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Regulatory Amendment

**Fishery Ecosystem Plan
for the Pelagic Fisheries of the Western Pacific Region**

**Mandatory Electronic Reporting for the Hawaii and American Samoa
Longline Fisheries**

April 23, 2021

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Regulatory Amendment
Fishery Ecosystem Plan for the Pelagic Fisheries of the Western Pacific Region
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Mandatory Electronic Reporting for the Hawaii and American Samoa Longline Fisheries
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National Oceanic & Atmospheric Administration (NOAA)

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Abstract

The Hawaii and America Samoa longline fisheries operate under limited entry permits under the Pelagic Fishery Ecosystem Plan (FEP). Vessel operators under these permits must submit federal logbooks with an accurate and complete record of catch, effort and other data. A regulatory amendment implemented in 2007 authorized the optional use of electronic logbook forms and submission of data through over-the-air transmissions (e.g., satellite systems) for federal permit holders who fish for Western Pacific management unit species (MUS) under any of the Western Pacific Regional Fishery Management Council's FEPs (formerly Fishery Management Plans), including the Pelagic FEPs. Electronic Reporting (ER) can allow for near real-time data submission that increases accuracy, reduces data processing time, and more rigorously monitors and forecasts the attainment of international longline catch quotas. Since the implementation of the optional ER program, the National Marine Fisheries Service (NMFS) and the Council have supported development of Elog-It, an electronic logbook application for use in the Hawaii and American Samoa longline fisheries.

The Council recommended a regulatory amendment for mandatory electronic reporting for vessels operating under the Hawaii longline limited entry permit and vessel size classes C and D

under the American Samoa longline limited entry permit. Specifically, the proposed action would:

a. Require applicable vessel operators to record and submit logbook data electronically using a NMFS-certified electronic logbook application;
b. Require daily submission of electronic logbook data (24 hours after completion of each fishing day); and
c. In the event of technology malfunction with hardware, software, or transmission, logbook data should be submitted by paper or electronically within 72 hours of the end of each fishing trip.

The Council additionally recommended a target implementation of July 1, 2021.

How to Comment

Instructions on how to comment on this document and the associated proposed rule can be found by searching on RIN 0648-BK28 at www.regulations.gov or by contacting the responsible official or Council at the above address. Comments are due on the date specified in the instructions.

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1   INTRODUCTION

The Western Pacific Regional Fisheries Management Council (Council) and the National Marine Fisheries Service (NMFS) manage fishing for pelagic management unit species (PMUS) in the U.S. Exclusive Economic Zone (EEZ or federal waters, generally 3–200 nautical miles or nm from shore) around American Samoa, Guam, the Commonwealth of the Northern Mariana Islands (CNMI) and Hawaii, and on the high seas through the Pelagics Fishery Ecosystem Plan FEP (FEP) as authorized by the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act; 16 U.S.C. § 1801 *et seq.*).

The Hawaii-based longline fishery and America Samoa longline fishery operate under longline limited entry permits. There are 164 Hawaii permits, 150 of which were actively fished in 2019 and a maximum of 60 American Samoa permits, 17 of which were actively fished in the South Pacific Ocean in 2019. Vessels operating under these permits are required to submit federal logbooks with an accurate and complete record of catch, effort, and other data. A regulatory amendment implemented in 2007 authorized the optional use of electronic logbook forms and submission of data, or electronic reporting (ER), through over-the-air transmissions (e.g., satellite systems) for federal permit holders that fish for Western Pacific management unit species under the then Pelagics, Coral Reef Ecosystems, Crustaceans, and Precious Corals, and Bottomfish Fishery Management Plans.

Since the implementation of the optional ER program, the National Marine Fisheries Service (NMFS) and the Council have supported development of Elog-It, an electronic logbook application for use in the Hawaii and American Samoa longline fisheries. Approximately 60 vessels in the Hawaii fleet are currently using Elog-It, with training in progress to provide the ER tablet and training to that fleet's remaining vessels.

ER can allow for near real-time data submission that increases accuracy, reduces data processing time, and more rigorously monitors and forecasts the attainment of international longline catch quotas. Both the Council and NMFS have supported the development of an ER system for use in the Hawaii and American Samoa longline fisheries. The Council took final action on mandatory implementation of ER in Hawaii and American Samoa longline fisheries at its 183rd Meeting in September 2020, and recommended a target implementation date of July 1, 2021.

1.1   Proposed Action

The Council recommended a regulatory amendment for mandatory electronic reporting for vessels operating under the Hawaii longline limited entry permit and vessel size classes C and D under the American Samoa longline limited entry permit (Sub-Alternative 1b). Specifically, the proposed action would:

   a. Require applicable vessel operators to record and submit logbook data electronically using a NMFS-certified electronic logbook application;
   b. Require daily submission of electronic logbook data (24 hours after completion of each fishing day); and

c. In the event of technology malfunction with hardware, software, or transmission, logbook data should be submitted by paper or electronically within 72 hours of the end of each fishing trip.

1.2 Purpose of the Proposed Action

The purpose of this action is to require ER for certain vessels operating under Hawaii and American Samoa longline limited entry permits under the Pelagics FEP to allow for near real-time data submissions to increase accuracy, reduce data processing time, and more rigorously monitor and forecast the attainment of international longline catch quotas.

At present, the Council and NMFS manage US longline bigeye tuna catch limits and allocation limits between US Participating Territories and US-permitted vessels, which require forecasts of bigeye tuna catches throughout the fishing season to inform in-season management. Near-real-time reporting via ER will add precision to these forecasts and will improve timeliness for enacting in-season accountability measures for catch or effort limits. This action is needed to ensure that the Hawaii and American Samoa longline vessels have the opportunity to maximize sustainable catch of bigeye and other PMUS to meet US market demands while streamlining effectiveness of catch accounting.

1.3 Initial Council Actions

The Council at its 174th Meeting in October 2018, recommended as initial action requiring mandatory ER in the Hawaii longline fishery operating under the Pelagics FEP. Subsequently, the Council at its 178th Meeting in June 2019, requested the Pacific Islands Fisheries Science Center (PIFSC) to convene an Electronic Technologies Steering Committee (ETSC) to address implementation challenges. In response to the initial recommendations from the ETSC, the Council at its 180th Meeting in October directed staff, in coordination with the ETSC, to develop an options paper regarding mandatory ER cost allocation, the necessary regulatory and non-regulatory changes for requiring daily ER transmissions, and the system requirements for providing data access to vessel owners and/or operators.

At its 181st meeting in March 2020, the Council reviewed the options paper and recommended setting a target implementation date of January 1, 2021, for requiring mandatory ER in the Hawaii longline fishery. Furthermore, the Council directed staff to prepare the necessary amendment package with analysis and draft regulations for requiring mandatory reporting for the Hawaii longline fishery with a target final action schedule for the September 2020 Council meeting. The Council further directed that the analysis should build on the options paper, including considerations for the 2013 NMFS Policy on Electronic Technologies and Fishery-dependent Data Collection (revised May 2019).

At its 182nd Meeting in June 2020, the Council reviewed the Pacific Islands Region ER Implementation Plan and considered inclusion of the American Samoa longline fishery in the action because the American Samoa vessels catch a small, yet significant tonnage of Western and Central Pacific (WCPO) bigeye tuna which are attributed and shared among American Samoa and US-permitted vessels under catch and allocation limits under the Pelagic FEP

Amendment 7. The Council directed staff to work with PIFSC to convene a meeting with American Samoa longline owners to discuss the inclusion of American Samoa in the ER Implementation Plan and to include an American Samoa representative in its ETSC. The Council also directed staff to include the American Samoa longline fishery in the mandatory electronic reporting amendment package scheduled for final action at the September meeting, and recommended setting a target implementation date of October 1, 2021. Lastly, the Council requested PIFSC work with the American Samoa longline fishery to begin training and rollout of the electronic reporting system as soon as possible.

At its 183rd Meeting in September 2020, the Council reviewed the draft regulatory amendment and took final action to require mandatory electronic reporting on vessels operating under the Hawaii longline limited entry permit and vessel size classes C and D under the American Samoa longline limited entry permit. Specifically, the Council recommended requiring applicable vessel operators to record and submit logbook data electronically using a NMFS-certified electronic logbook application; requiring daily submission of electronic logbook data (24 hours after completion of each fishing day); and, in the event of technology malfunction with hardware, software, or transmission, logbook data should be submitted by paper or electronically within 72 hours of the end of each fishing trip. In recommending the applicable vessels, the Council considered the volume of catch of PMUS that require in-season catch monitoring (e.g. bigeye tuna) and the availability for a mechanism to transmit data at-sea on a daily basis to achieve the purpose of mandatory ER. The Council also reviewed previous target dates for mandatory ER implementation (January 1, 2021 for Hawaii; October 1, 2021 for American Samoa) and recommended that mandatory ER be effective for specified vessels by July 1, 2021, in time for WCPO bigeye tuna in-season reporting requirements for that fishing year. The Council final action is herein identified as the preferred alternative.

