

***Tracking PIFSC Activities-Associated with MSRA Research Priorities for 2025***

At its 153<sup>rd</sup> SSC Meeting in September 2024, through a working group report, the SSC identified 10 key research priorities from the previously endorsed 2025-2029 five year MSRA research priorities document to be addressed in 2025. Among those 10 items, two items were elevated as most pressing. The below tables are intended to track progress of addressing those 10 items in 2025 and if they are to be addressed in 2026. The tables are provided in order of the two most pressing items and then by Council program area. At the 155<sup>th</sup> SSC, PIFSC will provide an update on the progress of these 10 priorities. Additionally, PIFSC may provide progress updates on other MSRA priorities that may be **significantly fulfilled** in 2025 as well and on a priority also discussed at the 153<sup>rd</sup> SSC.

Status of two highest priorities for 2025 addressed by the 153<sup>rd</sup> SSC

	Research Priority and/or Activity	Expected Progress in 2025	Addressed in 2026?
PF5	Mitigation of depredation and development of deterrents to reduce incidental interactions in U.S. Pacific Island fisheries	<p><b>Ex) PIFSC expects to follow-up on this ____, limitations include</b></p> <p>PIFSC recently completed a trial of commercially available magnetic deterrent on rates of shark depredation in the Hawaii bottomfish fishery. Initial trials indicated that the deterrent device being tested appeared to be ineffective in decreasing depredation rates on Hawaii bottomfishing vessels.</p> <p>PIFSC acoustic monitoring efforts to understand patterns and drivers of false killer whale depredation is presently on hold while instruments are being upgraded and existing datasets are being more fully analyzed. Acoustic deployments may resume later this FY.</p>	<b>Ex) Yes, depredation mitigation is expected to be multi-year</b>
PS2.2.1	Improved pelagic false killer whale assessments on the high seas with a focus of delineating full stock range	PIFSC initiated an update to the Hawaii pelagic FKW assessment model this year,	Density model and GTSeq analyses will

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	<p>based on robust biological data; Inclusion of other available data, including tagging and acoustic data to fulfill the above priority to better discern information beyond the EEZ and among the range of the species where it overlaps with U.S. fisheries</p>	<p>funded by the Protected Species Toolbox Initiative and the national Take-Reduction Program. The Toolbox effort will update the model through inclusion of the 2023 HICEAS dataset, will integrate new variance propagation approaches to ensure a variance is being properly estimated, is examining alternative environmental covariates, and will consider model validation and extrapolation approaches, with all code and documentation available on GitHub for public use. The TRT extension of the effort includes reformulating the model to incorporate acoustic detections, likely requiring a shift to a Bayesian modeling framework. The team is about halfway through the toolbox portion of the work, with the updated model expected this fall.</p> <p>PIFSC collected eDNA samples using the ship's flow-through system during the SCOPE survey and other recent ecosystem surveys in the central Pacific. Those samples resulted in detection of false killer whales at 3 sites. The mtDNA extractions from those filters are being shared with the SWFSC marine mammal genetics lab for further processing.</p>	<p>continue. PIFSC is exploring collaboration with UH Manoa on analysis of additional eDNA samples collected on a transect from Hawaii to Guam.</p>

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		The PIFSC and SWFSC are collaborating on development of a GTSeq panel for blackfish that will enable higher resolution examination of population structure for false killer whales. Lab work is underway and will ultimately include examination of all available false killer whale samples available in NMFS archives.	

Status of other top 2025 priorities addressed by the 153<sup>rd</sup> SSC, by Council program area

	Research Priority and/or Activity	Expected Progress in 2025	Addressed in 2026?
<b>Pelagic Fisheries</b>			
<b>PF2</b>	Understanding the effects of spatial closures and large-scale marine protected areas on fisheries, island communities, and population dynamics on target and non-target species	PIFSC is in the process of completing an analysis to look at the potential impacts of displaced effort caused by a closure of the Hawaiian Islands Southern Exclusion Zone (SEZ) to commercial Hawai‘i deep-set longline fishing to reduce bycatch of false killer whales. This work was submitted for publication and is in revisions.	
<b>Island Fisheries</b>			
<b>IF2.1.2</b>	Perform resource assessments including growth and recruitment, estimates of unreported catch, etc. to determine life history, population dynamics and connectivity information on MUS	PIFSC has recently hired a new stock assessment scientist to focus on data-limited and risk-based assessment approach assessments for island fisheries MUS. This will include work to move from complex assessments to indicator	

