VESSEL MOVEMENT MONITORING PUBLIC SCOPING DOCUMENT

At the September 2014 Council meeting, under the omnibus prioritization Agenda Item J1, a number of vessel and gear movement issues were aggregated to be addressed as the vessel movement monitoring (VMM) agenda item. In April 2015, the Council adopted purpose and need statements and a range of alternatives for the following four management measures:

1. Monitoring Restricted Areas with VMS
2. Removal of Derelict Crab Pots from Rockfish Conservation Areas (RCAs)
3. Fishery Declaration Enhancements
4. Movement of IFQ Fishpot Gear Across Management Lines

Two management measures support cost effective and sufficient monitoring of vessel movement in restricted areas: 1) Monitoring Restricted Areas with VMS; and 2) Removal of Derelict Crab Pots in Rockfish Conservation Area (RCA). In addition, the Council is considering two management measures to create efficiencies in fishery operations and promote safety at sea: 3) Fishery Declaration Enhancements; and 4) Movement of Fishpot Gear Across Management Lines.

The Council is scheduled to adopt preliminary preferred alternatives at its November 2015 meeting and select final preferred alternatives in April, 2016. The following table provides the proposed public scoping process and Council action timeline (Table 1).

Table 1. Proposed timeline for public scoping for VMM and the Council decision making process.

Council Meeting	Decision/Product
April 2015	Council adopts purpose and need statements and a range of alternatives for analysis
May-Oct 2015	National Environmental Policy Act (NEPA) scoping, Council staff develops analysis.
November 2015	Council adopts preliminary preferred alternatives
April, 2016	Council adopts final preferred alternatives with intent that Final Rules are effective Jan 1, 2017

Table of Contents

Management Measure 1 - Monitoring Restricted Areas with VMS

This management measure would increase the amount of VMS data that is collected to closely track vessel movements in restricted areas, such as the trawl and non-trawl RCAs. Additional monitoring technology could be implemented to collect gear use data with sensors on fishing equipment to monitor closed areas without continuous transit requirements such as protected species zones and EFH closed areas. The management measure would only apply to vessels that are already required to have VMS; the Council is not proposing to add or remove VMS requirements for a fishery.

Recent case law has revealed a need for more VMS data to show a vessel is transiting a closed area when required to do so. Therefore, alternatives were developed to increase the ping rate from one per hour to four per hour. Additionally, because VMS requirements have expanded to the drift gillnet and albacore fisheries, this action now considers those fisheries. Some area restrictions are no fishing zones and may require more monitoring to show fishing activity is not occurring. This is a change from the original scoping document that focused on solutions to address enforcement concerns of the continuous transit requirements for the non-trawl and trawl RCAs. Therefore alternatives were developed to assist managers in monitoring gear deployment when a vessel is transiting or drifting in a restricted area.

Purpose and Need

The purpose of this management measure is to improve the VMS data collection program for vessels that are currently required to have VMS. Restricted areas, such as Rockfish Conservation Areas (RCAs) and protected species closures, are monitored by NMFS using VMS systems on some vessels; however, the location information collected can be insufficient for enforcement. Therefore, this measure is needed to enhance monitoring of restricted areas.

Background

Who is required to have VMS?

Any vessel registered to a limited entry groundfish permit must have VMS to fish in state or federal waters (0-200 nautical miles offshore). In addition, non-groundfish trawl vessels, vessels that use trawl gear but are not registered to limited entry groundfish permits, must have VMS to fish in federal waters (3-200 nautical miles offshore). Any vessel using non-trawl gear, that is not

registered to a limited entry groundfish permit, must have VMS on trips in which groundfish are taken and retained, possessed or landed in federal waters (3-200 nautical miles offshore).

In addition, NMFS finalized a rule that requires use of a NMFS-approved VMS and institute a 48-hour pre-trip call-in notification requirement for West Coast Large-mesh Swordfish Drift Gillnet (DGN) vessel owners. VMS on vessels in this fishery would provide NMFS and law enforcement personnel the ability to monitor the fishery for compliance with time/area closures and facilitate the deployment of law enforcement assets to inspect vessels for compliance.

Vessels that target albacore and are greater than 24 meters is required to use VMS for location identification according to the Inter-American Tropical Tuna Commission international treaty requirements.

Groundfish Conservation and Protected Species Closed Areas

VMS first became a requirement for limited entry permit (LEP) vessels, both trawl and fixed gear, in 2004 with the establishment of rockfish conservation areas for protecting overfished rockfish stocks. The VMS requirement was expanded to Open Access vessels retaining groundfish in Federal waters in 2006. In 2015, VMS requirements were added for the swordfish drift gillnet fishery and the albacore tuna fishery. At the time, VMS was the only electronic monitoring (EM) tool in the "tool box." Today, numerous EM systems are either available for immediate deployment or are in various stages of analysis and development.

A summary of applicable groundfish conservation areas and protected species closed areas is provided. The current list of approved VMS units is listed in Appendix A.

Groundfish conservation areas (GCAs) applicable to trawl vessels. A GCA, a type of closed area, is a geographic area defined by coordinates expressed in degrees of latitude and longitude. Fishing activity may or may not be permitted within a particular groundfish conservation area.

- North Coast Commercial Yelloweye Rockfish Conservation Area (YRCA)
- Salmon Troll YRCA
- Westport Offshore Recreational YRCA
- Stonewall Bank YRCA
- Point St. George YRCA
- South Reef YRCA
- Reading Rock YRCA
- Point Delgada YRCAs
- Southern Point Delgada YRCA
- Cowcod Conservation Areas
- The Eastern Cowcod Conservation Areas
- Farallon Islands
- Cordell Banks

Rockfish Conservation Areas. RCAs are a groundfish closed area. RCAs may apply to a single gear type or to a group of gear types such as "trawl RCAs" or "non-trawl RCAs." Specific latitude and longitude coordinates for RCA boundaries that approximate the depth contours selected for

trawl, non-trawl, and recreational RCAs are provided in §§660.71 through 660.74. Also provided in §§660.71 through 660.74, are references to islands and rocks that serve as reference points for the RCAs.

- *Trawl RCAs - Trawl (Limited Entry and Open Access Nongroundfish Trawl Gears) Rockfish Conservation Areas.* Trawl RCAs are intended to protect a complex of species, such as overfished shelf rockfish species, and have boundaries defined by specific latitude and longitude coordinates intended to approximate particular depth contours.

- *Non-Trawl RCAs - Non-Trawl (Limited Entry Fixed Gear and Open Access Non-trawl Gears) Rockfish Conservation Areas*. Non-trawl RCAs are intended to protect a complex of species, such as overfished shelf rockfish species, and have boundaries defined by specific latitude and longitude coordinates intended to approximate particular depth contours.

Essential Fish Habitat Conservation Area or EFHCA means a geographic area defined by coordinates expressed in degrees latitude and longitude, wherein fishing by a particular gear type or types may be prohibited. EFHCAs are created and enforced for the purpose of contributing to the protection of West Coast groundfish essential fish habitat. EFHCAs apply to vessels using bottom trawl gear or to vessels using "bottom contact gear," which is defined at §660.11, subpart C, to include bottom trawl gear, among other gear types.

These ecologically important closed areas are intended to minimize, to the extent practicable, the adverse effects of fishing on groundfish EFH. There are two types of closures: 1) areas where bottom trawling is prohibited, and; 2) areas where the use of bottom-contacting gears is prohibited. The boundaries of the EFH conservation areas are straight lines connecting latitude and longitude coordinates. Unlike RCAs, EFH conservation areas do not vary seasonally.

Protected Resource Area Closures (PRACs apply only to gillnet):

- *Leatherback Conservation Areas.* No person may fish with, set, or haul back drift gillnet gear in U.S. waters of the Pacific Ocean from August 15 through November 15
- *Pacific loggerhead conservation area.* No person may fish with, set, or haul back drift gillnet gear in U.S. waters of the Pacific Ocean east of the 120° W. meridian from June 1 through August 31 during a forecasted, or occurring, El Nino event off the coast of southern California
- *Mainland Area Closures.* Areas off the Pacific coast are closed to driftnet gear
- *Channel Islands Area Closures*. Areas off the Channel Islands are closed to driftnet gear

Table 2 provides a list of fisheries that have VMS units and the area restrictions that apply to them. Not all vessels in the list are required to have VMS, rather these vessels have used VMS in 2014 in the fisheries they declared into. A vessel is required to have VMS if it is registered to a limited entry trawl (LE) permit. The LE vessels must continuously move through the trawl RCA (a closed area for groundfish fishing) with some exceptions for midwater trawl vessels during the primary whiting season. Midwater trawl vessels may fish in the trawl RCA during the primary whiting season but are restricted from groundfish fishing in the RCA outside the primary season. Open access fixed gear vessels are subject to restricted areas such as the non-trawl RCA and may not fish

for groundfish in those areas. Salmon troll vessels that retain groundfish are subject to VMS requirements and the non-trawl RCA; however, these vessels would need to be declared as open access line gear participants in order to retain groundfish other than yellowtail rockfish and lingcod. In addition, vessels that fish with drift gillnets are subject to restricted areas, such as the Protected Resources Area Closures. Finally, albacore vessels larger than 24 meters must have VMS according to the IATTC international measures and is for location only

Table 2. Number of vessels with VMS that declared participation, by fishery, and the applicable restricted area, 2014.

