
**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.....	1
II. False Killer Whale Take Reduction Plan Goals.....	1
III. Monitoring the FKWTRP	2
A. Overview	2
B. Compliance Monitoring.....	2
C. Effectiveness Monitoring.....	4
IV. Monitoring Protocol	6
V. Summary	7
Appendix - Monitoring Protocol Flow Charts	8

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 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 of information 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 the NMFS Pacific Islands Regional Office’s [FWKTRT webpage](#).

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).
- 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.

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.

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- 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 and/or understanding compliance levels and Plan effectiveness:

- *Biological measures* – abundance estimates, serious injury determinations, serious injury and mortality estimates and trends, PBR and ZMRG calculations, observer information (locations and timing of observed takes);
- *Fishing industry practices and compliance indicators*– fishing effort and location; gear characterization, including bending/breaking strength and performance during marine mammal interactions; observer program information on gear configuration, changes in crew/captain practices related to releasing animals; enforcement data on patrol hours, boardings, warnings/violations issued, fishing within closure areas;
- *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 organized 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 simultaneously to the yearly evaluation for effectiveness monitoring (described below – part C). Using this annual review and based on available resources, NMFS, after consultation with the Team, will make decisions about whether to adjust the techniques, scale, and geographic locations of outreach and enforcement efforts to enhance compliance.

Compliance-Related Activities

NMFS will continue to work with various partners, including NOAA's Office of Law Enforcement (OLE) 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
- 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

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

Additionally, the Pacific Islands Regional Observer Program (PIROP) data will serve as an important source of information to gauge industry-wide compliance with TRP measures, although the observers themselves are not involved in supporting enforcement activities. For example, observer data may provide information on compliance with FKWTRP requirements that are not easily enforceable, such as captains' supervision of handling and release of animals, or an assessment of whether gear involved in an observed false killer whale interaction was in compliance with the FKWTRP regulations.

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. Monitoring of outreach and education efforts will also take into account effectiveness at reaching the different ethnic groups that make up the fishery.

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 periodically. 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, prompt 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 actions taken under the Plan or are attributable to normal intra- or inter-annual fluctuations. Accordingly, we will use a suite of both primary and secondary indicators, and annual and multi-year evaluations to assess effectiveness and trends. The indicators are outlined below.

Primary Indicators of Effectiveness

- 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 Indicators of Effectiveness

- Observed false killer whale interactions and any associated trends
 - o Ratio of M&SI to non-serious injuries (e.g., Plan may be effective if an increasing proportion of false killer whale interactions result in non-serious injuries rather than serious injuries)
 - o Ratio of depredation to interactions (e.g., Plan may be effective if depredation and false killer whale interactions are decoupled, such that steady or increasing depredation is not linked to increasing numbers of interactions)
- False killer whale abundance data and trends

Understanding Effectiveness²

In addition to indicators of effectiveness, we plan to collect and analyze data that will help us to understand why the Plan or specific measures within the Plan are or are not working, whether there are unintended impacts that may limit the Plan's effectiveness, and whether there are other adaptive management measures that could improve Plan effectiveness. These data and analyses are outlined below.

- Observed false killer whale interactions and any associated trends
 - o Ratio of false killer whale interactions to blackfish interactions
 - o Location and seasonality of interactions
 - o Gear/vessel configurations associated with interactions

² Many of the items in this list are dependent on data that are not collected on a regular or predictable basis. This is an ideal list, but some data or analyses may not be available every year.