1.4 Background

1.4.1 Overview of Existing Reporting and Recordkeeping Regulations

NMFS and the Council conduct several administrative processes relevant to managing fisheries under the Pelagics FEP, including fleet requirements for reporting and recordkeeping found at 50 CFR § 665.14. Based on Council final action at the 123rd Meeting in June 2004, NMFS published a final rule in April 2007 that allowed participants in U.S. domestic pelagic, crustaceans, bottomfish and seamount groundfish, precious corals, and coral reef ecosystems fisheries of the western Pacific region the optional use of NMFS-approved electronic logbook forms in lieu of paper logbooks (72 FR 19123, effective May 17, 2007; WPRFMC 2006). Subsequently, on July 7, 2009, NMFS published a notice in the Federal Register describing the certification requirements for the optional ER program (74 FR 32109).

Currently, the operator of a fishing vessel must maintain on board the vessel an accurate and complete record of catch, effort, and other data on paper logbook forms provided by the Regional Administrator, or electronically as specified and approved by the Regional Administrator. All information specified by the Regional Administrator must be recorded on paper or electronically within 24-hours after the completion of each fishing day. The logbook information, reported on paper or electronically, for each day of the fishing trip must be signed

and dated or otherwise authenticated by the vessel operator in the manner determined by the Regional Administrator, and be submitted or transmitted via an approved method as specified by the Regional Administrator within 72 hours of the end of each fishing trip.

1.4.2   The Benefits of Electronic Reporting and Near Real-Time Catch Estimation

The 2007 optional ER program was implemented, in part, because the processing of paper logsheets is associated with a two to three week delay from at-sea catch retention until a vessel lands in port and the data can be incorporated into databases. The purpose of the ER process is to allow for near real-time data submissions to increase accuracy, reduce data processing time, and more rigorously monitor and forecast the attainment of international longline catch quotas. NMFS limits the amount of bigeye tuna that US longline vessels may retain in the Western and Central Pacific Fisheries Commission (WCPFC) Convention Area and in the Inter-American Tropical Tuna Commission (IATTC) Convention Area. The annual bigeye tuna limit has changed periodically since 2009 (Table 1). The bigeye tuna limit for the WCPFC Area in 2019 was 3,554 metric tons (t) and applies to all pelagic longline vessels of Hawaii and the west coast of the United States. The limit for the IATTC Area in 2019 is 750 t and applies to all U.S. longline vessels greater than or equal to 24 meters (m) in length. In the WCPFC Area, when a catch limit is reached, fishing is restricted unless or until another limit is established for attributing additional bigeye tuna catch to a US Territory (e.g. American Samoa, Guam, and CNMI).

Throughout the year, the US cumulative catch in relation to the WCPFC and IATTC bigeye limits are estimated and a catch forecast is produced that predicts when the WCPFC catch limit will be attained. Current catch accountability is difficult as logbook data are reasonably accurate to approximately 17 days prior to the current date (e.g. logbooks submitted by 17 August would only be accurate to 1 August) due to unknown catch by vessels at sea. This is important because forecasting inaccuracy due to lack of near-time data streams have resulted in overages and underages of bigeye tuna catch with respect to the WCPFC and IATTC catch limits (Table 1). Since 2009, the WCPFC catch limit has been exceeded during two years and the IATTC catch limit has been exceeded during three years. Any overage in the WCPFC Convention Area is subtracted from the catch limit in the subsequent year; therefore the catch in the subsequent year will be reduced for a U.S. fleet that has been historically capable of attaining the limit. There is no provision in the WCPFC nor the IATTC to carry-over any unused portion of the catch limit in the subsequent year.

Table 1. U.S. bigeye tuna catch limits and catches (t) in the WCPFC and IATTC Convention Areas.

Year	WCPFC				IATTC (vessels ≥ 24 meters)			
	Limit (t)	Catch (t)	Overage (t)	Underage (t)	Limit (t)	Catch (t)	Overage (t)	Underage (t)
2019	3,554	3,521	-	23	750	510	-	240
2018	3,554	3,392	-	162	750	516	-	234
2017	3,138	2,948	-	190	750	481	-	269
2016	3,554	3,747	193	-	500	322	-	178
2015	3,502	3,427	-	75	500	549	49	-
2014	3,763	3,823	60	-	500	505	5	-
2013	3,763	3,654	-	109	500	586	86	-
2012	3,763	3,660	-	103	500	309	-	191
2011	3,763	3,565	-	198	500	337	-	163
2010	3,763	3,577	-	186	500	407	-	93
2009	3,763	3,741	-	22	500	199	-	301
Avg	-	-	127	119	-	-	47	209
St dev	-	-	94	69	-	-	41	66

Though not yet implemented domestically, the WCPFC also imposes a striped marlin catch limit which the Council has recommended for domestic implementation through a Hawaii-based longline catch limit. ER proactively reduces the management uncertainty of any in-season accountability measures based on logbook data that may be necessary for compliance with future RFMO or Council-recommended management actions.

For both operators and fisheries managers, there are other benefits to be gained through the implementation of ER beyond bigeye tuna quota tracking in the WCPFC and IATTC Convention Areas. This is due in large part to the efficiencies that can be gained utilizing mobile technologies.

For vessel operators, ER can provide a means to reduce reporting burdens (e.g., the time spent acquiring, filling out, and submitting paper logbooks), which can lead to more accurate reporting. For example, mobile technologies can automate data fields (e.g., locations, dates, etc.), limit user responses through dropdown menus and other data selection fields, and check for data entry errors in real-time. This can provide a faster, more accurate, recording of the day's fishing effort. Also, the use of mobile technologies eliminates the need to deliver paper logbooks 72 hours after the conclusion of fishing trip. For vessels operating out of California, ER further eliminates the needs to mail paper logbooks to NMFS in Hawaii. This also eliminates reporting burdens on vessel operators. Lastly, ER can provide user features and data visualizations that traditional paper logbooks cannot, such as set and trip summaries. NMFS is currently developing a web-based data portal to allow permit holders quicker access to logbook data. However, this web-based portal would be an additional feature, or "value-add", that is outside the current scope for developing a minimal viable product to meet program objectives. Additional features are subject to available NMFS resources for development.

For fisheries managers, ER can provide timelier and more accurate data, and eliminates the data-entry burden, among other timely administrative tasks. Currently, NMFS processes ~20,000

paper logbook forms per year. Errors can enter fishery data streams during human data entry, and the more data that are entered by humans the more potential errors there are. Because mobile technologies can automate and limit responses to data fields, they can also provide real-time quality control. For example, when invalid data are entered, the system responds with warnings. If the user has still not entered a valid response, the system may accept the invalid response, but flags it as invalid, and fisheries managers are then notified of potential inaccurate data reporting.

1.4.3 Status of the Current Electronic Reporting Project

Since 2014, PIFSC has received support from both the Council and the NMFS' Fisheries Information Systems Program to forward the development and implementation of ER in the Hawaii and American Samoa longline fishery. The objective of this project was to develop and implement a mobile application, "Elog-It", for electronic logbook data entry. This project includes development by both a software contractor, Quick Access Computing (QAC; developers of iFIMS) and PIFSC developers. Elog-It is a native Android application for use on the Android operating system only. Elog-It transmits encrypted data via satellite using the vessel's existing Vessel Monitoring System (VMS) to a QAC server where it is available for NMFS to securely retrieve. Currently QAC provides software updates which are available to download when operators return to port and connect to Wi-Fi.

