Research ID	Description	Management concern addressed
N001	What is causing the average size/weight of Cook Inlet halibut to decline?	The halibut fishery usage by commercial fishing charters is taking a disproportionate share of the resources from Alaskan sport fish interests.
N002	Operational, multiple cameras/satcams on all fishing vessels at all times, with observers monitoring	Factory trawling
N003	Crab spatial-temporal distribution relative to life history events, life stage, fishing, habitat.	Alaska crab stocks support important commercial fisheries. Many are at historic low levels. This research helps to understand potential fishing impacts.
N004	Pacific cod predation on commercially important crab species	Several BSAI crab stocks are at critically low levels making it important to identify the relative contribution of different sources of mortality to crab stock recovery. Pacific cod are ubiquitous groundfish and know predators on juvenile and adult crab yet the patterns and extent of cod predation on crab has received limited direct study. Cod stomach content analyses have been conducted from samples obtained as part of the annual Bering Sea trawl survey, but these provide limited insights since the timing of the survey is not well suited especially to soft shell king crab. Stomach samples from cooperating fixed gear cod fisheries would expand coverage to areas and time periods that the survey misses.
N005	Satellite tagging for Pacific cod in the GOA, AI, EBS, and NBS	Tagging studies of Pacific cod in all waters offshore of Alaska are needed to resolve the extent of cod distribution as well as intra- and interannual movement within the total geographic area. Satellite tags with long term deployment capability can also address spawning site fidelity, mixing of multiple spawning populations during the summer trawl survey, the importance of migratory pathways, and vertical position in the presence of survey gear, among other issues.
N006	identify EFH by crab life stage and consider habitat protections by localized stock management unit	Important crab stock management units are at historic lows with increasing habitat disturbance from fishing and multiple stressors by life stage
N007	Improved age determination methods for Pacific cod	Accurate estimation of ages from Pacific cod otoliths has been problematic and is constraining progress of cod stock assessments. Age data is needed to track changes in Pacific cod growth rates which also have important implications on stock assessments. The large backlog of Pacific cod otoliths could be prioritized once satisfactory ageing methods are developed and operationalized.

N008	Maturity estimates for BSAI crab stocks - The availability of maturity data from male and female crab are incomplete for use in stock assessment models. Key parameters defining size at maturity, proportion mature at size, and the potential for biennial reproductive cycles are currently uncertain for many stocks. Methods for determining spatial and temporal variability of these quantities are needed to adequately characterize mature biomass and for evaluations of size limits.	Estimates of mature male and female abundance and biomass for crab are included in both stock assessments and harvest control rules. Size limits are typically set to be one growth increment larger than size of maturity. Proxies for size at maturity are used to define management currencies (e.g. 95 mm carapace width new shell snow crab males are assumed to be terminally molted and mature) with substantial impact on both status specification (OFL) and harvest management (TAC). For some BSAI stocks these estimates are not independent from other size controls in harvest consideration (e.g. legal and preferred sizes can be smaller and larger, respectively than the maturity size). Seasonal or episodic changes in actual maturity related to acute or systematic changes require urgent research to inform management.
N009	Age structure of commercially harvested Pacific cod	Despite continued SSC requests for characterizing EBS Pacific cod fishery ages, there is a large backlog (>130,000, i.e., 88%) of the Pacific cod otoliths obtained by vessel-based fishery observers. A proportionately similar backlog exists for GOA cod. Pending resolution of Pacific cod ageing methods, these otoliths should be highly prioritized.
N010	Maximum age for Pacific cod in the GOA, AI, and BS	Assumed natural mortality (M) is central to fishery stock assessments. Recent methods for estimating M that are contingent on assumed maximum age would benefit from improved estimates of max age and whether max age differs among management areas.
