



Joint Groundfish Plan Teams

Research Priorities Meeting Report

January 17, 2024

BSAI Groundfish Plan Team members in attendance:

Steve Barbeaux AFSC REFM (co-chair)
Kalei Shotwell AFSC REFM (co-chair)
Cindy Tribuzio AFSC ABL (vice chair)
Diana Stram NPFMC (coordinator)
Lukas DeFilippo AFSC ABL
Lisa Hillier WDFW

Phil Joy ADF&G
Beth Matta AFSC REFM
Andrew Seitz UAF
Jane Sullivan AFSC ABL
Steven Whitney NMFS AKRO

GOA Groundfish Plan Team members in attendance:

Jim Ianelli AFSC REFM (co-chair)
Chris Lunsford AFSC ABL (co-chair)
Sara Cleaver NPFMC (coordinator)
Kristan Blackhart NOAA OST
Craig Faunce AFSC FMA
Lisa Hillier WDFW
Pete Hulson AFSC ABL

Abby Jahn NMFS AKRO
Sandra Lowe AFSC REFM
Cecilia O’Leary AFSC RACE
Jan Rumble ADF&G
Paul Spencer AFSC REFM
Ben Williams AFSC ABL

Introduction

The Groundfish Plan Teams met jointly through Zoom on January 17th. The goal of this meeting was to refine the list of existing, new, and team member submissions to a list of 3-5 top priorities. Approximately 30 people attended the meeting.

Research Priorities

Nicole Watson, Council staff, provided a presentation on the research priority process, a checklist of responsibilities for the Plan Teams, and background information and resources relevant to research priorities, such as the [website](#) and Research Priorities [eAgenda](#). Prior to the meeting, Plan Team members were asked to provide staff and the co-chairs a list of their top five, unranked priorities to focus meeting discussion. Any new submissions developed by Plan Team members are included on pages 9-12 in the attached “Shortlist” document. That document was compiled based on Plan Team member review of existing and new submissions.

The Teams discussed the priorities that were submitted in advance of the meeting from the existing and new submissions, discussing rationale for their selections and identifying key considerations. The Teams did not receive any public comment at this meeting.

Critical ongoing monitoring topics are included in a list separate from the top 5 list of research priorities that will be provided to the SSC at the February 2024 Council meeting (see pages 15-17 in attached “shortlist” for critical ongoing monitoring list). The Team noted that their interpretation of the continued ongoing monitoring category was for monitoring or surveys that are already occurring, and that any new surveys should be considered “research” and not be included in the critical ongoing monitoring category.

The [voting results](#) identified the Groundfish Plan Teams’ top five priorities in rank order shown in

Table 1. A supplementary list of priorities deemed important but not included in the final top 5 list nor in the list of critical ongoing monitoring topics. was also produced at this meeting; the Plan Teams agreed to include the 10 priorities that were not selected as the top 5 to be the supplementary list of priorities (Table 2). Additional comments were provided for each of the top research priorities, which were compiled into the Google sheet.

Table 1. GFPT Top 5 Research Priorities in Ranked Order. Descriptions are included in the attached “Shortlist” with corresponding Research IDs and titles.

Research ID	Title
GPT015	Develop stock-specific indicators and evaluate incorporation of nonstationarity and climate change impacts for informing the stock assessment process.
GPT002	Maturity Studies
GPT016	Develop Operating models to evaluate management strategies under varying climate, ecological, and economic conditions and evaluate impacts to managed resources and coastal communities.
146	Improve surveys in untrawlable habitat, particularly for rockfish, Atka mackerel, and sculpins
GPT008	Incorporate economics into decisions

Table 2. Supplementary list of research priorities

Research ID	Title
GPT013	Alternative models for data or resource limited stocks
GPT001	New: Modernization of fisheries-independent groundfish monitoring methods.
GPT019	Pacific cod, pollock FT-NIRS, and age validation.
GPT017	Analyses on loss of biological samples due to implementation of EM
235	Investigate gear modifications and changes in fishing practices to reduce bycatch and PSC
366	Continue to investigate time variation and the shape of fishery and survey selectivity models
GPT014	Bmsy proxy evaluation
GPT011	Marine mammals & ABCs
174	Develop spatially explicit stock assessment models
144	District-wide survey for demersal shelf rockfish in Southeast Alaska

The Teams recommend a process be developed for removing priorities from the database, or creating a new list every year that does not include old priorities. One example of a priority that may be able to be removed is #381 (potential updates to the observer program). The Team noted that this priority is old and originates from 2013 with concern over halibut catch estimates and observer restructuring.

The Team did not discuss putting any new priorities in the database beyond those in Tables 1 and 2.

SHORTLIST: compiled from review of new and existing submissions by plan team members

NOTE: If editing a submission will alter the original intent/scope, write as a new member submission. Otherwise, minor edits are fine as long as intent/scope does not change.