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		<p>species in Guam, CNMI and American Samoa.</p> <p>PIFSC developed an assessment update for the CNMI BMUS. This assessment will be reviewed by an SSC panel in April 2025.</p> <p>PIFSC will initiate the main Hawaiian islands deep 7 bottomfish research track focusing on the non-commercial data and the refinement of the research fishing for BFISH.</p>	
<b>Protected Species</b>			
<b>PS2.2.6</b>	Development of tagging and other innovative approaches for improving species-specific post-release mortality estimate for false killer whales that interact with the Hawaii longline fishery	PIFSC-funded grant to partner Cascadia Research Collective includes analyses of the multi-decade MHI insular FKW catalog for insights into age, sex, and other factors that may relate to interaction rates and whether evidence of interactions is related to differences in the length of sighting histories.	Pending availability of funds to pursue additional work.
<b>PS4.1.1</b>	Develop and test mitigation methods to reduce post-release mortality of oceanic whitetip shark and false killer whale interactions in small-boat fisheries; noting the urgency with oceanic whitetip sharks especially.	<p>No work is ongoing for false killer whales.</p> <p>PIFSC continues to fund work through the Hawaii Community Tagging Program (HCTP) to use telemetry data to analyze habitat use of oceanic whitetip sharks around Hawaii. This includes analysis of oceanic whitetip shark residency around instrumented aquaculture operations and</p>	

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		FADs, as well as demographics of oceanic whitetip sharks observed in Hawaii including; size, sex, assessment of seasonality and proportion of individuals that are either pregnant or have evidence of mating, assessment of association type (e.g marine mammal, FAD), and assessment of proportion of individuals with evidence of fishery interactions (e.g. type and quantity of trailing gear, injuries, etc) around the main Hawaiian islands	
<b>Human and Communities</b>			
<b>HC1.1.2</b>	Characterizing non-commercial vessels, participants, motivations, catch and effort	PIFSC SEES Program is implementing the 2025 Marianas small boat economic survey which will provide valuable baseline updates from past survey efforts in 2018 and 2011 to characterize fishing vessels, participants, motivations, catch and effort for commercial and non-commercial fishers.	
<b>HC1.1.3</b>	Improving estimations of the relative proportionality of commercial and noncommercial catch and effort	PIFSC continues to work with DAR and the fishing community on the execution of the uku pilot mail survey. We expect the initial mail out of the survey cards in March 2025. The survey will run for a whole year.	
<b>HC1.1.4</b>	Understand product flow, price determination, demand structure, consumer preferences and non-market channels of fish distributions relationships with formal markets; including origin of products	PIFSC SEES Program is implementing the 2025 Marianas small boat economic survey which will provide valuable updates on the use of non-market	PIFSC SEES Program will explore fish flow for small boat fleet in the CNMI to better

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		channels for fish distribution by Marianas small boat fishers. Additionally SEES Program work in American Samoa is exploring fish flow for small boat and longline fleets to better understand catch distribution for both formal and non-market channels through semi-structured interviews with key community members.	understand catch distribution for both formal and non-market channels through semi-structured interviews with key community members.
<b>HC3.1.2</b>	Assess the human dimensions of US Pacific Marine managed areas (such as area closures or MPAs) regarding procedural and distributive justice, transferred economic, social and ecological effects and safety.		PIFSC SEES staff are building a spatial location choice model for the Hawaii longline fishery to explore behavioral responses and economic impacts to future spatial management scenarios.

Below are status lines for other research priorities in the Five Year MSRA Research Priorities that may be **significantly fulfilled in 2025**

ID	Research Priority and/or Activity	Expected Progress in 2025	Addressed in 2026?
PF1.1	Improve the estimation of non-commercial catches in state and territorial non-longline fisheries	FRMD analyzed the DMWR recreational fishing data provided by the Pago Pago Game Fishing Association collected by the FAD program.	
PF1.4	Analyze fishery performance of non-target pelagic management unit species (PMUS), including effects due to climate change. Priority species are mahimahi,	FRMD completed the hiring of a CIMAR position to work on assessments for secondary pelagics and will start addressing these priorities.	The PIFSC SEES/Hawaii IEA is analyzing and refining indicators to track the trends in small-boat commercial