N011	Spatial distribution and movement of crabs relative to life history events and fishing - Seasonal BSAI king and Tanner crab distributions across juvenile and adult life stages are poorly understood. The development and further refinement of seasonal monitoring and sampling methods to fill gaps in temporal and spatial extent is critical. Pairing smart tag deployment on crabs during new and existing survey opportunities is yielding relevant new information and should continue to be a high priority during the continuing depressed crab stock period.	A complete description of the distribution of crabs by life stage is lacking. The distributions and roles of new shell males versus skip-molt males relative to females for mating is poorly understood. Moreover, environmental conditions are changing rapidly in the eastern Bering Sea, driving related changes in the distribution of commercial crab stocks. Fishing behavior and life history timing (e.g., reproduction, growth) may subsequently be influenced by changes in crab distribution. The CPT discussed collection of data on distribution and movement relative to oceanographic conditions as critical for the development of the complex models needed to predict future stock abundance, stock boundaries, stock production, and management strategies. Improved understanding of crab movement and distribution will provide new management options.

N012	Continue efforts to reduce crab bycatch and improve understanding of fishing impacts on crab stocks through different times of year and during molting/mating using existing information and including use of technology.	This helps fill a data gap that is important for fisheries managers, quantifying the impacts of fishing gear and bycatch of crab throughout the year. Crab are vulnerable during their molt, which is a different time of year for each crab stock and bycatch fisheries move in space over time as well, suggesting different rate of impacts.
N013	Development of crab explicit management strategy evaluation (MSE) options - Management strategy evaluation (MSE) is a powerful simulation tool that models an ecological system to evaluate management approaches, such as harvest control rules. MSEs are evaluated using performance metrics determined cooperatively by managers, stakeholders, and scientists that guide decision-makers when considering alternative management approaches. Several crab stocks are presently depressed in the BSAI, partly due to ecosystem changes, and prioritizing MSE options is essential for exploring management strategies suitable for crab when existing options are limited.	MSEs provide a structured yet adaptable framework for evaluating the efficacy of proposed management strategies, such as harvest control rules or size limits. They can also be used to explore sources of uncertainty in assessment models and existing life history assumptions of commercial species. Crab population dynamics are cyclic and highly uncertain, and MSE is a robust tool for examining general trends and presenting overall differences in proposed management strategies in a projection framework, informing risk assessment, and identifying management strategies that balance economic and ecological objectives. MSE has been used to update crab management in the past, notably for the state Tanner crab harvest control rule in 2020. Further research into the utility of MSE is urgently needed to explore methods to improve the resilience of the crab industry while balancing sustainability. This is especially critical in a period of rapid environmental change, where established biological reference points may no longer be appropriate.
N014	Continued efforts to reduce bycatch and impacts on crab from fishing gear - Bycatch impacts on BSAI crab stocks should continue to be a high priority research topic across a number of topics: directed fishery research to modify gear and fishing practices to reduce incidence of females and small male discards, non-directed fixed and mobile gear experiments to evaluate fishing gear impacts on seafloor habitats and crab species - including estimation of unobserved mortality, evaluation of existing protection/regulatory areas for efficacy - including consideration of dynamic boundaries relative to updated and new information, update and evaluate procedures for discards, and estimation of discard and handling mortality.	BSAI crab stocks are continuing in a depressed status and further refinement of management options to reduce all sources of mortality from fishing impacts is critical. While fishing impacts are not believed to be a primary driver in stock status, more refined understanding of potential scale is lacking. There are a number of data gaps that, if filled, could provide improved options to further reduce impacts. A primary goal of further bycatch research would be the updating of spatial and temporal management measures (e,g., trawl closures) including consideration of dynamic options to protect crab.

N015	Artificial propagation of BSAI crab stocks - Artificial propagation of BSAI crab stocks offers a promising avenue for stock enhancement, and there are cooperative industry efforts to fully support and build out the options for artificial propagation of stocks through the AKKCRAB program. Building on the successes of AKCCRAB, there's a need to scale efforts towards hatching, rearing, and releasing crabs into the wild. This scaling process is complex, requiring significant capital, coordination, planning, and cooperation with industry and managers. Research efforts should continue to address gaps in life history and habitat knowledge while also focusing on the development of necessary infrastructure and stocking implementation strategies.	BSAI crab stocks have suffered from great variation in recruitment and understanding of recruitment mechanisms is limited. Artificial supplementation of early life stages by outplanting juvenile crab into the wild could lead to stability in subsequent recruitment.