Key: CCA=Cowcod Conservation Areas, EFHCA=Essential Fish Habitat Conservation Areas, GCA=Groundfish Conservation Areas, PRAC=Protected Resource Conservation Area, RCA=Rockfish Conservation Areas

Fishery with VMS	Number of vessels	Applicable Federal Restricted Area*
Limited Entry Groundfish:		
LE Midwater Trawl Non-whiting	4	GCAs including Trawl RCA (outside primary whiting season),CCAs GCAs
LE Bottom Trawl	51	including Trawl RCA, EFHCAs, CCAs
LE Midwater Trawl Whiting Fisheries:		
Shorebase IFQ	26	GCAs, No RCA restriction during primary whiting season, CCAs
Mothership	26	GCAs, No RCA restriction during primary whiting season, CCAs
Catcher/Processor	9	GCAs, No RCA restriction during primary whiting season, CCAs
Open Access (other gears):		
Prawn trap	5	Non-Trawl RCA, EFHCAs, CCAs
Dungeness crab	255	Non-Trawl RCA, EFHCAs, CCAs
Pacific halibut longline	47	Non-Trawl RCA, EFHCAs, CCAs
CA halibut line gear	6	Non-Trawl RCA, EFHCAs, CCAs
Sheephead trap	5	Non-Trawl RCA, EFHCAs, CCAs
Salmon troll gear**	152	Non-Trawl RCA**, CCAs
HMS line gear**	90	Non-Trawl RCA**, CCAs
Open Access Fixed Gear for Groundfish (non-IFQ):		
Longline	82	Non-Trawl RCA, EFHCAs, CCAs
Trap or pot	58	Non-Trawl RCA, EFHCAs, CCAs
Line gear	66	Non-Trawl RCA, EFHCAs, CCAs
Open Access Non-groundfish trawl:		
Ridgeback prawn	4	Non-Trawl RCA (exception for prawn/pinkshrimp), CCAs
Pink shrimp	82	Non-Trawl RCA (exception for prawn/pinkshrimp), CCAs
CA halibut	6	EFHCAs, CCAs
Sea cucumber	3	EFHCAs, CCAs
LE Fixed Gear (e.g. sablefish)	130	Non-Trawl RCA, EFHCAs, CCAs
Swordfish Drift Gillnet	4	PRACs: Pacific Loggerhead and Leatherback Conservation Areas, Mainland Area Closures, and Channel Islands Area Closures
Albacore (vessels larger than 24 meters)	up to 7	No applicable closures, International requirement for location only

*Federal restricted areas are closed to fishing. Some closures are restricted seasonally. **If a salmon troll or HMS line gear vessel would like to retain groundfish then it would need to declare participation in the open access line gear fishery and is therefore subject to the non-trawl RCA.

Public Scoping of VMS Issues

In March, 2014 the Enforcement Consultants Report (Agenda Item H1b) recommended that the following fisheries be considered for an increased ping rate of up to 4 times per hour:

- Limited Entry Fixed Gear
- Limited Entry Bottom Trawl
- Limited Entry Demersal Trawl
- Limited Entry Midwater Trawl, except when operating during the primary whiting fishery, Mothership exempt (includes whiting and nonwhiting targeting with midwater trawl).
- Open Access Longline, Groundfish and Halibut
- Open Access Trap or Pot, Groundfish and Halibut
- Open Access California Gillnet Complex Gear
- Open Access Salmon Troll when retaining Groundfish.

The Council directed staff, the EC, and Office of Law Enforcement to explore alternatives to a one-hour VMS ping rate. The exploration of options has identified various alternatives which may provide the Council, fisheries managers, industry, and enforcement with more precise vessel location and gear deployment status.

During the November 2014 meeting, the EC worked with advisory bodies to discuss their informational report with the goal of developing a strawman range of alternatives for Council consideration at its April 2015 meeting. On February 18, 2015 the EC conducted a meeting via webinar to further discuss and develop strawman alternatives.

The Council adopted a range of alternatives for VMM at its April 2015 meeting, is currently scheduled to adopt preliminary preferred alternatives at its November 2015 meeting and to take final action at its April 2016 meeting.

Three issues were identified that relate to changes in VMS ping rates 1) enforcement of the continuous transit requirements; 2) enforcement of fishing closures; 3) shifting the data collection and management burden.

Continuous Transit Issue

The current NMFS type-approved VMS units may not be sufficient at a one-hour ping rate to enforce the requirement for vessels to continuously transit restricted areas. In 2014 and 2015, both the NOAA Office of Law Enforcement (OLE) and the Council's Enforcement Consultants Advisory Body (EC) briefed and made comments/recommendations to the Council regarding the case of the F/V Risa Lynn (NOAA Case. No. SW1002974). This Magnuson Act case involved a single charge of operating a vessel in a restricted area for purposes other than continuous transit, as required by the West Coast Groundfish Fishery regulations.

This case was notable in that the primary issue for litigation was whether the VMS provided sufficient evidence of the vessel's activity in the restricted area. The Administrative Law Judge (ALJ) determined that the hourly VMS position report evidence in the case was insufficient to

prove that the vessel was not operating in continuous transit through the closed area as required by regulation. Additionally, the ALJ agreed with the assertion that under certain maritime conditions (e.g., wind, swell, current), it might be impossible for a vessel to comply with the regulatory definition of "continuous transiting" due to its requirement for vessels to stay on a "constant heading, along a continuous straight line course."

In a separate process, the Council is considering changes to essential fish habitat designations and RCAs for trawl and non-trawl fisheries. This may result in a reduction or expansion of these areas and could include multiple changes to the shape of these designated areas, especially the RCAs. These potential changes in area management may increase the complexity of enforcement and would support the need for a different type of VMS unit (not NMFS type-approved) to accurately and efficiently monitor the closed areas on the west coast.

United States Coast Guard, OLE, and its state enforcement partners may find it difficult to successfully enforce on a consistent basis the continuous transit requirement using VMS with a ping rate of 1 per hour. Achieving this enforcement objective requires a data stream that demonstrates that the vessel has not stopped or reduced speed, and maintained continuous transit through the restricted area. By providing more data either through an increase in the VMS ping rate or through some other electronic technologies, the vessel would be able to clearly show it is transiting the area and has not slowed or stopped to fish in the RCA.

Fishing Closure Issue

Some area restrictions prohibit fishing activity, such as drift gillnet closures and essential fish habitat closures. These areas do not require vessels to continuously transit the area. In these areas, vessels are allowed to drift or transit the area; however, it's not possible to know the status of its gear when the vessel is in the area. In addition, it's possible that some areas may be small or narrow enough to be fished and go undetected by VMS. Therefore, VMS is not the tool to manage these restrictions. Alternatives 3 and 4 use other technologies in conjunction with VMS to provide a more comprehensive data set in order to determine whether a vessel is fishing in a restricted area. For example, a vessel that uses electronic monitoring (i.e., video monitoring) could maintain a VMS ping rate of one per hour since video and GPS tracking is recorded during fishing activity. Another option is to allow the use of enhanced VMS units that can use Geofencing and collect gear sensor data. Gear sensors (e.g., drum or winch) can be placed in-line and provide a report when the vessel uses the equipment. These enhanced units can also collect more frequent location information (every 10 minutes) with little increase in cost from the current costs incurred using the NMFS type-approved units.

Alternatives 3 and 4 would provide the best available information to closely monitor these closed areas since gear activity could be recorded. Using either EM or the enhanced VMS unit would provide the necessary gear use data to show the vessel did not use the gear when transiting or drifting in the area. If these restricted areas are modified, shrunken or expanded, Alternatives 3 and 4 could provide the confidence managers need to ensure these areas are not fished, especially if the area is small or narrow.

These units have been used in other fisheries with success. A case study under the Louisiana Department of Wildlife and Fisheries implemented one of the Polestar units (See Appendix B) on 500 + vessels to monitor 1.6 million acres of oyster beds. The unit tracked vessel movement on a one minute reporting requirement. The unit also provided Geofencing and real-time web based monitoring of each vessel with great success.

The two units in Appendix A are being tested by PSMFC on several vessels. Results will be provided in April 2016.

VMS Data Collection and Management Burden Issue

The National Oceanic and Atmospheric Administration Office of Law Enforcement (OLE) develops the official list for type-approved VMS equipment for the nation by region. The OLE West Coast Region manages the vessel monitoring system (VMS) program and uses the information gathered as part of enforcement for restricted areas and as evidence for potential violations.

The initial development of the VMS program was housed under OLE for "real-time" management of vessel movements and provides OLE with direct access to the data being gathered. OLE currently only has capacity to collect and store GPS location data, with no immediate plans to expand the type of EM data it collects and stores. If the Council expands the amount and type of data currently collected under the VMS program, then it may be appropriate to shift the data collection and management burden from OLE to another management entity such as the Pacific States Marine Fisheries Commission. This move may be consistent with development of the electronic monitoring program (EM) that is currently being considered by the Council under the Shorebased IFQ Program. The OLE would continue to have direct access to data when needed.

Draft Alternatives - Monitoring Restricted Areas with VMS

The following draft alternatives were developed to address the need to enhance the monitoring of restricted areas. One alternative was developed to examine options for new low cost VMS units (enhanced VMS) that can perform a variety of functions (e.g., GPS tracks, Geofencing, and equipment monitoring). More than one option could be selected for each fishery to provide a suite of options for vessels to choose from based on their business plan, or meet the management goal. Each fishery is listed below for which an alternative or multiple alternatives may be selected. See Table 2 for details of each fishery group listed here:

- Limited Entry (LE) Groundfish
- LE Midwater Trawl Whiting
- Open Access Non-groundfish (other gears)
- Open Access Fixed Gear Groundfish (non- IFQ)
- Open Access Non-Groundfish Trawl
- LE Fixed Gear
- Swordfish Drift Gillnet

- Albacore (vessels larger than 24 meters)

Alternative 1– No Action, maintain ping rate one per hour

Vessels required to have VMS would maintain a ping rate of one per hour regardless of area fished.

- *Rationale for Alternative*: The No Action Alternative would maintain each fishery's VMS requirement (status quo). The National Marine Fisheries Service (NMFS) Office of Law Enforcement (OLE) would maintain the ability to increase the ping rate through an official request to the NMFS OLE headquarters in Silver Spring, MD. NMFS OLE may request an increase the ping rate for an individual vessel under the program if, for example the vessel is suspected of behavior not characteristic of their fishing method, whether trawl, non-trawl, etc.