As of August 2020, 60 of 150 active vessels under the Hawaii longline limited entry permit are participating in Elog-It (approximately 40% overall participation). From those 60 of those vessels, 697 trips and approximately 9,000 set forms have been submitted to NMFS using Elog-It. Only about 30 of the 9,000 set forms have failed requiring a resubmission, which represents 0.33%, or less than one percent of all electronic forms submitted. NMFS has acquired tablets to distribute to the remaining vessel under Hawaii and American Samoa (Class C and D) longline limited entry permits. Distribution and training of Elog-It tablets were delayed due to the COVID-19 pandemic, but is scheduled to resume in October 2020 through minimal-contact remote training approaches and is expected to be completed in advance of the target implementation date of July 1, 2021. NMFS is also developing instructional videos to facilitate remote training, and the Council is providing support for a Vietnamese-speaking outreach personnel to assist in training the Vietnamese-American sector of the Hawaii longline fleet. NMFS will also translate training materials into Samoan to facilitate training with American Samoa vessels.

Details of the ER system implementation are described in the Pacific Islands Region Longline Electronic Reporting Implementation Plan (APPENDIX A). The plan includes:
- Tablet Acquisition and Maintenance
- VMS Acquisition and Maintenance
- Data Quality and Reliability
- User Guide Documentation
- Data Security
- Encryption Key Management
- Initial Outreach, Training, and Setup
- Backend Data Retrieval and Processing
- Error Detection & Handling
- Access to Logbook Data
- Development and Testing
- Sustaining Costs
- Contingency Plans
- Tablet or Application Malfunction
- VMS Malfunction
- Technical Support

While the longline industry or a third party have had the option to develop alternative systems, the Elog-It application has been the only system developed and certified for use in the longline fishery to date.

1.5   List of Preparers

- Asuka Ishizaki, Protected Species Coordinator, WPFMC
- Mark Fitchett, Pelagic Ecosystem Scientist, WPRFMC
- Joshua Lee, Fisheries Management Specialist, NMFS PIRO SFD
- Keith Bigelow, Supervisory Research Fish Biologist, NMFS PIFSC

2   MANAGEMENT ALTERNATIVES

This section describes the alternatives that the Council considered at the 183rd Meeting. Comparison of features of the alternatives are summarized in Table 2.

Table 2. Comparison of Features of the Alternatives.

	Alternative 1: Mandatory ER (Preferred Alternative)	**Alternative 2: No Action (Optional ER Program)**
Overview	Vessel operators would be required to record and submit logbook data electronically using a NMFS-certified electronic logbook application	Fishery participants have the option of using electronic logbook forms or paper forms.
Reporting requirement	Maintain on board an accurate and complete record of catch: • <u>Electronically</u> using an electronic logbook application certified by NMFS • *Exception for hardware or software failure:* paper report forms provided by the RA	Maintain on board an accurate and complete record of catch: • On <u>Paper report forms</u> provided by the RA; <u>or</u> • <u>Electronically</u> as specified and approved by the RA
Submission requirement	• Submit electronic report to the RA within <u>24 hours after completion of each fishing day</u> using an electronic logbook application certified by NMFS • *Exception for hardware, software, or transmission failure:* submit electronic or paper report forms within 72 hours of the end of each fishing trip	Submit logbook to RA within <u>72 hours of the end of each fishing trip</u>
Applicability	***Sub-Alternative 1a:*** vessels operating under: • HILL limited entry permit ***Sub-Alternative 1b (preferred sub-alternative):*** vessels operating under: • HILL limited entry permit; and • ASLL limited entry permit, vessel size classes C & D (≥50ft)	All fisheries with federal permits under the 5 Council FEPs

2.1   Alternative 1 (Preferred): Mandatory ER – Require Vessel Operators to Record and Submit Logbook Data Electronically using a NMFS-certified Electronic Logbook Application

Under Alternative 1, vessel operators would be required to record and submit logbook data electronically using a NMFS-certified electronic logbook application. This mandatory program would also consist of an "open program" whereby operators have the choice between the existing Elog-It application, or to develop or purchase applications that meet NMFS certification guidelines for use in the fishery. Currently, the Elog-It application is the only system certified by NMFS to use in the longline fisheries operating under the Pelagic FEP. If additional applications are developed in the future, NMFS would review and certify it for use in the fishery under guidelines published in 2009 (74 FR 32109), or any update thereof. The existing Elog-It application uses the vessel's existing VMS system to transmit data in near real-time; however, VMS would not be a required component of an electronic logbook application as long as the system can meet the frequency and timing of data transmission described below. Sub-alternatives for the applicability of the mandatory ER are described below. This alternative would not change any of the required data elements currently reported through the paper logbooks.

Mandatory ER would increase the capability of expeditious in-season catch accounting for longline catch limits for US fisheries and/or allocation limits between US Participating Territories and US-permitted vessels. ER would streamline and add precision to catch forecasts of bigeye tuna (or any other pelagic fish) throughout the fishing season. These forecasts and catch monitoring inform in-season management in order to implement appropriate accountability measures. Additional benefits of mandatory ER are to reduce tedious data entry requirements for participating vessels and data processing for NMFS alike.

Because this alternative would only change the administrative mechanisms by which commercial fishing vessel permit holders submit reports, the alternative would not result in a substantial change in any of the following: Fishing location, timing, effort, authorized gear types, access to fishery resources or quotas. Therefore, there would be no impacts from the proposed action on any fishery resources or habitat managed under the Pelagics FEP, or on any associated protected resources.

Contingencies for Technology Failure

In the event that the hardware (e.g., tablet) and/or software (e.g., Elog-It application) malfunctions and the operator is unable to record data into the electronic logbook application, the operator would be required to record the remainder of the trip activities using paper logbook forms and submit them upon returning to port. Upon returning to port, the operator should notify NMFS that they will be submitting paper forms for the trip.

In the event of a transmission failure (e.g., VMS equipment failure but the tablet and application are still functioning; or tablet fails to transmit data due to no connectivity to the VMS), the operator would have the option to 1) continue to record the data electronically and request NMFS to assist in the submission upon returning to port; or 2) record the remainder of the trip

activities using paper logbook forms and submit them upon returning to port. If submitting paper forms, the operator should notify NMFS that they will be submitting paper forms for the trip.

Frequency and Timing of Data Submission

Vessel operators would be required to record and submit data electronically daily within 24 hours after the completion of each fishing day (i.e., after each hauling operation). Daily reporting of catch and effort data would facilitate improved monitoring and forecasting of international longline catch quotas. In the event of technology malfunction with the hardware, software, or transmission, and backup paper logbook forms are used in place, the vessel operator would be required to submit the paper forms within 72 hours of the end of each fishing trip. In the event of ER transmission failure and the operator continues to record their data electronically, the operator may request NMFS assistance with submission upon returning to port and would be required to submit the data electronically within 72 hours of the end of each fishing trip. Based on data from the voluntary ER program, submission failure rate is low, at less than one percent of all electronic forms submitted.

The lack of "near real-time" catch accounting has led to the Hawaii longline fishery having both underages and overages in its bigeye tuna quota management when NMFS has implemented in-season accountability measures such as closing the US longline fishery in the western and central Pacific Ocean, or attributing catches of Hawaii-permitted vessels to US Participating Territories under Amendment 7 of the Pelagics FEP. These situations prevent the fishery from fully utilizing its quota or result in penalized reductions of quota in the following year. At present, catch monitoring and projections rely on data from paper logsheets, and the Hawaii-permitted longline fishery closure is scheduled one week prior to a projected date of 50% probability of reaching the US longline quota for bigeye tuna. Any submission frequency longer than 24 hours from the end of hauling operations may reduce the efficacy of reaching the objective of increased precision for in-season catch accounting.

Cost

The Elog-It system is currently the only electronic logbook application certified by NMFS. NMFS would be responsible for providing and maintaining Elog-It software and tablets that meet minimum program specifications at no cost to fishery participants. This would allow NMFS the ability to "lock down" the mobile device and ensure that tablets are working as expected, and no other applications conflict with the ER software. There are no additional features such as email on the Elog-It tablets, and vessel operators would not be able to use the tablet for any additional applications other than ER.

Under the Elog-It system, NMFS would subsume satellite data transmission costs. The total cost to maintain the Elog-It system is variable and dependent on many factors such as fishing effort. Annual satellite data transmission costs fluctuate relative to fishing effort, and is estimated at approximately $49.00 per month per vessel, or a total of $96,432 annually for 150 vessels in the Hawaii longline fishery and 14 vessels in the American Samoa longline fishery, which allows a maximum of 25 kilobytes. NMFS and the NOAA Office of Law Enforcement (OLE) will bundle the existing VMS data costs with ER data transmission costs, which would eliminate the burden

for vessel operators to setup and maintain accounts with approved VMS providers. The tablet lifecycle is currently estimated to be three years with an annual cost of approximately $40,000 based on an anticipated 50 tablets procured each year at $800 per tablet.

