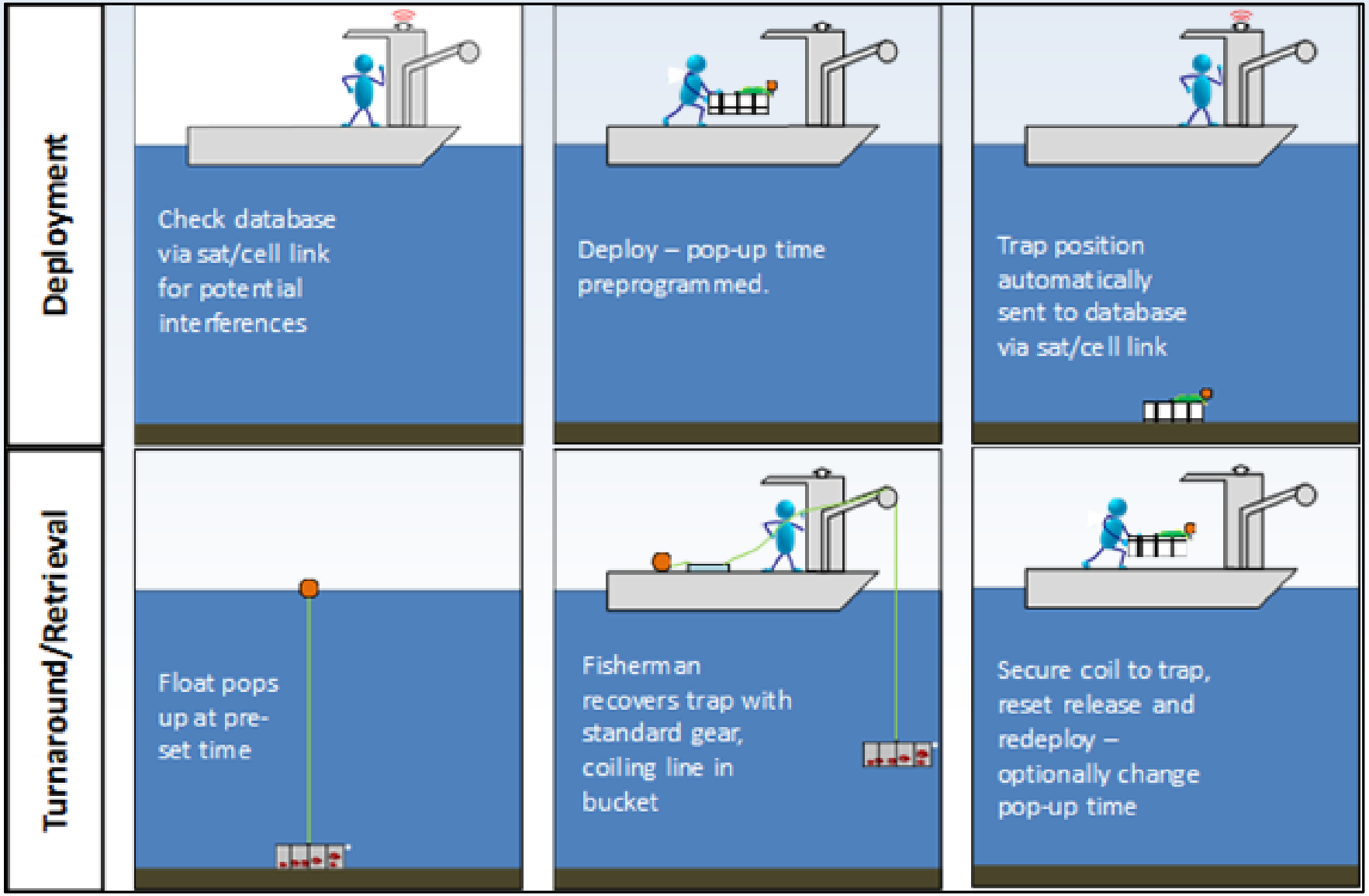
Proposed Pop-Up Systems

- Pop-up unit options
  - AR4RT (Acoustic release)
  - TR4RT (Timer release)
- Line handling options
  - Sub Sea Sonics (bungee/release loop system)
  - Longsoaker Guardian (drawstring/mesh line system)