- *Consideration*: Although NMFS would maintain the ability to increase the ping rate at the cost of the agency and is sufficient to support ongoing investigations, it neither allows for instantaneous changes to the ping rate while a technician is monitoring a VMS incursion nor does it provide an enhanced data set for evaluating incursions after the fact.

Alternative 2 – Increase ping rate to four times per hour

Vessels continue to use NMFS type-approved units with VMS ping rate of four times per hour.

- *Rationale for Alternative:* This alternative was designed to allow vessels to use current type-approved units. An increase from one ping per hour to four times per hour would provide a more robust data set to better determine speed and direction. Thus providing an improved opportunity to determine whether a vessel went through or around a restricted area and whether the continuous transit requirement was met. Additionally, this improved data set may provide better resolution on when gear may have been deployed or retrieved.

- *Consideration:* A cost analysis for ping rates of 1, 2, 3, and 4 per hour is provided in Table 4 for discussion. It's possible that sub-alternatives under Alternative 2 could be created for ping rates of 2 or 3 per hour for a specific fishery.

Alternative 3 –Maintain ping rate one per hour with Electronic Monitoring System

Maintain a VMS ping rate of one per hour when the vessel uses an electronic monitoring system (i.e., video monitoring under the IFQ shorebased program). If the vessel does not use EM for a period of time then it would be subject to applicable VMS alternatives for that fishery.

- *Rationale for Alternative:* This alternative was designed for vessels that use EM systems. Since EM systems would provide a more robust data stream regarding vessel location and fishing activity, the vessel could maintain the current VMS type-approved system with a ping rate of 1 per hour. As currently deployed in the LE IFQ trawl fishery under exempted fishing permits, the system provides camera video stream with a corresponding lat/long assigned to each picture at 10 second intervals, coupled with hydraulic and drum sensors

indicating gear deployment and retrieval. Using this system in conjunction with VMS, the VMS monitoring technicians would monitor VMS reports. If potential incursions are identified, the EM system data could be used to confirm the location of the vessel and the status of the gear.

Alternative 4 – Allow use of enhanced VMS units (non-type approved)

Allow the use of VMS units that can bundle and transmit multiple positions via satellite, offer Geofencing capabilities, and contain sensor ports to provide gear activity reports. These units would not be NMFS type-approved units, but would need to meet reporting standards of NMFS (e.g., type and frequency of data collected, form of transmittal, ruggedized, and an encrypted format).

- *Rationale for Alternative:* This alternative was designed to provide location information at a finer scale with an additional data stream to monitor gear deployment. In addition, the purchase price is less expensive than current NMFS type-approved units. The non-typed approved VMS unit would collect location data (latitude and longitude), for example, every 5 minutes and then transmit that data every 60 minutes. The 5-minute position reports could provide high resolution data on location which can also be extrapolated to determine heading and speed. These units are also capable of supporting other sensory gathering such as hydraulic and drum speed again offering additional options for determining time and location of gear deployment. Much of the location data is not needed in real time and can be stored for examination at a later date if necessary.

- *Consideration:* This type of unit would not meet the NMFS type-approval criteria because they would not have two-way communication ability. VMS units without the two-way communication feature is less expensive compared to the current purchase price of NMFS type-approved units. Devices may range in cost from $800 to $1,000 per unit and $20 to $39 per month for data transmission. There would be additional costs if sensors are added to monitor gear activity, such as winch and drum sensors. These would be an added cost above the quoted costs noted in Table 4.

- *Consideration*: The enhanced VMS units would expand the data collection burden and management of the data would be needed by another entity, such as PSMFC rather than Office of Law Enforcement. See Section “VMS Data Collection and Management Burden Issue” for discussion of issue.

Analysis

Table 3 provides a summary of the alternatives and their potential management benefit for each fishery. Not all alternatives are applicable for all fisheries. The midwater trawl fishery for whiting during the primary season is allowed to fish in the RCA. This fishery operates mainly off Oregon and California therefore no other continuous transit restrictions or fishing restrictions apply to this fishery; therefore, only Alternative 1 (status quo) applies to these fisheries. The drift gill net fishery is allowed to be in the closed area so these vessels do not need to be monitored for continuous transit but are not allowed to fish in the closed areas. Therefore, Alternative 1 and 2 would not provide the necessary data to manage the prohibition of fishing for these vessels. The albacore tuna fishery must adhere to international treaty agreements that requires vessel location information; therefore only Alternative 1 and 2 would be applicable.

Table 3. Potential benefits of each alternative by fishery.

Fishery with VMS	**Alternative 1 – No Action**	**Alternative 2 - Increase ping rate, 4 times per hour**	**Alternative 3 - Maintain ping rate 1 per hour with Electronic Monitoring System**	**Alternative 4 - Enhanced VMS (non-type approved)**
Limited Entry Groundfish: LE Midwater Trawl Non-whiting LE Bottom Trawl	Status Quo, 1 ping every 60 minutes, insufficient for enforcement of continuous transit	Provides improved data set on maintaining continuous transit	EM provides improved data set, coupled with VMS at 60 min ping rate	Provides improved data set indicating fishing. May provide data on gear status and location
LE Midwater Trawl Whiting: Shorebase IFQ Mothership Catcher/Processor	Status Quo, 1 ping every 60 minutes, Sufficient for enforcement	Midwater trawl gear can fish in the RCA. Continuous transit is not a requirement so improved data set is not necessary for compliance monitoring **(Alt 2 is not applicable for this fishery)**	Midwater trawl gear can fish in the RCA. Continuous transit is not a requirement so improved data set is not necessary for compliance monitoring **(Alt 3 is not applicable for this fishery)**	Midwater trawl gear can fish in the RCA. Continuous transit is not a requirement so improved data set is not necessary for compliance monitoring **(Alt 4 is not applicable for this fishery)**

Fishery with VMS	Alternative 1 – No Action	Alternative 2 - Increase ping rate, 4 times per hour	Alternative 3 - Maintain ping rate 1 per hour with Electronic Monitoring System	Alternative 4 - Enhanced VMS (non-type approved)
Open Access Non-Groundfish (other gears): Prawn trap Dungeness crab Pacific halibut longline CA halibut line gear Sheephead trap Salmon troll	Status Quo, 1 ping every 60 minutes, insufficient for enforcement of continuous transit	Provides improved data set on maintaining continuous transit	EM provides improved data set, coupled with VMS at 60 min ping rate	Provides improved data set indicating fishing. May provide data on gear status and location
Open Access Fixed Gear (non-IFQ): Longline Trap or pot Line gear (include salmon)	Status Quo, 1 ping every 60 minutes, insufficient for enforcement of continuous transit	Provides improved data set on maintaining continuous transit	EM provides improved data set, coupled with VMS at 60 min ping rate	Provides improved data set indicating fishing. May provide data on gear status and location
Open Access Non-groundfish trawl: Ridgeback prawn Pink shrimp CA halibut Sea cucumber	Status Quo, 1 ping every 60 minutes, insufficient for enforcement of continuous transit	Provides improved data set on maintaining continuous transit	EM provides improved data set, coupled with VMS at 60 min ping rate	Provides improved data set indicating fishing. May provide data on gear status and location
LE Fixed Gear	Status Quo, 1 ping every 60 minutes, insufficient for enforcement of continuous transit	Provides improved data set on maintaining continuous transit	EM provides improved data set, coupled with VMS at 60 min ping rate	Provides improved data set indicating fishing. May provide data on gear status and location
Swordfish Drift Gillnet	Status Quo, 1 ping every 60	No improvement on data indicating fishing.	EM provides improved data set indicating	Provides improved data set indicating fishing.

Fishery with VMS	Alternative 1 – No Action	Alternative 2 - Increase ping rate, 4 times per hour	Alternative 3 - Maintain ping rate 1 per hour with Electronic Monitoring System	Alternative 4 - Enhanced VMS (non-type approved)
	minutes, insufficient for enforcement of "no-fishing" restricted areas	Provides no information on gear status	fishing. Provides data on gear status and location	May provide data on gear status and location
Albacore (vessels larger than 24 meters)	Status Quo, 1 ping every 60 minutes, sufficient to meet treaty regulatory requirement	Meets international treaty regulatory requirement	Does not meet regulatory requirement **(Alt 3 is not applicable for this fishery)**	Does not meet regulatory requirement **(Alt 3 is not applicable for this fishery)**

Varying ping rates and associated costs

Under Alternative 1, all vessels that are registered must operate and maintain the mobile transceiver unit in good working order continuously and provide the vessel's position at least once every hour, 24 hours a day throughout the fishing year (one ping per hour). The standard ping rate provides the date/time of ping, date/time ping was received, latitude/longitude, speed, and course/direction. The mobile transceiver unit must remain in continuous operation at all times (powered up and operating). When a vessel remains in port for an extended period of time, regulations allow the VMS to provide less frequent position reporting at least once every four hours (sleep mode). In addition, less frequent ping rates are allowed by regulation through several exemptions: when the vessel is hauled out, when the vessel fishes beyond the EEZ (outside 200 miles) for at least one week or for an extended period of time, if the limited entry permit had a change in vessel registration, and for emergency (fire, flooding, or extensive physical damage to critical areas of the vessel).

Purchase and installation costs for currently NMFS-approved VMS units and the enhanced VMS units (non-NMFS-approved) are provided in Table 4. Purchase cost of enhanced VMS units is lower than the type-approved units. The costs associated with increased ping rates for NMFS type-approved units is noted in Under Alternative 2 the ping rate would be increased to 4 times per hour or 15 minute ping rate. Under this alternative vessel owners would incur the most costs if they purchase a NMFS-approved unit with a ping rate of 4 times per hour. In addition, we provide the base cost of one ping per hour and the costs of adjusting the ping rate to 2 and 3 times per hour.

Table 5).

Table 4. Overall costs for NMFS type-approved units and new enhance VMS units.