If industry or other third-party-funded applications are developed in the future, NMFS would review and certify those applications for use in the fishery under guidelines published in 2009 (74 FR 32109), or any update thereof. No alternative application has been developed to date, and none are in development at this time. The cost to fishery participants of any future application is unknown at this time, but may include equipment costs, data transmission costs, and/or software subscription fees. NMFS may consider bundling ER transmissions with the existing VMS data costs for any future applications.

Permit Types Affected

The Council considered mandatory ER for the Hawaii longline and American Samoa longline fisheries. Specific permit types that may be affected are the Hawaii longline limited entry permit, and vessel size classes C and D ($\geq$ 50 ft) under the American Samoa longline limited entry permit, which are described in further detail under the sub-alternatives below. These permit types comprise nearly all of the longline catches under the Pelagic FEP that affect in-season catch accounting for longline catch limits for US fisheries and/or allocation limits between US Participating Territories and US-permitted vessels.

The remaining longline permit types under the Pelagic FEP are not included in the scope of this regulatory amendment. Very few vessels have actively fished in recent years under the American Samoa limited entry permit vessel size classes A or B (<50ft) or the Western Pacific general longline permit, and thus catch from these vessels have minimal impact on in-season catch accounting. Additionally, vessels operating under these permits are not required to carry VMS under the Pelagic FEP, and currently do not have a mechanism to allow for daily reporting while at sea with the existing Elog-It system. Vessels operating under the American Samoa limited entry permit vessel size classes A or B (<50ft) or the Western Pacific general longline permit would continue to operate under the existing optional ER program with the option to submit logbooks electronically within 72 hours of the end of each fishing trip.

Sub-Alternative 1a: Require Mandatory ER for Vessels Operating under the Hawaii Longline Limited Entry Permit

Under Sub-Alternative 1a, only vessels operating under the Hawaii longline limited entry permit would be required to submit reports electronically through a NMFS-certified electronic logbook application. Mandatory ER for vessels operating under the Hawaii longline limited entry permit would allow catches of bigeye tuna by these vessels to be more precisely attributed to US Participating Territories under agreements pursuant to Amendment 7 of the Pelagics FEP.

If mandatory ER is limited to Hawaii-permitted vessels and do not include vessels operating under the American Samoa longline limited entry permit vessel size class C and D, the ability to manage catch limits for those fisheries pursuant to Amendment 7 to the Pelagics FEP will be less

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precise for in-season catch monitoring and may also result in under-utilization or overages of catch.

Sub-Alternative 1b (Preferred): Require Mandatory ER for Vessels Operating under the Hawaii Longline Limited Entry Permit and the American Samoa Longline Limited Entry Permit Vessel Size Classes C and D

Under the preferred Sub-Alternative 1b, vessels operating under the Hawaii longline limited entry permit and vessels of size classes C or D (≥ 50 ft) operating under the American Samoa longline limited entry permit would be required to submit reports electronically through a NMFS-certified electronic logbook application. Sub-Alternative 1b would require mandatory ER on vessels operating under longline permits that comprise nearly all of the longline catches under the Pelagic FEP that affect in-season catch accounting for longline catch limits for US fisheries and/or allocation limits between US Participating Territories and US-permitted vessels. Additionally these vessels are currently required to carry VMS and have a pre-existing mechanism for daily data transmission, which would allow for immediate implementation of ER through the existing Elog-It system.

Mandatory ER for Hawaii-permitted vessels and American Samoa-permitted vessels 50 ft in length or greater would provide consistent reporting systems for both longline fisheries currently operating under the Pelagics FEP. Bigeye tuna catch and allocation limits for American Samoa may be used by both American Samoa-permitted vessels and Hawaii-permitted vessels under specified agreements between vessels from Hawaii and American Samoa under Amendment 7 to the Pelagics FEP. Mandatory ER for both fleets would allow for more precise specifications and accounting of bigeye tuna (or any other pelagic species) so that American Samoa's catch and allocation limits are managed optimally for vessels under both permits.

2.2   Alternative 2: No Action/Status Quo (Optional ER)

Under Alternative 2, NMFS would continue to allow fishery participants the option of using NMFS-certified electronic logbook applications in substitution of paper logbook forms to meet the recordkeeping and reporting requirements found at 50 CFR § 665.14. For operators who choose to use ER, traditional paper logbook forms would only be used in situations of technology malfunctions. This optional program would also consist of the "open program" whereby operators have the choice between the existing Elog-It application, or to develop or purchase ER applications that meet NMFS certification guidelines for use in the fishery.

Under Alternative 2, NMFS would subsume all program costs for the NMFS-certified Elog-It system. The total cost to maintain the Elog-It system is variable and dependent on many factors such as fishing effort. Annual satellite data transmission costs fluctuate relative to fishing effort, and is estimated at $49.00 per month per vessel, or a total of $96,432 annually for 150 vessels in the Hawaii longline fishery and 14 vessels in the American Samoa longline fishery, which allows a maximum of 25 kilobytes. NMFS and the NOAA OLE will bundle the existing VMS data costs with ER data transmission costs, which would eliminate the burden for vessel operators to setup and maintain accounts with approved VMS providers. The tablet lifecycle is currently estimated

to be three years with an annual cost of approximately $40,000 based on an anticipated 50 tablets procured each year at $800 per tablet.

If industry or any other third-party ER applications are developed in the future, NMFS would review and certify those applications. No alternative application has been developed to date, and none are in development at this time. The cost to fishery participants of any future application is unknown at this time, but may include equipment costs, data transmission costs, and/or software subscription fees.

Under Alternative 2, NMFS would continue to perform outreach and trainings to encourage the use of Elog-It in the fishery under no specific timeline. However, some vessels may opt out of the Elog-It system and continue to use paper logsheets without a requirement for mandatory ER.

With an optional ER program, in-season management of bigeye tuna (or any pelagic) catch limits would continue to be less timely and less accurate compared to a mandatory program under Alternative 1 in which all longline vessels with significant catch in Hawaii and/or American Samoa would be reporting data near-real time. As stated in prior sections, expedient reporting renders more precision in catch forecasts used to enact in-season accountability measures. Alternative 2 would also likely result in continued underages and overages of the US longline bigeye tuna quota and attribution of catch to US Participating Territories. The potential benefits of timely data entry and auto-population of data fields would not be consistent across the fleet as vessel operators would have the option of continuing to use paper logsheets.

3   IMPACTS OF THE PROPOSED ACTION AND ALTERNATIVES

As described below, this action is administrative in nature and will not result in a substantial change in any of the following: Fishing location, timing, effort, authorized gear types, access to fishery resources or harvest levels. As such, it qualifies for a categorical exclusion (CE) from NEPA requirements to conduct an Environmental Assessment (EA) or Environmental Impact Assessment (EIS).

3.1   Impacts on Fishery Resources

The alternatives address purely administrative mechanisms by which Federal permit holders in Council-managed commercial fisheries would report data and would have no impacts on pelagic resources. Electronic reporting would not affect fishing vessel effort, operations, species targeted, or areas fished. Moreover, there would be no direct impacts of the proposed action on any fishery resources managed under the Council's Pelagics FEP. This action will likely have some positive impacts on the management capabilities for fishery resources by improving data available to fishery scientists and mangers. The implementation of electronic reporting would provide a near-real time catch monitoring for implementing accountability measure for the purpose of bigeye tuna quota management and for management of incidental species of concern (i.e., striped marlin) which may have catch and/or retention limits. The alternatives would provide a means to optimally utilize target species while reducing the probability of overfishing.

3.2 Impacts on Protected Resources

Similar to the impacts on fishery resources, due to the administrative nature of the measures under consideration, there would be no impact on protected resources. The alternatives would not directly result in a substantial change in fishing location, timing, effort, access to fishery resources or propensity to encountering protected species.

3.3 Impacts on Habitat

Because the proposed action is purely administrative, there will be no impacts on habitat or essential fish habitat (EFH). Similar to impacts on fishery resources and protected resources, the alternatives would not result in a change to fishery operations (fishing location, effort distribution, fishing gears, access to fishery resources, or harvests).

3.4 Impacts on Socioeconomic Setting

Because the alternatives are purely administrative and NOAA is fulfilling the costs of the hardware (tablets) and transmission costs (via Iridium) under the existing Elog-It system, there are no socioeconomic changes or expected economic burdens on the fishery. Training for use and implementation of the Elog-It tablets has been fulfilled by NOAA and through the use of an interpreter to ensure that Vietnamese-speaking operators are effectively trained. Instructions and manuals on implementation will be provided through the native language of operators.