Research ID	# times cited	Title	Description	GPT Member Notes	Include in Voting list?	Include in Monitoring list?	Ongoing?
366	7	Continue to investigate time variation and the shape of fishery and survey selectivity models	There is considerable controversy about (1) whether selectivity should be dome-shaped or asymptotic, and (2) whether selectivity should be time-varying by default. Using a dome-shaped curve can create a large increase in biomass which may not be real. Treating selectivity as time-varying increases the number of model parameters greatly, which may lead to confounding among parameters. Better scientific guidance through research studies is needed to address these two problems.	Could be dealt with in MSE GPT 16	?		
536	6	Evaluate incorporation of climate change impacts into stock assessments	Climate change impacts are becoming an increasingly important consideration for long term planning and should be included in projections of exploitable fish stocks and associated ecosystem components. Incorporation of climate-based parameters into fish stock assessments will allow for exploration of harvest scenarios in the context of evolving climate conditions. Research is needed to explore how these parameters can be integrated into fishery stock assessments.	Similar to 733 and new submission N039g, also part of MSE? Not able to address this as quickly, a lot of work needed before accomplishing this. other assessments lacking basic biology which may be more crucial first.	N		Combined in GPT015
146	5	Improve surveys in untrawlable habitat, particularly for rockfish, Atka mackerel, and sculpins	For groundfish in general, and rockfish and Atka mackerel in particular, continue and expand research on trawlable and untrawlable habitat to improve resource assessment surveys. For example, improved surveys, such as hydro-acoustic surveys, are needed to better assess pelagic rockfish species that are found in untrawlable habitat or are semi-pelagic species such as northern and dusky rockfish. A number of publications specific to untrawlable grounds and rockfish sampling have been published recently, but have not been incorporated directly into routine stock assessment routine survey designs.	Is this addressed by Oyafuso et al's rec	Y		GPT 10 is this too
155	4	Evaluation of salmon PSC mitigation measures	Develop a research program that will facilitate evaluation of salmon (both Chinook and non-Chinook) PSC mitigation measures in the BSAI and GOA. This includes updated estimates of the amounts reasonably necessary for subsistence, timing of runs and openings relative to subsistence requirements, and access to cost data for the commercial pollock and salmon industries so that impacts on profits (not gross revenues) can be calculated.	Can someone with expertise in this topic speak to its relative importance? Diana thinks this is an old priority that has been or is being addressed	N	Y? this is ongoing, but is it considered monitoring in terms of Critical Ongoing Monitoring?	

189	4	Develop stock-specific ecosystem indicators and incorporate into stock assessments	Develop stock-specific ecosystem indicators and incorporate into stock assessments. (in progress)	Supported by N035a new submission Similar with 536	N		Combined in GPT015
208	4	Explore factors that contribute to year class strength for managed resources	New information and data are needed that would inform our understanding of the stock- recruit relationship for groundfish, Pacific halibut, and crab to project year-class strength.	Ongoing for many years.		Y	
225	4	Develop projection models to evaluate management strategies under varying climate, ecological, and economic conditions and evaluate impacts to managed resources and coastal communities.	There is a need to develop projection models that evaluate the robustness and resilience of different management strategies under varying climate, ecological, and economic conditions. Projection models should forecast seasonal and climate related shifts in the spatial distribution and abundance of commercial fish and shellfish, and impacts to communities.	In alignment with AFSC stock assessment team priorities to improve projections. Combine with other MSE priorities.	To be reworded and combined		
535	4	Development and evaluation of data poor and data moderate methods	Several methods are currently in use around the country for setting harvest specifications for data-poor and data-moderate stocks (corresponding, respectively, to Tiers 6 and 4-5 of the BSAI and GOA groundfish harvest control rules), several others are currently under development, and still others could be developed in the future. There is a need to continue development of such methods and to conduct comparative performance tests of the methods.	GPT 13 duplicated	N		
712	4	Gap Analyses on loss of biological samples due to implementation of EM	Research to determine the effects of loss of biological data collections due to Electronic Monitoring (EM). As the use of EM increases in different fisheries, fewer at-sea observer observations and collections are being made which reduces haul specific data collections. Evaluations of the effects of this on catch accounting estimates and stock assessment are needed as well as an evaluation of alternative sources or proxies for biological data as EM use increases.	Now GPT17 andn GPT18	N		