VMS Units	Purchase Cost	Installation cost	Overall cost
Current VMS Units (NMFS-Approved)			
Boatracs FMCT/G	$3,095	$200-300	$3,295 – $3,395
CLS America Thorium TST A2.0 & CLS America Thorium LEO A2.0	$2,999	$400– $700	$3,399 – $3,699
Faria WatchDog 750VMS (with Messaging Terminal)	$3,195	$300– $400	$3,495 – $3,595
Network Innovations - Sailor VMS Gold & Network Innovations – Sailor VMS Gold Plus	$2,500	$400 – $800	$2,900 – $3,300
Enhance VMS systems for Management Measure 1 (Non-NMFS approved)			

Polestar by Skywave	$795	self-install	$795
Faria Watchdog FWT 750VMS	$995	self-install	$995

Under Alternative 2 the ping rate would be increased to 4 times per hour or 15 minute ping rate. Under this alternative vessel owners would incur the most costs if they purchase a NMFS-approved unit with a ping rate of 4 times per hour. In addition, we provide the base cost of one ping per hour and the costs of adjusting the ping rate to 2 and 3 times per hour.

Table 5. Monthly transmission costs with varying ping rate per hour.

VMS Units	1 ping per hr	2 ping per hr	3 ping per hr	4 ping per hr
NMFS-Approved VMS Units				
Boatracs FMCT/G*	$48	$63	$63	$63
CLS America Thorium TST A2.0 **CLS America Thorium LEO A2.0**	$45	$55	$62	$69
Faria WatchDog 750VMS (with Messaging Terminal)	$32.95	$34.95	$36.95	$38.95
Network Innovations - Sailor VMS Gold **Network Innovations – Sailor VMS Gold Plus**	$43.20	$86.40	$129.60	$172.80
Enhance VMS systems for Management Measure 1				
Polestar by Skywave**	$19.80	$27.50	$38.50	$38.50
Faria Watchdog FWT 750VMS**	$32.95	$34.95	$36.95	$38.95

*1 ping report/hour (60 minute interval) = $48/vessel/month. 2, 3 or 4 ping reports/hour (30, 20 or 15 minute intervals) = $63/vessel/month fixed rate.
** If Geofencing is enabled, rates can increase because an increase in data transmissions is needed to support this feature.

Some industry representatives requested an analysis of varying ping rates based on participation in a fishery; specifically would costs be affected if a vessel moved from a fishery with a higher ping rate to one with a lower ping rate or with no VMS requirement. Under the no action alternative it would depend on the VMS provider contract and the type of unit that is installed. NMFS type-approved units are not capable of variable ping rates based on area fished (Geofencing) or must be manually serviced to change the pig rate. Some providers do not allow an adjustment in the rate based on the contract, and some do not provide lower monthly costs or may increase costs for changing the rate mid contract. Costs per month are typically based on the number of bytes (data) per month allowed for transmissions as noted in Table 4. Some providers charge a service fee for turning the system off and on (when powered off and transmission of the ping stops for a period of time and then is turned on again). The VMS unit can go into sleep mode or have reduced reporting rate when in port if the unit is capable, but that choice is made through the individual vessel operator/owner and the provider.

The ping rate frequency for the enhanced VMS units (Alternative 4), as described in Appendix B, can be remotely adjusted as needed. Vessels do not need to return to port. In addition, the ping rate can be adjusted based on area fished (Geofencing). For example, if the vessel enters a closed area, the unit can automatically increase the data transmission (ping rate, GPS track, or sensor info). The transmission rates would need to be specified by the client with the GPS coordinates preloaded in the VMS unit.

If a vessel wants to switch fisheries, a change in the ping rate and costs incurred would be dependent on the type of VMS unit the vessel has, the unit's ability to be adjusted for a lower rate, and the provider of the VMS service. If the new policy for ping rates varies base on fishery, then the fishery appropriate rules would apply to the vessel when it registers or changes its declaration to that fishery. Again, the ping rate change would be dependent on the client, VMS provider and the unit that was installed. For example, if an LE vessel switches to an open access fishery or LE fixed gear it would still be subject to VMS requirements and non-trawl RCAs. The appropriate ping rate would apply for that fishery.

Switching fisheries to avoid VMS may not be practical. For example, in order for a vessels with a limited entry "A" endorsed permit to eliminate a ping rate, the permit would have to be removed from the vessel and fished in another fishery without VMS requirements. Permit removal is unlikely to occur in order to lower a ping rate (for example six months) since the vessel is allowed one transfer per year and the cost savings would be minimal. Open access vessels would have to opt out of the fishery and enter a state fishery that does not require VMS or catch groundfish outside the US EEZ (3-200 miles) throughout the year to avoid VMS requirements. Vessels that switch to California halibut, shrimp or some other state fishery would not be required to have VMS if they do not retain groundfish therefore the unit could be turned off. If an owner hauls the vessel out for repair or to storage then the exemption to turn the unit off would be granted since the vessel is not going to be fished.

Allowing multiple VMS options for a fishery provides flexibility for a fishermen to switch fisheries and continue using the same VMS system or possibly change the ping rate to fit the management need of another fishery. For example, by implementing the option to use enhanced VMS for all fisheries (Alternative 4) vessels can freely switch fisheries without having to meet

NMFS-Type approved VMS requirements and the ping rate be adjusted remotely to fit the requirement. Implementing the use of EM and a ping rate of one per hour (Alternative 3) for a fishery that currently does not offer EM would provide flexibility for fishers in the future. For example, a vessel could switch from midwater trawl whiting (assuming implementation of EM in 2016) to fixed gear (assuming that EM will be an option in the future for fixed gear IFQ participants).

At some point NMFS type-approved VMS units will need to be replaced and the NMFS/PSMFC VMS reimbursement program has ended. Allowing the option for enhanced units will be a lower cost solution for fishermen with the management benefit of higher data quality and quantity. Some additional management costs may be incurred for the data management agency but these are not expected to be substantial.

Appropriateness of VMS ping rate adjustments for a fishery

The decision to change the status quo VMS ping rate for a fishery is dependent on whether continuous transit is required and the size of the restricted area. For those fisheries that require continuous transit in restricted areas, the 1 hour ping rate may not be appropriate. Therefore Alternatives 2, 3, and 4 would be appropriate for all fisheries noted in Table 2 except for midwater trawl whiting and possibly albacore tuna fisheries. Whether the ping rate should be increased by 2, 3 or 4 pings per hour may be determined by how big the closed are is and whether a vessel could fish on the "edge" of the area without being detected. Ping rate points create a straight line when they are connected via a GIS program however the vessel may not be traveling in a straight line (Figure 1). Based on more frequent pings, the heading and speed can be determined with more accuracy, which can be analyzed to show whether the vessel was fishing or just transiting the area.

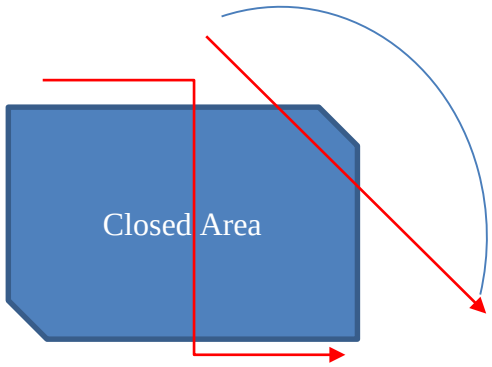


Figure 1. Vessel movement schematic.

Electrical supply issues

Under alternative 2 and 4, an increase in the ping rate will draw more power from both NMFS type-approved units and new VMS units. During initial implementation of the VMS requirement some fishermen cited that the power draw on batteries have caused batteries to die and extra batteries are needed to support the new equipment. Some solutions have been identified such as

plugging into dockside electrical outlets, using back-up batteries supplied by VMS providers, and using sleep mode when in port. Most battery back-up systems last 72 hours. Some vessels are moored in bays and do not have access to a continuous power supply. In these cases vessels have been serviced on a daily basis to charge batteries.

Area Management and Enforcement

The additional information collected under Alternative 4 is an opportunity to continue providing access to areas and potentially provide more access if RCAs and EFH are modified in the future. Changes to the VMS requirements may provide a suite of options to provide confidence that vessels are not operating in closed areas and may provide an enforcement tool for state officials that lack presence on the water to enforce closed areas. It's also possible that state managers of Marine Protected Areas could benefit from the change in VMS requirements to support enforcement.

Although RCA incursions have declined since 2010, the majority of them occur in fisheries other than trawl (Table 6). A total of 152 investigations were opened in 2014, 138 were for fisheries other than trawl.

Table 6. 2010 to 2014 VMS/RCA incursion report, April 2015.

VMS/RCA Investigations Opened (all fisheries) Disposition			
Year	**SW**	**NW**	**Total Number of Investigations**
2010	75	171	246
2011	72	162	234
2012	89	134	223
2013	107	100	207
2014	62	90	152

VMS/RCA (Trawl)	**RCA/EFH Incursions**	**Total Number of Vessels**
2011	122	59
2012	50	18
2013	30	26
2014	14	11

Description of Enhanced VMS Units

While there are a variety of off-the-shelf (OTS) units that are capable of transmitting GPS coordinates and utilizing cellular or WiFi data connections to transmit location data, most of the OTS units evaluated had significant drawbacks when it came to being rugged enough to withstand

time at sea and being able to be tied into a vessel's power grid vs. running on batteries — none had geo-fencing capabilities or additional I/O ports for additional sensors. It became clear that to capture the type of data desired, taking into account the environment the equipment would be placed in and the reliability needed, many common OTS units simply would not be viable solutions.