While industry or other third-party-funded applications may be developed in the future, no alternative application has been developed to date, and none are in development at this time. The cost to fishery participants of any future application is unknown at this time, but may include equipment costs, data transmission costs, and/or software subscription fees. NMFS may consider bundling ER transmissions with the existing VMS data costs for any future applications.

There may be some anticipated temporary reporting burden in the early phases of implementation of the proposed action. Once operators are accustomed to the use of the Elog-It system, reporting fields will be pre-populated or automatically filled in. As users become familiar with the Elog-It system, reporting burden will decrease as many fields (e.g., location, vessel information) would be automatically filled in and the system eliminates the need for filing and mailing paper forms to NOAA. To date, the Elog-It system has resulted in less than 1% of entries to be re-submitted due to entry errors, all of which were successfully re-transmitted.

4 REFERENCES

WPRFMC (Western Pacific Regional Fishery Management Council). 2006. Regulatory Amendment Authorizing the Optional Use of Electronic Logbook Forms. Honolulu, HI.

5 DRAFT PROPOSED REGULATIONS

This section contains the draft proposed regulations necessary to implement the conservation and management measures described in the FEP amendment. Additions to the existing regulatory language are shown in underline, and deletions are shown in strikethroughs.

§665.14 Reporting and recordkeeping.

(a) * * *

(b) *Fishing record forms*—(1) *Applicability.* (i) The operator of a fishing vessel subject to the requirements of §§665.124, 665.142, 665.162, 665.203(a)(2), 665.224, 665.242, 665.262, 665.404, 665.424, 665.442, 665.462, 665.603, 665.624, 665.642, 665.662, 665.801(a), vessel size Class A or B under 665.801(c), 665.801 (d) through (g), 665.905, 665.935, or 665.965 must maintain on board the vessel an accurate and complete record of catch, effort, and other data on paper report forms provided by the Regional Administrator, or electronically as specified and approved by the Regional Administrator, except as allowed in paragraph (b)(1)(iii)(iv) of this section.

(ii) The operator of a fishing vessel registered for use under a Hawaii longline limited access permit or vessel size Class C or D under the American Samoa longline limited access permit, pursuant to the requirements of §665.801(b)-(c), must maintain on board the vessel an accurate and complete record of catch, effort, and other data electronically using an electronic logbook application certified by NMFS. If the operator is unable to maintain electronic records due to hardware or software failure, the operator must maintain on board the vessel an accurate and complete record of catch, effort, and other data on paper report forms provided by the Regional Administrator.

(iii) (ii) All information specified by the Regional Administrator must be recorded on paper or electronically within 24 hours after the completion of each fishing day. The logbook information, reported on paper or electronically, for each day of the fishing trip must be signed and dated or otherwise authenticated by the vessel operator in the manner determined by the Regional Administrator, and be submitted or transmitted via an approved method as specified by the Regional Administrator, and as required by this paragraph (b).

(iv) (iii) In lieu of the requirements in paragraph (a)(1)(i) of this section, the operator of a fishing vessel registered for use under a Western Pacific squid jig permit pursuant to the requirements of §665.801(g) may participate in a state reporting system. If participating in a state reporting system, all required information must be recorded and submitted in the exact manner required by applicable state law or regulation.

(2) *Timeliness of submission.* (i) If fishing was authorized under a permit pursuant to §§665.142, 665.242, 665.442, 665.404, 665.162, 665.262, 665.462, 665.662, or 665.801(a), vessel size Class A or B under 665.801(c), or 665.801 (d) through (g), the vessel operator must submit the original logbook information for each day of the fishing trip to the Regional

Administrator within 72 hours of the end of each fishing trip, except as allowed in paragraphs (iii)-(iv)..

(ii) If fishing was authorized under a permit pursuant to §665.203(a)(2), the vessel operator or vessel owner must submit the original logbook form for each day of the fishing trip to the Regional Administrator within 72 hours of the end of each fishing trip.

(iii) If fishing was authorized under a PRIA bottomfish permit pursuant to §665.603(a), PRIA pelagic troll and handline permit pursuant to §665.801(f), crustacean fishing permit for the PRIA (Permit Area 4) pursuant to §665.642(a), or a precious coral fishing permit for Permit Area X-P-PI pursuant to §665.662, the original logbook form for each day of fishing within EEZ waters around the PRIA must be submitted to the Regional Administrator within 30 days of the end of each fishing trip.

(iv) If fishing was authorized under a permit pursuant to §§665.124, 665.224, 665.424, 665.624, 665.905, 665.935, or 665.965, the original logbook information for each day of fishing must be submitted to the Regional Administrator within 30 days of the end of each fishing trip.

(v) If fishing was authorized under a permit pursuant to §665.801(b) or vessel size Class C or D under 665.801(c), that vessel operator must submit the electronic report to the Regional Administrator within 24 hours after the completion of each fishing day using an electronic logbook application certified by NMFS. If the operator is unable to submit the electronic report within 24 hours due to hardware, software, or transmission failure, the vessel operator or vessel owner must submit electronic or paper report forms provided by the Regional Administrator for each day of the fishing trip to the Regional Administrator within 72 hours of the end of each fishing trip.

APPENDIX A. PACIFIC ISLANDS REGION LONGLINE ELECTRONIC REPORTING IMPLEMENTATION PLAN

DRAFT
Pacific Islands Region Longline Electronic Reporting

Version <1.0>

17 June 2020

Prepared by
NMFS Pacific Islands Region
Electronic Technologies Steering Committee

Table of Contents

Acronyms and Terminology

Acronym	Definition
BT	Bluetooth
CML	Commercial Marine License
CNMI	Commonwealth of the Northern Mariana Islands
CSV	Comma Separated Value
DBMS	Database Management System
ER	Electronic Reporting
FEP	Fisheries Ecosystem Plan
HILLE	Hawaii Longline Limited Entry
IATTC	Inter-American Tropical Tuna Commission
IFP	International Fisheries Program
ITS	Information Technology Services
JIMAR	Joint Institute for Marine and Atmospheric Research
m	Meter(s)
NMFS	National Marine Fisheries Service
OLE	Office of Law Enforcement
PIFSC	Pacific Islands Fisheries Science Center
PIR	Pacific Islands Region
PIRO	Pacific Islands Regional Office
PMUS	Pacific Pelagic Management Unit Species. Species managed under the Pelagic FEP
QAC	Quick Access Computing
SDK	Software Development Kit
sFTP	Secure File Transfer Protocol
t	Metric Ton(s)
WCPFC	Western and Central Pacific Fisheries Commission
WAP	Wireless access point
WHG (CLSA)	Woods Hole Group (formerly CLS America)
WPRFMC	Western Pacific Regional Fishery Management Council
VMS	Vessel Monitoring System

Executive Summary

Electronic Reporting (ER) has been developed for longline fisheries in the Pacific Islands Region (PIR). The current ER process allows fishers to enter catch and effort data with software on an Android tablet that interfaces with the vessel monitoring system (VMS). Data are then sent via satellite to a receiving station where data are pulled by the Pacific Islands Fisheries Science Center (PIFSC) and incorporated into databases. In 2019, there were 150 active longline vessels in the Hawaii and California-based longline fisheries and 14 vessels in the A. Samoa-based fishery. As of the date of this document, 61 Hawaii and California-based vessels have volunteered to submit ER data. In October 2018, the Western Pacific Regional Fishery Management Council (WPRFMC) took initial action to require ER in pelagic longline fisheries. During voluntary and mandatory reporting, NOAA Fisheries will provide entire funding for the longline ER for vessels based in Hawaii, Hawaii and west coast region permitted vessels based in California and vessels based in American Samoa. To achieve mandatory reporting, ER tablets need to be distributed to the remaining 89 vessels and 14 in A. Samoa. While the ER software is easy to use, it typically requires at least one initial in-person training session to ensure that the hardware and software are working and that data are entered correctly and accurately.

Challenges to the program include: 1) Covid-19 has postponed ER outreach and tablet distribution to the longline fleet, 2) outreach to the Vietnamese and Korean longline sectors of the fleet can be difficult, 3) reluctance to use new technology, 4) captain turnover requires additional training, 5) the introduction of new VMS unit types require additional ER software development and testing and 6) deployment to vessels in American Samoa and California can require travel and/or training of local staff.