145	3	Continuation of State and Federal annual and biennial surveys	Continuation of State and Federal annual and biennial surveys in the GOA, AI, NBS, and EBS, including crab pot surveys, is a critical aspect of fishery management off Alaska. It is important to give priority to these surveys, in light of recent federal budgets in which funding may not be sufficient to conduct these surveys. Loss of funding for days at sea for NOAA ships jeopardizes these programs. Budgetary concerns have resulted in cuts to not only days at sea, which increases uncertainty, but also sampling the deepest strata, which threatens the value of trawl surveys as a synoptic ecological survey. These surveys provide baseline distribution, abundance, and life history data that form the foundation for stock assessments and the development of ecosystem approaches to management. Although an ongoing need, these surveys are considered the highest priority research activity, contributing to assessment of commercial groundfish and crab fisheries off Alaska.	can we slightly modify to include slope survey? this is already in critical ongoing monitoring		Y	
381	3	Effects of changes to the observer program	Evaluate the effects of changes to data collection protocols that occur because of observer restructuring, potential funding limitations and the introduction of electronic monitoring. Ensure that data collected provides a valid representation of the catch and can be compared easily to the previous data collection methods and time series remain intact.	This is old and relates to catch stability over time. Originates from 2013 with concern over halibut catch estimates.	N		
163	2	Conduct routine fish, crab, and oceanographic surveys in the Arctic Ocean	Dynamic ecosystem and environmental changes in the Arctic Ocean are occurring. Assessment of the current baseline conditions and trophic interactions is important. This effort should not supplant the regular surveys in the BSAI and GOA, which are of critical importance to science and management.	Similar to 186 in continued ongoing monitoring (Collect and maintain zooplankton and meroplankton biomass and community composition time series) and includes Arctic		Y	
176	2	Refine methods to incorporate uncertainty into harvest strategies	Refine P* and decision theoretic methods to incorporate uncertainty into harvest strategies for groundfish for ACL estimation. Continue existing management strategy evaluations at the stock level.	combine with other MSE priorities 176, 366, NOW in GPT 16			
235	2	Investigate gear modifications and changes in fishing practices to reduce bycatch and PSC	Gear modifications and changes in fishing practices to reduce bycatch and PSC are needed.		Y		

533	2	Explore optimal sampling strategies and geospatial approaches for time series of survey data	The Stock Assessment Improvement Plan seeks to ensure that NMFS conducts its surveys in the most effective and efficient manner possible. Statistical analysis of the optimal number of survey stations needed to accurately assess the status and trends of groundfish and crab stocks is required to achieve this goal. An extension of this activity would be to explore alternative abundance estimation methods. For example exploring Thorson's geostatistical model as an alternative to the designed-based estimates for abundance indices used in stock assessments is a potentially useful analysis. Extensions would include an assessment of whether there are certain life history characteristics or levels of aggregation when geospatial models are used.			Y	
534	2	Continue to develop technical interaction model for BSAI MSE	A multi-species management strategy evaluation (MSE) with technical interactions among species is being developed to explore the potential implications of alternative harvest policies as was done for the Programmatic Supplemental Environmental Impact Statement (PSEIS). The approach of using an MSE with technical interactions is useful and unique in that the whole cycle of a fishery system is modeled: "true" status of several fish stocks in the fishery (Pacific cod, pollock, yellowfin sole, and Pacific halibut) are simulated; data are generated based on the "true" status of each stock, stock assessments are performed using the generated data; catch limits and bycatch limits are calculated, and the management system and fleet dynamics are mimicked to simulate the decision-making process that occurs when allocating catch limits among stocks within the constraint of the 2 million ton cap.	Could someone fix the formatting of the text? (done - I think)	N		Y
556	2	Re-evaluate the location and temporal structure of Herring Savings Areas	Re-evaluate whether the current locations of the Herring Savings Areas are likely to be effective at protecting herring populations (i.e. overlap with current distribution of herring during the specified dates) and whether seasonally-fixed or moving closures would be the most effective. Re-evaluation is particularly necessary due to recent changes in herring distributions. The research would ensure that groundfish fisheries are not pushed into areas with higher salmon PSC and squid bycatch without meeting the goal of protecting herring.	Areas are mispecified, but probably a management priority, potentially not a research priority as the information needed is already in hand.	N	Y	
144	1	District-wide survey for demersal shelf rockfish in Southeast Alaska	Conduct a district-wide survey for demersal shelf rockfish in Southeast Alaska on a biennial or triennial basis. Survey information is becoming extremely dated.	Very difficult, need to develop a full plan and cooperation with ADFG, but is necessary	Y		

154	1	Pacific cod stock assessment for the Aleutian Islands	Develop an age-structured Pacific cod stock assessment for the Aleutian Islands region. In 2014 the Aleutian Islands and eastern Bering Sea regions were split and have separate ABCs and OFLs. There is need to develop an assessment model for cod in the Aleutians.		N		
156	1	Improve knowledge for salmon PSC impact assessment	Improve the resolution of Chinook and chum salmon genetic stock identification methods (e.g., baseline development, marker development), improve precision of salmon run size estimates in western Alaska, and initiate investigations of biotic and abiotic factors influencing natural mortality rate during ocean migration in the GOA	ABL lab working on genetics	N		Y
158	1	Research ecosystem indicators and their thresholds for inclusion in ecosystem-level management strategy evaluation.	Initiate/continue research on the synthesis of ecosystem indicators, developing and evaluating thresholds for ecosystem indicators, and ecosystem-level management strategy evaluation.	Included in MSE	N		
173	1	Expand studies to identify stock and management boundaries	To identify and refine stock boundaries and understand source/sink dynamics (e.g., scallop metapopulations). Conduct studies to evaluate all crab stock boundaries relative to management boundaries (e.g, Bristol Bay red king crab, Adak red king crab, Aleutian Island golden king crab, EBS Tanner crab, Pribilof blue king crab). Expanded studies are needed in the areas of genetics, mark-recapture, reproductive biology, larval distribution, and advection. Such boundaries are to be evaluated so that the risks and consequences of management actions are clear.		N		Y
174	1	Develop spatially explicit stock assessment models	Develop spatially explicit stock assessment models. High priority species for spatially explicit models include: walleye pollock, snow and Tanner crab, Pacific cod, sablefish, yellowfin sole, rock sole, arrowtooth flounder, Pacific ocean perch, black spotted rockfish, rougheye rockfish, and Atka mackerel.		Y		
177	1	Conduct prospective and retrospective analyses of changes in the spatial and temporal distribution of fishing effort in response to management and environmental changes	Conduct prospective and retrospective analyses of changes in the spatial and temporal distribution of fishing effort, in response to management actions (e.g., time/area closures, marine reserves, PSC and other bycatch restrictions, co-ops, IFQs, multi-target crab fisheries) and environmental changes.		N		Y
178	1	Develop a framework and collect economic information	Develop a framework for the collection of economic information on commercial, recreational, and charter fishing, as well as fish processing, to meet the requirements of the MSFCMA sections 303(a)(5, 9, 13), 303(b)(6), and 303A.	In conjunction with RID# 611 which is critical ongoing monitoring	N		
182	1	Evaluate the effectiveness of current and alternative Council PSC/bycatch reduction initiatives	Analyze the effects of recent Council actions on PSC and bycatch, including the interaction among PSC and bycatch reduction initiatives (e.g., halibut, salmon, crab). Attention should be given to different incentives that have the potential to cost-effectively reduce PSC.		N		Y