Pop-up unit AR4RT (top) and TR4RT (bottom)

Ropeless Fishing Operations (Timed-Release)





Proposed Special Conditions

(Specific changes to the proposed EFP project are marked with an asterisk* and are in ***bold italics***)

- Allow up to 10 authorized agents (fishers)
- Fishers shall only participate in one EFP per fishing trip
- ****Fishing may only occur between the California/Oregon border and Point Conception***
- Dungeness crab may only be taken or possessed during the statutory season
- ****Fishers must notify CDFW of any landings made during a RAMP closure***
- Fishers must suspend fishing operations or move fishing gear, when requested by CDFW

Proposed Special Conditions, cont.

(Specific changes to the proposed EFP project are marked with an asterisk* and are in ***bold italics***)

- A maximum of 50 traps may be deployed per trip
- ****A maximum of up to 5 traps may be deployed per fishing line***
- ****Buoy and buoy line marking requirements***
- Electronic vessel monitoring requirement
- ****Data sharing and reporting requirements***
- ****Best practices for avoiding whale entanglement***
- All other applicable fishing laws and regulations apply

Recommendation

Approval of Tier 2 EFP with proposed special conditions

Approval of a permit fee reduction

Thank You

Ryan Bartling, Senior Environmental Scientist Supervisor

Invertebrate Management Project

Email: AskMarine@wildlife.ca.gov

To: California Fish and Game Commission

From: Bart Chadwick, Sub Sea Sonics

Subject: Comments on the EPF "Testing of Pop-Up Gear in the California Dungeness Crab Fishery"

Date: 15 January 2023

Dear Commission Member

Sub Sea Sonics respectfully provides these public comments with respect to our Experimental Fishing Permit entitled "Testing of Pop-Up Gear in the California Dungeness Crab Fishery."

Our application provides a detailed description of the purpose and approach for the permit. Here we provide detail on our personal motivations for undertaking this work, and some specific responses to typical criticisms of the pop-up or "ropeless" fishing gear technology.

Historically, Sub Sea Sonics was founded as a company that was focused on providing low-cost technology for recovering equipment from the seafloor. For over twenty years, the company has continued this focus, allowing for companies, institutions and individuals to have access to these technologies that were previously only available to select, high-budget projects and programs. In 2019, Sub Sea Sonics initiated an effort to develop technologies that could be used specifically for fishing traps. In undertaking this effort, we recognized that the challenge for fishing gear is much different from the traditional challenge for ocean science and oceanography. In the typical scientific effort, a limited amount of valuable gear is deployed and retrieved on an infrequent basis. In fishing, it is just the opposite, and a large amount of low cost gear is deployed and retrieved very frequently.

To meet this challenge, we reviewed all of the available information on gear and testing that had been conducted and concluded that we could not meet the challenge with any of our existing equipment. Even our lower cost gear was too expensive and too cumbersome operationally to be effectively used in a fishing application. So instead we developed new gear that was specifically designed to be as low cost as possible and as efficient to use as possible, while still being reliable and robust for use under harsh conditions. Much of our inspiration for the design came from reading reviews and criticisms from fishers that had tested gear that was currently available, gear that was primarily designed for scientific use rather than fishing.