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	ono, monchong complex, opah complex, and shortbill spearfish.		catch of non-target (and target) management species that were previously published in the 2022 Hawaii Ecosystem Status Report. Newly developed indicators will be included in a subsequent Ecosystem Status Report to be published in FY26.
PF1.5	Develop status, productivity, or risk indicators for PMUS that currently lack stock assessments or have historically lacked complete landings information. Investigate available size-based indicators, if possible		
PF1.6	Work with regional fishery management organization science providers to collect and develop CPUE time series and other necessary information to conduct stock assessments on non-target PMUS currently lacking stock status evaluation in the following priority: mahimahi, ono, opah complex, monchong complex, and shortbill spearfish		
PF2	Understanding the effects of spatial closures and large-scale marine protected areas on fisheries, island communities, and population dynamics on target and non-target species	PIFSC developed the Protected Species Ensemble Random Forest (PSERF) model that looked at displacement of effort and impacts to the fleet	
PF3.1	Discerning impacts of climate change on distributions and connectivity of PMUS through synthesizing existing studies and through what other needs	FRMD continues to collect pelagic species life history samples through International Billfish BioSampling (IBBS)	
PF3.2	Identifying environmental variables that have a direct effect on PMUS life history		

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PF3.3	Mixing of target and incidental species between U.S. fisheries and sub-populations and/or larger populations		
PF4.5	Determine the influence of mesoscale oceanographic features on island fisheries		PIFSC's Uncrewed Marine Systems project assessing productivity gradients in the Hawaiian Islands will help increase our understanding of how mesoscale ocean features drive spatio-temporal variation in phytoplankton biomass and therefore fisheries productivity. In addition, the Hawaii IEA is analyzing and refining oceanographic and climate indicators published in the 2022 Hawaii Ecosystem Status Report and will add additional efforts that combine these indicators to understand ocean-fisheries related interactions.
PF5.1	Estimates of total fishery-wide occurrence and economic loss in longline fisheries due to shark depredation including events associated with cookie cutter shark mutilation of catch	PIFSC SEES and PRP staff are publishing a fish price model manuscript that estimates total revenue lost due to cookie cutter shark depredation and other damage for the Hawaii longline fishery	
IF1.1.1	Promote and begin development of electronic reporting and monitoring for fisheries harvesting management unit species (MUS)	1. FRMD completed the transition from Visual FoxPro to Progressive Web Application for the commercial	



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IF1.1.2	Develop novel data collection systems to replace antiquated data collection systems using image recognition technology	purchase reporting system. This system is now called Sellit Logit V2.0 2. FRMD conducted a data collection improvement workshop to refine the spatial/temporal resolution of fishing effort reporting and use of surveillance technology	
IF1.1.3	Research on data biases (e.g. shark depredation, noncommercial catch, underreporting, etc.) that impacts stock assessments, status, and other data products	3. FRMD through PacStates is developing the eCREEL to replace the paper reporting to increase efficiency in data collection 4. In the MHI, FRMD is collaborating with Hawaii Division of Aquatic Resources, in testing an alternative mail survey focused on the uku fishery 5. FRMD initiated the Guam BFISH survey and completed the first year of the pilot project. In Hawaii BFISH, the research grids will be increased to 500+ grids	
IF1.2.1	Develop and define objectives for target ECS reference points and/or a threshold level that would transfer an ECS back to MUS	FRMD staff taking the lead in the Archipelagic Plan Team in developing a conservation and management framework for ECS under the federal FEP	
IF1.2.3	Improve the collection and monitoring of environmental parameters (via satellite-derived imaging or in-situ logs) to generate data products that can in turn be used to monitor the impact of variability in the environmental parameters on fishery performance.		PIFSC Uncrewed Marine Systems project will combine in situ and satellite data to quantify the surface and subsurface gradients in phytoplankton biomass around

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			Hawaii and the associated underlying drivers of changes across space and time. This information will support increased understanding of how changes in ocean conditions influence fisheries performance.
IF2	Improve information, particularly life history information and fishery-independent information, to support and improve stock assessments of island fisheries MUS and ECS	<ol style="list-style-type: none"> <li>1. FRMD completed the CIMAR hiring to focus on ramping up the collection, processing, and analysis of the life history information for ECS. Another CIMAR hire will be responsible for developing assessments for ECS;</li> <li>2. PIFSC is conducting BFISH in Guam and Hawaii and BioSampling in Guam, CNMI, and Hawaii. The FRMD Life History Program is testing the use of FishMats (a graduated vinyl mat) to support the development of an AI tool that would ID and estimate fish length.</li> <li>3. FRMD-LHP will conduct a Life History cruise in the northern Mariana islands to conduct standardized survey and biosampling.</li> </ol>	
IF5.1.4	Support the development of fishery management decision making tools that incorporate ecosystem processes and environmental changes (e.g. investigate the utility of e-DNA to analyze species distribution, apply Integrated Environmental Assessments, perform		PIFSC collaborative (PRP and SEES/Hawaii IEA) Hawaii Biodiversity and Ecosystem Study is working on a joint model that combines eDNA and visual surveys and