184	1	Evaluate efficacy of habitat closure areas and habitat recovery	Establish a scientific research and monitoring program to understand the degree to which impacts on habitat, benthic infauna, etc., have been reduced within habitat closure areas, and to understand how benthic habitat recovery of key species is occurring (e.g., Red King Crab Savings Area efficacy and Pribilof Island Habitat Conservation Area). (This is an objective of EFH research approach for the Council FMPs).		N		Y
197	1	Develop methodologies to monitor for new/emerging diseases and/or parasites among exploited species and higher trophic levels	Develop methodologies to monitor for new/emerging diseases and/or parasites among exploited species and higher trophic levels.		N		
202	1	Improve estimation of total removals	Develop improved methods for reliable estimation of total removals (e.g., surveys, poorly observed fisheries) to meet requirements of total removals under ACLs. Catch Accounting System now provides total removals annually. Improved reporting on some data such as subsistence catches and Pacific cod bait in crab fisheries is needed. Improvements are needed for in-season catch accounting by sex and size for crab in non-directed fisheries with high bycatch or PSC rates, particularly for blue king crab in the Pacific cod pot fishery in the Pribilof Islands.		N		Y
205	1	Age determination methods for Pacific cod, Pacific sleeper sharks, and spiny dogfish	Studies are needed to validate and improve age determination methods for Pacific cod, Pacific sleeper sharks, and spiny dogfish. Conventional tagging studies of young of the year and/or one-year old Pacific cod would be useful in this regard (partially underway for cod and dogfish).	Suggest taking Pcod out of this and using N010 for Pcod. See GPT019	N		Y
220	1	Research on survey analysis techniques for species that exhibit patchy distributions	Continue research on the design and implementation of appropriate survey analysis techniques, to aid the Council in assessing species (e.g., Pribilof Island king crabs and rockfish) that exhibit patchy distributions and, thus, may not be adequately represented (either over- or under-estimated) in the annual or biennial groundfish surveys.	And related existing submission #146	Y		Y

221	1	Collect maturity scans during fisheries that target spawning fish	Expand existing efforts to collect maturity scans during fisheries that target spawning fish (e.g., pollock). Time series of maturity at age should be collected to facilitate the assessment of the effects of density-dependence and environmental conditions on maturity. Maturity information for pollock and Pacific cod is collected by observers and should be analyzed. Maturity information for rockfish species near Kodiak has been collected recently, both during the fishery and dedicated scientific cruises, and should be analyzed. A dedicated survey to examine spawning sablefish has also been conducted. Efforts to collect maturity data, and then analyze for rockfish and other species should continue. In particular, retrospective studies to identify factors (e.g., fishing, climate, prey quality and quantity) influencing the maturity schedule should be conducted.		Y	I	
241	1	Develop bottom and water column temperature database and indices	Develop bottom and water column temperature database and indices for use in EBS, GOA, and AI stock assessments.		N		Y
242	1	Collect and maintain primary production time series	Collect and maintain primary production time series in the EBS, AI, GOA, and Arctic; particularly in relationship to key climate and oceanographic variables.		N		Y
383	1	Determine quantitative indicators of spatial structure, particular for walleye pollock and Pacific cod	The next generation of stock assessment models will be spatial age- and length-structured assessment models, in line with the goal of ecosystem-based fishery management. Current distributions of spatial location have been empirically summarized, but methods should be explored to convert these to movement patterns for biological and/or management regions.	Covered to some degree in stock-structure evaluations, also in ESRs such as condition factors	N		Y
431	1	Develop tools for analyzing coastal community vulnerability to fisheries management changes	Develop tools for for assessing and predicting coastal community vulnerability to fisheries management changes. Assess changes in community vulnerability over time by FMP and individual catch share fishery.		N		
612	1	Maintain observer program	Maintain the observer data collection activity and ensure that fishery dependent data collected provides a valid representation of the catch and can be compared easily to the previous data collection methods and time series remain intact.	This is already in critical ongoing monitoring		Y	

