

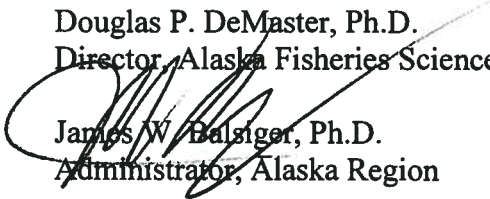


UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration

National Marine Fisheries Service
P.O. Box 21668
Juneau, Alaska 99802-1668

November 6, 2013

MEMORANDUM FOR: Douglas P. DeMaster, Ph.D.
Director, Alaska Fisheries Science Center (AFSC)

FROM:  James W. Balsiger, Ph.D.
Administrator, Alaska Region

SUBJECT: Application for an Exempted Fishing Permit from
Alaska Longline Fishermen's Association

We have received the attached application from the Alaska Longline Fishermen's Association (ALFA) for an exempted fishing permit under 50 CFR 679.6. I am required to consult with the AFSC on exempted fishing permit applications at § 679.6(c)(1). While we are requesting some additional clarifications from the applicant as required under § 679.6(b) and 50 CFR 600.745, the application is sufficiently complete for the AFSC to determine if the experimental design is valid. ALFA has consulted with members of your staff and the Alaska Region regarding this project, and we support the concept of advancing Electronic Monitoring research and development in Alaska.

The application is tentatively scheduled for review by the North Pacific Fishery Management Council (Council) and its Scientific and Statistical Committee at the February 2014 meeting. AFSC review and comment on the experimental design supporting the EFP application is necessary before the February meeting so that your review may be considered by the Council and the public, along with other supporting documents. If you have any questions, please contact Jeff Hartman at 907-586-7442. Thank you for your consideration.

Attachment:
EFP Application

cc: Jennifer Ferdinand
Martin Loefflad





Alaska Longline

FISHERMEN'S ASSOCIATION

Post Office Box 1229 / Sitka, Alaska 99835 907.747.3400 / FAX 907.747.3462

To: Jim Balsiger, NOAA
From: Linda Behnken, ALFA
Date: November 5, 2013
Subject: EM EFP supplemental information

Dear Dr. Balsiger,

Below are the clarifications and supplemental information that you requested in your letter dated October 23, 2013. Unfortunately, that letter did not reach me until November 4th; this is the first chance I have had to respond.

EFP Application Checklist

- 1) Complete
- 2) Linda Behnken, as Executive Director of the Alaska Longline Fishermen's Association (ALFA) is the principal investigator for this project. ALFA is the applicant with Linda Behnken as the representative. Dan Falvey is the overall Project Coordinator. Contact information is below:

Linda Behnken, ALFA
834 Lincoln Street Rm 23
Sitka, AK 99835
(907) 747-3400 office; (907) 738-3615 cell
alfafish@acsalaska.net

Dan Falvey, ALFA
834 Lincoln Street Rm 23
Sitka, AK 99835
(907) 747-3400 office; (907) 738-8710 cell
Myriadfisheries@gmail.com



Linda Behnken, ALFA (PI/Applicant)



(Dan Falvey, Project Coordinator)

- 3) Complete
- 4) Proposed projected start date for exempted fishing: March 2014 (to coincide with halibut/sablefish IFQ season start date).
- 5) NA
- 6) Contract participants:
Dave Colpo, Pacific States Marine Fisheries Commission, 205 SE Spokane St #100, Portland, OR 97202; (503) 595-3100; dcolpo@psmfc.org

Tim Carroll, Saltwater Inc, 733 N Street, Anchorage AK 99501 (907) 276-3241;
tim@saltwaterinc.com

Jason Bryan, Archipelago Marine Research, 525 Head Street, Victoria BC V9A 5S1 (250) 383-4535 amr@archipelago.ca

Letters of support and engagement from these organizations are attached.

- 7) No supplemental information was requested under this item number per your highlights, but to be clear: Vessel selection vessels will be randomly selected by NMFS; names will be provided to NMFS prior to commencement of exempted fishing. Trip selected boats are volunteering for the project; requested data will be provided prior to commencement of exempted fishing.
- 8) Signature of applicant: see number 2 above.
- 9) Complete

I have also attached letters of support from SEAFA, PVOA, FVOA and K-Bay Fisheries.

Please let me know if additional information is needed as you continue to review our application.

Sincerely,



Linda Behnken, ALFA



Post Office Box 1229 / Sitka, Alaska 99835 907.747.3400 / FAX 907.747.3462

Integrating Electronic Monitoring of Fixed Gear Vessels with the North Pacific Research Program

**An Exempted Fishing Permit Application
October 18, 2013**

1.0 Background and Project Justification

Amendments 86 and 76 to the BSAI/GOA Fishery Management Plans fundamentally changed the funding and deployment system for observer coverage in North Pacific fisheries. The new funding and deployment system allows the National Marine Fisheries Service (NMFS) to determine when and where to deploy observers according to management and conservation needs, with funds provided through a system of fees based on the ex-vessel value of groundfish and halibut in fisheries covered under the new system.

Along with changing the observer funding mechanism and the observer service delivery model, the Amendments authorize observer coverage for the first time on vessels under sixty feet and vessels participating in the halibut fishery. Because many of these vessels lack accommodations for an additional person, in June 2010 the North Pacific Fishery Management Council (Council) recommended that: *“the Observer Advisory Committee, Council Staff, and NMFS staff develop electronic monitoring [EM] as an alternative tool for fulfilling observer coverage requirements with the intent that it be in place at the same time as the restructured observer program.”*¹

As a result, one of the analytical assumptions noted in the March 2011 Secretarial Review draft of the EA/RIR supporting the decision on Amendments 86/76 was that: *“staff has thus proceeded with the assumption that development of electronic monitoring for specific sectors would be addressed under a separate, but coordinated process and timeline.”*² At the October 2011 meeting, the Council recommended the *“initial phases of an EM program focus on halibut and sablefish hook and line vessels from 40 ft LOA to 57.5 ft LOA.”*³ Encouraged by this Council direction, fixed gear industry groups sought and secured funding from the National Fish and Wildlife Foundation to work in partnership with NMFS and the Council to pilot test EM on small fixed gear boats. The goal of the EM pilot program was to inform development of the

¹ http://alaskafisheries.noaa.gov/npfmc/PDFdocuments/conservation_issues/Observer/ObserverMotion610.pdf

² http://alaskafisheries.noaa.gov/analyses/observer/amd86_amd76_eairirfa0311.pdf P 22

³ <http://alaskafisheries.noaa.gov/frules/77fr70062.pdf> P 70081. NMFS response to comment 71.

performance standards, technical specifications and regulatory structures necessary to support an EM alternative. Although the pilot program was conducted as planned, the performance standards and technical specification were not developed in time to provide EM as an alternative when Amendments 86/76 were implemented. The Proposed Rule for Amendments 86/76 noted that the: *“initial draft regulations included a provision that would have required vessels selected for coverage in the vessel selection pool to have either an observer or an electronic monitoring system onboard the vessel for the duration of the selection. Upon further review, concerns were raised about the legality of requiring electronic monitoring on vessels since NMFS has not yet developed performance standards or technical specifications for electronic monitoring.”*⁴

In response to this NMFS declaration, the Council noted the following in their May 14, 2012 comments on the proposed rule:

“The use of electronic monitoring is an important alternative on smaller vessels that, because of logistical and economic challenges with accommodating an observer onboard, may otherwise be released from observer coverage. Although voluntary efforts have been made by members of these sectors to experiment with electronic monitoring systems, the impetus for these efforts has largely been the promise that, at some point, the use of an electronic monitoring system would be a viable alternative to having an observer onboard. The Council is concerned that the change to the proposed rule will severely undermine NMFS’s incentive to continue development of electronic monitoring systems as a tool in the restructured observer program.

*The Council proposes that NMFS consider alternative ways to meet the Council’s intent, which is to incentivize the agency and the fleet to actively develop appropriate standards for the use of electronic monitoring, at the outset of the newly restructured observer program. It is the Council’s view that a critical component of this effort is for the regulations to allow a vessel in the vessel selection pool, that would otherwise be required to take an observer, to use an electronic monitoring system instead (at the agency’s discretion).”*⁵

In the Final Rule implementing Amendments 86/76, NMFS responded that for the reasons cited in the Proposed Rule EM could not be provided as an alternative to human observers. NMFS also noted the need to resolve identified issues associated with species identification, seabird identification, data review time lags, and system reliability. The Final Rule proposed a voluntary pilot program to conduct this work.⁶

⁴ <http://alaskafisheries.noaa.gov/prules/77fr23326.pdf> P 23336.

⁵ http://alaskafisheries.noaa.gov/npfmc/PDFdocuments/conservation_issues/Observer/Council_EMLtr051412.pdf

⁶ <http://alaskafisheries.noaa.gov/frules/77fr70062.pdf> P 70081

At the April 2013 meeting, the Council approved the formation of an EM working group “to evaluate alternative EM approaches, with a consideration for tradeoffs between achieving monitoring objectives, timelines, and other factors (e.g., costs, disruption to fishing practices). The EM Working Group will be guided by the Electronic Monitoring Strategic Plan that the Council is scheduled to adopt at the June 2013 Council meeting.”⁷ At the June 2013 meeting, the Council specified the following sections of the strategic plan as applicable to the working group’s considerations:

- A) *Goal II: NMFS is advancing cost effective EM/ER capabilities through science-based studies and technological developments.*

Objective 1: Conduct scientific research to advance the science of monitoring and data integration

Strategy C: Evaluate EM technologies in the 2013-14 EM project on volunteer vessels in the <57.5 ft longline and pot vessels.

Action: Evaluate species identification issues.

Action: Identify data gaps and potential solutions for species weight estimates, biological samples and rare species interactions.

Action: Assess the efficacy of using technology for capturing information that would quantify discard and provide spatial and temporal distribution of effort.

- B) *Goal III: NMFS has a cost effective, adaptable and sustainable fishery data collection program that takes advantage of the full range of current and emerging technologies.*

Objective 1: Implement EM/ER technology where appropriate and cost effective to improve catch estimation and better inform stock assessments.

Strategy A: Implement EM as appropriate based on scientific research from goal II.

Action: Select EM approach.

Action: Analyze EM approach, impacts, cost, and benefits.

Action: Write implementing regulations.

Action: Implementation, roll out, outreach.

⁷ http://alaskafisheries.noaa.gov/npfmc/PDFdocuments/conservation_issues/Observer/ObserversMotion413.pdf

The Exempted Fishing Permit (EFP) process has been used by other U.S. regions to develop and test EM performance standards, technical specifications, and operator responsibilities. It also provides a transparent, collaborative, and scientifically rigorous process through which management needs can be identified and solutions to data gaps tested. The EFP can require participants to meet performance elements outlined in the EFP to ensure the experimental design is followed. This ability to enforce compliance is not possible under a voluntary program. The EFP also provides the flexibility to test operational practices which currently may be prohibited by regulation. Under an EFP, performance standards and operational practices can be developed, tested and annually refined prior to developing regulations that, once implemented, take years to change. Additionally, data gathered under an EFP can contribute toward target at-sea monitoring coverage levels until superseded by regulations. For these reasons, the EFP process provides an effective structure to achieve the Council and industry goal of integrating EM with the North Pacific Research Program (NPRB) and providing fixed gear vessels with an EM alternative to observers.