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	trophic analyses and diet studies to understand species-specific dynamics);		quantifies fish abundance and biomass, using reef fish along west Hawaii as a case study.
PS1.1.1	Improve understanding of relationships between species distribution and interaction distribution (including fishery distribution), interchangeability of those for management purposes, and consequences of each distributions on predictions under climate scenarios	PIFSC developed the Protected Species Ensemble Random Forest (PSERF) model that looked at displacement of effort and impacts to the fleet	
PS2.1.5	Ongoing data collection to improve evaluation of impacts on ESA-listed species (including data limited species such as giant manta ray)	Ongoing tagging project of mobulid rays	
PS2.1.7	Complete tagging mechanism development and deploy satellite tags on post-interaction leatherback turtles in the longline fishery to estimate species-specific post-hooking mortality rates	FRMD developed the leather back tag head that would safely deploy a dart through the carapace of leatherback turtles	
HC1.1.1	Monitor and track changes of the costs of fishing, fisher effort (who and where) and/or participation	PIFSC is maintaining ongoing trip cost data collection program for regional longline fisheries and territory small boat fisheries. PIFSC is maintaining economic performance metrics for regional longline fisheries and MHI Deep 7 bottomfish fishery. All these data are provided in annual SAFE report updates.	
HC1.1.7	Monitor community engagement, reliance, and dependence on fishery resources	Community-level Fishing Engagement and Reliance Indicators for Commercial and Noncommercial fisheries in the State of Hawaii will be updated through 2024	

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HC1.1.9	Perform comparative analyses of data from different qualitative and quantitative sampling designs such as focus groups, fishing panels, general household surveys, and targeted fishing community surveys to inform fishery characterizations	In preparation of 2026 CNMI Fish Flow project, PIFSC SEES staff are conducting a review/synthesis of various available datasets relevant to catch distribution in CNMI fisheries.	
HC2.1.2	Evaluate integrated social, ecological, biophysical, and bioeconomic research efforts to inform EBFM	PIFSC SEES staff have submitted a manuscript for review that presents a discrete dynamic bioeconomic model to study Catchability and the Approach to Management Targets in Fisheries	
HC2.1.4	Collaborate with local and Indigenous knowledge holders to improve EBFM characterization, including appropriate datasets and trends over time	PIFSC SEES affiliate staff compile annual fisher observations in an annual report (and SAFE report narratives) to contextualize ecosystem information for each jurisdiction	
HC2.3.2	Generate attributes of island communities, including local knowledge and traditional practices, that may help them be resilient when exposed to change	PIFSC SEES staff and affiliates are working to formalize a methodology for assessment of social-ecological benefits of loko i'a and aquaculture and climate vulnerabilities of these communities and practitioners across the MHI.	
HC2.3.3	Determine the cultural importance of and community reliance on species vulnerable to effects of climate change	PIFSC SEES staff are collaborating with other NMFS social scientists to develop community climate change vulnerability indicators for the State of Hawaii, aligned with nationally-established methods	
HC3.1.1	Examine interactions between culture and contemporary fisheries to understand dimensions of fishing potentially impacted by management	PIFSC SEES work exploring AmSam Fish Flow could illuminate less reported non-market motivations and uses of small boat and US LL catch	PIFSC SEES work exploring CNMI Fish Flow could illuminate less reported non-market motivations and uses

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		associated with such intangible benefits.	of small boat and US LL catch associated with such intangible benefits.
HC3.1.4	Identify community priorities (e.g., places, practices, species) at appropriate scales (e.g., village, island, fishery, community -- including communities of practice, etc.)		PIFSC SEES affiliate staff are collaborating with PIFSC ARP affiliate staff to assess & compile information on the sociocultural importance of key reef fish in Hawaii to assist Holomua Navigation teams.
HC3.1.5	Perform focused research on attributes of culture (examples such as: materials, fishing practice, identity, motivation, governance, distribution, etc.) to ensure appropriate consideration in management action		PIFSC SEES affiliate staff are working to develop guidance to cultivate relationships with loko i'a / aquaculture practitioners to develop a best practices document on how to develop reciprocal relationships with communities