Through grant support and self-funding, in 2019 we developed our first system, the Timer Release for Ropeless Traps (TR4RT). This system provides reduced risk for entanglement by allowing the fisher to pre-program when the line and float will come to the surface. The system is low cost and simple to use and is supported by a virtual gear-marking app that keeps track of the gear locations and pop-up times. To date, the system has been tested in multiple fisheries under both test and fishing conditions and has proved to be highly reliable while minimizing impact to fishing operations. In 2022, we developed an on-demand acoustic version of this system, the Acoustic Release for Ropeless Traps (AR4RT). This system releases using the same simple rotating cam but can be triggered at any time. This system has also had significant testing and fishing. Recent applications are summarized in Table 1 below indicating overall reliability of the system in the range of 98% over a total of 847 trap sets in three different fisheries.

Fishery	Gear Type	Total Sets	Release Successful	Line Handling Successful	Overall Successful	Release Success Rate	Line Handling Success Rate	Overall Success Rate
SE Black Sea Bass	TR4RT	473	471	468	466	99%	99%	99%
	AR4RT	117	117	117	117	100%	100%	100%
	Overall	590	588	585	583	99%	99%	99%
CA Dungeness Crab	TR4RT	130	128	127	124	99%	97%	95%
	AR4RT	0	0	0	0	-	-	-
	Overall	130	128	127	124	99%	97%	95%
CA Spiny Lobster	TR4RT	5	5	5	5	100%	100%	100%
	AR4RT	122	120	119	117	99%	98%	96%
	Overall	127	125	124	122	99%	98%	96%
All Fisheries	TR4RT	608	604	600	595	99%	99%	98%
	AR4RT	239	237	236	234	100%	99%	98%
	Overall	847	841	836	829	99%	99%	98%

Table 1. Summary of recent results for the TR4RT and AR4RT pop-up gear systems.

While we are encouraged by the results to date, the only way for the gear to continue to improve and meet the needs of the fishing fleet is for the gear to be used under real fishing conditions. This is also the only way to determine if the technology is a viable alternative to the time-area closures that are currently the primary management tool used in fisheries such as the California Dungeness crab fishery. Thus, the primary motivation for our EFP is to allow fishers to try the gear under realistic fishing conditions in order to see if it could provide them the opportunity to fish effectively and safely during periods when the fishery would otherwise be closed due to high entanglement risk.

During the course of our efforts, we have encountered a wide range of opinions and criticisms of the potential for gear like this to be useful for the fishery. We hold the utmost respect for these fishers who are always working under challenging conditions and seem to under pressure from so many directions that are impacting their ability to do their jobs. With this perspective of respect, we summarize some of the key criticisms below and how we have attempted to address them in a way that is consistent with the concerns that fishers have.

1. <u>The gear is too expensive and will put fishers out of business.</u> In citing this issue, the general claim is that a typical pop-up system costs about $2500, and for 500-trap operation this translates to a cost of about $1.25M to adopt the gear. These are valid arguments and require gear developers to recognize that the same gear that is used for science and military applications is not the answer for the fishing fleet. For our timers and on demand systems, the cost per unit is currently in the range of $300-$350 per unit (costs that can still be reduced at higher volume manufacturing). Ideally these systems would be used on at least short trawls of 3-5 traps per trawl. Assuming mid-range values for cost and trawls indicates an adoption cost in the range of $40K. This is still a substantial cost for a fishing operation, but it shows that the economics of the gear can be driven significantly in the right direction by designing purpose-built gear without a lot of fancy frills.
2. <u>The gear is unreliable and will result in a bigger problem of lost gear.</u> This is a valid concern because any time gear is placed out in the open ocean there is a potential for gear loss and relying on electronic technologies under harsh conditions could clearly exacerbate this situation. However, as can be seen from the recent reliability results for the gear, the testing and fishing of

the gear indicates that it can be highly reliable. There are key elements to this reliability that need to be understood to provide the context for how it is achieved. First, the gear does need to undergo extensive testing under non-fishing conditions and be optimized to address issues that could lead to gear loss. Second, there needs to be an education, proficiency, and integration development phase in which the fisher learns how to use the gear, develops proficiency with the gear, and takes the required steps to integrate the gear for their vessel, fishing style and fishing conditions. Third, there needs to be redundancy and backup methods to minimize the loss of gear when systems do fail. Our experience to date has shown that when these elements are put in place, the gear is highly reliable, and when issues do occur, the gear generally can still be recovered.