In Alaska, the EFP application process is governed by regulations. This process ensures that a scientifically rigorous yet collaborative process is followed. The EFP application process generally takes three to six months to complete. Applicants believe that an expedited process may be justified in this case for two reasons: 1) the Commerce Department appropriations bill reported by the Senate Appropriations Committee has requested an EM EFP be approved and funded in 2014; and, 2) 2013 observer coverage levels in the vessel selection pool were well below target levels due to difficulties associated with physically accommodating an observer on these vessels. The EM EFP will provide the vehicle to augment vessel selection coverage levels in 2014, and may allow target coverage levels to be achieved. In an effort to develop an EM EFP application in time for the 2014 season, the Alaska Longline Fishermen's Association (ALFA) consulted with fishermen, fixed gear associations, fishery managers and stock assessment scientists. These consultations informed development of the proposed EM EFP. The EM EFP is intended to provide a transparent, collaborative, and scientifically rigorous multi-year process to an EM alternative for fixed gear boats. The objectives identified in this EFP are consistent with Council identified priorities, and the approach set out in this EFP application is consistent with the sections of the strategic plan identified by the Council and referenced above.

2.0 Purpose and Goals

2.1 EFP Purpose: To experimentally develop the performance standards, operational procedures, and operator responsibilities necessary to integrate EM as a component of the NPRP for fixed gear vessels. The EFP seeks to make EM available as an alternative to human observers where EM provides a cost effective or less problematic alternative to human observers to meet management needs.

2.2 EFP Goals

- A. Develop operational procedures necessary to obtain representative data from fixed gear vessels employing EM to achieve NMFS/Council target coverage levels.**
- B. Experimentally test methods of estimating effort, catch composition (in numbers and weight), and disposition of catch sufficient to meet management needs in fixed gear fisheries.**
- C. Identify and assess programmatic decision points for the Council and NMFS related to EM integration, and provide the necessary quantitative data on cost, vessel compatibility and data quality to inform development and implementation of EM regulations.**

3.0 EFP General Provisions: To achieve the goals of this EFP, applicants propose a phased approach to addressing fisheries, management objectives, and equipment. In the first year, the EFP project will focus on the Council identified priority fisheries--IFQ sablefish and halibut. EM testing and development for the Gulf of Alaska (GOA) Pacific cod hook and line fishery (the Council's 2nd identified priority) and the GOA Pacific cod pot fishery will begin in Year 2 and 3, respectively. In each fishery, specific EM management objectives will be identified and a detailed experimental design developed to evaluate the ability of EM systems to meet these objectives. During Years 2-5, regulatory changes necessary to support EM will be identified, and the Council will be asked to initiate amendments as needed. The intent is to have any necessary EM regulations in place by the end of Year 5 to ensure a seamless transition from the EFP to an integrated EM alternative within the NPRP.

Developing operational procedures to collect representative data will be a fundamental objective of the experimental design. The experimental design and sampling procedures will be reviewed through the established EFP process to elicit comment from scientists, fishery managers, industry stakeholders and the Council. The initial experimental design will focus on using existing EM technologies and operator handling practices to establish baseline information on data quality and costs. The baseline data will then be evaluated relative to management needs and priorities with the help of an EM EFP work group composed of stock assessment scientists, fishery managers, EM service providers, and industry. Data gaps, potential solutions, and new technologies will be evaluated and incorporated into the experimental design in subsequent years to quantify incremental improvements and costs. Throughout the process, decision points and potential regulatory requirements will be identified and reported to the Council for consideration. Consistent with Goal C of this EFP, this information will inform the development and implementation of EM regulations.

3.1 Integrating the NMFS EM Pilot Program:

The purpose of this EFP is to experimentally develop the performance standards, operational procedures, and operator responsibilities necessary to integrate EM as a component of the NPRP for fixed gear vessels. Applicants propose a phased approach and a suite of objectives to

accomplish this goal. Applicants believe that this suite of EFP objectives can incorporate or compliment the NMFS EM pilot program objectives of testing new EM technologies and data processing methods. The most cost effective approach, and the approach supported by the EM EFP applicants, would be to incorporate the pilot program by deploying the NMFS pilot program EM equipment (provided by Saltwater Inc.) on the Homer and Kodiak vessels operating under this EFP as specified in the current contract. Incorporating the objectives of the pilot program into the EFP would ensure compliance with operational procedures, incentivize participation to achieve objectives, and provide structure and transparency to the results. Since NMFS plans to review the data generated by the EFP, applicants anticipate that the pilot program objectives would be met and enhanced. Incorporating the NMFS EM pilot program equipment into the EFP will also reduce EFP costs and improve coordination between NMFS and the industry, which will benefit the industry, NMFS and the NPRP. Applicants invite full integration of the NMFS EM pilot program with this EFP and look forward to the working with the Agency to define specific objectives for the 2014 pilot program.

3.2 EFP Project Duration: The applicants propose a five year project period or until regulations are implemented superseding the need for this EFP, whichever comes first. Applicants anticipate that the EFP will identify most decision points related to performance standards, technical specifications and operator responsibilities during the initial two years of field testing in a fishery. This initial field testing will be followed by continued deployment and refinement of techniques while the regulatory process is initiated. The five year duration provides sufficient time for this process to occur sequentially in the IFQ sablefish and halibut fisheries, the GOA Pacific cod hook and line fishery, and the GOA Pacific cod pot fishery. The EFP is designed to develop procedures to obtain representative data from the fisheries; the five year period will allow sustained participation and EM deployment to achieve target coverage levels until implementing regulations are in place. Finally, as EM systems are durable and built to provide service for a number of years, the five year period will provide a reasonable and realistic service life for the EM hardware used in the EFP. This will lead to realistic cost estimates associated with an integrated EM alternative.

3.3 Data Confidentiality: Individual vessel set locations and catch amounts will be kept confidential and images from the vessel will not be used publicly without the skipper's permission. To monitor system performance and cost data, each vessel will be assigned a number and the EFP project will report on the number of trips a vessel takes, the performance of the EM system on that vessel, the video quality achieved, and the cost/sea day of using the EM systems on that vessel. Catch information will be aggregated across multiple vessels to protect confidentiality consistent with existing federal and Alaska statutes and Council procedures.

3.4 Reporting and Annual Review of Sampling Plan: By May 1st 2014, and each year following, applicants will provide a report to the Council on activities under this EFP. The May report will contain an initial work plan identifying potential objectives for the following year to allow Council input during the June meeting. Beginning in 2015, the May report will also

include a final report on the previous year activities and results. By October 15th each year, the applicants will submit specific objectives and a detailed EFP sampling plan for the following year for NMFS and Council review. The October report will also describe current year activities with available data. To facilitate this reporting schedule, the EM workgroup will meet in advance of the April and October Council meetings to define future research objectives and refine the proposed sampling plan and experimental design prior to submission to NMFS.

4.0 Provisions Specific to Year 1

4.1 Project Scope. Applicants intend to use the ports of Petersburg, Sitka, Homer and Kodiak as hub communities during Year 1. Each community will have local technicians trained in EM system installation and maintenance. Each community will also have a part-time port coordinator responsible for identifying EM candidate vessels, coordinating schedules, performing quality control checks, collecting and securing data, and performing or overseeing dockside monitoring tasks. Additional communities may be added in Years 2 and 3 with the goal of establishing EM capacity in at least eight GOA communities by Year 5.

4.2 Objectives (note full details associated with the 2014 sampling plan are provided under Section 6 below).

4.2.1 Rockfish Identification Objective: To determine whether at-sea monitoring using IP digital cameras provides sufficient identification of rockfish species to meet management needs or whether an operational EM program will require full retention of all rockfish with subsequent dockside identification. The Final Rule implementing Amendments 86/76 noted concern with the capability of EM systems to provide species identification adequate for management needs. Although the intent is to identify to the lowest possible taxonomic level all catch harvested under the EFP, rockfish identification will be a Year 1 focus. Under this objective, all vessels participating in the EFP will be required to retain 100% of rockfish species harvested during each trip throughout Year 1. At least one trip from each vessel will be sampled for dockside rockfish identification and compared with 100% video review for this same trip. Vessel selection for dockside monitoring will follow International Pacific Halibut Commission (IPHC) guidelines (Erikson and MacTavish, 2012). The utility of species groupings will be considered in Year 1, such as the grouping of shorttraker and rougheye rockfish.

4.2.2 Vessel Selection Objective: To develop operational procedures necessary to obtain representative data from the vessel selection and trip selection vessels operating in the halibut and sablefish Individual Fishing Quota (IFQ) fisheries. Managers have indicated that data collected from volunteer vessels cannot be considered representative of the fleet as a whole. This fact, more than any other, has guided design

of this EFP. The process for selecting EFP participants from the vessel selection pool is designed to secure data representative of this pool; the selection process for sampling data obtained from trip selection vessels is designed to secure cost data representative of the trip selection pool and catch data representative of the EFP trip selection participants. More detail is provided below.

NMFS Vessel Selections Stratum-- NMFS currently selects a pool of vessels for observer coverage for each two month period with 60 days advanced notice. These vessels may then request a conditional release based on bunk space or life raft capacity. Applicants propose that NMFS refer vessel owners who request a release to the EFP program coordinator to participate in the EM EFP in lieu of carrying an observer. If EM hardware is available and the vessel can travel to an EFP port for EM installation, NMFS will issue a release for that selection period conditional on the vessel's participation in the EM EFP. If the EFP project cannot accommodate a vessel due to full use of the available EM systems, the vessel will be referred back to NMFS for further release evaluation.

Applicants intend to deploy four EM systems in each port for the vessel selection pool. There is potential to rotate the EM systems to more than one vessel during a selection period if fishing schedules are compatible. Conversely, if for example only two selected vessels apply for a waiver from any one port, there will be selection periods when all four systems are not deployed. Applicants anticipate deploying EM system on 50 – 64 vessels from this stratum, with 60 vessels being the Year 1 goal (Table 1).

As proposed, the EM EFP vessels from the vessel selection pool will be selected through the same random selection process currently in place for this pool. Because EM will only be deployed on vessel selection boats seeking observer releases, the EFP will augment rather than reduce coverage in the vessel selection pool and is intended to assist the Council and NMFS in meeting coverage targets for this observer stratum.

NMFS Trip Selection Pool--NMFS currently requires trip selection vessels to log into the Observer Declaration and Deployment System (ODDS) at least three days in advance of each fishing trip. Trip selection vessels have a 15% probability of being randomly selected to carry an observer on any given trip. Because three day notice is too short to allow EM systems to be installed on vessels and installing and removing EM systems on a trip by trip basis is not cost effective, applicants propose opportunistically selecting up to 12 trip-selected vessels participating in the IFQ sablefish and halibut fisheries to carry EM systems on every trip taken in these fisheries during Year 1. After data retrieval, 15% of the trips taken by a vessel will be randomly selected for video review. To achieve the target trip selection coverage levels, at least one additional EM system will be provided to each port specifically for trip selection vessels. Some trip selection vessel owners have offered to pay for the EM systems installed on their vessels. EM data from

these vessels will also be reviewed as part of the EM trip selection pool. Applicants anticipate deploying EM system on 6 to 12 trip selection vessels with 8 vessels being the Year 1 goal (Table 1).

4.2.3 Catch Estimation Objective: To develop baseline estimates of effort, catch composition (in numbers and weight), and disposition of catch in the IFQ halibut and sablefish fisheries. This objective was identified by NMFS in a May, 2012 letter to the Council: *“Our goal for a fully-integrated EM program in the North Pacific includes obtaining quality effort (location and quantity of gear set) and catch composition information from EM-observed vessels.”*⁸ To achieve this objective, the Pacific States Marine Fisheries Commission (PSMFC) has agreed to review video footage of all hauls from the vessel selection vessels and all hauls from trip selection vessels. Sensor data will supply trip start times, number of sets, set location and haul time. To capture additional effort information, participating vessel operators will be provided a data sheet on which they will be required to record hook size, number of hooks, average hook spacing, and set length or number of skates. In following years, this information will be used to inform development of an electronic logbook that requires fishermen to enter only the data that is not easily captured by EM equipment. Based on the haul time, PSMFC will review 30% of the haul video for species identification to be congruent with the current NMFS groundfish observing program (AFSC, 2013). Species will be identified to the lowest taxonomic level. The disposition status of each fish will be noted as retained, drop-off, or discarded. In Year 1, the applicants propose using average weights to estimate total weight of discarded species. In subsequent years, this baseline will be used to assess the costs and impacts associated with changing performance standards, deploying new technology, or requiring additional handling procedures to meet management needs.