By stepping up to a more commercial application, it was possible to identify equipment that would fit the stated minimum requirements. Council staff and NMFS SFD staff searched for existing OTS components that could meet numerous stated objectives. The following is a list of minimum requirements that was developed to guide the search:

Minimum Requirements:
- Unit cost under $1,000.00
- Geo-fencing capabilities
- Adjustable ping frequency
- Capability to store location data locally and transmit at set intervals to minimize costs
- Ideal transmission cost around $30-$60/month
- Rugged & tamper-proof design for saltwater environments
- Additional input/output (I/O) ports for scalability. Addition of hydraulic sensors, gear movement sensors, etc.

The core benefits of utilizing commercial units are the rugged design, proven track record for this type of application, and overall reliability offered from companies that design these types of units. After detailed discussions with vendors, the group identified two devices as recommended alternatives to augment VMS for reliable vessel monitoring. These units, the Polestar IDP-690 by SkyWave and the FW Telematics FWT 750VMS; and a description of their costs and attributes can be found in the Appendix B.

Alternatives Not Considered for Further Analysis

Alternative – Maintain a VMS ping rate of 1 per hour when the vessel uses a secure data logger with capabilities to store and transmit positional reports and sensory data via cell tower and/or Wi-Fi. After consideration, it was determined that vessel plotters, which were designed as a navigational aid, would not be an adequate enforcement monitoring tool for depth-based management no a secure method to prevent tampering.

Management Measure 2: Removal of Derelict Crab Pots from Rockfish Conservation Areas

This management measure would create federal regulations to allow certain vessels to retrieve derelict crab pots from the trawl and non-trawl RCAs and potentially modify the current derelict gear retrieval state programs.

Purpose and Need:

The purpose of the measure is to allow vessels to stop in the RCAs to remove derelict gear, provided that the activity can be monitored by NMFS. Some groundfish fishing vessels are required to continuously transit RCAs and cannot stop to retrieve derelict gear. This measure is needed to provide additional opportunities to remove derelict gear, such as crab pots, from RCAs to reduce ghost fishing, prevent vessel/gear entanglement, and support marine stewardship.

Background

Dungeness crab are a state-managed species on the West Coast. The states of Washington (WA), Oregon (OR), and California (CA) provide opportunity for derelict gear removal outside the Dungeness crab season provided that the vessel is a registered Dungeness crab vessel (DCV) and declares the activity to the state. All other vessels that are not DCVs and have groundfish aboard the vessel cannot stop to pull pot gear from the RCA. Current federal regulations for continuous transit prohibit certain vessels from stopping in the RCAs, therefore crab pots could not be removed by these vessels. The current status of state regulations regarding the retrieval for derelict crab pots are provided in Table 7.

Table 7. State and Federal regulations on retrieval of derelict Dungeness crab traps. Key: DCV - Dungeness Crab Vessel; DGP- Derelict Gear Program

	WA	**OR**	**CA**	**Feds**
Can Pull Traps of Others (In Season/DCV)	No	Yes, 25 between Dec 1 and mid-June, 50 from mid-June till close of season	Yes (6 Max w/DCV Permit, > 6 w/waiver)	No
Can Pull Traps of Others (Out of Season/DCV)	Yes, unlimited during DGP	Yes, unlimited	Yes (unlimited)	No
Can Pull Traps of Others (In Season/other than DCV)	No	Yes, except groundfish trip vessels (prohibited gear)	No	No
Can Pull Traps of Others (Out of Season/other than DCV)	No	Yes, except groundfish trip vessels (prohibited gear)	No	No

It's possible that these vessels could be allowed to retrieve derelict crab gear in accordance with state regulations in the RCAs and declare the activity to NMFS. A new declaration process would need to be added to the existing declaration system. A process to declare the activity would need to be created in support of the alternatives. If so, it's like that the existing fishery declaration process would include a declaration for derelict gear removal from the RCA. This declaration could be done either at the time of leaving port, during the trip, or after a trip has been completed. It's likely that most situations would be that a vessel would see derelict gear only upon transiting the RCA and need to declare to NMFS that it will stop for removal or declare the removal at the end of a trip. The opportunity to stop is typically infrequent so vessels would need the flexibility to declare during or after retrieval. It would be imperative for the vessel operator to document, through declaration, the activity so that OLE will understand why a vessel stopped in the RCA.

For any option under this topic to be a success, the evidence must be clear that the vessel is in fact retrieving derelict gear and not stealing gear, fishing for groundfish, or fishing for crab outside the commercial crab season. Regardless of the type of vessel, the issue of concern is whether the activity can be documented using electronic monitoring or with enhance VMS units proposed in Alternatives 3 and 4 under "Management Measure 1 - Monitoring Restricted Areas with VMS" and corroborated with the actual activity of retrieving derelict gear. Vessel tracking through VMS or some other type of location tracking hardware as noted under Alternatives 1 and 2 may not provide enough evidence to prove the vessel is retrieving derelict gear. However, if the vessel has an observer aboard the vessel then documentation would clearly show that the activity is derelict gear retrieval.

Strawman Alternatives - Removal of Derelict Crab Pots from Rockfish Conservation Areas

This measure would only be applicable to vessels that are required to continuously transit trawl and non-trawl RCAs. The proposed alternatives would not change the list of vessels that are currently allowed to pull gear from the trawl and non-trawl RCAs as defined in respective state regulations. While the proposed management measures would allow derelict gear to be removed from RCAs via federal regulations, state regulations would still apply and may be more restrictive. In addition, additional declaration system would need to be set up to let NMFS know that a vessel was stopping in the RCA to retrieve gear. This would create a list for VMS technicians to cross check when a vessel stops.

Alternative 1 – No Action, existing state derelict gear removal programs would remain in place.

Rationale for Alternative: The No Action Alternative would maintain the current derelict gear retrieval programs for each state. Vessels

Alternative 2 – Allow vessels using electronic monitoring (EM) or an observer to retrieve derelict gear from RCAs.

Rationale for Alternative: This alternative would provide a video feed to verify that the vessel is pulling gear and not fishing, or documentation of the activity from an observer.

Alternative 3 – Allow vessels that *do not* have groundfish aboard the vessel to retrieve derelict gear from RCAs.

Rationale for Alternative: This alternative was developed to allow only vessels that do not have fish on board to pull gear. Upon landing, vessels could be inspected for fish to verify that fishing did not take place or if a fish ticket was created for that vessel on that date then the vessel may be in violation.

Alternative 4 – Allow vessels that *have* groundfish aboard the vessel to retrieve derelict gear from RCAs.

Rationale for Alternative: This alternative was developed to allow vessels that were fishing outside the RCA to retrieve gear opportunistically when transiting the area.

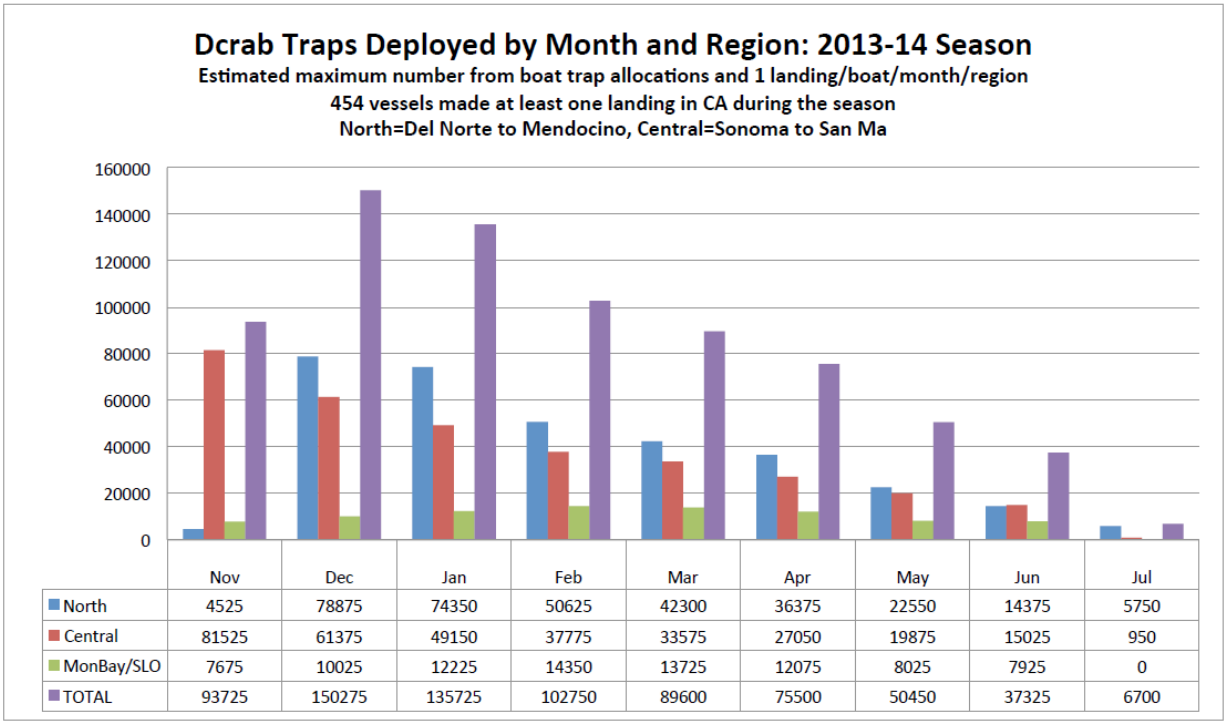
Alternative 5 – Allow limited entry groundfish vessels to retrieve derelict gear from RCAs (with or without groundfish on board) provided the vessel has either: 1) a VMS unit with a ping rate of four times per hour and an observer; 2) has a VMS unit with a ping rate of one per hour and using electronic monitoring; or 3) uses an enhanced VMS unit that can bundle and transmit multiple positions via satellite, offer Geofencing capabilities, and contain sensor ports to provide gear activity reports.

Rationale for Alternative: This alternative was developed to allow only vessels with additional monitoring methods other than just VMS would be allowed to retrieve gear in the RCA. This alternative incorporates the Council's motion to include alternatives from Management Measure 1 (April 2015). The additional methods provide verification that the vessel is retrieving gear and not fishing.

