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**FALSE KILLER WHALE
TAKE REDUCTION PLAN MONITORING STRATEGY**

*Monitoring the Effectiveness and Regulatory Compliance
of the False Killer Whale Take Reduction Plan*

NOAA Fisheries
Pacific Islands Region
Protected Resources Division

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Table of Contents

I. Background.....	3
II. False Killer Whale Take Reduction Plan Goals.....	3
III. Monitoring the FKWTRP	4
A. Overview.....	4
B. Compliance Monitoring.....	4
C. Effectiveness Monitoring.....	6
IV. Monitoring Protocol.....	7
V. Summary	9
Appendix 1. FKWTRP Monitoring Strategy.....	10

I. Background

As mandated by the 1994 amendments to the Marine Mammal Protection Act (MMPA), NOAA Fisheries (NMFS) developed the False Killer Whale Take Reduction Plan (FKWTRP or Plan) to reduce the incidental mortality and serious injury (M&SI) of the Hawaii Pelagic and Main Hawaiian Islands Insular stocks of false killer whales (*Pseudorca crassidens*) in the Hawaii-based commercial longline fisheries.

The Plan was developed in consultation with the False Killer Whale Take Reduction Team (FKWTRT or Team), which is a stakeholder team consisting of fishing industry representatives, scientists, environmental advocates, and state and federal officials. Four Team meetings and were held between February and July 2010. On July 19, 2010, the Team provided consensus recommendations in a Draft Plan to NMFS. The Draft Plan formed the basis of a proposed rule, which was published in the *Federal Register* on July 18, 2011 (76 FR 42082). One Team meeting was held during the 90-day public comment period, which ended October 17, 2011. The final rule published on November 29, 2012 (77 FR 71260), and became effective on December 31, 2012 (for all measures except gear requirements) and February 27, 2013 (for gear requirements).

The FKWTRP has several components, including gear requirements (“weak” circle hooks and strong branch lines) for the deep-set fishery, longline prohibited areas, training and certification for vessel owners and captains in marine mammal handling and release, captains’ supervision of marine mammal handling and release, and posting of NMFS-approved placards on longline vessels. The FKWTRP also includes six “non-regulatory measures,” which are actions that NMFS will carry out to improve data quality, efficiency, and dissemination to the FKWTRT and the public. Finally, the FKWTRP includes prioritized research recommendations to better inform long-term solutions to reduce false killer whale bycatch. For further information on the FKWTRP, please visit www.fpir.noaa.gov/PRD/prd_FKW_take_reduction_team.html.

II. False Killer Whale Take Reduction Plan Goals

The goals of the False Killer Whale Take Reduction Plan are described in the final rule (77 FR 71260) and summarized below.

- The short-term goal of the FKWTRP is to reduce, within six months of its implementation,¹ incidental M&SI of the Hawaii Pelagic and Hawaii Insular stocks of false killer whales occurring in the Hawaii-based longline fisheries within the U.S. Exclusive Economic Zone (EEZ) around Hawaii to less than the stocks’ potential biological removal (PBR) levels of 9.1 and 0.3 false killer whales per year, respectively (as of the 2012 Stock Assessment Report, SAR).

¹ The Plan implementation date is considered to be the effective date of the final rule, December 31, 2012, but the gear requirements for the deep-set fishery did not go into effect until February 27, 2013. Therefore, the full potential for the Plan’s take reduction measures may not be seen until all requirements are in effect.

- Another goal of the FKWTRP is to not increase above current levels the M&SI of the high seas component of the Hawaii pelagic stock (i.e., 11.2 false killer whales per year, as of the 2012 SAR). This goal ensures that conservation measures of the FKWTRP do not simply displace fishing effort and its corresponding impacts on the Hawaii Pelagic false killer whale from U.S. EEZ waters to the high seas.
- The long-term goal of the FKWTRP is to reduce, within five years of its implementation, the M&SI of the Hawaii Pelagic and Hawaii Insular stocks of false killer whales to insignificant levels approaching a zero mortality and serious injury rate (i.e., less than 10 percent of their respective PBR levels), as determined under 50 CFR 229.2.

III. Monitoring the FKWTRP

A. OVERVIEW

A comprehensive monitoring strategy is a necessary component of take reduction plans to monitor compliance with the plan's elements and to evaluate the effectiveness of the plan in achieving its goals and objectives. The FKWTRP monitoring strategy incorporates a variety of measures that assist in evaluating compliance levels and Plan effectiveness:

- *Biological measures* – abundance estimates, mortality estimates, PBR and ZMRG calculations, observer information (locations and timing of observed takes);
- *Compliance measures* – observer information (gear configuration information, fishing within closure areas), enforcement data (patrol hours, boardings, warnings/violations issued);
- *Research* – evaluating results from biological and/or gear research in support of the FKWTRP; and
- *Education/outreach measures* – distribution of compliance guides and placards, permit holder letters, FKWTRP website maintenance, industry outreach, FKWTRP trainings/briefings (including to enforcement officers and observer program staff), direct communications, and publication of an annual compliance and effectiveness report.