4.2.3.1 Sub-sampling Objective: Determine a percentage of haul video review that will maximize species identification and catch estimation while remaining cost effective. The haul subsampling rates for video review will be: 10%, 30% and 50% of the total haul time. This will allow total catch to be estimated for the different amounts of haul time reviewed. The results from the Rockfish Identification study will be used to compare the 100% video review catch information with the different subsampling rate catch information.

4.2.4 EM System Performance Objective: Identify EM system attributes and performance standards necessary to obtain quality effort and catch composition sufficient to meet management needs. The lack of performance standards and questions about system reliability were identified in the Amendment 86/76 Final Rule as issues requiring resolution prior to EM implementation (NMFS response to comment 71).

⁸ http://alaskafisheries.noaa.gov/npfmc/PDFdocuments/conservation_issues/Observer/NMFS_EMLtr053112.pdf

In Year 1, the EFP will deploy digital IP cameras and EM systems supplied by two EM service providers. Multiple EM service providers will be engaged to evaluate system reliability and to identify best attributes for monitoring the IFQ fleet. The Year 1 EM service provider for Sitka and Petersburg will be AMR; Year 1 EM provider for Homer and Kodiak will be Saltwater Inc. The technical details associated with each system and evaluation metrics are described in detail under Section 6.0.

4.2.4.1 Frame Rate Objective: An additional study on frame rates during video recording will be conducted on trip selection vessels. The goal of this project will be to compare the ability to identify catch to the species level at different frame rates and to compare cost and time for video review and quality checks. Video quality (low, medium, high, or unusable) will be evaluated for the selected time segments (ALFA, 2012).

4.2.5 Operator Responsibilities Objective: Identify operator responsibilities and handling procedures necessary to obtain quality effort and catch composition sufficient to meet management needs. An operational EM program requires clear operator responsibilities detailed in regulation. In Year 1, applicants will evaluate the efficacy of using a pre-departure function check to ensure system reliability and the necessary lens cleaning requirements to achieve acceptable data quality. Year 1 operator responsibilities will focus on EM system maintenance and proper handling to ensure effective video capture of the required fishing information. Once the baseline data from Year 1 is reviewed and management needs are assessed, catch handling procedures and operator responsibilities can be tested in subsequent years to resolve any outstanding management requirements.

4.2.6 Regulatory Area Compliance Objective: EM systems record position and sensor data at a higher resolution than Vessel Monitoring Systems (VMS) units are currently required to record. This enables sensor data from EM systems to identify fishing effort and video footage to verify catch. VMS provide real time transmission verifying vessel position but lack the ability to verify fishing activity or catch. Regulations under 679.7 (f)(4) prohibit a vessel from retaining IFQ halibut or sablefish in excess of the total amount of unharvested IFQ applicable to the vessel category and IFQ regulatory area(s) in which the vessel is deploying fixed gear unless an observer is onboard. Under the restructured observer program, there is no means of obtaining an observer for partial coverage vessels outside of the ODDS and vessel selection deployment systems. Consequently, IFQ holders who have small amounts of quota in multiple areas no longer have a cost effective solution for harvesting their IFQ. Halibut regulations allow a vessel to carry VMS or an observer in IPHC Area 4 to address this same issue with small amounts of halibut. The purpose of VMS in this application is to verify that the vessel harvests the fish in the regulatory area associated with the IFQ.

Applicants propose to evaluate the feasibility of using EM systems to validate compliance with this regulatory area provision and the cost effectiveness of using EM versus observers for this task. This is consistent with the fundamental purpose of this EFP; namely to develop performance standards, operational procedures, and operator responsibilities necessary to integrate EM as a component of the NPRP for fixed gear vessels where EM provides a cost effective or less problematic alternative to human observers.

4.2.7 Seabirds objective: Develop and test the operator responsibilities and logistical procedures necessary to implement a “bag-and-tag” program to identify seabird remains. The limitations associated with using EM technology to identify seabird bycatch remains have been raised by NMFS at numerous Council meetings. Observers often cannot adequately identify the remains and rely on a bag-and tag- program to bring remains on shore for identification. Although applicants recognize the logistical and permitting challenges associated with implementing a bag-and-tag program on unobserved vessels, we propose that a similar bag-and-tag program be tested on vessels using EM systems.

4.3 Vessels and Gear. Vessels participating in this EFP will use longline gear to harvest IFQ halibut and sablefish. Types of longline gear that may be covered include conventional, auto line, and snap on. EFP vessels may participate in all regulatory areas in which they may legally harvest halibut or sablefish IFQ.

Vessel selection boats will be those selected by NMFS for 2014 coverage that apply for and are granted an observer release subject to complying with the terms and conditions of the EM EFP. These vessel owners will sign a compliance agreement indicating they will comply with the terms and conditions of this EFP. Once the compliance letter is signed, the vessel name, ownership, and vessel specific information required for an EFP will be transmitted to NMFS by the project coordinator. If NMFS continues providing 60 day notice to vessel selection candidates and communicates release requests to the EFP project coordinator in a timely manner, it is anticipated that the information needed to list vessels under this EFP will be provided to NMFS and the appropriate EM service provider 30 days prior to the vessel commencing fishing operations.

Trip selection boat will be selected on a volunteer basis and owners will also sign a compliance agreement indicating they are willing to comply with the terms and conditions of this EFP. Once the compliance letter is signed, the vessel name, ownership, and vessel specific information required by the EFP will be transmitted to NMFS and the appropriate EM service provider by the project coordinator 30 days prior to the vessel commencing fishing operations.

4.3 Disposition of Species--Year 1: Vessels participating in the EFP will operate within the confines of the normal fixed gear fishing seasons with participating vessels legally harvesting

sablefish and halibut IFQ and other legally harvestable bycatch species. With the exception of rockfish species landed in excess of maximum retainable amounts identified in 50 CFR 679.20 (e), disposition of landed catch will be consistent with existing regulatory guidelines and will be unaffected by the EM EFP. Rockfish from federal waters retained above maximum retainable amounts will be handled by the processor taking delivery of that fish, with the ex-vessel value forfeited to fund further work under this EFP. Rockfish harvested in state waters and retained above maximum retainable amounts will be handled by the processor taking delivery of that fish, with the ex-vessel value forfeited to the State of Alaska as is currently required.

4.5 Requested Regulatory Exemptions Year 1--Applicants request that vessels listed under this EFP be exempted from the following regulations.

4.5.1 Exemption from regulations governing maximum retainable amounts of rockfish. Regulations governing maximum retainable amounts are listed at 50 CFR 679.20 (e), with specific percentages for the Gulf of Alaska listed in Table 10. In order to fulfill the rockfish identification objective of this EFP, applicants are requesting that vessels participating in the EFP be exempted from the “aggregate rockfish,” “SR/RE” and “DSR” percentages listed in this table when directed fishing for IFQ halibut or sablefish. Applicants also request an exemptions from regulations prohibiting retention above the MRAs including 679.7 (a) (16), 679.20 (d) (iii) (B) and 679.20 (e) (a) and (f). For conservation reasons, applicants do not request exemption from regulations at 679.20 (d) (2) requiring discard if NMFS places a rockfish species on prohibited status due to Total Allowable Catch (TAC) or Allowable Biological Catch (ABC) concerns. If this occurs, EFP vessels will be required to discard that species, and the hauls during this period will not be included in the evaluation of the rockfish management objective. Finally, consistent with the disposition of other rockfish described in Section 4.4 above, applicants are requesting an exemption from 679.20 (j) (iii) to allow the overages from fish harvested in federal waters to be sold and the ex-vessel value forfeited to fund further work under this EFP.

Because the mortality of captured rockfish is 100% for most species, requiring all EFP vessels to retain rockfish will not increase rockfish mortality, therefore will not create a conservation concern; in fact, full retention will provide a more accurate estimate of rockfish bycatch in the longline fisheries than is currently available, reduce waste, and allow this important EFP objective to be achieved.

4.5.2 Exemption from observer coverage requirements under 50 CFR 679.51.

Regulations governing observer coverage for vessels in the partial coverage category are listed under 50 CFR 679.51 (a) (1). Applicants request an exemption from this section to allow a vessel to be removed from the partial coverage category, the associated observer coverage requirements, and the requirement to register trips in ODDS. Participating

vessels will still be subject to the observer fee collection program described in 50 CFR 679.55. These release provisions are necessary to incentivize participation and to provide a sufficient sample size to secure the data necessary to answer the questions posed by the EFP. Since vessel selection boats that will be referred to the EFP are vessels that request a waiver from observer coverage, exempting these boats from observer selection will not reduce observer coverage but will, in fact, assist NMFS in securing representative data from the vessel selection pool. Exempting trip selection boats will reduce the number of vessels in this pool slightly, but NMFS is still likely to achieve coverage targets by selecting additional trips from the remaining vessels.

4.5.3 Exemption from observer requirements under 679.7 (f) (4). Regulations under 679.7 (f) (4) prohibit a vessel from retaining IFQ halibut or sablefish in excess of the total amount of unharvested IFQ applicable to the vessel category and IFQ regulatory area(s) in which the vessel is deploying fixed gear unless an observer is on board. Applicants request an exemption from this regulation to allow EM systems to be used in lieu of an observer. This will facilitate participation in the EFP and is consistent with the stated purpose of the EFP to develop performance standards, operational procedures, and operator responsibilities necessary to integrate EM as a component of the NPRP for fixed gear vessels where EM provides a cost effective or less problematic alternative to observers. EM data review will verify that vessel harvest occurred in the appropriate IFQ areas and that the amount of catch matches the IFQ assigned to that area. This will allow IFQ holders to efficiently harvest IFQ from multiple management areas while ensuring conservation and management objectives are not compromised.

4.5.4 Seabird exemptions. Sablefish fixed gear boats are required to retain incidentally taken seabirds only if an observer is on board. Halibut regulations require all vessels to retain any incidentally harvested seabird but the United States Fish and Wildlife Service (USFWS) has not developed a system for recovering seabirds incidentally taken by unobserved boats. Currently NMFS has a “salvage” permit that authorizes observers to retain sea bird remains for future identification. Applicants have not been able to identify specific regulations that would require an exemption; however seabirds can only be retained under a permit issued by the USFWS. Thus the logistical, permitting and regulatory challenges associated with unobserved vessels retaining seabird remains for subsequent identification are significant and best addressed under an EFP.

In Year 1, applicants request NMFS designate vessels participating in this EFP as sub-permittees under the existing NMFS salvage permit. If this is not possible, applicants will work with NMFS to find an alternative solution or delay the seabird objective until Year 2 to allow more time to resolve this issue. Since unobserved vessels currently cannot legally retain seabird bycatch for subsequent identification, developing a system that allows retention will improve seabird bycatch accounting.