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- Hook/terminal tackle performance during interactions (e.g., anecdotal information about how/whether the gear is working as expected)
 - Implementation of handling/release guidelines (e.g., anecdotal information from observers or fishermen)
 - Observed interactions and bycatch estimates for other protected species (i.e., 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 (requires sampling of gear used by fleet³)
 - Characterize types and manufacturer of hooks used by the fleet
 - Test strength of hooks (at maximum strength - new); evaluate strength over time
 - Test strength of branch lines (at minimum strength – used); evaluate strength over time
 - Characterize gear performance, as possible, by manufacturer
 - Longline fishing effort and any associated trends
 - Location, numbers hooks and sets, seasonality, split sets, etc.
 - Track effort shift due to SEZ closure
 - Assess fishing effort inside and outside of the EEZ using available data to determine if the Plan is displacing fishing effort outside the EEZ
 - Assess potential differences in location of fishing effort and other potentially bycatch-related variables for observed versus non-observed trips
 - Track if any changes are concurrent with or indicative of a switch to shortline fishery
 - New/emerging fisheries and/or new management regulations potentially impacting false killer whales
 - Survey/interviews to assess benefit/value of captain/owner training, placards, captain supervision of any disentanglements
 - Relevancy, effectiveness of training, implementation challenges, gaps (e.g., materials in non-English languages), etc.
 - Adoption of best practices
 - Impacts to fishery’s structure and economics, and any associated trends
 - Number of vessels in fishery, value and size of catch, populations active in the fishery, economic status of participants and of the deep-set and shallow-set fisheries generally, cost of compliance with MMPA-based requirements

Additional Monitoring

NMFS will also endeavor to periodically evaluate factors affecting bycatch rates by developing and applying a standardized bycatch model on an annual basis, once post-Take Reduction sample sizes are sufficient to support it, to ensure we are tracking the most importantly correlated variables. This model might include consideration of environmental conditions, timing of

³ Note: NMFS may work with HLA to facilitate the voluntary collection of gear and/or information regarding the manufacturers and suppliers of gear.

fishing operations (i.e., time of day of set/haul), and other variables. This model will be developed in consultation with the Team and the results will be shared promptly with the Team.

To the extent that the indicators described above point to problems with the FKWTRP's effectiveness, NMFS, in consultation with the Team, will evaluate the data to examine potential modifications to the existing requirements.

IV. Monitoring Protocol

The monitoring protocol includes conducting annual assessments, multi-year reviews, and, as needed, more detailed reviews. These reviews are described below and flow charts are included in the Appendix. In addition to these period reviews, NMFS will conduct ongoing monitoring to track near-real time M&SI to facilitate implementation of the Plan's Southern Exclusion Zone closure provisions.

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 and the additional FKWTRP goal related to false killer whale M&SI on the high seas. A comparison of M&SI to PBR/ZMRG and to baseline levels on the high seas provides an initial indication of the effectiveness and impact of FKWTRP regulations, enforcement, and education/outreach efforts, and provides an indicator of the level of compliance with the Plan. The intent is not to revamp the 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 Review

If annual assessment suggests MMPA goals (either the near-term PBR mark or the longer-term ZMRG) or the additional FKWTRP goal related to M&SI on the high seas are not being met, or trends are moving in the wrong direction, NMFS may determine that a more detailed review is warranted to provide a more intensive understanding 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. As with the annual assessment, 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. The Team will be consulted upon initiation of a detailed review and the results of such a review will be promptly presented to, and discussed with, Team members to consider implications for program implementation.

The need for and frequency of a detailed review would be dependent on the results of yearly evaluation (see table below). NMFS may choose to conduct a detailed 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 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; assess necessity of existing FKWTRP elements – 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, if any, 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, if any, needed to further reduce bycatch levels – Consider need for detailed review if takes stable or rising 1-2 consecutive years – 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 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 review – Reconvene team

Additionally, if false killer whale M&SI on the high seas increases above the pre-FKWTRP baseline levels (as noted in the 2012 SAR) for 2-3 years in a row, a detailed review will be conducted in conjunction with the reviews noted in the table above, as applicable.