Effort and Pot Loss Analysis

California

Depth range data for pot deployment was not available. Generally, the depth range for CA fishing activity ranges from 6 fathoms to the continental shelf. Deployment data by month and region show most fishing activity occurs in northern CA from Del Norte to Mendocino in Dec – Feb.



	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul
North	4525	78875	74350	50625	42300	36375	22550	14375	5750
Central	81525	61375	49150	37775	33575	27050	19875	15025	950
MonBay/SLO	7675	10025	12225	14350	13725	12075	8025	7925	0
TOTAL	93725	150275	135725	102750	89600	75500	50450	37325	6700

Figure 2. Number of crab pots deployed in California by month and region, 2013-2014.

Maximum Potential Traps Fished by Management Area and Timing of Season: 2013-14 and 2014-15

Caveats to data presented:

•2014-15 data is preliminary and includes landings up to February 2015, but may not be complete for time period

•Maximum potential traps was calculated using the max number of traps for each vessel permit that made at least one landing in the time period and geographic area, but may not actually reflect the amount of traps actually fished by the vessel permit.

Table 8. Potential maximum number of pots deployed by season and district, 2013-2015.

Season	First Half of Season (Nov-March)		Second Half of Season (April-June/July)	
	Northern	District 10/Central	Northern	District 10/Central
2013-2014 max potential traps	79,800	91,250	39,375	41,100
2014-2015 max potential traps	59,575	108,625	N/A	N/A

Source: CDFW

Caveats to Derelict Data Calculation:
The number of derelict pots are estimated by the number of replacement tags that are issued by California Department of Fish and Wildlife (CDFW), Table 9.

• Numbers are calculated using replacement buoy tags as a proxy for derelict traps (but lost tags do not necessarily mean a trap is lost since these tags can be ripped apart from buoy).
• Assuming all In-season tags replace Between Season tags, so don't count same number twice.
• Min/Max due to those vessels that landed in port area and other ports so that vessels tag number requested is a range between all tags/traps lost at port area to no traps lost at port area.

Table 9. Number of vessels requesting crab pot replacement buoy tags, provided by CDFW for 2013-2015.

2013-14*	**Geographic Area**		
Number of Vessels	**Humboldt**	**Trinidad**	**Crescent City**
min	26	12	31
max	46	15	51
Replacement Buoy Tags/Derelict Traps			
min	764	360	817
max	1,772	450	1,349
2014-15**			
Number of Vessels	**Humboldt**	**Trinidad**	**Crescent City**
min	0	1	0
max	0	1	1
Replacement Buoy Tags/Derelict Traps			
min	0	40	0
max	0	40	16

*2013-14 uses both In-season and Between Season Tags.
**2014-15 uses only In-season Replacement tags, no "Between Season" tags are purchased since biennial period for trap tags ends and all 2015-2017 tags will be used for 2015-16 season.

2014 Crab Gear Retrieval Program Final Report

The following text is quoted from the California Lost Gear Recovery Program's final report (by Jennifer Renzullo, Sea Doc Society):

> The goal of this project was to establish a port community-based, fishermen-led lost commercial fishing gear recovery and recycling effort on the Northern-Central California coast. Working in close collaboration with participating members of the Humboldt Fishermen's Marketing Association (HFMA; Eureka, CA), we conducted 4 weeks (20 days) of derelict crab gear recovery between July – October 2014 out of ports in Crescent City, Trinidad and Eureka, CA. We recovered 666 derelict Dungeness crab traps. In total, 666 Dungeness crab traps were recovered from the coast of Del Norte and

Humboldt Counties: 364 Dungeness crab traps were recovered out of Crescent City, 193 out of Trinidad, and 109 out of Eureka. Of the 666 traps recovered, 323 were removed by attaching the buoy line of each trap to a winch and hauling the trap aboard the vessel. The other 343 traps were partially buried in the seafloor sand, requiring the crew to attach a specialized nozzle to the trap line that was connected to a fire hose and pump, which forced seawater through the nozzle blowing the sand out of the trap to unbury it from the substrate. Based on permit numbers visible on buoys and identification tags located inside the construction design of the traps, we determined that recovered gear represented losses from 65 different fishing vessels.

Fishermen who performed the recovery work "sold" the gear to the HFMA, earning a total of $41,675; the HFMA then sold the recovered gear to original owners at a fleet-agreed per trap price, depositing $25,805 in proceeds into an escrow account to support derelict gear recovery work in future seasons.

For further information please visit: http://www.opc.ca.gov/2009/04/dungeness-crab-task-force/ and http://www.opc.ca.gov/webmaster/ftp/project_pages/dctf/ec-meeting-10/2014-Crab-Gear-Retrieval-Program-Final-Report-DCTF-EC.pdf

Oregon

Based logbook data, the carb gear depth distribution for five seasons off the Oregon coast is concentrated in waters 10 to 40 fathoms in each season; pots are not usually deployed beyond 90 fathoms. Therefore, most of the effort is outside the trawl and non-trawl RCA.

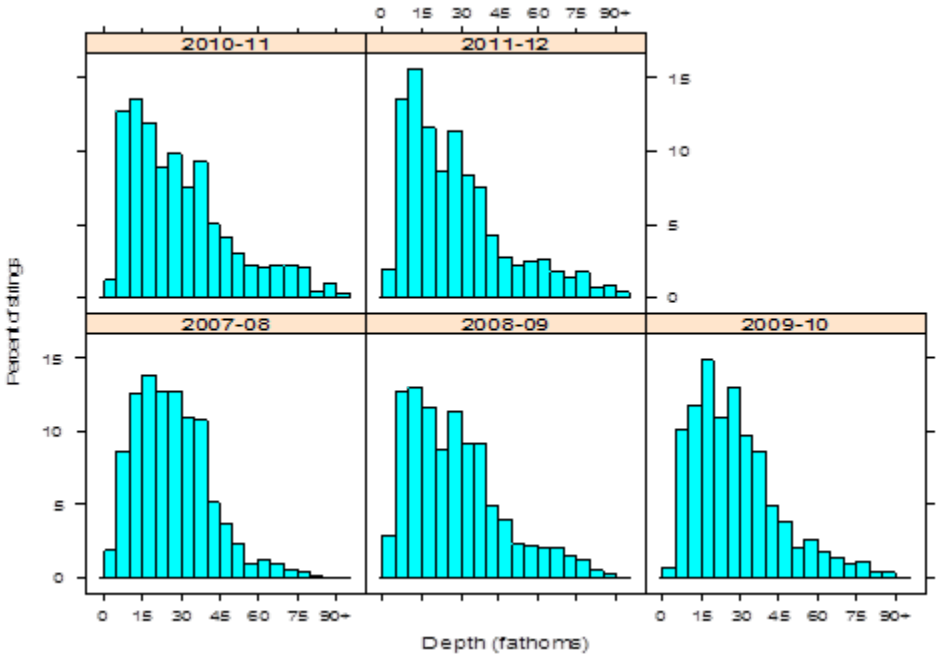


Figure 3. Oregon Dungeness crab pot distribution 2007-2012.

Total number of pots set is not available. The number of lost pots and derelict pots retrieved are as recorded in logbooks are noted in
Table **10**. An estimate for recovery rate was added to the table and shows a range of 7% to almost 25% of pots lost were recovered between 2008 and 2012.

Table 10. Estimated number of crab pots lost and derelict pots retrieved in the Oregon commercial Dungeness crab fishery in the ocean and Columbia River.

Crab Season	Estimated pots lost	Estimated number of pots retrieved	Estimated Recovery Rate
2008-09	7,418	547	7.4%
2009-10	6,167	958	15.5%
2010-11	5,479	1,350	24.6%
2011-12	6,876	1,210	17.6%

Note: Data is from summarized and expanded logbook data for crab seasons 2008-09 through 2011-12. Expansion factors of percentage of landings with associated logbook data by port and month were applied.

Washington

Most of the fishing effort for crab is inside 100 fathoms, outside the trawl and non-trawl RCA (Table 11). Inside the RCA there is low effort and low number of pots lost.

Caveats to Data

The number of pots fished is the number of times the same pots are pulled over and over. The most pots that could possibly be laid at any one point in the winter of 2013/14 is actually 82,800 pots. For example, the number of pots fished in the winter of 2013/14 is 1,055,064 pots but each fisher is limited to a 300 or 500 pot limit so the same pots are being pulled multiple times per month.

Table 11. Washington State Coastal Commercial Dungeness Crab Fishery Estimated Pot Gear Loss And Recovery, 2013-2014.

Sets within 100 fathoms (fm)	2013_14		2012_13		2011_12	
	Winter	Summer	Winter	Summer	Winter	Summer
# sets	17,420	3,198	19,105	2,08	12,71	1,204
Pots Fished	1,055,064	203,056	1,083,703	128,52	761,24	82,660
Pots Lost %	0.21%	0.14%	0.15%	0.25	0.31	0.19%
Pots Recovered %	0.01%	0.00%	0.02%	0.00	0.05	0.04%

Sets from 100 fm to 150 fm	2013_14		2012_13		2011_12	
	Winter	Summer	Winter	Summer	Winter	Summer
# sets	132	0	118	0	101	0
Pots Fished	3,479	0	3,130	0	3,353	0
Pots Lost %	0.11%	0%	0.16%	0%	0.12%	0%
Pots Recovered %	0.00%	0%	0.06%	0%	0.06%	0%

Sets from 150 fms to 200 fms	2013_14		2012_13		2011_12	
	Winter	Summer	Winter	Summer	Winter	Summer
# sets	8	0	8	0	4	0
Pots Fished	360	0	242	0	214	0
Pots Lost %	0%	0%	0%	0%	0%	0%
Pots Recovered %	0%	0%	0%	0%	0%	0%

Note: This table is from logbook data. Pots fished is the total amount of pots recorded in logs for winter and for summer. Winter: Dec-May Summer: June-Sep

Analysis

Overall, the Dungeness crab fishery in each state generally does not fish inside the trawl RCAs. Each state manages its own derelict gear program and have only begun to see the success of the original program. Some additional recovery may occur if vessels are allowed the opportunity to recover pots from the RCA; however, it's unknown how many pots would be recovered since spatial data from loss and recovery is limited. Much of the effort to recover pots in the California portion of the fishery occurs with 3 miles of shore and in 40 fathoms or less.