4.5.5 Exemption from State regulations. EFP applicants are working with State of Alaska fishery managers to identify regulations that might require an exemption in order for this project to proceed. In the Southeast region, full retention is already required for demersal shelf rockfish (DSR), black rockfish, and thornyhead rockfish in all state waters. Dark and blue rockfish have a 15% limit in aggregate but their occurrence is not likely to exceeded this amount. Thornyhead rockfish and all other rockfish in the 0-3 mile area of State waters have a 5% retention limit in aggregate. The Central region requires full retention of all rockfish harvested in State waters with the ex-vessel value of overages forfeited to the State. The Western region rockfish bycatch limits apply only to black, blue, and dark rockfish and do not include a full retention provisions. Preliminary discussion suggests that requiring EFP vessels to retain all rockfish caught in State waters with forfeiture of the ex-vessel value of overages to the State as one possible solution. A Commissioner's permit has been identified as a possible alternative solution. Applicants will continue to investigate this issue and to work with the State of Alaska as needed. Applicants have also contacted appropriate ADF&G staff to inquire about permits needed to retain seabird bycatch from State waters for subsequent on-shore identification. The State has a salvage permitting process, which applicants will complete if this EFP is approved. Again, since seabird bycatch retention is not currently required on unobserved boats, developing a retention methodology will improve seabird bycatch accounting.

4.6 Anticipated Impacts on the Environment from Year 1 Activities: Applicants anticipate no additional impacts to the fisheries, environment, marine mammals, endangered species or EFH beyond that which normally occurs during the standard fixed gear season.

4.7 Project Timing: Preparation, training and equipment installation for the EM EFP will start in January 2014 to ensure EM systems are deployed and operable when the halibut/sablefish IFQ season opens. This timing is crucial to achieving Year 1 objectives. Applicants request guidance from NMFS on how to best plan for and manage the preparation and training tasks necessary for success in conjunction with the EFP review process and timeline.

5.0 Future Studies

5.1 Year 1

Survey vessels

Applicants are working with the Alaska Fisheries Science Center (AFSC) and the IPHC to deploy EM systems on survey vessels to pilot test their capability to capture length measurements during video review. This feature may be tested in Year 1 on survey vessels to evaluate the use of average weights and to identify operational procedures needed to obtain lengths electronically.

5.2 Year 2

Vessel Selection

Based on the outcome of Year 1 vessel selection and the quality of catch estimates collected from the EFP, applicants may request that the Council revise the conditional release policy in Years 2 and 3 of the EFP to include more vessels. Expansion could be in the halibut and sablefish IFQ fisheries and/or in the Pacific cod pot fisheries. A vessel's compliance record and video quality rating from the previous year(s) will be a factor in selecting EFP vessels after Year 1.

Video Quality

After baseline data from Year 1 is reviewed by the PSMFC and management needs are assessed, catch handling procedures will be tested to resolve remaining management needs or data gaps. These may include halibut release methods that allow video reviewers to estimate length, installation of measuring boards on vessels for size estimates, and equipment maintenance specifications. With additional ports, new technology may also be pilot tested as identified and when appropriate.

Vessel Logbooks

The results of effort data extracted from the sensor information will be used to identify data fields necessary for an electronic log (elog) component. The elog component will be added in Years 2 and 3 to improve Meta data collection and haul location verification using GPS.

Catch Estimation

Year 1 data are intended to establish a baseline data-set that will identify data gaps and management priorities. This will inform decisions on the need to include additional species of management concern or alternative weight estimation techniques in subsequent years. Discard mortality and halibut viability are estimated on a subsample of halibut harvested in fisheries with observer coverage. In Year 2 of this EFP, new strategies for assessing halibut viability with EM will be tested. Variables to consider will include method of hook release, soak time, and halibut size.

Bird Deterrent Use

Use of bird deterrents is a requirement for vessel deploying fixed gear during daylight hours. In Year 2, the EFP will explore methods to verify deterrent use with EM.

5.3 Year 3:

New Technologies

After existing technology is tested, enhanced through performance requirements and retested, applicants will solicit ideas for new technology that might enhance species identification or fill other identified data gaps. Applicants will work with the EFP EM work group/ steering committee to select new technology to deploy and test. On-going testing of new technology will occur on a subsample of vessels selected for EM coverage.

6.0 Year 1 Methods and Sampling Plan Technical information: Year 1 hypothesis are identified and explained in the following section. These hypotheses may be answered in the first year, if data is conclusive, or may require additional testing. Hypothesis for subsequent years will be developed, along with sampling strategies and protocols, by the EM EFP work group and will be reviewed by the Council. These will include monitoring objectives and technical specifications for deploying EM on Pacific cod longline and pot vessels.

6.1 Rockfish Identification:

It is essential to determine whether IP digital cameras can provide sufficient identification of rockfish species to meet management needs or whether an operational EM program will require full retention of all rockfish and subsequent dockside identification. To make this determination, all vessels participating in the EFP will be required to retain 100% of rockfish species harvested during each trip throughout Year 1.

Hypothesis: Rockfish species composition identified from EM haul videos will not differ significantly from rockfish species composition identified during dockside sampling.

Dockside sampling

Vessel operators will be required to notify program coordinators of potential delivery schedules and ports. At least one trip from each vessel will be sampled dockside for rockfish identification and comparison with the video data. Rockfish dockside identification landings will be opportunistically sampled. The port coordinators will communicate with the vessels to determine offload schedules and will choose which vessels to sample based on the port sampler's availability and whether or not that boat has already been sampled. If multiple boats are offloading at the same time, port coordinators can select the landing with the greatest haul weight similar to the IPHC protocols for dockside sampling vessel selection (Erikson and MacTavish, 2012). Each port coordinator will have, within a two month period, five offloads to attend and each port location will have between 64 and 96 hauls for 100% video review (Table 2).

Video Review for Rockfish

For each randomly selected offload, 100% of the video from hauls associated with the trip will be reviewed by PSMFC for species identification to the lowest taxonomic level. The rockfish catch information will then be compared to the rockfish identified dockside during the offload by a port sampler. All port samplers will be required to pass a competency test on rockfish species

identification prior to working unaided as a dockside sampler. Verification of full retention will be made by comparing the total number of rockfish counted during video review with the total number counted by the dockside sampler (Stanley *et al.*, 2011).

6.2 Vessel Selection

NMFS Vessel Selection Stratum

As explained above, vessels in this selection stratum are randomly selected by NMFS for at-sea monitoring to obtain representative data. The vessel selection component of the EFP will focus on four sampling periods: March-April, May-June, July-August, and September-October. These sampling periods are consistent with the selection periods used in the observer program and span the entire fishing season for the halibut and sablefish fisheries with the exception of one week in November. As proposed, a pool of vessels will be selected for observer coverage for each two month period by NMFS with 60 days advanced notice. These vessels may then request a conditional release based on bunk space or life raft capacity. When NMFS receives a release request, the vessel will be referred to the EFP program coordinator for the option of participating in the EM EFP in lieu of carrying an observer. If EM hardware is available and the vessel owner agrees to the terms and conditions of the EFP, NMFS will issue a release for that selection period conditional on the vessel's participation in the EM EFP. If the EFP project cannot accommodate a vessel due to full use of the available EM systems or the inability of the vessel to travel to an EM EFP port, the vessel will be referred back to NMFS for further release evaluation. Trip selection vessels will have 15% of their trips randomly selected for video review. This approach is congruent with the 15% probability of having to carry an observer on any given trip. Each trip selection vessel will also have one landing met by a dockside monitor for rockfish species identification.

Two additional studies are planned for the trip selection vessels. The first involves evaluating the effect of the frame capture rate on species identification and costs and the second involves using EM systems to spatially monitor fishing activity and to verify that fishing activity is occurring in the correct regulatory area. The methods associated with these studies are described in Section 6.5.1 and 6.7 respectively below.

6.3 Catch Estimation

The EFP will estimate total catch for each haul based on species identification and counts. Species identification in Year 1 will establish a baseline of EM capacity to accurately and reliably identify species to the lowest taxonomic level. All hauls from the vessels selected for catch estimates will be reviewed by PSMFC and 30% of the video will be processed for species identification. Portions of the haul video will be randomly selected by PSMFC video reviewers to cover 30% of the haul time in three 10% increments. Species identification, including

seabirds, will be recorded to the lowest taxonomic level. Species discarded at the roller station and drop-offs will be identified to the lowest taxonomic level and counted; this discard data will be used to estimate total percentages of discarded species. A catch estimate will then be extrapolated from the subsamples for each species or species group:

$$\text{Total catch} = \frac{\text{Number of fish counted in video review}}{\text{Time covered in 30\% video subsample}} \times \text{Total time for haul}$$

In the first year the EFP will focus on using average weights to estimate total catch for commonly discarded species, including grenadier, dogfish, skates, sub-legal halibut, and sablefish. Average weights will be applied to discarded species and drop-off events to allow catch weights to be calculated. Survey data from NMFS will be used to determine species average weights (personal communication). Once extrapolated for each species, the catch estimates of discards and drop-offs will be summed with retained catch to determine total catch weights for each haul. Species groupings will be used when it is impossible to distinguish different species on the gear, for example shortraker and rougheye will be grouped. In Year 1, grouping species into size categories (e.g. observably smaller or larger) will also be tested with giant grenadier (*Albatrossia pectoralis*), in order to evaluate base-line estimates of average weights for this species.

6.4 Subsampling Rates

Hypothesis: Catch estimates will be more cost effective and as accurate in subsampled haul videos as they are in video reviewed for 100% of the haul.

The hauls reviewed for rockfish identification will also be reviewed by PSMFC at different percentages to compare catch estimates, species identification, and time and cost for video review. Each haul will have 10%, 30% and 50% of the haul time reviewed for species identification. The EFP research coordinators will randomly select 10% segments from each haul that was 100% reviewed for rockfish identification to be used for species identification and catch estimations at each of the subsampling rates. This will allow total catch to be estimated by extrapolation for the different amounts of haul time reviewed:

$$\text{Total catch} = \frac{\text{Number of fish counted in video review}}{\text{Time covered in video subsample}} \times \text{Total time for haul}$$

The results from the Rockfish Identification study will be used to compare 100% video review catch information with the subsampling rates.

Haul Sampling

In order to obtain quality catch composition data, video will be reviewed by PSMFC for species identification according to the sampling percentage assigned to that haul (Table 1). Species will

be identified to the lowest taxonomic level. The disposition status of each fish will be noted as retained, drop-off, or discarded. Camera placement and instructions on vessel-specific monitoring plans will be used to ensure that discard events during hauling are captured by the cameras.

All hauls from the vessel selection vessels and all hauls from randomly selected, trip-selection vessel trips will have 30% of the video processed for species identification to be congruent with the current NMFS groundfish observing program (AFSC, 2013). The total time between the first and last hooks leaving the water will be broken into time segments of one-tenth the total haul time; three time segments will then be randomly selected from the ten total segments for species identification. To randomly select the three segments, a number from the random number table will be chosen (Appendix A). That number will begin the segment selection; the next two segments will be selected by counting up by the number randomly selected. For example, if the random number is 4, the segments for review would be 2, 4, and 8 (Figure 1)

6.5 EM System Performance

In Year 1, the EFP will use digital IP cameras and EM systems supplied by two EM service providers, Archipelago Marine Research, (AMR) and Saltwater Inc., to record fishing activity. AMR will deploy their EM Observe v4.5 Electronic Monitoring System which includes a control center powered by 12v DC or 120v AC and a removable 1 terabyte hard drive. Sensors used on AMRs system include hydraulic pressure, rotation sensors, and GPS. The AMR system can accommodate up to eight 1 mp IP digital cameras with variable frame rate capture setting from 1 to 30 frames per second (FPS), and a selection of lenses with different fields of focus. Saltwater's onboard computer contains system operating software and data storage. Each server contains two 500GB hard drives. The system has a USB 3.0 port that allows for efficient data download to password protected external hard-drives. Sensors used on Saltwater's EM system include hydraulic pressure sensors, magnetic drum sensors and motion detection to trigger recording. A GPS sensor is integrated into the camera housing and time, data, latitude and longitude are stamped on each video frame. Saltwater's camera system uses two digital Internet Protocol (IP) cameras. One has a hemispheric lens that can capture the entire deck. The second camera has various lens options that capture a narrower field of view. All frames can be zoomed-in on during the review process. The cameras can record at 12+frames per second at a resolution equivalent to HDTV (1280 x 960). Resolution and frame rate can be easily adjusted for each camera at the installation, if lower rates (requiring less storage space) are adequate to meet project requirements. Both the AMR and Saltwater EM systems record sensor activity continuously and use threshold setting on the sensors to trigger video recording of events. Sensor and video data will be stored on a hard drive installed with a tamper evident seal.