613	1	Maintain and update coupled biophysical projections for the North Pacific	Coupled model projection systems are needed to support the NPFMC's strategic initiatives related to the Bering Sea Regional Action Plan, the Bering Sea Fisheries Ecosystem Plan and the Alaska Climate Integrated Modeling activity. Research is needed on methods to dynamically downscale physics and bio-geo-chemical information derived from global models and earth systems models to regional ocean models (ROMs) as well as methods for coupling nutrient-phytoplankton-zooplankton (NPZ) into ROMs. Likewise continued research on methods for coupling biological models (including the response of fishers) to projected environmental change will be an ongoing strategic activity. Projected environmental conditions from the ROMs/NPZ model is the foundation for management strategy evaluations needed to provide climate informed harvest strategies for the future. Support for continued update and refinement of the ROM/NPZ coupled models will be an ongoing strategic research need for the NPFMC.	And related #223, ACLIM covered	N		Y
615	1	Evaluate the interactions between fisheries and killer whales and sperm whales	Attempt to quantify killer whale and sperm whale depredation on halibut, sablefish, and turbot in the CV and CP longline and trawl fleets. Study the effects on DMRs, the observer program, stock estimates, wastage, and unobserved mortality. Evaluate methods of avoidance, deterrence, and cost.		N		Y
732	1	LK and TK data collection	This research priority would support more structured and consistent sources of ecosystem information for use in annual reports (such as ESRs), specific fishery management actions, or future development of conceptual models, especially as there are some areas that are data poor. Ultimately want to build systematic onramps into the Council process, but need data to be able to populate those onramps also.	This should already be covered in 611 (collection of socioeconomic information) and is already critical ongoing monitoring	N	Y	Y
735	1	Fishery monitoring and catch accounting	Fishery dependent data collected by observers, electronic monitoring, and the state of Alaska provide information critical for sustainable fisheries management. These data include: a) the amount, distribution, species composition, size, age, maturity and genetics of both the targeted catch and PSC catch (including genetics for chum and Chinook salmon); b) seabird catch; and c) marine mammal encounters and mortalities.	This is already critical ongoing monitoring		Y	Y
N010	1		Assumed natural mortality (M) is central to fishery stock assessments.	If this is kept, take pcod out of #205	N		

N035a	1	Emphasize the ongoing urgency of priority #189 from the 2021 review: "Develop stock-specific ecosystem indicators and incorporate into stock assessments." This work should include precautionary responses to climate change factors.	Informing ecosystem-based fisheries management with data collection and research that bolsters use of ecosystem indicators, and dynamic management frameworks, within stock assessments, fishery management plan development, and TAC setting processes. These approaches are increasingly critical considering the large-scale changes occurring in North Pacific ecosystems, the cascading effects of those changes, and the complexity of interactions/impacts between fisheries.	Also relevant to 189 & 536	N		Combined in GPT015
N039g	1	AMCC underscores the urgency of: #733: Climate change: Develop predictive tools to inform management options related to resilience and adaptation: As evidenced by climate-related challenges for marine species and fisheries managers, this priority should also include precautionary tools in addition to predictive tools, and be elevated from Strategic to Urgent			N		Combined in GPT015

SHORTLIST (cont): New GPT Member Submissions

GPT001		New: Modernization of fisheries-independent groundfish monitoring methods.	Description: modernize AFSC RACE GAP fisheries-independent sampling designs, sampling gear and methods, and inclusion of supplemental emerging technologies.		Y		Y
GPT002		Maturity Studies	Consistently assess maturity at age/size of all Tier 1 and Tier 3 species to evaluate variability and determine climate impacts on maturity. We manage these stocks based on spawning biomass, without an accurate estimation of maturity our basis for management may be biased. This would be for all regions, Bering Sea, GOA, and AI. Expansion of 221.	Expansion of #221?	Y		
GPT003		Add non-stationarity to RID 536	#536, with added language about accounting for non-stationarity in biological reference point calculations	expansion of GPT 015	N		
GPT004		Develop a coastwide assessment model for Pacific cod.	Given recent evidence that Pacific cod move between the BS and GOA, individual models for these areas may be resulting in biases. A better understanding of the connections and how that affects the assessment and management of Pacific cod would be useful.		N		Y
GPT005		New: Deepwater species assessment -	Reinstate the EBS slope survey or evaluate alternative surveys with design- (e.g., ABL longline) or model-based (e.g., IPHC FISS) estimators to assess trends in deepwater species such as turbot, rockfishes, skates, and sleeper sharks.		N		Y