Incorporating the measures described above, the FKWTRP monitoring strategy is divided into two components: evaluating compliance with the FKWTRP elements, and evaluating the FKWTRP's effectiveness.

B. COMPLIANCE MONITORING

Compliance includes adherence by the fishing industry to the Plan's regulations and by other parties to non-regulatory Plan elements (i.e., observer coverage, education/outreach, research, etc.). The purpose of compliance monitoring is to measure the consistency with regulatory and non-regulatory aspects of FKWTRP, and, as possible, to identify causes of non-compliance.

The NMFS Pacific Islands Regional Office (PIRO) and Pacific Islands Fisheries Science Center (PIFSC) will conduct an annual review of compliance with the FKWTRP's measures. This annual review will be conducted simultaneous to the yearly evaluation for effectiveness monitoring (described below – part C). Using this annual review and based on available resources, NMFS will make decisions about whether to adjust the techniques, scale, and geographic locations of outreach and enforcement efforts to enhance compliance.

Enforcement Activities

NMFS will continue to work with various partners, including NOAA's Office of Law Enforcement (OLE), the Pacific Islands Regional Observer Program (PIROP), and the U.S. Coast Guard to track compliance with regulatory requirements of the Plan. Specifically, we will evaluate compliance with:

- Gear requirements on deep-set longline trips - hook shape and wire diameter, branch line material and diameter
 - o Note: In particular, gear involved in observed false killer whale interactions should be collected by observers and measured to verify the gear involved was in compliance with the regulations.
- Compliance with longline area closures - MHI Longline Fishing Prohibited Area (year-round) and Southern Exclusion Zone (if area is closed)
- Placement of on-board placards
- Captain supervision of handling and release of hooked or entangled whales

As part of this evaluation, we will work with partners to evaluate enforcement capacity (summarize enforcement-related warnings/violations (e.g., patrol hours, number of boardings, trends and comparisons with other fisheries) and enforcement actions (warnings/violations issued).

Education and Outreach Efforts

Monitoring FKWTRP education and outreach efforts will assist NMFS in its efforts to monitor and understand compliance levels and overall effectiveness of the Plan. NMFS will record and track the various components of its education and outreach program, including, but not limited to: distribution of printed material (e.g., permit holder letters, Plan outreach guides, placards), FKWTRP website maintenance, media releases (e.g., press releases, printed articles), email distribution, and NMFS staff attendance at workshops or outreach meetings.

NMFS will also work with the Hawaii Longline Association to track the extent and nature of any voluntary industry outreach efforts to vessel operators.

Research

NMFS will maintain a list of prioritized research activities that support the FKWTRP. The list will be based on the research recommendations made by the Team, and updated annually. The list will be used to support various funding initiatives by government and non-governmental organizations.

Other Implementation Aspects

PIRO will track implementation of the FKWTRP's other non-regulatory measures, including expedited injury determinations, notification of the Team of observed false killer whale interactions, and Team meeting frequency.

C. EFFECTIVENESS MONITORING

NMFS will evaluate the Plan's effectiveness in achieving the short- and long-term take reduction goals. We will examine both the individual measures and the Plan as a whole. Effectiveness will be monitored and evaluated annually and at multi-year time-step.

Given the false killer whale populations' relatively low abundance, the small number of observed interactions, and the lack of temporal or seasonal trends in the interactions, it may be difficult, at least across short time-frames, to determine whether changes in the number or rate of M&SI are driven by the Plan or are normal intra- or inter-annual fluctuations. Accordingly, we will rely on both primary and secondary indicators, and annual and multi-year evaluations to assess effectiveness and trends. The indicators are outlined below.

Primary Indicators

- False killer whale M&SI relative to MMPA short-term and long-term goals
 - o Tracked on annual basis and averaged across up to five years
- Trends in false killer whale M&SI on the high seas
 - o Tracked on annual basis and averaged across up to five years
- False killer whale M&SI relative to SEZ trigger
 - o Tracked on real-time basis using Observer Program data and serious injury determinations

Secondary Indicators²

- Observed marine mammal interactions and any associated trends
 - o Number and location of interactions
 - o Ratio of serious injuries to non-serious injuries
 - o Ratio of depredation to takes
 - o Gear/vessel configurations associated with takes

² Many of these secondary indicators are dependent on data that are not collected on a regular or predictable basis. This is an ideal list, but some indicators may not be available every year.