Throughout the EFP, attributes of the EM systems which improve the collection of effort and catch composition data will be noted. The reliability of EM systems will be evaluated on a vessel specific basis by comparing the number of hauls the vessel made with the number of hauls

successfully captured on video. GPS sensor performance will be evaluated based on the number of hours in each trip compared to the number of hours the GPS was operational, excluding momentary lapses of 30 seconds or less and night-time gaps if the vessel is anchored and the system powered down. Video quality will be rated as good, medium, and poor based on criteria identified in Table 4. While applicants acknowledge that the video quality rating will contain elements of operator maintenance and system performance, the reason for lower quality video ratings such as lighting, glare, camera alignment or moisture on the lenses will also be noted to allow evaluation.

6.5.1 Frame Rate: This experiment is the first step in testing particular variables within EM technology. The goal is to determine cost effectiveness and species identification ability from video captured at different frame rates.

Hypothesis: There is no difference in ability to identify species to the lowest taxonomic levels from video recorded at different frame rates.

Vessels from the NMFS trip selection pool that are randomly selected for EM will be outfitted with two cameras similar to the other EM covered vessels. For the frame rate project, one camera will record at the same frame rate as the vessel selection cameras while one will record at a higher frame rate. The goal of this project will be to compare the ability to identify catch to species at the different frame rates and to compare cost and time for video review and quality checks. PSMFC technicians will randomly select 30% of the trips to review haul video (Table 3). Selected hauls from each camera will be reviewed for 30% of the haul time by multiple reviewers. Reviewers will use the same method used with catch estimates for randomly selecting three 10% time segments to review. The time segments randomly selected from one camera by one reviewer will be the same as those reviewed from the second camera by a second reviewer. The 30% video review will also be used to determine catch estimates as described above. However, because the trip selection vessels were chosen opportunistically these data are not intended to be representative of the fleet and will not be pooled with the vessel selection catch estimates.

6.6 Operator Responsibilities

Each vessel will receive an on-board quality check after the first trip to evaluate system performance, image quality and operator responsibilities, and to resolve any installation issues. The EFP will evaluate the efficacy of using a pre-departure function check to ensure system reliability and the necessary lens cleaning requirements to achieve acceptable data quality. At the end of the deployment period, or as needed, the hard drives will be collected by a port coordinator. The port coordinator will note the conditions of the tamper evident seal prior to removing the hard drive.

The port coordinator will make a copy of the data on the hard drive which will be sent to PSMFC for video review. Upon receipt, PSMFC will make a second copy to be sent to a designated person within NMFS for internal review and use. Upon review of the video and sensor data by PSMFC, the vessel will be evaluated for compliance with system maintenance provisions of this EFP and assigned a numeric grade. This grade will be communicated to the port coordinator and used to track vessel compliance with the operator responsibilities of this EFP, identify good candidate vessels for EM, and to track performance improvements over time. The original hard drive will be stored in a secure location until PSMFC has notified the program coordinator that they have completed their review of the data from that vessel. At that point the hard drive will be reformatted and returned to the port coordinators for reuse.

Vessel operators will be provided data sheets; this data can eventually be used to gather information similar to commonly used logbooks in other commercial fixed gear fisheries (AFSC, 2013). For each haul, hook size, number of hooks, average hook spacing, and set length or number of skates will be manually recorded. Additional information about each haul and trip will be gathered during video review.

6.7 Regulatory Area Compliance

For the regulatory area compliance study, trip selection vessels wishing an exemption from the regulations in 679.7 (f) (4) which prohibit a vessel fishing multiple areas from retaining IFQ halibut or sablefish in excess of the total amount of unharvested IFQ applicable in any single area unless an observer is on board, will be required to notify their respective program coordinators when making these trips. Sensor data will be used to identify set location and video footage will be used to verify fishing activity. All hauls made by trip selection vessels that are fishing multiple areas will be reviewed for regulatory area compliance. Unless otherwise randomly selected as part of the vessels 15%, these trips will not be further reviewed to avoid introducing bias.

6.8 Seabirds Objective

Vessels will be tasked to retain all seabirds caught on their longlines. Vessel operators will be instructed to place all seabird remains in a sealed bag along with a specimen label noting the date, time, and location then placed in a second sealed bag. The double-bagged seabird will then be placed in the freezer or iced in the fish hold until the vessel reaches port. The vessel operator will inform the port coordinator of all seabird bycatch events and the port coordinator will contact NMFS.

7.0 Statistical Analyses

All statistical analyses will be performed by the EFP project research coordinators Adam and Molly Zaleski. The descriptive statistics for each Year 1 project are included in the following outline and have been developed through consultation with the Alaska Fisheries Science Center (AFSC).

Additional statistical analysis will be developed in consultation with the EFP work group, the Council's SSC and staff from the AFSC.

7.1 Rockfish Identification

The EFP will compare rockfish species identified in the 100% video review with rockfish identified during dockside sampling using an appropriate statistical analysis determined by the structure of the collected data and the number of vessels participating in the program. In lieu of agreed upon statistical methods, preliminary results will estimate the accuracy of species identification from recordings using rockfish collected during dockside sampling as the control. Separate estimates of accuracy will be run for each species of rockfish, as well as groupings of rockfish species. Groupings of rockfish and subsequent analyses will be done retrospectively. Estimates of uncertainty will initially be made using standard likelihood methods. In addition, the average weight of rockfish by species and species grouping will be estimated and compared to the estimated weight of rockfish from the dockside samples using standard ANOVA methods.

7.2 Subsampling Rates

Video reviewed at different percentages (10%, 30%, 50%, and 100%) will allow for a direct comparison of the type and number of species identified among the different review rates. The statistical method used for this comparison will be identified based on the structure of the collected data and the number of vessels participating, after consultation with the Council's SSC and staff from the AFSC. Included in this analysis will be an effort to provide the information needed for managers to decide which of the subsampling rates is most cost effective. Input from the SSC and NMFS managers will be needed to properly weight the cost-associated errors in estimates of species identification and average weight.

7.3 EM System Performance

The quality of imagery during all video review will be ranked as low, medium, high, or unusable. The following criteria identified in Table 4 will be used to determine video quality and the ability to accurately identify catch: video frame is free of debris, fish or sea spray, light glare, and the field of view remains focused on the roller station during all hauling activity. In addition, we will estimate the proportion of the time the imagery was considered of low, medium, or high quality for each trip. These data will be used to evaluate the cost effectiveness of different EM systems used in the EFP.

7.4 Frame Rates

The EFP will compare the extrapolated catch estimates for targeted as well as bycatch species between hauls recorded at different frame rates using an appropriate statistical analysis, as determined by the structure of the collected data and the number of vessels involved in the program. The statistical significance of both the total catch estimates and estimates by species

will be compared to evaluate hypotheses related to discrepancies in species identification and estimates of total number, length, and weight among different species/species groups.

7.5 Cost Analysis

Throughout the study period, costs will be tracked and assigned to one of five categories: equipment, planning, operational field work, data review, or analysis and reporting. This data will be reported and will be used to inform decisions related to options within an EM program and cost comparisons between EM programs and the existing observer program.

8.0 Project Partners and Qualifications

Alaska Longline Fishermen's Association (ALFA) --ALFA is a non-profit association of independent commercial longline vessel owners and crew members. Founded in 1978, ALFA has extensive experience participating in fishery management forums and cooperative research projects. ALFA will be responsible for overall project management and reporting. ALFA will also coordinate stakeholder involvement, vessel participation, and outreach with the other industry partners. In 2009, ALFA launched a Fishery Conservation Network (FCN) to engage fishermen in developing and testing innovative solutions to address resource and management issues. The 65 FCN members and other interested fishermen will be engaged in the EM field tests.

Linda Behnken—Executive Director, Alaska Longline Fishermen's Association (ALFA): Ms. Behnken has BA from Dartmouth College and a Masters in Environmental Science from Yale University. She has been a commercial fisherman in Alaska since 1982, has served as the Executive Director of ALFA since 1991. Linda served on the North Pacific Fishery Management Council (NPFMC) from 1992-2001 and co-chaired the NPFMC's Essential Fish Habitat Committee. Ms. Behnken was awarded the National Fisherman Highliner award in 2009 for her work promoting healthy marine ecosystems and strong coastal communities, and was a keynote speaker at the 2009 Young Fishermen's Summit in Anchorage, Alaska. ALFA is based in Sitka, Alaska and has members from the Alaska communities of Sitka, Juneau, Haines, Port Alexander, Wrangell and Petersburg, as well as members who winter in Oregon, Washington and Idaho. Ms. Behnken will be responsible for fishing fleet participation in the project, and stakeholder outreach and education. She will also supervise the project coordinator.

Dan Falvey-- project coordinator, ALFA: Mr. Falvey has a BA in resource management and policy from Western Washington University and training in Geographic Information Systems analysis from Penn State World Campus. He has owned/operated commercial fishing vessels in Alaska since 1984. Mr. Falvey served on the Advisory Panel to the NPFMC from 1991-2004, serving as vice-chairman from 1999-2004. He was the acting director of the Alaska Marine Safety and Education Association in 1998, was recently appointed to the Advisory Panel of the North Pacific Research Board, and has served on numerous community economic development

and educational advisory boards. Mr. Falvey was awarded the National Fisherman Highliner award in 2011. Through his involvement with ALFA, Mr. Falvey has successfully coordinated several cooperative research projects, most recently serving as overall program coordinator for a successful NFWF funded pilot program to operationalize video-based electronic monitoring of Alaska's halibut and sablefish catch share fisheries.⁹ Mr. Falvey has also managed numerous other projects such as developing selective fishing techniques for underutilized rockfish species in southeast Alaska, identifying an appropriate product recovery rate for sablefish, and coordinating a rockfish identification project with NMFS observers and regional processing plant workers. Mr. Falvey will serve as overall project coordinator and be responsible for contract management, program design and planning, and coordinating reports.

Petersburg Vessel Owners Association (PVOA)—PVOA is a multi-gear, multi-species advocacy group that monitors and acts on current issues that affect the fishing industry and represents a diverse group of over 100 commercial fishermen and businesses operating primarily in Southeast Alaska. The purpose of the organization is to protect the economic viability of the commercial fishing fleet in Petersburg; promote the conservation and rational management of the North Pacific fisheries resource; and advocate for protection of fisheries habitat.

Brian Lynch, Executive Director, Petersburg Vessel Owners Association (PVOA): Mr. Lynch has a BS in Fisheries Science from Oregon State University. He recently retired from the Alaska Department of Fish and Game (ADFG), where he worked as a biologist for over thirty-year's in commercial fisheries management and research projects. For the first ten years of his tenure with ADFG he was involved with various research projects in Southeast Alaska involving pre-logging physical characteristic inventories, salmon rearing habitat and adult migration studies on the Stikine River, salmon drift gillnet selectivity studies and was the Petersburg port sampling supervisor in charge of the biological sampling of commercial troll, drift gillnet and purse seine salmon landings. From 1991-2001 he was the ADFG Commercial Fisheries Division Petersburg assistant area management biologist with direct management authority over salmon drift gill net, purse seine, spring troll fisheries as well as herring and dive fisheries. During this time he was also a member of the Pacific Salmon Commission (PSC), Transboundary Rivers Technical Committee. From 2001-2010 he was the ADFG Commercial Fisheries Division Southeast Alaska regional salmon troll fishery management biologist. During his tenure as the troll fishery manager he was also a member of the PSC Chinook Technical Committee and served as technical staff to the PSC US Northern Panel and the PSC Transboundary Panel. Mr. Lynch is currently a member of the Advisory Panel to the NPFMC. He has extensive community involvement as a past member of the Petersburg city council, planning commission, volunteer fire department and is currently a member of the Petersburg Economic Development Council. Mr. Lynch will be responsible for fishing fleet participation in the project, and stakeholder outreach and education.