Introduction

The purpose of this paper is to outline the current pre-implementation state of Electronic Reporting (ER) for holders of Hawaii and American Samoa longline permits. The purpose of ER is to submit near real-time data submissions that have increased accuracy, reduce data processing time, and more rigorously monitor and forecast the attainment of international longline catch quotas. This is a living document which will be updated as the ER program evolves.

ER cost structure

During voluntary and mandatory reporting, NOAA Fisheries will provide entire funding for the longline Electronic Reporting for vessels based in Hawaii, Hawaii permitted vessels based in California and vessels based in American Samoa. Other U.S. longline fisheries in the Pacific will be responsible for maintaining their own electronic logbook system.

NOAA's Pacific Islands Fisheries Science Center (PIFSC) will be responsible for:
1. PIFSC personnel for outreach, training, technical support and back-end database development,
2. Initially providing 160 tablets with the ER software,
3. Conducting ER software updates,
4. Downloading ER data and incorporating into PIFSC databases,
5. Updating software encryption keys on an annual basis, and
6. Producing an archived re-compiled logsheet for potential use by the Office of Law Enforcement

(OLE).

NOAA's OLE will be responsible for:
1. Providing Vessel Monitoring Systems (VMS) on longline vessels,
2. Providing VMS maintenance and software updates,
3. Providing transmission costs of ER data from the VMS unit and via satellite to a receiving station, and
4. Providing tablets dependent on attrition of the initial 160 tablets. These tablets would be procured from the VMS company along with the VMS unit.

Pre-Implementation of Findings and Outcomes on ER Development
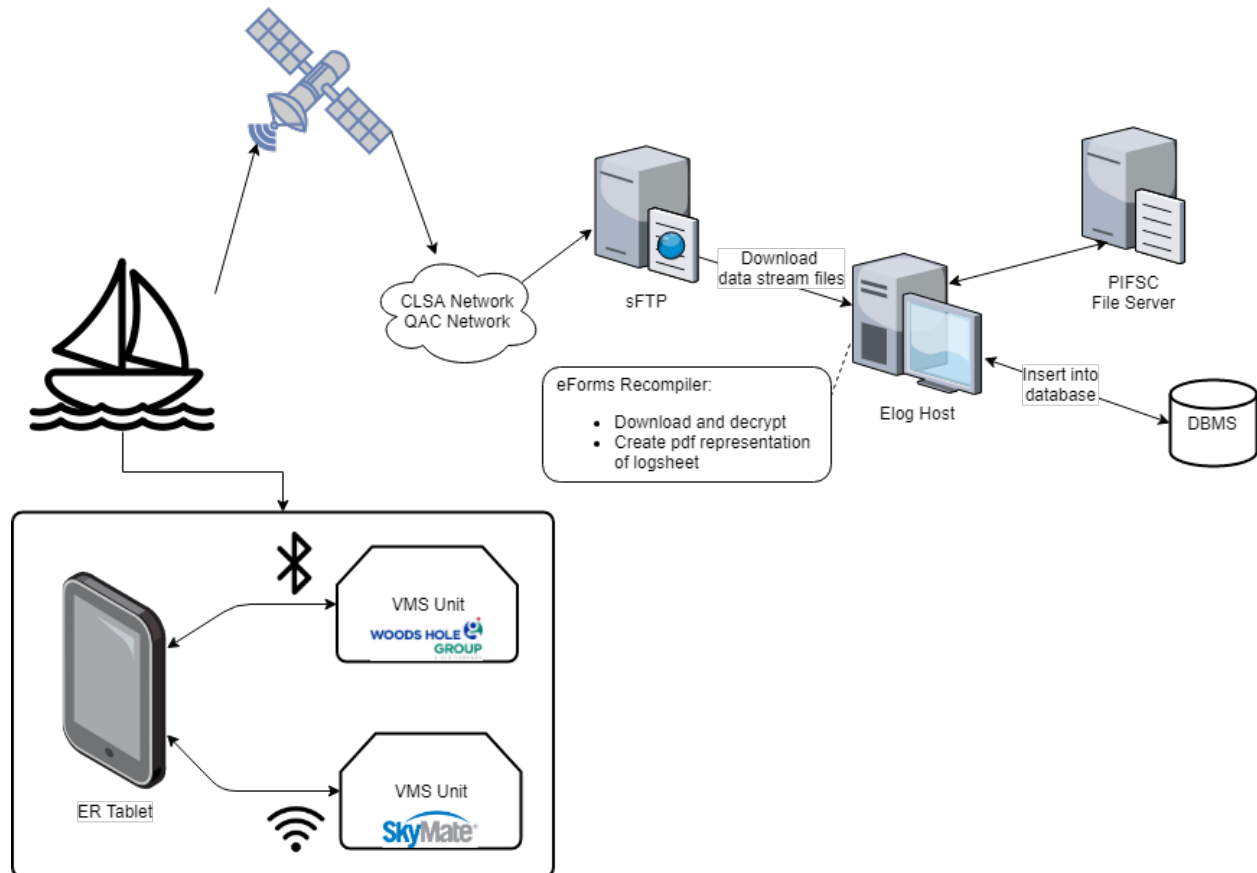
Figure 1: General Electronic Reporting process flow

Data Flow Overview

The current ER process is illustrated in Figure 1. Software on an Android tablet interfaces with the vessel monitoring system (VMS). There are currently two VMS companies that have units installed on longline vessels in Hawaii and American Samoa. Woods Hole Group (WHG, formerly CLS America) has models LEO/THORIUM and TRITON (two different model types), which allow the tablet to interact with the unit via Bluetooth (BT) technology. Skymate has models M1500 and M1600, which allows the tablet to interact with the unit via Wi-Fi. 12 vessels have the discontinued M1500 unit installed. Skymate data transmission is currently being tested.

Data are sent from the tablet through the VMS unit and via Iridium satellite to a receiving station where data are pulled by the Pacific Islands Fisheries Science Center (PIFSC). Data are decrypted inside of the PIFSC firewall and incorporated into Oracle databases where quality control occurs and a PDF version of the re-compiled logsheet is produced for archiving. The PDF version of the re-compiled logsheet is required for the Office of Law Enforcement (OLE). A screen view of individual logsheets is available for OLE to review when boarding vessels. Fishermen can confirm data transmission by referring to the application's e-form queue, data transmission dialogue messages, and "SENT" indicators on e-log set listings.

At PIFSC, quality control reports are generated on all e-logs received and are reviewed by staff. Fishers are contacted when follow-up is necessary.

Software Certification and Acceptance Process

In 2009, WPRFMC, Pacific Islands Regional Office (PIRO), and PIFSC developed draft guidelines for the certification of an ER application software for Hawaii longline vessels (74 FR 32109; NOAA PIFSC 2009). These guidelines were written primarily for electronic logbook vendors. The software goes through a PIFSC certification process where validation testing is conducted by sending simulated logbook data through the ER process and the re-compiled logsheet is compared with the simulated data. Since that time, in 2017, NMFS in partnership with Quick Access Computing (QAC) developed "Elog-It", a software application to replace the paper-based logbook reporting system. In 2019, the PIFSC certified Elog-it for use in the Hawaii longline fisheries to submit production data. NMFS will continues to provide and maintain the "Elog-It" software as there is currently no alternative ER software available.

Hardware Requirements

Tablet Acquisition and Maintenance

Tablets are currently purchased through the application developer and maintained by PIFSC Joint Institute for Marine and Atmospheric Research (JIMAR) staff. Basic troubleshooting can be performed by PIFSC and JIMAR staff at their discretion. As of 1 January 2020, PIFSC has 160 tablets ready for deployment. Tablet attrition has been very low and replacement tablets are not being considered at this time.

Tablet Requirements

The ER application is optimized for the following tablets:
- **Samsung Galaxy Tab S2**; 8 inch screen; 2048 x 1536 screen resolution; USB-micro
- **Samsung Galaxy Tab Active 2**; 8 inch screen; 1280 x 800 screen resolution; USB-C
- **Both** are FIPS (Federal Information Processing Standards) 140-2 certified, which means they meet the National Institute of Standards and Technology's (NIST's) standards for software and hardware cryptography. External service providers are required to use FIPS for processing, storing, or transmitting federal information on information systems.

VMS Acquisition and Maintenance

VMS units that are provided to the Hawaii longline fleet are currently procured and maintained by the OLE. All possible malfunctions with connecting the tablet to the unit shall be reported to OLE for basic troubleshooting. Any issue that cannot be resolved can be escalated to a work order ticket with the

associated VMS vendor. PIFSC and/or vessel operators and owners shall not perform any maintenance on the VMS or request work from the service contractor without consent from OLE.