GPT006	Analyze how competitive Alaska fishery commodities are and identify ways to lower production costs.	Quantify production costs for Alaska's seafood commodities and detail how they compare with other seafood and protein commodities from outside the state. Track commodity trends for Alaska over time and project them into the future. Examine barriers to cheaper local production and identify potential solutions. This should factor in the global increase in aquaculture and include price trend projections. Quantify the need for secondary processing abroad, particularly in China, and identify potential solutions and any local impediments to processing domestically.		N		
GPT007	Quantify the amounts of plastics coming from Alaska fisheries and identify alternatives.	Microplastics and macroplastics in the marine environment are matters of increasing concern. Fishing gear is a major source of marine plastics and a significant threat to marine ecosystems and species, especially endangered species. Recent developments in biodegradable plastics and even edible plastics from renewable feedstocks as well as traditional fossil feedstocks are increasingly promising alternatives. Research should quantify the impacts of plastic from Alaska's fisheries and assess the availability and economic feasibility of biodegradable gear alternatives.		N		
GPT008	Incorporate economics into decisions	Research to incorporate economic advice into NPFMC fisheries management decisions such as improved economic advice in ESPs and consideration of alternative Harvest Control Rules that capture economic objectives.	Highly important, but PT currently restricted in using this in decisions may need more research on how this can be considered for ABC and TAC determination. How do we get this information into the council and management process.	Y		
GPT009	Maternal age & reproductive potential	Investigation into value of maternal age in regards to stock assessments accounting for reproductive potential of groundfish species	Combine with GPT002? - agree that combining makes sense, can this be broadened to cover life-history studies?	N		
GPT010	Increase survey areas	Expansion of survey data into non-trawlable areas	Combine with #146? Agree Definitely		+	
GPT011	Marine mammals & ABCs	Ability to specify ESA requirements for Steller sea lion population trends by area-season specific ABCs		Y		
GPT012	Management Strategy Evaluations	MSE testing of data-driven ABC recommendations and potential adjustments. Some overlap with 534. Rewritten as GPT016.	Suggest moving this to shortlist, overlaps with 534 to some extent? To GPT 16	N		

GPT013	Alternative models for data or resource limited stocks	Several methods are currently in use around the country for setting harvest specifications for data or resource limited stocks (corresponding to Tiers 4 - 6 of the BSAI and GOA groundfish harvest control rules), several others are currently under development, and still others could be developed in the future. There is a need to continue development of such methods and to conduct comparative performance tests of the methods. This priority is adapted from RID # 535	535 covers this (but add text to include data moderate), change to "data or resource limited" instead of "data poor" . This is an exact duplicate of 535, what's the intended change?	Y		
GPT014	Bmsy proxy evaluation	Efficacy evaluation of Bmsy proxies for Tier 3 stocks when the recruitment estimates change substantially and propagate into the estimates in unintended ways	Suggest moving this to voting list	Y		
GPT015	Develop stock-specific indicators and evaluate incorporation of nonstationarity and climate change impacts for informing the stock assessment process.	Informing ecosystem-based fisheries management with data collection and research that bolsters use of ecosystem indicators within the stock assessment process. These approaches are increasingly critical considering the large-scale changes occurring in North Pacific ecosystems, the cascading effects of those changes, and the complexity of interactions/impacts between fisheries. Climate change impacts are becoming an increasingly important consideration for long term planning and precautionary and predictive tools should be developed to inform management options related to resilience and adaptation to climate change. This information should be included in projections of exploitable fish stocks and associated ecosystem components. Incorporation of climate-based parameters into fish stock assessments and accounting for non-stationarity in biological reference point calculations will allow for exploration of harvest scenarios in the context of evolving climate conditions. Combines language from 189, 536, 733, NO35a, NO39g, and GPT003.	Combines language from 189, 536, 733, NO35a, NO39g, and GPT003.	Y		
GPT016	Develop Operating models to evaluate management strategies under varying climate, ecological, and economic conditions and evaluate impacts to managed resources and coastal communities.	There is a need to develop projection models that evaluate the robustness and resilience of different management strategies under varying climate, ecological, and economic conditions. Projection models should forecast seasonal and climate related shifts in the spatial distribution and abundance of commercial fish and shellfish, and impacts to communities. Could include testing P* approaches.	Combines language from 225, 158, 176, 366, 536	Y		

GPT017	Analyses on loss of biological samples due to implementation of EM	Research to determine the effects of loss of biological data collections [on stock assessments] due to Electronic Monitoring (EM). As the use of EM increases in different fisheries, fewer at-sea observer observations and collections are being made which reduces haul specific data collections. An evaluation of alternative sources or proxies for biological data as EM use increases may be needed. References 712.	old 712	Y		
GPT018	Analyses on loss of catch precision due to implementation of EM	Evaluations of the effects of EM implementation on catch accounting estimates. References 712 and 735.	old 712. Already covered in 735?	N		Y
GPT019	Pacific cod, pollock FT-NIRS, and age validation.	Improve and validate age determination methods for Pacific cod and investigate the feasibility of Fourier transform near infrared spectroscopy (FT-NIRS) as a method for producing ages for Pacific cod and pollock. Partially references: 205, N010.	Partly extracted from 205, and remove N010	Y		Y