3. The gear slows down fishing too much. This is a major concern for any fishing operation and especially for the Dungeness crab fishery where time to reset gear is very short and efficiency is critical to economic viability. Our testing to date indicates that this is a real impact, but that it can be minimized through the steps described above including training, proficiency and integration. Because the technology adds some additional steps to the process, the set times associated with traditional gear will generally be shorter than with pop-up gear, but we have seen this difference reduced to the range of about 30 seconds (~50% longer) even in the early stages of integration. This means that either less gear can be handled in the same time, or more time will be required to handle the same amount of gear. However, this impact has to be weighed against the opportunity that is created to be able to fish during times that would otherwise be closed. In addition, this impact would be further reduced if the use of at least short trawls were adopted because there would be fewer pop-up systems per trap.
4. Allowing a limited number of fishers to use the gear under an EFP is not fair to other fishers. This criticism has been voiced as an argument to only allow for testing the gear and not fishing with the gear. This argument has validity from the standpoint of trying not to create an unlevel playing field within the fishery, and also to assure that the gear has been adequately tested before it is used under fishing conditions. We essentially agree with this argument and that is why we tested the gear extensively first, and then submitted an application for the gear to be fully authorized under the RAMP so that anyone would have the opportunity to use it during the spring when the fishery might otherwise be closed due to entanglement risk. However, CDFW rejected our application on the basis that they did not have a method to enforce the gear and recommended that the gear by authorized under a limited EFP instead. Under a limited EFP, it is not possible to allow the entire fishery to have access to the gear, and thus that level of fairness cannot be met or expected. However, because the EFP is limited in the number of fishers, the number of traps, and the depth range the gear can be used in, there is an inherent limit on how much fishing can take place. Given these limits, the issue of fairness does not seem to be at a level that should cause significant concern. In addition, it has to be recognized that those that would fish under the EFP are giving up other opportunities to do so and thus being able to fish and keep their catch seems like a reasonable approach to provide at least some level of compensation for the risk. Finally, given the high level of testing that has already occurred with this gear, there is a strong need to use the gear under realistic fishing conditions in order to fully understand if the gear will provide the desired opportunity for fishers to effectively fish during periods when the fishery would otherwise be closed due to entanglement risk.

5. <u>Gear manufacturers are only trying to make money at the expense of fishers.</u> This economic argument is often put forward as being the overriding motivation of gear developers in wanting to see pop-up gear broadly adopted in trap fisheries. This is because when you count up the number of trap fisheries and multiply it by the number of traps and then by the cost of a pop-up system, you get a very big number. For Sub Sea Sonics, this is simply not our expectation, our motivation, or our goal. Instead, we view the issue from the perspective of trying to preserve the opportunities for fishers to keep fishing. As a small business, we feel a kinship to the independent-minded folks who make their living in these fisheries and have no illusions that we will become rich by putting them out of business or by forcing them to use gear they don't want. An EFP that would allow for people to try fishing this gear and see what they think of it, having been trained, become proficient, and integrated the gear, and whether it is an opportunity or a liability. Conducting a few tests under non fishing conditions will never answer these questions, but only continue to propagate speculation on what might or might not be true. On the other hand, if such an opportunity is created under this EFP, an no one in the fishery is willing to even try the gear under fishing conditions, then we will understand that there really is not a strong desire to have alternatives outside of the time-area closures and that may be the best approach for this fishery.

We sincerely appreciate the consideration of this EFP by the California Fish and Game Commission and encourage you to support our goals of creating alternatives and opportunities for fishers in the California Dungeness crab fishery.

Very Respectfully

Bart Chadwick

Sub Sea Sonics