⁹ <http://www.alfafish.org/observer-programelectronic-monitoring.html>

Adam Zaleski and Marilyn Zaleski - Project Research Coordinators: Mr. and Mrs. Zaleski are recent graduates of the University of Alaska Fairbanks School of Fisheries and Ocean Sciences. Both received Master's degrees in Fisheries. Mr. Zaleski's project focused on anthropogenic contamination as an alternative hypothesis contributing to the decline of western Steller sea lions. Ms. Zaleski studied the snow crab fishery with a focus on reproductive physiology. Prior to their Master's work, they were fisheries observers in Alaska. Marilyn has 104 active sea days on 4 vessels and Adam has 213 sea days on 6 vessels, including both trawl and longline vessels. As the Project Research Coordinators they are responsible for determining the data collection and sampling methodologies for this project. They will work in collaboration with the Alaska Fisheries Science Center to perform statistical analysis of the data and to determine if and how changes to the program will be made in order to meet project objectives as well as management needs.

Saltwater Inc. is a small business headquartered in Anchorage, Alaska that is focused on collecting accurate, reliable scientific data. Saltwater Inc. was started in 1988 in response to the growing need for data about the fisheries off Alaska. It was one of the first companies to be certified by the Alaska Department of Fish and Game (1988) and by the National Marine Fisheries Service (1989) to employ trained biologists to collect data onboard commercial fishing vessels.

For over 20 years Saltwater has worked closely with commercial fishermen and government agencies to collect data on fisheries, marine mammals, and seabirds throughout Alaska as well as Hawaii and along the West Coast. Saltwater Inc. has years of experience in planning and executing complex and time sensitive logistics to meet sampling goals. They have extensive experience in editing observer data and writing reports.

Since 2009, Saltwater Inc. has been working to develop electronic monitoring systems that will offer a viable monitoring option in fisheries where observers would be impractical. In 2012, NMFS selected Saltwater Inc. to deploy its EM system on small halibut and sablefish vessels as part of the restructure of the North Pacific groundfish observer program. This is the first time a U.S.-based fishery monitoring company has been awarded a US government contract to deploy EM systems.

Kathryn Carovano is the Saltwater Inc. Program Manager responsible for optimizing the use of new technology in fishery monitoring. She has guided the development and implementation of Saltwater's electronic monitoring program, and oversees Saltwater's new technology initiatives. She has a BA from Middlebury College and an MA in International Relations from the Johns Hopkins University. She comes to Saltwater Inc. with over 20 years experience in project development and program management. Kathryn will oversee Saltwater Inc.'s responsibilities in the proposed EFP including program design, planning, and implementation.

Archipelago Marine Research Established in 1978, Archipelago Marine Research Ltd. Is a global provider of sustainable marine resource management products and services. From its

headquarters in Victoria, British Columbia, the company's team of 175+ industry professionals helps fisheries, coastal communities, and government organizations around the world to implement sustainable practices through at-sea and dockside observer services, electronic monitoring programs, and marine environmental services.

Jason Bryan joined Archipelago Marine Research in early 2010 as a Project Manager focused on international projects. He began his career in the 1980s in freshwater fisheries and over the next 25 years conducted freshwater and marine fish projects on both coasts of Canada as well as terrestrial field studies in Canada, USA and Belize. Over the years Jason has proven himself as a highly motivated, results-oriented problem solver and a very capable Project Manager who is currently responsible for Electronic Monitoring projects in the United States of America as well as Europe. Jason holds a Masters of Science in Fisheries and has contributed to the development of Electronic Monitoring in America through work with the National Marine Fisheries Service, the Alaska Longline Fishermen's Association, the Nature Conservancy and the Pacific States Marine Fisheries Commission. Internationally he has worked with a number of organizations, including the Institute for Marine Resources & Ecosystem Studies (Netherlands), the Marine Management Organization and Marine Scotland (UK) and the Danish AgriFish Department (Denmark). Jason will oversee AMR's responsibilities in the proposed EFP including program design, planning, and implementation.

Pacific States Marine Fisheries Commission. Pacific States Marine Fisheries Commission. Established in 1947 by consent of Congress, the Pacific States Marine Fisheries Commission (PSMFC) is an interstate compact agency that helps resource agencies and the fishing industry sustainably manage our valuable Pacific Ocean resources in a five-state region. Member states include California, Oregon, Washington, Idaho, and Alaska. Each is represented by three Commissioners.

PSMFC's primary goal is to promote and support policies and actions to conserve, develop, and manage our fishery resources in California, Oregon, Washington, Idaho and Alaska. We accomplish this through coordinating research activities, monitoring fishing activities, and facilitating a wide variety of projects. We work to collect data and maintain databases on salmon, steelhead, and other marine fish for fishery managers and the fishing industry.

PSMFC has no regulatory or management authority. Instead, as a neutral party, we serve a number of other vital functions that include providing for collective participation by the Pacific States to work on mutual concerns; serving as a forum for discussion regarding our vital fisheries resources; working for coast-wide consensus in cooperation with state and federal authorities; addressing issues that fall outside state or regional management council jurisdiction; acting as a primary contractor on grants and projects for states and other organizations; dispersing monetary assets from the variety of federal, state, and other resources; coordinating research and management projects related to interstate fisheries, and making these data available; and

participating as a non-voting member of the Pacific Fishery Management Council and the North Pacific Fishery Management Council.

Dave Colpo. Mr. Colpo is a Senior Program Manager at Pacific States Marine Fisheries Commission. In this capacity he acts as the Principal Investigator or provides oversight on a number of commercial fisheries related projects on the West Coast, Alaska and Hawaii. Mr. Colpo has an M.S in Economics from the University of Washington. Mr. Colpo will supervise PSMFC staff working on the video and sensor data review and reporting.

9.0 Budget

This preliminary budget is based on a stand-alone EM EFP. A significant portion of the budget includes start up costs that will not be annual or part of an operable, fully integrated EM component. More explicitly, start up costs include:

- \$140,000 in planning to support a collaborative effort involving stakeholders, EM service providers, PSMFC, and NMFS staff to evaluate results and plan next steps in an open transparent process.
- \$245,000 in Year One for equipment purchase. This equipment should last five or more years; an operational program can be expected to spend approximately \$50,000/year to replace the equipment as it ages.
- \$40,000 for research coordinators to review EFP data and provide the planning group with the timely answers critical to rapid adaptation and development. Once procedures are set, this funding may no longer be necessary.
- \$60,000 in travel, training and support from project partners to build capacity in Alaska communities to develop the data review capacity and procedures. Once this capacity is established, training and support at this scale will not be necessary.
- Approximately \$180,000 to install and remove the EM systems from participating vessels randomly selected per the Council /NMFS observer deployment plan. This may not be the most cost effective means of deploying EM to meet at-sea monitoring needs. Once base line data is secured, the EFP will evaluate alternate and more cost effective deployment scenarios tailored to EM systems and fishery specific coverage needs. This may result in significant savings.
- Approximately \$30,000 to conduct experiments on the IPHC and NMFS survey vessels. These experiments are designed to resolve questions related to the use of recorded length vs. average weights for estimating catch. These costs will be eliminated once program design is determined.

In sum, approximately \$300,000 to \$400,000 of the Year 1 costs are associated with launching the EM component, taking it to scale, and developing the procedures and systems to support data

gathering with EM. These start up costs will not be annual or ongoing. Applicants expect cost efficiencies to be identified and achieved in subsequent years.

Applicants look forward to working with NMFS and AFSC to integrate, if possible, equipment and services from the existing pilot program. The integration would constitute a significant cost savings and enhance collaboration between EM initiatives. Applicants are also seeking supplemental funding to reduce the observer fees necessary to support the project, and will be applying to the National Fish and Wildlife Foundation Fisheries Innovation Fund to support the planning, coordination, and reporting aspect of the EFP.

While the annual revenue stream afforded by the observer fees is essential to this project, applicant's intent is that the revenue stream support EM deployment on fixed gear vessels instead of observer deployment on fixed gear vessels. It is not the intent of the applicants to divert funds or observers from the trawl to the fixed gear fleet.

9.1 Budget Narrative Planning/Reporting--\$142,006 Total

Personnel--\$30,000—Funds will support ALFA staff engaged in overall project planning, developing 2015 experimental designs and sampling plan details, writing the 2015 EFP application, coordinating and participating in the EM working group, developing reporting templates for data, writing the May and October 2014 EM EFP progress reports, and providing outreach to stakeholders on the EFP project. This work is estimated to require a 1/3 FTE position.

Contract--\$73,929—Funds will be used to contract with project research coordinators (\$10,000) for technical assistance with overall project planning, developing 2015 experimental designs and sampling plan details, writing the 2015 EFP application, developing reporting templates for data, and reviewing the May and October 2014 EM EFP progress reports. Contract funds will also support media assistance (\$3,000) with developing reporting templates and lay-out of the annual report, accounting services (\$5,000), and legal assistance (\$2,500) with developing project partner contracts.

Travel--\$26,888—Funds will support travel for two ALFA staff (\$5,500), the two Research Coordinators (\$5,000), and one representative from project partners Archipelago Marine Research, Saltwater Inc., and PSMFC (\$16,338) to two EM workgroup meetings each year in Anchorage and to report to NPFMC on EM EFP progress.

Supplies--\$5,000—Funds will purchase office supplies (\$1,000) related to project planning and reporting and for printing/postage of outreach material (\$4,000) including a mailing of an annual report to an estimated 3,000 Alaskan IFQ and fixed gear permit holders.

Indirect--\$6,189—Applicants request an indirect rate of 10% be applied exclusive of contract and equipment line items. Funds will cover ALFA overhead costs including audits, facility rent,

phone, internet, insurance, employee supervision, employee training, and other organizational expenses related to normal business operations.

Budget Table 1: Planning and Reporting

Planning and Reporting 2/1/2014 - 2/01/15		
Personnel	ALFA Staff	\$30,000
	Total Personnel	\$30,000
Contract	Research coordinators	\$10,000
	Project Partners	\$53,429
	Media	\$3,000
	Accounting	\$5,000
	Legal	\$2,500
	Total Contract	\$73,929
Travel	Project Cord	\$5,500
	Research Cord	\$5,000
	Project Partners	\$16,388
	Total Travel	\$26,888
Equipment		
	Total Equipment	\$0
Supplies	Office Supplies	\$1,000
	Report printing	\$4,000
	Total supplies	\$5,000
Indirect		\$6,189

Planning/Reporting Total

\$142,006

9.2 Budget Narrative 2014 Field Services--\$775,119 Total

Personnel--\$99,000—Funds will support a 0.5 FTE (\$44,000) ALFA Project Manager engaged in implementing the 2014 experimental design and sampling plan, coordinating logistics among project partners and participating vessels, supervising initial data review logistics, data base development, budget management, reporting requirements, and overall project management. Funds will also support two 0.5 FTE Port Coordinator position (\$50,000 total), one in Sitka and one in Petersburg. These positions will be supervised by the Project Manager and will provide the detailed logistical coordination to ensure local technician are trained on EM system installs, up to 20 NMFS referred vessels in each port are engaged in the project and installation schedules coordinated, quality control visits to participating vessels after the initial trip are made, any necessary follow-up visits from EM hardware providers to resolve technical issues are coordinated, and dockside monitoring of unloads are scheduled and performed. Port Coordinators will also be responsible for data retrieval, copying, and transmission to PSMFC for review.