VOTING LIST

Research ID	Title	Description	GPT Member Notes
GPT019	Pacific cod, pollock FT-NIRS, and age validation.	Improve and validate age determination methods for Pacific cod and investigate the feasibility of Fourier transform near infrared	Partly extracted from 205, and remove N010
GPT015	Develop stock-specific indicators and evaluate incorporation of nonstationarity and climate change impacts for informing the stock assessment process.	Informing ecosystem-based fisheries management with data collection and research that bolsters use of ecosystem indicators within the stock assessment process. These approaches are increasingly critical considering the large-scale changes occurring in North Pacific ecosystems, the cascading effects of those changes, and the complexity of interactions/impacts between fisheries. Climate change impacts are becoming an increasingly important consideration for long term planning and precautionary and predictive tools should be developed to inform management options related to resilience and adaptation to climate change. This information should be included in projections of exploitable fish stocks and associated ecosystem components. Incorporation of climate-based parameters into fish stock assessments and accounting for non-stationarity in biological reference point calculations will allow for exploration of harvest scenarios in the	Combines language from 189, 536, 733, NO35a, NO39g, and GPT003.
GPT016	Develop Operating models to evaluate management strategies under varying climate, ecological, and economic conditions and evaluate impacts to managed resources and coastal communities.	There is a need to develop projection models that evaluate the robustness and resilience of different management strategies under varying climate, ecological, and economic conditions. Projection models should forecast seasonal and climate related shifts in the spatial distribution and abundance of commercial fish and shellfish, and impacts to communities. Could include testing P* approaches.	Combines language from 225 and others (need to clearly define "others" - which others?)
GPT017	Analyses on loss of biological samples due to implementation of EM	Research to determine the effects of loss of biological data collections [on stock assessments] due to Electronic Monitoring (EM). As the use of EM increases in different fisheries, fewer at-sea observer observations and collections are being made which reduces haul specific data collections. An evaluation of alternative sources or proxies for biological data as EM use increases may be needed.	old 712
GPT013	Alternative models for data or resource limited stocks	Several methods are currently in use around the country for setting harvest specifications for data or resource limited stocks (corresponding to Tiers 4 - 6 of the BSAI and GOA groundfish harvest control rules), several others are currently under development, and still others could be developed in the future. There is a need to continue development of such methods and to conduct comparative performance tests of the methods. This priority is adapted from RID	535 covers this (but add text to include data moderate), change to "data or resource limited" instead of "data poor" which encompasses everything that's not "data rich"
GPT014	Bmsy proxy evaluation	Efficacy evaluation of Bmsy proxies for Tier 3 stocks when the recruitment estimates change substantially and propagate into the estimates in unintended ways	Suggest moving this to voting list
GPT011	Marine mammals & ABCs	Ability to specify ESA requirements for Steller sea lion population trends by area-season specific ABCs	

GPT008	Incorporate economics into decisions	Research to incorporate economic advice into NPFMC fisheries management decisions such as improved economic advice in ESPs and consideration of alternative Harvest Control Rules that capture economic objectives.	Highly important, but PT currently restricted in using this in decisions may need more research on how this can be considered for ABC and TAC determination. How do we get this information into the council and
GPT002	Maturity Studies	Consistently assess maturity at age/size of managed stocks to evaluate variability and determine climate impacts on maturity. We manage these stocks based on spawning biomass and accuracy is required. This would be for all regions, Bering Sea, GOA, and AI. Including Investigations into value of maternal age in regards to stock assessments accounting for reproductive potential of groundfish species. This is an expansion of 221.	Expansion of #221 and addition of GPT009
GPT001	New: Modernization of fisheries-independent groundfish monitoring methods.	Description: modernize AFSC RACE GAP fisheries-independent sampling designs, sampling gear and methods, and inclusion of supplemental emerging technologies.	See Oyafuso et al's <u>recent work</u>
146	Improve surveys in untrawlable habitat, particularly for rockfish, Atka mackerel, and sculpins	For groundfish in general, and rockfish and Atka mackerel in particular, continue and expand research on trawlable and untrawlable habitat to improve resource assessment surveys. For example, improved surveys, such as hydro-acoustic surveys, are needed to better assess pelagic rockfish species that are found in untrawlable habitat or are semi-pelagic species such as northern and dusky rockfish. A number of publications specific to untrawlable grounds and rockfish sampling have been published recently, but	This relates more to work on untrawlable grounds, Zach's work seems more about survey design (related, but different?) Cecilia and co are working on a drop cam project for untrawlable habitat - currently
174	Develop spatially explicit stock assessment models	Develop spatially explicit stock assessment models. High priority species for spatially explicit models include: walleye pollock, snow and Tanner crab, Pacific cod, sablefish, yellowfin sole, rock sole, arrowtooth flounder, Pacific ocean perch, black spotted rockfish, rougheve rockfish, and Atka mackerel.	
144	District-wide survey for demersal shelf rockfish in Southeast Alaska	Conduct a district-wide survey for demersal shelf rockfish in Southeast Alaska on a biennial or triennial basis. Survey information is becoming extremely dated.	Very difficult, need to develop a full plan and cooperation with ADFG, but is necessary
235	Investigate gear modifications and changes in fishing practices to reduce bycatch and PSC	Gear modifications and changes in fishing practices to reduce bycatch and PSC are needed.	
366	Continue to investigate time variation and the shape of fishery and survey selectivity models	There is considerable controversy about (1) whether selectivity should be dome-shaped or asymptotic, and (2) whether selectivity should be time-varying by default. Using a dome-shaped curve can create a large increase in biomass which may not be real. Treating selectivity as time-varying increases the number of model parameters greatly, which may lead to confounding among parameters. Better scientific guidance through research studies is	Could be dealt with in MSE GPT 16