- Hook/terminal tackle performance (e.g., anecdotal information about how/whether the gear is working as expected during interactions)
- Implementation of handling/release guidelines
- Biopsy sampling rate
- False killer whale abundance data and trends
- Observed interactions with other protected species (other marine mammals, turtles, sea birds) and any associated trends
- Deep-set longline gear performance – evaluate whether required hooks and branch lines are performing as expected
 - Test strength of new hooks (at maximum strength)
 - Test strength of branch lines (at minimum strength – used) collected by observers; evaluate strength over time
- Longline fishing effort and any associated trends
 - Location, numbers hooks and sets, seasonality, split sets, etc.
 - Track effort shift due to or in anticipation of SEZ closure
 - Track if any changes are concurrent with or indicative of a short to shortline fishery
- Impacts to fishery’s structure and economics, and associated trends
 - Number of vessels in fishery, value and size of catch, populations active in the fishery, economic status of participants
- New/emerging fisheries and/or new management regulations potentially impacting false killer whales
 - Assess whether current management actions are appropriately targeted and yielding expected results given changes in fisheries
- Survey to assess benefit/value of captain/owner training, placards, captain supervision of any disentanglements
 - Relevancy, effectiveness of training, gaps, etc.
 - Adoption of best practices

NMFS will also endeavor to periodically evaluate factors affecting bycatch rates by running standardized bycatch model on an annual basis, to ensure we are tracking the most importantly correlated variables. This model might include consideration of environmental conditions, timing of fishing operations (i.e., time of day of set/haul), and other variables.

IV. Monitoring Protocol

The monitoring protocol includes conducting annual assessments, multi-year reviews, and, as needed, more detailed status reviews.

Annual Assessment

The annual assessment is intended to provide a snapshot of effectiveness. It focuses primarily on tracking where the program is relative to the MMPA short-term and long-term goals. A

comparison of M&SI to PBR/ZMRG provides an initial indication of the effectiveness of FKWTRP regulations, enforcement, and education/outreach efforts, and provides an indicator of the compliance level. The intent is not to revamp program based on one year's worth of data, but, rather, to assess annual performance and recent trends. The annual assessment will be conducted each year; and results will be shared at earliest possible time with Team members.

Detailed Status Review

If annual assessment suggests MMPA goals are not being met or trends are moving in the wrong direction, NMFS may determine that a more detailed status review is warranted to provide a more intensive review of effectiveness and compliance measures and recent trends. The goal of such a review would be to identify possible barriers to successful implementation and needed changes. The intent is not to revamp the program based on one year's worth of data, but, rather, to gather trends over sufficient time (three to five years) to reasonably assess the effectiveness of both the overall program and individual measures. Results of a detailed status review will be discussed with Team members to consider implications for program implementation.

The need for and frequency of detailed status review would be dependent on the results of yearly evaluation (see table below). NMFS may choose to conduct a detailed status review annually for the first few years of FKWTRP implementation to generate an early and broader perspective on the program's results.

Multi-year Review

A multi-year review (every three to five years) is intended to assess longer-term trends, as well as consider the need for more substantial program revisions. The review would inform Team deliberations and, as needed, development of consensus recommendations related to program changes. The multi-year review is expected to be more prescriptive than annual review (which is seen as more of a snapshot).

A multi-year review may not be needed if the PIRO has been conducting frequent detailed status reviews.

Status of False Killer Whale M&SI	Monitoring Protocol
If false killer whale M&SI are achieving ZMRG	<ul style="list-style-type: none"> - Continue outreach and monitoring program, and consider program modifications needed to maintain bycatch levels - Little to no Team deliberations unless warranted
If false killer whale M&SI are below PBR and above ZMRG (with <i>decreasing</i> take rate)	<ul style="list-style-type: none"> - Continue outreach and monitoring program, and consider program modifications needed to further reduce bycatch levels - Conduct multi-year review every three to five years
If false killer whale M&SI are below PBR and above ZMRG (with <i>stable</i> take rate)	<ul style="list-style-type: none"> - Continue outreach and monitoring program, and consider program modifications needed to further reduce bycatch levels - Conduct multi-year review every three to five years
If false killer whale M&SI are below PBR, and above ZMRG (with <i>increasing</i> take rate)	<ul style="list-style-type: none"> - Conduct detailed status review if increasing takes 2-3 years in a row - If sufficient new data, reconvene team
If false killer whale M&SI are above PBR	<ul style="list-style-type: none"> - Close SEZ (if warranted) - Conduct detailed status review - Reconvene team

V. Summary

This comprehensive monitoring strategy will assist PIRO/PIFSC in evaluating compliance levels with the FKWTRP, effectiveness of the FKWTRP's measures for achieving their goals and objectives, and the ability of the FKWTRP to meet the goals mandated by the MMPA. As well, it will inform the Team's efforts to track the status of and revise the plan as needed.

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Appendix 1. FKWTRP Monitoring Strategy.

Comment [n1]: This is a placeholder for a flow chart or similar diagram (see the other TRP Monitoring Strategies for examples). This will be drafted after the above sections are a bit more developed and input from TRT is incorporated.