Management Measure 3: Fishery Declaration Enhancements (Gear Testing and Whiting Fishery Declaration Changes)

There are two topics under this management measure: 1) Gear Testing; and 2) Whiting Fishery Declaration Changes. The first measure would set up a formal fishery declaration process that includes a waiver or exemption for observer coverage when the fishermen want to test legal commercial fishing gear. The gear test would need to be done with the intention of not catching fish or other species. The waiver/exemption request could be processed through the VMS call-in system. The second measure would allow midwater trawl whiting vessels to change their fishery declaration at sea or allow operators to declare two fisheries prior to leaving port.

Purpose and Need

Gear Testing

The purpose of this management measure is allow vessels an exemption from observer coverage to test fishing gear. There is a desire by the industry to create a formal process for requesting a waiver or exemption from observer coverage when vessel operators want to test fishing gear and related vessel systems, without the intent of catching fish. Therefore this management measure is needed to create a more efficient groundfish fishery, provide efficient and effective monitoring, and increase profitability or create cost savings for the industry.

Declaration Changes

The purpose of the measure is to allow vessels to change their declaration at sea or declare more than one fishery prior to leaving port. Midwater trawl vessels that fish for whiting in the at-sea mothership fishery or shorebased IFQ fishery are currently required to declare only one fishery prior to leaving port and must return to port to change their declaration. This requirement is inefficient for the whiting fishery. Therefore this management measure is needed to increase the operational flexibility and create a more efficient groundfish fishery.

Background

Gear Testing

Infrequently fishermen want to test their equipment or fishing vessel during an open or closed season. For purposes of analysis, “gear testing” means the deployment of lawful gear without the intention of catching fish. For example, using trawl gear with an open cod end to test the deployment of the net, engine horsepower with a new net, deployment of wire and doors to tighten the spool, testing new electronic equipment, or testing a new engine. Even though this type of activity may not involve retention of fish, it falls under the definition of fishing as defined in the Magnuson-Stevens Act 109-479 (16)(D) (see the following underline text).

“(16) The term "fishing" means—
(A) the catching, taking, or harvesting of fish;
(B) the attempted catching, taking, or harvesting of fish;
(C) any other activity which can reasonably be expected to result in the catching, taking, or harvesting of fish; or

(D) any operations at sea in support of, or in preparation for, any activity described in subparagraphs (A) through (C).
Such term does not include any scientific research activity which is conducted by a scientific research vessel."

Fishermen seek to increase efficiencies in fisheries management and lessen the cost burden to them for activity that may be considered unnecessary for observer coverage. A waiver from the random observer coverage provided by NMFS in the open access or LE fixed gear fishery or an exemption from the 100% observer coverage requirement in the shorebased IFQ program could be provided for non-retention type fishing activity.

Currently, fishermen call the NMFS West Coast Groundfish Observer Program (WCGOP) per federal requirements prior to embarking on a fishing trip. These vessels sometimes inquire if certain gear testing situations are considered fishing activity and if they are required to carry an observer. Inquiries for gear testing and potential exemptions from observer requirements are examined on a case by case basis by WCGOP. The WCGOP may ask OLE if certain activity is considered fishing and if waivers for observer coverage may be granted.

This process could be formalized under the existing VMS program through OLE or in accordance with management measure 1. For example, a vessel operator could call the VMS line to request a change in their declaration (e.g., "gear/equipment testing") and a VMS technician could evaluate the request to determine if the vessel is eligible for a waiver or exemption, then make the declaration change. This would be similar to a fishery declaration when an operator calls NMFS to switch gears. For vessels that are not required to carry VMS/observer, the vessel operator could call the VMS line in the same manner to provide a fishery declaration. This information would be noted in the OLE vessel activity logs to be sure the agents and WCGOP know that a vessel is not required to carry an observer for a specific trip.

The term "gear testing" under these options is inclusive of fishing activities to test: deployment of nets using open cod ends; calibration of engines and transmission under load, i.e. towing a net; deployment of wire and/or doors; testing new electronic equipment associated with the deployment of fishing gear; and testing and calibration of newly installed propulsion systems, i.e. engine, transmission, shaft, propeller, etc.

The alternatives would apply to all vessels that are subject to observer coverage (i.e., open access, limited entry trawl, shorebased IFQ vessels, limited entry fixed gear, etc.)

Strawman Alternatives - Gear Testing

Alternative 1 – No Action; individual vessels continue to make informal requests to the WCGOP and OLE for potential waivers, or inquiries for applicable rules for observer requirements when testing gear.

Alternative 2 – Set up formal waiver/exemption process to *allow any groundfish vessel* subject to observer coverage be waived or exempted from observer coverage for a trip that tests gear. The trip could be during an open or closed fishing season.

Rationale: This alternative was developed to include all groundfish fishing vessels regardless if they are required to have 100% observer coverage (LE IFQ) or are randomly selected for observer coverage (e.g. open access or LE fixed gear). Vessels that are required to have 100% human observer coverage do not receive an exemption form the WCGOp but vessels in other fisheries may receive an exemption. This alternative would allow the exemption to occur during the fishing season or during a closed season. For example, a midwater trawl whiting fishery vessel that is required to have 100% observer coverage could be exempted from observer coverage if the vessel wanted to test gear prior to the start of the primary fishery.

Sub-option 2B: Allow vessels to only test gear during open fishing season.

Rationale: Same as Alt 2 however vessels would be limited to testing gear when the season is open for a particular fishery such as midwater trawl whiting, limited entry sable fish fixed gear fishery.

Alternative 3 – Set up formal exemption process to allow *only Shorebased IFQ vessels* to be exempt from observer coverage for a trip that tests gear. The trip could be during an open or closed fishing season.

Rationale: Similar to Alternative 2 but limited to only LE shorebased IFQ vessels.

Sub-option 2C: Allow vessels to only test gear during open fishing season.

Rationale: Same as Alt 2 however vessels would be limited to testing gear when the season is open for a particular fishery such as midwater trawl whiting or limited entry midwater trawl vessels targeting rockfish during the primary whiting season.

Whiting Fishery Declaration Changes

This management measure would allow midwater whiting vessels to change their fishery declarations at sea or allow an additional fishery declaration prior to leaving port. Vessels are currently required to declare only one fishery prior to leaving port and must return to port to change their declaration.

Background

The current regulation found at 660.13 (d)(1) requires a declaration report to be filed before a midwater trawl whiting fishing vessel leaves port. Additionally, 660.13(d)(5)(iv) restricts vessels to one fishery. Vessels that participate during the primary whiting season can declare one of the following:

(4) Limited entry midwater trawl, Pacific whiting shorebased IFQ,
(5) Limited entry midwater trawl, Pacific whiting catcher/processor sector,
(6) Limited entry midwater trawl, Pacific whiting mothership sector (catcher vessel or mothership)

As reported by the GAP, the restriction does not allow catcher vessels in the mothership fishery that have completed their delivery obligations to make a tow for Pacific whiting for delivery to a shoreside processor without first returning to port. This current situation is described as inefficient and expensive. Note that midwater trawl catcher vessels would not declare they are entering the catcher/processor sector therefore the alternatives do not include the catcher/processor declaration option.

Alternative B would allow vessels to declare a different fishery at-sea. A change in the requirements would allow midwater trawl vessels to move from the at-sea mothership sector to shorebased IFQ or vice versa without having to return to port to declare the change.

Alternative C would to allow vessels to declare two fisheries prior to leaving port. If the vessel knows that at some point during the trip it will switch from at-sea mothership to shorebased IFQ or vice versa, then it could declare the two gears prior to leaving port. Vessels would need to continue making declaration changes in port.

Both Alternative 2 and 3 are viable options and both could be selected to provide a suite of options to choose from based on a vessel's business plan.

Strawman Alternatives - Whiting Fishery Declaration

Alternative 1 – No Action; vessel would still be required to return to port to declare a change in fishery participation.

Alternative 2 – Allow midwater trawl vessels to change their whiting fishery declaration while at-sea. Other restrictions for fishery declaration reporting would remain in place.

Rationale: This alternative was developed to provide a vessel with an opportunity to select a new fishery while at sea and optimize available resources before returning to port. Vessels would likely move from the at-sea portion of the whiting fishery to the shoreside, harvest fish on the way into port and deliver fish to a shoreside facility under the shorebased IFQ program. A vessel could not declare into any other fishery while at seas other than Pacific whiting mothership sector or Pacific whiting shorebased IFQ.

Alternative 3 – Allow midwater trawl vessels to declare participation in both Pacific whiting shorebased IFQ and Pacific whiting mothership sector prior to leaving port. Other restrictions for fishery declaration reporting would remain in place.

This alternative was developed to provide a vessel with an opportunity to select a new fishery while in port. If the vessel anticipates moving from the at-sea fishery to the shoreside fishery it could declare participation in both fisheries prior to leaving port. Again, vessels would likely move from the at-sea portion of the whiting fishery to the shoreside, harvest fish on the way into port, and deliver fish to a shoreside facility under the shorebased IFQ program. A vessel could not declare into any other fishery while at seas other than Pacific whiting mothership sector or Pacific whiting shorebased IFQ.

Management Measure 4: Movement of IFQ Fishpot Gear Across Management Lines

The management measure would allow Shorebased IFQ Program fixed gear vessels to move pot gear across management lines during a single trip. The measure would allow the vessel to retain fish from the primary management area while moving to a new management area to deploy gear. The vessel would not be able to catch and retain fish from the second management area with fish aboard the vessel from the primary management area (i.e., fish from multiple management areas could not be mixed during a single trip).