MONITORING LIST

This list is unranked and does not count towards the top 5 or supplementary list. It will be provided to the SSC.			
Research ID	Title	Description	GPT Member Notes
155	Evaluation of salmon PSC mitigation measures	Develop a research program that will facilitate evaluation of salmon (both Chinook and non-Chinook) PSC mitigation measures in the BSAI and GOA. This includes updated estimates of the amounts reasonably necessary for subsistence, timing of runs and openings relative to subsistence requirements, and access to cost data for the commercial pollock and salmon industries so that impacts on profits (not gross revenues) can be calculated.	Can someone with expertise in this topic speak to its relative importance? Diana thinks this is an old priority that has been or is being addressed
208	Explore factors that contribute to year class strength for managed resources	New information and data are needed that would inform our understanding of the stock- recruit relationship for groundfish, Pacific halibut, and crab to project year-class strength.	Ongoing for many years.
145	Continuation of State and Federal annual and biennial surveys	Continuation of State and Federal annual and biennial surveys in the GOA, AI, NBS, and EBS, including crab pot surveys, is a critical aspect of fishery management off Alaska. It is important to give priority to these surveys, in light of recent federal budgets in which funding may not be sufficient to conduct these surveys. Loss of funding for days at sea for NOAA ships jeopardizes these programs. Budgetary concerns have resulted in cuts to not only days at sea, which increases uncertainty, but also sampling the deepest strata, which threatens the value of trawl surveys as a synoptic ecological survey. These surveys provide baseline distribution, abundance, and life history data that form the foundation for stock assessments and the development of ecosystem approaches to management. Although an ongoing need, these surveys are considered the highest priority research activity, contributing to assessment of commercial groundfish and crab fisheries off Alaska.	can we slightly modify to include slope survey? this is already in critical ongoing monitoring

163	Conduct routine fish, crab, and oceanographic surveys in the Arctic Ocean	Dynamic ecosystem and environmental changes in the Arctic Ocean are occurring. Assessment of the current baseline conditions and trophic interactions is important. This effort should not supplant the regular surveys in the BSAI and GOA, which are of critical importance to science and management.	Similar to 186 in continued ongoing monitoring (Collect and maintain zooplankton and meroplankton biomass and community composition time series) and includes Arctic
533	Explore optimal sampling strategies and geospatial approaches for time series of survey data	The Stock Assessment Improvement Plan seeks to ensure that NMFS conducts its surveys in the most effective and efficient manner possible. Statistical analysis of the optimal number of survey stations needed to accurately assess the status and trends of groundfish and crab stocks is required to achieve this goal. An extension of this activity would be to explore alternative abundance estimation methods. For example exploring Thorson's geostatistical model as an alternative to the designed-based estimates for abundance indices used in stock assessments is a potentially useful analysis. Extensions would include an assessment of whether there are certain life history characteristics or levels of aggregation when geospatial models are used.	
556	Re-evaluate the location and temporal structure of Herring Savings Areas	Re-evaluate whether the current locations of the Herring Savings Areas are likely to be effective at protecting herring populations (i.e. overlap with current distribution of herring during the specified dates) and whether seasonally-fixed or moving closures would be the most effective. Re-evaluation is particularly necessary due to recent changes in herring distributions. The research would ensure that groundfish fisheries are not pushed into areas with higher salmon PSC and squid bycatch without meeting the goal of protecting herring.	Areas are mispecified, but probably a management priority, potentially not a research priority as the information needed is already in hand.
612	Maintain observer program	Maintain the observer data collection activity and ensure that fishery dependent data collected provides a valid representation of the catch and can be compared easily to the previous data collection methods and time series remain intact.	This is already in critical ongoing monitoring

732	LK and TK data collection	This research priority would support more structured and consistent sources of ecosystem information for use in annual reports (such as ESRs), specific fishery management actions, or future development of conceptual models, especially as there are some areas that are data poor. Ultimately want to build systematic onramps into the Council process, but need data to be able to populate those onramps also.	This should already be covered in 611 (collection of socioeconomic information) and is already critical ongoing monitoring
735	Fishery monitoring and catch accounting	Fishery dependent data collected by observers, electronic monitoring, and the state of Alaska provide information critical for sustainable fisheries management. These data include: a) the amount, distribution, species composition, size, age, maturity and genetics of both the targeted catch and PSC catch (including genetics for chum and Chinook salmon); b) seabird catch; and c) marine mammal encounters and mortalities.	This is already critical ongoing monitoring