Contract-\$377,639—Funds will be used to contract for Port Coordinators in Homer and Kodiak (\$55,575) to perform the duties described above. Funds will also be used for Project Research Coordinators (\$10,000) to evaluate in-season management decisions related to the sampling plan and review initial data. Funds for contracts with project partners AMR, Saltwater Inc., and PSFMC (\$258,564) will be used to train local technicians to install EM systems on vessels, perform the installations on up to 20 vessels/port, and provide support services such as system maintenance, repair and trouble-shooting. Funds will support dockside monitoring of rockfish unloads (\$20,000) by trained technicians. Funds will also support installation of EM systems on the AFSC Sablefish survey vessels and on an IPHC Survey vessel (\$21,000) to pilot test the ability of EM systems to accurately extract length data during manual video review. Applicants also request \$10,000 in contract contingency funds to meet unanticipated needs, services, and opportunities.

Travel-\$19,250—Funds will support travel for the project Coordinator (\$5,000) to each participating community to coordinate with local stakeholders and EFP project personnel. Funds will support travel for local technician training in Sitka and Petersburg (\$8,950). Applicants also request contingency travel funds (\$5,300) to meet unexpected needs and opportunities.

Equipment--\$244,224—Funds will purchase 22 EM (\$218,414) systems for the EFP project, which will include 2 cameras per system, hydraulic sensors, rotations sensors, motions sensors, and computer control boxes with hard drives from project partners. Funds will be spent on one set of spare parts (\$21,182) including cameras (but excluding the computer control boxes) for each of the four communities to ensure reliability and allow additional vessels to be pre-wired if

practical. Finally, funds will also be spent to acquire 20 additional hard drives (\$4,628) to allow continuous system operation and data transfer from participating vessels.

Supplies—\$26,074—Funds will be spent for EM system shipping (\$3,735), hard drive shipping to PSMFC (\$3,600), office supplies (\$1,500), program supplies (\$4,000) for materials related to EM system installations and support, and supplies for Port Coordinators (\$13,239), including computers, software, office, and other necessary items to establish a local capacity.

Indirect--\$13,932—Applicants request an indirect rate of 10% be applied exclusive of contract and equipment line items. Funds will cover ALFA overhead costs including audits, facility rent, phone, internet, insurance, employee supervision, employee training, and other organizational expenses related to normal business operations.

Budget Table 2: Field Services

Field Services 2/1/2014 – 2/01/15		
Personnel	ALFA Staff	\$44,000
	Sitka & Petersburg Port Cord.	\$50,000
	Total Personnel	\$94,000
Contract	Port cord	\$55,575
	Research cord	\$10,000
	Project Partners	\$258,564
	Dockside monitoring	\$20,000
	Legal	\$2,500
	Survey Vessel Projects	\$21,000
	Contingency	\$10,000
	Total Contract	\$377,639
Travel	Project Cord	\$5,000
	Project partners	\$8,950
	Contingency	\$5,300
	Total Travel	\$19,250

Equipment		
	22 EM systems	\$218,414
	Spare parts	\$21,182
	Hard drives	\$4,628
	Total Equipment	\$244,224
Supplies		
	EM System and Hard Drive Shipping	\$7,335
	office supplies	\$1,500
	program supplies	\$4,000
	Port Coordinator supplies	\$13,239
	Total supplies	\$26,074
Indirect		\$13,932
	Field Services Total	\$775,119

9.3 Budget Narrative Data Review--\$171,343 Total

Contract-\$166,283— Funds will support PSMFC (\$110,000) in developing a data base for 2014 data, purchasing necessary software, reviewing an estimated 1,400 sets using methods described in the sampling plan, and contribute to report preparation. Funds will also allow Project Research Coordinators (\$20,000) to evaluate 2014 data, perform statistical analysis, evaluate alternative sampling designs and generate summary data on 2014 field services and collected data. Contracts with project partners AMR and Saltwater Inc. (\$18,783) will include funding to resolve technical issues identified by PSMFC reviewers as they review data. Contract funds will also be used to review data collected from the AFSC and IPHC survey vessel (\$7,500). Finally applicants are requesting a \$10,000 in contingency funds to support unanticipated data review needs and opportunities.

Travel-\$3,600—Funds will support travel for up to two trips by the Project Coordinator or Research Coordinators to Portland to meet with data reviewers as needed.

Supplies--\$1,000—Funds will purchase office supplies, hard drives, and pay for shipping related to the data review aspect of the project.

Indirect--\$460—Applicants request an indirect rate of 10% be applied exclusive of contract and equipment line items. Funds will cover ALFA overhead costs including audits, facility rent,

phone, internet, insurance, employee supervision, employee training, and other organizational expenses related to normal business operations.

Budget Table 3: Data Review

Data Review 2/1/2014 - 2/01/15	
Personnel	\$0
	\$0
<hr/>	
Contract	
Research Coordinators	\$20,000
PSMFC	\$110,000
Data Review support	\$18,783
Survey Data Review	\$7,500
Data review contingency	\$10,000
	\$166,283
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Travel	
Project Cord	\$3,600
	\$3,600
<hr/>	
Equipment	
	\$0
<hr/>	
Supplies	
Program supplies	\$1,000
	\$1,000
<hr/>	
Indirect	\$460
	\$460
<hr/>	
Data Review Total	\$171,343

9.4 Budget Table 4: Project Total

EM EFP Project Total 2/1/2014 - 2/01/15		
Personnel	ALFA Staff	\$74,000
	Sitka & Petersburg Port Coordinator	\$50,000
	Total Personnel	\$124,000
Contract	Port coordinator	\$55,575
	Research coordinator	\$40,000
	Project Partners	\$440,776
	Dockside monitoring	\$20,000
	Professional services	\$13,000
	Survey Vessel Projects	\$28,500
	Contingency	\$20,000
	Total Contract	\$617,851
Travel	Project Manager/research coordinator	\$19,100
	Project partners	\$25,338
	Contingency	\$5,300
	Total Travel	\$49,738
Equipment	EM systems, spare parts, and hard drives	\$244,224
	Total Equipment	\$244,224
Supplies	Shipping	\$7,335
	office supplies	\$3,500
	program supplies	\$17,239
	Printing	\$4,000
	Total supplies	\$32,074

Indirect	\$20,581
EM EFP Project Total	\$1,088,468

10.0 Tables and Figures

10.1 Tables

Table 1. Number of vessel covered for Year 1 by electronic monitoring (EM) for the different projects within this Exempted Fishing Permit (EFP) proposal.

Objective	Goal # vessels	% video reviewed per haul	Selection pool
Rockfish Identification	68	100	Vessel and trip selection pool
Catch Estimation	60	30	Vessel selection pool
Subsampling Rates	60	10, 30, 50, 100	Vessel selection pool
Frame Rates	8	30	Trip-selected
Seabirds	60	100	Vessel selection pool

Table 2. Total estimated number of hauls from vessel selection vessels that will be sampled for video review at each port over four sampling periods. Each port has vessels with different rates of hauls/day and days/trip; averages of these different rates were used to estimate hauls to be sampled (ALFA, 2012). Petersburg and Kodiak data were unavailable so Sitka and Homer rates were averaged for haul estimations.

Objective	Sitka		Homer		Petersburg		Kodiak		TOTAL
	hauls/day	days/trip	hauls/day	days/trip	hauls/day	days/trip	hauls/day	days/trip	
Average Rates:	1	4	2	3	1.5	3.5	1.5	3.5	
Rockfish Identification	60		90		79		79		308
Catch Estimation	160		320		240		240		960
Subsampling Rates	60		90		79		79		308
Seabirds	60		90		79		79		328

Table 3. Total estimated number of hauls from trip selection vessels that will be sampled for video review.

Objective	Goal # Vessels	Average Rates		Estimated # Hauls
		reviewed trips/vessel	hauls/trip	
Frame Rate	8	2	6	96

Table 4. Imagery quality classification used while reviewing imagery.

Classification	Description
High	Data are of superior quality; overall sensor and video data from all catch handling are clear and complete; retained and released catch can be detected and identified.
Medium	Data are of adequate quality; overall data from catch handling are complete and reasonably clear; retained and released catch can be detected and identified but with at a slightly slower pace.
Low	Data are of poor quality; overall data from catch handling are complete but not reasonably clear; retained and released catch can be detected and identified but with greater difficulty and at a much slower pace
Unusable	Data are not usable; data from when catch was handled may be incomplete and/or catch may not be detected or identified from the video.

10.2 Figures

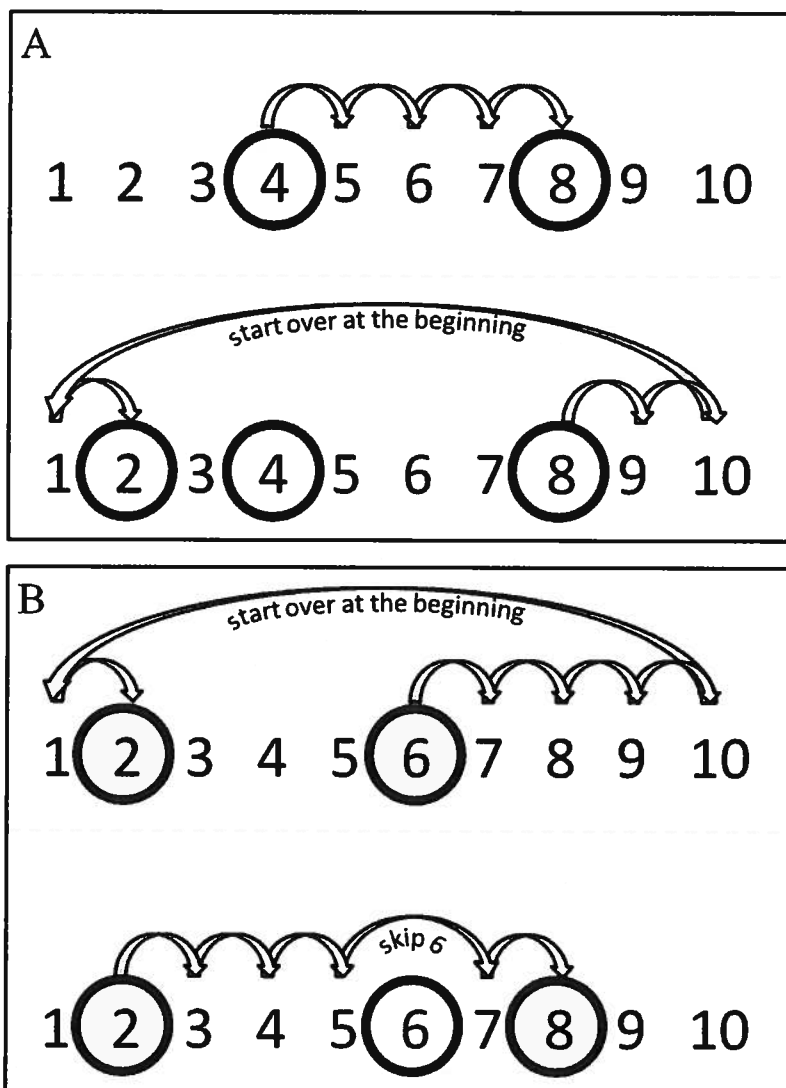


Figure 1. Randomly selecting time segments from haul video: (A) An example if the number from the random number table is 4 shows that you would review time segments 2, 4, and 8. (B) If the number is 6, using that number to begin the segment selection and counting up 6 to select the next two segments, the segments reviewed are 2, 6, and 8. When going through the numbers, you should skip over any that have already been selected.