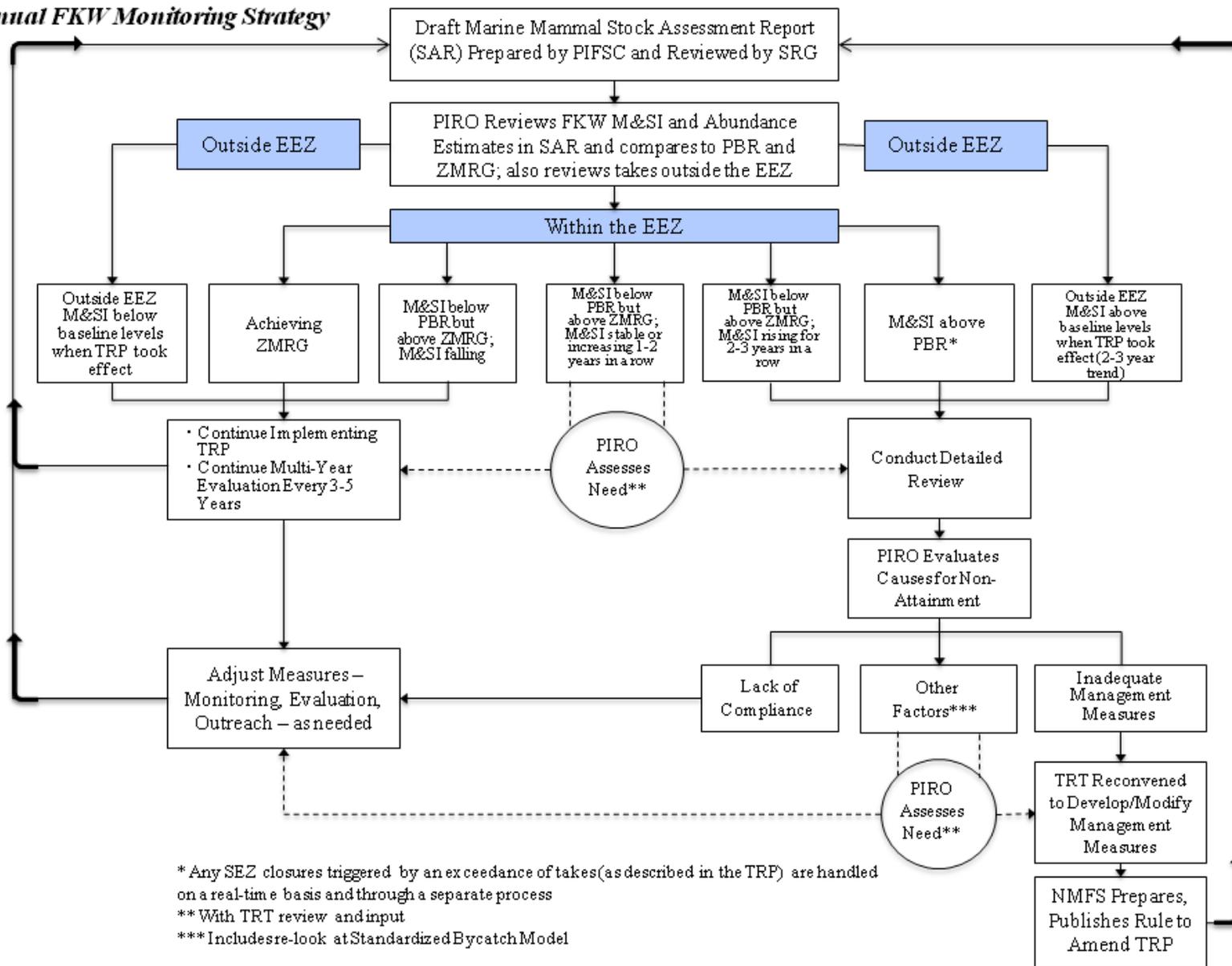
V. Summary

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.