Currently, OLE PIR maintains the VMS units for all vessels holding a Hawaii Longline Limited Entry (HILLE) and A. Samoa Longline Limited Entry permit and will repair or replace malfunctioning units

VMS Requirements

All VMS hardware type approval requirements can be found at CFR Title 50, Part 500, sub-part Q.

Other Hardware Acquisition

PIFSC has been responsible for acquiring US wall chargers/adapters for the tablets and protective cases for some of them. PIFSC is currently exploring the procurement of tablet mounts.

Android Application Details

The software has been developed by QAC. PIFSC owns the Elog-It software source code. QAC is an Australian company with over 10 years' experience in sustainable software development for fisheries management in the Pacific. A team of 12 software developers and support staff are available to provide a comprehensive service in electronic reporting and data transmission (Table 1).

Table 1. Personnel and contact information at Quick Access Computer for Elog-It software support and development.

Name	Position	Contact
Darren Saunders	QAC Director	darren@quickaccesscomputing.com.au darren@ifims.com
Mark Oates	QAC Manager and Android Developer	mark@quickaccesscomputing.com.au mark@ifims.com
Andrew Trendell	QAC Support	andrew@ifims.com

Elog-it is a native Android application (Java) for use on devices that support Android OS only. The application was developed using the Android Software Development Kit (SDK). Elog-It software collects and transmits data in a FIPS 140-2 Certified Encrypted comma separated values (CSV) string. Collected data are held on the tablet in encrypted database tables.

If the tablet is connected to a WHG VMS unit, the encrypted data are sent via satellite to a QAC server, where it is available for NMFS to download using secure file transfer protocol (sFTP).

When Skymate support is implemented, the encrypted data will be sent via satellite to a server, where it will be available for NMFS to download using secure Web services.

The encryption key is accessed and updated remotely and automatically by the application from time to time when the tablet has access to Wi-Fi. This will ensure that data are encrypted in a manner that meets ITS requirements. There is a secure WAP (wireless access point) at Pier 38 that will serve up the encryption key updates. The software and software updates are available for download as an APK (Android package, or install files for the Android OS) from QAC. PIFSC has software support through QAC

until September 2021. A decision will be made in 2021 if modifications to the Elog-It will occur at PIFSC or externally.

Android Tablet Specifications

Android tablets are required to be FIPS 140-2 Certified and are rugged hardware to meet the demands of at-sea data collection. The minimum Android tablet specifications include:
- Android 4.4 Operating System (KitKat)
- 2Gb of RAM
- 16 GB of Data Storage
- 2GHz CPU Speed
- 8.0 Inch Main Display Size
- GPS Location Technology
- Bluetooth Capability
- Wi-Fi Capability
- FIPS 140-2 Certified

Data Entry Flow

The process of entering an e-log is as follows:
1. User enters Begin Trip information when departing for a trip.
2. User enters Set, Haul and Catch information as fishing operations occur. User may enter this information later if information is not complete.
3. User signs each Set by entering Commercial Marine License (CML), name, and the date. By signing, the user confirms his or her identity and the correctness and completeness of the information recorded. The user must also agree to the acknowledgement that appears as a check box before submitting (transmitting) the set.
4. User enters End Trip information after returning to port.
5. The captain can verify if the data has been sent by referring to the data transmission queue or in the Catch Information records.

Output Format

The output data stream specifications can be obtained from PIFSC upon request (PIFSC email address: pifsc.elogsupport@noaa.gov, ER phone number – (808) 725-5604).

Data are sent in messages that need to be reassembled and decrypted by PIFSC. If any part of the eForm is missing, which is an extremely rare occurrence, the eForm cannot be decrypted and the data are unusable. Data would need to be re-sent from the tablet.

Data Quality and Reliability

The application has data validation for many of the data fields and are illustrated in Appendix 1: Data Validation.

There are a number of Error Checking functions built into Elog-It including checks that all required fields are completed, Positional checks (for when position must be manually entered) and Catch checks (see Appendix 1). The software has a re-transmit option. The system has worked well as only 0.33% of all longline set data had to be re-transmitted.

Additional Features

- **VMS location integration** – Current location can be populated from the VMS unit via on-board API. This requires the condition that the user is entering data as the associated fishing activity is being completed.
- **Set review** – Users are able to review current and previously submitted sets in a format that is visually similar to the paper logsheet form. Currently, e-log data cannot be modified, so users are asked to contact the ER team should corrections or edits be necessary. Making corrections within the software is under consideration as a future feature.
- **Trip catch summary** – Users are able to view current and previously submitted trip summaries, which include a total number of kept and released by species for the associated trip.

Documentation

User Guide Documentation

A 2-page quick guide and a 50-page comprehensive guide have been produced (Appendix 2) and are available in three languages (English, Vietnamese and Korean) on the ER tablets as PDF files. The quick and comprehensive guides (three languages) are available as PDFs on the tablet.

Staff Setup Guide Documentation

A draft Administrative User Guide is available as Appendix 3. This will function as a reference guide for ER staff who need to manage, setup, deploy, and provide technical support on ER tablets.

Data Security

Application User Logins

User accounts are created for individual boat operators who function as vessel captains. Users log in with their Commercial Marine License (CML) number and a password. Users use their unique CML to set up the tablet in collaboration with NMFS Staff. Users are required to set their own Login Password, and an Activation Code for the Elog-It Application is provided by the NMFS Staff. NMFS Staff have Administrative functions available including Activation, Password Reset, Re-Transmit of Data, Account Transfer, and Account Removal.

Users must log in to enter and see their own data. They are also able to look at their trip summaries, where the catch are summed by a particular trip. It is preferred that individual accounts be created for each individual user. However, if a captain allows a relief captain to use his/her account, the relief captain must sign as him/herself (CML and name) when completing electronic submissions.

Data Encryption at Rest and in Transit

Data are sent as encrypted CSV file. The current encryption implementation adheres to FIPS. The following items relate to encryption considerations:

1. Encryption method must satisfy the FIPS 140-2 requirements.
2. Encryption should be implemented via a FIPS certified common off-the-shelf (COTS) library.
3. Using the encryption method chosen, fishing log information should be at least as secure as the current paper log (i.e. a captain locks up completed logs so no one else can see it, the tablet should not allow a casual user to read the logs)

4. Logs should be readable by authorized people (e.g. Coast Guard or OLE while boarding a vessel)
5. Logs should be encrypted from the time data are submitted until it is received by PIFSC or an authorized person (e.g. PIFSC staff; captain that signed the log) retrieves it. This could open up the data transmission methods and allow for more control or competition.
6. The chosen encryption method should minimize the labor and infrastructure required to manage encryption keys.
7. Encryption keys must be able to be expired or renewed. An encryption key is changed once per year.

Initial Outreach, Training, and Setup

Outreach

PIFSC staff has solicited participation in the current ER program since July 2018. The personalized outreach by staff at the Honolulu Pier 38 has led to a generally positive response from both vessel owners, permit holders, and captains. As for fleet involvement, PIFSC tried to make the Elog-It application mimic filling out paper logs as much as possible. Once the general functionality was completed, PIFSC got six captains to do beta testing. PIFSC received comments to improve the application and many suggestions were implemented. All six captains continued to use the application when it went into production.

PIFSC staff must obtain consent from both the captain and permit holder to set up ER on a fishing vessel. PIFSC staff must also obtain permission to board the vessel from the captain or vessel owner to set up a tablet and the ER application.

PIFSC has produced an informational pamphlet that can be distributed to the industry and illustrated in Appendix 4: ER informational pamphlet.

ER Setup and Training

PIFSC staff have noted that incorporating one-on-one, hands-on training immediately after setup helps captains successfully transition from paper log reporting to electronic submissions. The possibility of holding outreach and training classes has also been noted, but no classes have been held to date due to the preference of one-on-one training. The inventory of tablets ready for deployment and deployed tablets are kept track in a shared Google sheet ER Vessel List.

VMS Unit Activation for E-Log Data Transmission

A vessel's VMS unit account must be activated for data transmission before it can be used for sending e-logs. PIFSC contacts either Woods Hole Group (WHG) or Skymate for account activation.

In addition, Skymate VMS's must be running software version V2.201909281155 (September 2019) or greater before ER can be used on that vessel.