Appendix A

10.3 Random Number Tables (See Section 6.4: Sub sampling Rates: *haul sampling*)

Random Number Table A

2	8	5	1	2	8	8	7	7	10	7	8	5	6	2	9	7	10	4
9	2	10	8	5	8	8	1	3	6	5	5	4	4	8	1	1	5	7
3	5	4	1	7	8	4	5	5	7	1	10	3	1	2	3	6	4	4
2	10	5	3	5	5	10	6	4	2	3	10	7	5	4	5	4	10	9
4	5	3	1	6	1	4	10	8	6	9	7	7	1	1	3	9	9	10
7	5	6	3	8	3	3	6	4	10	5	10	3	1	10	2	2	1	1
2	9	10	3	2	7	9	8	2	7	1	7	3	8	1	3	8	10	1
8	8	4	6	6	6	3	6	1	7	6	6	4	3	3	9	3	5	2
2	8	1	4	8	1	7	4	6	4	3	9	10	1	1	5	6	2	6
2	4	7	6	6	10	9	2	1	10	8	10	5	8	7	1	4	3	9
8	3	4	4	9	5	3	4	9	3	5	5	9	10	4	7	4	5	2
9	7	3	6	5	5	3	10	3	6	10	1	5	2	4	1	1	3	6
9	1	5	4	7	1	8	4	1	4	8	10	3	3	7	10	3	10	5
3	1	6	4	4	5	6	5	7	9	8	5	3	5	6	7	2	4	1
6	7	4	8	3	10	7	8	5	3	2	8	5	8	7	4	6	6	10
9	9	4	8	5	6	1	10	7	6	2	2	10	3	6	6	4	2	5
2	2	1	5	8	2	5	3	6	6	10	3	2	7	4	3	10	8	8
2	5	3	6	7	8	4	9	5	1	4	4	1	3	5	8	7	9	10
4	10	8	2	1	3	8	10	3	10	6	3	10	7	9	3	10	9	3
1	2	2	8	8	3	10	9	1	1	3	8	9	4	5	7	4	8	1
7	1	10	4	3	2	2	8	5	9	6	4	2	7	9	5	3	6	7
6	6	6	4	8	8	5	2	2	7	1	10	2	10	5	10	1	7	9
6	9	5	8	8	10	8	1	2	2	3	10	10	5	9	5	8	7	8
9	6	8	7	9	10	6	2	7	1	4	9	10	2	7	6	3	1	6
6	1	6	2	6	8	5	7	4	2	8	10	10	1	2	5	2	4	5
9	5	6	7	8	5	7	3	8	5	4	2	10	2	6	7	9	2	2
5	9	8	1	3	7	3	9	7	2	1	9	10	10	6	7	2	7	3
8	1	10	6	2	10	6	2	8	7	5	6	1	8	1	9	6	4	2
9	8	7	10	6	8	4	4	1	10	5	10	3	5	4	3	4	1	10
8	4	5	9	6	10	1	1	2	7	4	5	3	2	9	6	2	1	4
1	5	8	3	3	4	10	4	10	9	2	3	6	9	10	3	3	4	10
1	3	3	10	2	7	5	10	1	4	8	8	3	2	2	10	6	8	10
3	1	2	3	8	3	8	1	3	10	6	8	10	1	9	7	5	1	1
6	1	9	9	6	1	4	8	8	7	2	6	3	2	7	6	1	10	7
5	5	6	4	1	8	6	9	6	4	3	8	1	7	8	2	2	7	6
9	6	2	7	6	2	3	1	5	10	1	5	7	1	7	1	5	4	4
4	10	10	7	1	5	5	7	6	1	4	1	10	10	3	3	9	6	8
3	3	6	4	1	1	1	5	7	9	1	6	2	2	9	8	6	9	4
6	6	10	5	4	2	1	10	9	1	1	2	5	4	8	8	2	7	4
6	7	3	3	7	7	6	6	3	7	9	4	3	5	9	3	8	1	4
8	2	3	7	2	10	5	2	4	10	5	7	10	10	3	7	2	1	1

Random Number Table B

3	9	5	7	8	2	4	2	7	7	8	3	6	8	3	1	2	5	3
2	8	5	7	10	8	4	2	4	1	7	4	3	1	1	9	8	3	4
3	10	4	10	6	5	10	1	6	10	9	8	10	9	2	8	3	5	8
4	8	3	3	10	1	2	4	6	3	5	6	7	5	4	6	1	8	4
4	2	9	5	4	2	1	10	5	9	7	10	2	3	3	8	10	2	3
6	8	6	5	9	8	9	3	8	8	5	5	2	9	7	2	2	3	2
10	2	6	10	10	3	3	5	1	10	4	7	6	8	5	8	4	1	4
10	8	8	7	1	8	4	3	3	8	4	10	2	6	10	1	8	2	7
7	2	7	8	7	2	4	10	9	10	9	4	8	5	6	10	5	10	6
3	1	1	8	3	9	9	10	4	3	3	6	4	10	6	7	8	7	1
8	1	4	4	10	4	6	7	7	10	2	4	7	6	1	7	2	3	1
5	6	6	7	9	4	3	8	7	5	10	4	8	8	10	9	1	5	1
9	1	8	5	3	1	3	2	5	3	6	2	5	8	1	9	4	5	6
9	4	3	8	9	6	7	3	5	6	8	2	10	8	10	10	6	7	7
5	6	9	5	3	2	9	10	4	3	5	6	2	1	4	10	1	8	4
10	3	10	3	6	1	10	6	6	1	3	8	4	10	7	1	4	8	5
2	2	4	9	5	1	3	7	5	7	10	3	9	1	4	5	1	5	5
5	10	4	3	7	8	6	9	1	10	8	1	7	9	5	1	5	6	4
1	9	2	6	2	10	10	4	5	4	6	6	1	4	8	10	10	10	9
1	9	6	7	9	5	6	6	2	9	7	2	3	10	7	1	10	2	5
6	3	9	7	10	8	10	8	10	7	8	1	6	9	7	10	1	9	10
8	3	8	7	3	10	9	10	5	5	10	3	6	8	10	10	9	10	6
3	6	4	5	10	2	7	2	2	3	8	4	1	2	5	8	5	8	8
3	9	3	10	1	4	10	4	1	1	6	7	3	6	8	1	2	2	6
8	9	8	1	10	7	5	1	3	1	4	5	9	9	1	6	7	8	1
3	9	1	4	6	3	3	7	3	8	5	2	4	2	2	6	7	6	10
9	10	5	1	4	6	8	10	5	4	4	4	10	10	5	1	2	1	6
3	3	8	2	4	2	3	7	4	9	10	10	7	6	10	3	1	2	6
2	1	8	5	5	7	4	5	1	1	9	3	7	4	7	4	1	10	10
8	8	8	3	2	3	1	2	3	4	9	5	9	8	4	6	1	7	1
10	6	5	7	4	8	2	7	8	7	8	8	6	4	8	6	8	3	1
6	2	5	4	2	5	8	10	1	9	1	2	8	6	3	10	6	6	2
5	1	6	1	9	4	4	9	5	7	10	9	3	5	10	3	4	9	7
3	7	2	2	3	1	2	5	1	1	8	7	3	3	10	5	10	10	8
3	3	2	7	9	3	3	3	4	6	7	5	6	1	4	8	8	3	7
10	8	10	9	2	8	5	6	2	5	9	9	8	5	8	1	8	8	8
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10	5	1	6	3	7	8	4	10	8	5	4	7	10	2	5	10	7	3
10	4	9	8	6	10	1	9	8	9	8	1	6	9	2	7	8	3	5

10 10 3 9 10 3 9 4 5 3 2 3 3 1 2 3 5 10 2
9 1 10 5 6 10 4 6 8 2 7 3 1 7 8 3 2 10 4

Random Number Table C

8 9 3 9 6 7 3 8 6 5 7 9 8 3 5 8 6 4 3
2 10 7 10 5 10 4 1 4 7 4 5 3 7 2 3 10 2 9
8 1 2 3 8 4 4 1 4 6 9 5 3 8 2 1 1 4 9
10 7 8 5 10 5 4 5 4 1 3 3 3 8 6 9 10 7 1
10 1 2 8 7 5 5 7 10 6 9 7 8 5 5 3 8 8 6
4 4 6 1 6 7 9 10 8 7 3 6 4 8 7 8 2 4 9
2 3 3 3 6 3 2 10 10 2 7 8 4 4 6 4 1 1 8
5 5 10 9 10 2 1 5 1 10 10 2 5 8 1 9 8 9 1
3 1 7 3 1 2 7 8 1 5 3 9 1 5 6 1 10 3 6
6 2 8 9 2 3 6 9 4 8 3 7 5 7 6 6 4 9 2
10 6 8 2 9 3 10 9 8 8 6 7 6 2 3 7 1 4 3
9 8 5 3 2 3 2 6 7 2 2 10 8 2 7 5 3 8 2
4 9 8 4 1 1 1 5 9 6 4 8 1 1 9 10 5 7 3
3 8 1 7 3 5 1 4 4 10 8 1 1 8 9 5 6 2 6
2 1 10 7 6 1 6 10 7 1 10 1 8 5 9 7 4 10 2
8 4 1 10 9 9 4 10 9 9 3 3 2 2 1 3 6 2 5
2 8 4 10 1 8 5 7 5 2 10 5 9 4 6 1 4 1 2
6 6 10 4 10 1 6 7 4 7 5 9 3 8 7 10 9 9 5
10 10 6 10 9 3 1 3 7 8 8 3 7 7 1 7 2 6 2
6 4 5 9 1 4 3 3 9 7 9 4 6 3 5 10 1 5 9
10 4 3 6 4 5 7 3 8 8 7 1 3 9 5 5 1 2 7
5 1 3 9 9 1 5 8 9 9 8 3 7 9 6 3 3 10 5
1 10 2 8 9 10 5 2 1 10 7 1 9 2 8 6 6 7 8
7 3 4 4 10 6 4 3 4 5 10 4 2 9 9 4 5 9 8
5 3 8 9 10 2 3 1 2 6 1 6 5 1 5 6 8 10 3
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1 5 6 5 6 5 8 4 9 6 10 4 10 9 9 4 1 7 8
4 6 8 9 9 9 10 3 2 6 7 10 9 5 10 9 10 4 4
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6 4 2 1 9 4 9 9 8 3 3 7 6 10 7 8 7 3 8
10 1 7 6 10 10 8 6 5 10 4 3 1 8 1 9 9 7 2
9 7 1 9 9 5 2 1 9 10 2 2 10 1 1 2 7 4 2
1 7 3 8 7 6 9 6 9 2 10 2 4 6 3 10 4 5 9
8 10 10 9 4 3 8 2 4 5 4 7 2 1 7 1 5 5 8
2 9 1 5 10 6 2 5 6 4 7 9 7 4 3 9 10 7 3
1 5 5 9 7 7 4 4 2 10 2 7 7 1 2 6 6 4 2
9 5 9 3 10 5 6 6 10 2 4 9 2 8 5 10 10 8 10
10 10 7 8 5 5 3 2 1 7 6 5 7 2 7 6 9 8 5
7 1 7 7 1 3 1 6 10 7 1 1 5 9 3 3 5 6 4

3	10	10	7	2	10	2	4	2	1	10	6	2	5	3	4	5	1	6
6	5	10	2	7	7	7	8	9	8	10	6	10	2	5	6	4	4	9
9	2	2	2	3	7	3	5	8	7	8	10	4	8	10	3	4	2	5