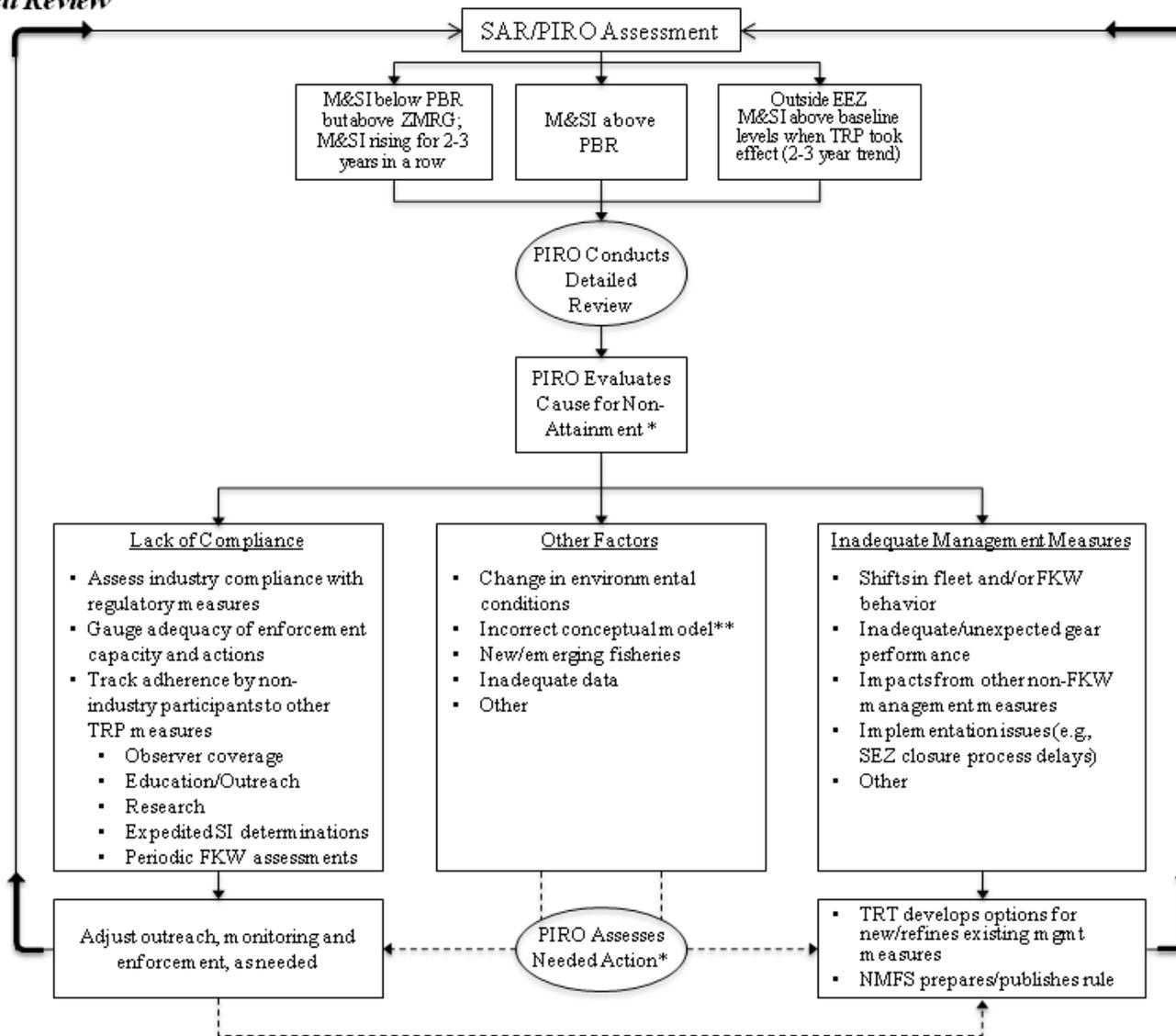
Appendix

Monitoring Protocol Flow Charts

Annual FKW Monitoring Strategy



Detailed Review



* With TRT review and input
 ** Includes re-look at Standardized Bycatch Model

Multi-Year Review