Tablet Setup

Initial tablet setup is done by PIFSC staff in the office. This setup includes the following:
Charge tablet and setup Android OS
1. Set time zone to HST and make sure date/time is accurate

2. Update OS and apps if necessary
3. Log device MAC address and serial number
4. Inventory device in Tablet Manager application
5. Adjust tablet settings to optimize tablet for ER (adjust display, adjust keyboard size, turn off predictive text, turn off screen auto-rotate.)

Install ER applications (ER Launcher, ELog-It, and WHG VMS Scanner)
1. Download Launcher Library files (Quick Guide, User Guide, Fish and Protected Species ID guides, etc.)

Setup ER applications
1. Lock tablet home button to Launcher application
2. Enter information into Tablet Manager application and print user deployment sheet with vessel and user information.
3. Setup vessel and user information
   a. Permit number (Vessel ID)
   b. Vessel name
   c. CML (User)
   d. User password
   e. Transmission type
      i. RockStar (no longer applicable)
      ii. WHG (Leo/Thorium, Triton)
      iii. SkyMate (not active yet)
4. Activate user (requires a code generated from a separate application used by PIFSC staff)
5. Log in to application and check for updates while connected to a secure Wi-Fi access point
6. Enter test trip (Depart port and return to port forms only; to be used to test transmission upon setup at the vessel)

Connectivity and Testing

Set appointment (if possible) with user and meet at the vessel.
Connect tablet to VMS
1. WHG units – require a Bluetooth pairing PIN
2. SkyMate units – Wi-Fi; not implemented yet
Test transmission with previously entered test trip. If successful, proceed to user training.

User Training

Walk user through a single set trip. Allow user to submit multiple test trips if requested.

PIFSC staff have also successfully assisted captains on HILLE vessels that are California-based in remote setup for the following situations:
1. Captain met with PIFSC staff in Honolulu and took a tablet back to San Diego. The captain was able to successfully pair with the VMS unit and send test trips with assistance from PIFSC via phone.
2. Captain added self as a user on the tablet with assistance from PIFSC via phone.
3. Following the replacement of a vessel's VMS unit, captain was able to change the VMS unit type selection in the application and pair to the new unit.
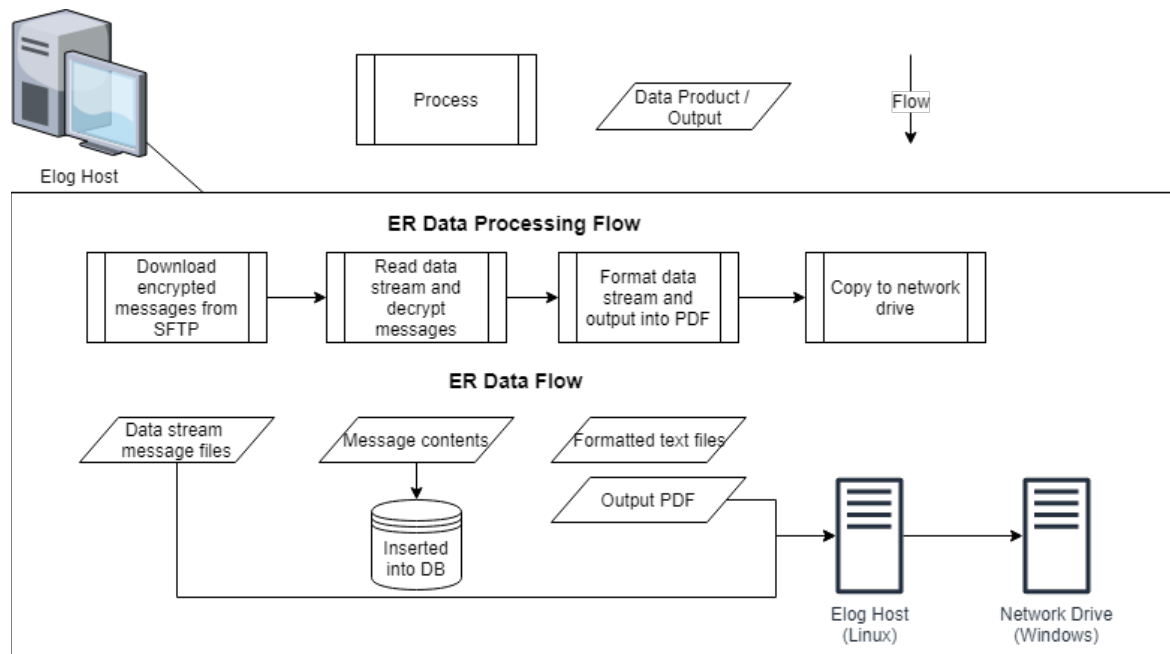
Back-end Data Retrieval and Processing

Figure 2: Back-end Data Processing Flow

Back-end Data Stream Application

In 2018, PIFSC contracted Point 5 Solutions to develop a back-end data stream application to download, read, and decrypt the incoming ER data. The application is written utilizing Python 2.7.x and Oracle PL/SQL. Limited support from the contractor is available, but PIFSC staff now maintains any updates and/or bug corrections for this application.

All data received are downloaded and entered into the Oracle database at PIFSC. Process and data flow are illustrated in Figure 2. After data are copied onto the network drive, these data follow the same data processing as the paper logs for consistency.

Error Handling

The current data stream application has built in error logging and handling. Also, email notifications are sent when one of the following occurs:
1. Incomplete eForms are identified by the back-end data stream application and not all parts of the message are received.
2. Duplicate trip or log ID's are detected for processing.
3. Data cannot be processed due to other errors.

Any of the above errors must be reviewed by PIFSC staff and handled accordingly. PIFSC is exploring additional methods to automate the process in the future.

Sustainable Development and Technical Support

Access to Logbook Data by Authorized Personnel

Logs should be readable by authorized people, such as Coast Guard personnel when boarding a vessel. Currently there is no user login set up for the Coast Guard as operators are requested to use their login and show completed elogs to the Coast Guard.

Application, Documentation, and Encryption Key Updates

Development and Testing

Potential Development Needs:
1. Transmission via new type-approved VMS units
2. Additional features such as:
   a. Allow correction submission
   b. Date/Time calculations (time zone changes based on location).

Pier 38 facility and infrastructure will serve for encryption key management. Development will occur for California and American Samoa-based vessels after the Hawaii permit holders have ER.

Dissemination

Updates to the software and encryption key will be available for vessels landing in Honolulu via an access point at Pier 38 office.

Contingency Plan

Incomplete Data

Each E-log trip is checked for missing sets and trip information as data are received and also when it is processed. When necessary, the ER team will arrange to meet with captains to resend data.

Tablet or Application Malfunction

In the event that the tablet and/or application malfunctions:
1. The user *must* record the remainder of the trip activities using paper logsheets. Upon returning to port, the user should alert PIFSC staff that they will be submitting paper logs for the trip and submit them within 72 hours.

VMS Malfunction

In the event of a) VMS equipment failure *but* the tablet and application are still functioning OR b) the tablet will not transmit data due to no connectivity to the VMS:
1. The user may opt to continue entering ER data. Upon returning to port, the user will need to submit eForms via Wi-Fi. With this option, the user will need to enter fishing locations manually since they cannot be retrieved from the VMS.
2. The user may opt to record the remainder of the trip activities using paper logsheets. Upon returning to port, the user should notify PIFSC staff that they will be submitting paper logs for the trip and submit them within 72 hours.

Technical Support Plan

PIFSC ITS Support

The ER team relies heavily on the PIFSC ITS division to support the maintenance of the database, application, and sFTP servers and any connectivity to those devices.

PIFSC compiles a list of comments and suggestions from Elog-It users and have incorporated many changes to make the user experience better. This line of communication also keeps users engaged and valued when modifications are made with Elog-it software updates.

Support to the Industry – See Technical Support Plan in Appendix 5
PIFSC email address: pifsc.elogsupport@noaa.gov
Dedicated ER phone number – (808) 725-5604

Access to near real-time fishery information by permit holders

Discussions with industry indicated that fishers (permit holders) were interested in receiving near-real time elog data submitted by ER from their vessels. PIFSC has re-compiled logsheets that are submitted each fishing day. PIFSC has been investigating the feasibility of hosting data on a secure website that is accessible by permit holders. PIFSC had recent (May 2020) discussions with NMFS Science & Technology, S&T who indicated that S&T could offer assistance in establishing a secure website. PIFSC will continue discussion with S&T for hosting the website and providing secure data transfer to incentivize the use of voluntary ER.

References

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