Purpose and Need

The purpose of this management measure is to allow these vessels to move pot gear across management lines during a single trip. The measure would allow the vessel to retain the IFQ fish from the primary management area when moving to a new management area to deploy gear. A vessel participating in the Shorebased IFQ Program may not fish in more than one IFQ management area during a trip; therefore, vessels must return to port to deliver fish before moving gear to a new management area. Due to limited space on the vessel, IFQ fixed gear vessels that use pots make multiple trips to deploy gear; this can be inefficient and expensive. This measure is needed to reduce time at sea, create a more efficient groundfish fishery, and increase profits for IFQ fixed gear vessels that use pot gear.

Background

Current regulations require fixed gear vessels to first return to port before deploying their gear in a different management area (660.140 (c)(2)). For example, if a fisher makes a fixed gear set in area A, they must land their fish before re-setting their gear in area B.

The four IFQ management areas are (660.140 (c)(2)):
1. Between the US/Canada border and 40°10′N. lat.,
2. Between 40°10′ N. lat. and 36° N. lat.,
3. Between 36° N. lat. and 34°27′ N. lat., and
4. Between 34°27′ N. lat. and the US/Mexico border

The species management lines that correspond to the management areas are shown in Table 12. It shows that 12 of the 25 IFQ species or species groups are managed relative to one of the above management lines. A vessel may have multiple IFQ quotas that are specific to management areas, such as sablefish north and south of 36° N. latitude.

In 2011, the Council directed the Trawl Regulatory Review and Evaluation Committee (TRREC) to evaluate the issue of fishing in two or more management areas on the same trip. This issue was first raised by an IFQ fixed gear pot fisherman who explained that, unlike trawl vessels or longline vessels who can stow all their gear on deck, pot gear vessels may have to make multiple trips to move their gear from one management area to the next. Some vessel owners report that the

regulation is expensive to their operations, particularly those that fish out of ports in close proximity to a management line.

The November, 2012 Gear Workshop report provided a recommendation to "allow IFQ program vessels to move fixed gear across management lines." This recommendation does not allow for setting fixed gear in two (or more) management areas at the same time and delivery of the combined catches to a single port. This prohibition is mentioned because the location of catch from each management area cannot be determined when the catches are mixed. Such separation is important for species that are allocated based on management areas such as minor slope rockfish. Also, this recommendation does not address the issue of fishing across management lines using trawl gear. The workshop did not receive sufficient input on this latter issue to make a recommendation. Therefore the recommendation in the Gear Workshop Report limited the recommendation to Shorebased IFQ vessels.

Since the issue relates to limited space on deck for pot gear and a need for increased efficiencies in the deployment of that gear, the management measure was narrowed in scope by Council staff. Therefore the management measure would only apply to Shorebased IFQ fixed gear vessels using pot gear.

Potential Efficiencies to Be Gained

Vessels may gain efficiencies by either pulling pots from one area then moving them to a second management area, then return to port to deliver fish from the first management area. The vessel could continue to do this until all pots from the first area are moved to the second. Another possible scenario would be to pull pots from the first area, deliver fish, then deploy the pots in the second management area and return to the first management area to continue harvesting fish. Again, the vessel could repeat these steps until all pots are deployed in the second management area. Allowing the pots to be baited upon deployment would provide maximum efficiency for the fishery.

Movement of Fishpot Gear Strawman Alternatives

Under the draft alternatives, the vessel would not be allowed to harvest fish from any additional management areas with fish aboard the vessel from a previous management area (i.e., fish from multiple management areas could not be mixed during a single trip). The deployed gear could only be retrieved during a separate IFQ fishing trip. Note that, per regulation, these trips are 100 percent observed and would ensure that harvest from two areas has not occurred.

Alternative 1 – No Action; vessels would continue to return to port to start a new trip in order to deploy gear in a new management area.

Alternative 2 –Allow IFQ fixed gear vessels to move pot gear from one management area to another management area during a single trip then deploy the gear *baited.*

Rationale: This alternative was developed to allow vessels to deploy gear baited efficiently harvest the catch upon return rather than pull the pots to bait them and then wait for them to soak. This option could provide the maximum amount of efficiency to the operational aspects of the fishery.

Alternative 3 – Allow IFQ fixed gear vessels to move pot gear from one management area to another management area during a single trip then deploy the gear *non-baited.*

Rationale: This alternative was developed to allow vessels to deploy non-baited gear as an incentive to not harvest the pots and mix fish between management areas; however, human observers would be present to monitor fishing activity. It's assumed under this alternative that the vessel would need to start a new trip, pull the pots, and bait them. This option could add some efficiencies to the operational aspects of the fishery but some inefficiencies could be realized by having to pull and bait pots.

Analysis

Table 12 provides the IFQ species and associated management lines. The area of operation that this measure would apply most is north and south of 36 degrees north latitude. Vessels that fish in theses management areas may work on both sides of the management. Vessels cannot harvest fish from two areas because the area of harvest supports stock assessments and allocations to fishermen stem from area-based stock management. Biological information is collected from area-specific species are used to support stock assessments; mixing fish from two areas would result in a loss of data.

Both alternatives increase the efficiency of the fishery. Deploying baited pots under Alternative 2 would provide the most efficient use of time and provide the most cost benefits. Alternative 3 provides similar opportunities however deployment of non-baited gear adds inefficiencies. Baited pots would speed fishery harvest of IFQ species vs non-baited. There are no expected biological impacts or differing impacts through deployment of baited versus non-baited pots.

Table 12. IFQ Species and associated management lines (50 CFR 660.140) [1/]

Roundfish	**Rockfish**
Lingcod.	Pacific ocean perch S. of 40°10′
Pacific cod.	Widow rockfish.
Pacific whiting.	Canary rockfish.
Sablefish north of 36° N. lat.	Chilipepper rockfish S. of 40°10′
Sablefish south of 36° N. lat.	Bocaccio S. of 40°10′
Splitnose rockfish S. of 40°10′	Yellowtail rockfish N. of 40°10′
Flatfish	Shortspine thornyhead S of 34°27′ N. lat.
Shortspine thornyhead N of 34°27′ N. lat.	Longspine thornyhead N of 34°27′ N. lat.
Dover sole.	Cowcod S. of 40°10′
English sole.	Darkblotched rockfish
Petrale sole.	Yelloweye rockfish
Arrowtooth flounder.	Minor Rockfish slope complex N. of 40°10′
Starry flounder.	Minor Rockfish shelf complex S. of 40°10′
Other Flatfish stock complex.	
Pacific halibut (IBQ) N of 40°10′	
Minor Rockfish slope complex N. of 40°10′	
Minor Rockfish shelf complex S. of 40°10′	

1/ Species or species groups without north/south latitude designations in the table are managed coast wide.

Appendix A

NOAA Fisheries Service Type-Approved VMS Units

Fisheries of the Northwestern United States
Boatracs FMCT/G
CLS America Thorium TST *Type-Approval expires September 30, 2015*
CLS America Thorium TST A2.0
CLS America Thorium LEO A2.0
Faria WatchDog 750VMS (with Messaging Terminal)
Network Innovations - Sailor VMS Gold[1]
Network Innovations – Sailor VMS Gold Plus
SkyMate – Stellar ST2500G (with closed Dell Laptop) *Type-Approval expires September 30, 2015*
Thrane & Thrane Sailor VMS Silver (no new installs approved)[2]

VMS Equipment Provider Contacts

Boatracs
800-262-8722
858-458-8116 fax
CLS America
301-925-4411
301-925-8995 fax
Network Innovations (Formerly GMPCS)
support@networkinv.com 888-664-6727
954-973-4800 fax
Faria Marine Instruments
877-888-5569
860-848-2704 fax
METOCEAN Data Systems (Stellar ST2500G)
902-468-2505
902-468-4442 fax
SkyMate (Stellar ST2500G)
703-961-5800
866-759-6283
703-814-8585 fax
OLE VMS Support
888-219-9228 301-427-0049 fax

1 Formerly GMPCS – Thrane & Thrane Sailor TT-3026D VMS Gold
2 Units no longer approved for new purchase/install

Appendix B

POLE STAR

IDP-690 by SkyWave

Unit Cost?

$ 799.00. Includes IDP-690, power cable and mounting bracket. About one hour install time.

Transmission Cost?

$50-60/mo—Pings every 10 minutes, stored locally, then transmitted every 2 hours.

GeoFencing Capable?

Yes. Up to 128 boundaries (fences), each of which can be a circle or a polygon (256 points in each).

Additional I/O Ports for additional sensors?

Yes. 4 additional I/O (Analog or Digital) ports and one serial interface. (Sensors sold separately)

Satellite System?

Inmarsat IsaData Pro Type approved

Power?

Hard wired to vessel. 9-32V

Over the air Programming capable? Yes. Ability to remotely change ping rate frequency over the air as needed.

Power?

Hard wired to vessel. 9-32V

Over the air Programming capable? Yes. Ability to remotely change ping rate frequency over the air as needed.

FW telematics

FWT 750VMS

Unit Cost?
$ 995.00

Transmission Cost?
$34.95/mo—720 position reports. NOAA type approval for this unit does not allow storing ping data locally and offloading it at designated intervals.

GeoFencing Capable?
Yes. Up to 380 GeoZones can be downloaded to the unit, which support complex polygon GeoFences.

Additional I/O Ports for additional sensors?
Yes. 4 additional I/O (Analog or Digital) ports (Sensors sold separately)

Satellite System?
Iridium SBS (Short Burst Data) Network

Power?
Hard wired to vessel. 120mA draw

Over the air Programming capable?
Yes. Ability to remotely change ping rate frequency over the air as needed.

Additional Feature:
GeoFence Alert module included.