N016	Crab predation - Crab are known prey for groundfish, notably Pacific cod. Understanding the magnitude of predation impacts on crab populations in the BSAI is critical for ecosystem-level management considerations. Expanding cod stomach data collection and analysis is crucial, especially during times when crab are molting and most vulnerable to predation. Specifically, the effects of predation in shallow nearshore areas occupied by juvenile red king crab are poorly understood. Modeling exercises to explore assumptions of species interactions, consumption rates, and how these factors relate to natural mortality are high priority, given the depressed status of crab stocks.	Longstanding research on cod stomach contents has provided a basis for understanding how much crab biomass may be consumed by cod, but most of these data are taken during the NMFS summer survey or collected opportunistically by observers. Crab predation during fall through spring is poorly studied. Further refinement of assumptions on predation rates on crab by various predators is essential, especially given changes to the cold pool and species distribution (e.g., a significant increase in spatial overlap of cod and snow crab). Additional research priorities should explore the roles of predation and cannibalism, as they relate to density dependence and recruitment failures. Contextually, in 2018 there was a significant snow crab cohort that failed to reach maturity, and the 2023 survey observed the largest pulse of juvenile Tanner crab in the time series, which faces uncertainties in reaching mature sizes. Prioritizing data collection and modeling exercises exploring assumptions of crab predation and impacts on the stock is urgent to better understand recruitment failure seen in snow, Tanner, and red king crab in recent years and promote ecosystem-level considerations in fisheries management.

N017	Cooperative research efforts to supplement existing at-sea surveys for increased spatio-temporal coverage - Continued focus on collaborating with the crab industry including chartering industry boats and their availability to support surveys (e.g., crab pot survey efforts for RKC and snow crab, juvenile surveys using modified pots or trawls, etc.). Prioritizing using industry vessels allows for other objectives to be built into or added to sampling plans (tagging, etc.). Specific priorities should include skipper survey efforts and collection of other information that may not typically occur (e.g., potential nursery hot spots for king and snow crab).	During closed or historically short crab seasons, the ability to work with the industry is critical. There is substantial value in developing new and continuing sampling (survey) efforts to help monitor and understand seasonal and shifting distributions of crab working in cooperation with the crab industry that is facing economic difficulties. Further, the windows of opportunity to use industry vessels and time for research is increasing during shorter or closed season periods, and cooperative research can help to keep them working.
N018	Quantification of unobserved fishing mortality on crab across all gear types and evaluate fishing gear impacts on crab and crab habitat during different times of the year and during molting/mating.	Quantifying, or at least book-ending the level of mortality that remains unaccounted for due to fishing gear, that is not natural mortality, should be a top priority for any fishery manager. Stock assessments need the most accurate accounting of all fishery removals, including directed, bycatch and unobserved mortality.
N019	Evaluate the efficacy of existing crab protection/regulatory areas, including consideration of dynamic boundaries for crab protections relative to updated and new information regarding movement and life stage and static boundaries for crab habitat protections.	It remains critically important to understand how well current crab protected areas are performing and what habitat is important for crab across life stages and what management efforts can protect those habitat areas most efficiently.
N020	Identify pathways and other opportunities for fishermen and communities to diversify and adapt in the face of climate-driven changes to fisheries (e.g., Bering Sea crab crashes).	Recent fishery collapses, in part driven by climate change, highlight the need to help fishermen and communities diversify to better handle disruptions. In addition to an assessment of vulnerability, fishermen and communities would benefit from actionable steps to building resilience and adaption planning with a focus on those most vulnerable fishermen and communities first.
N021	Develop appropriate crab PSC limits and trawl performance standards in groundfish fisheries to provide stronger incentives to minimize crab bycatch.	Some species of crab are not avoided when encountered at high rates like other PSC species, which has proved to be a great tool used to reduce bycatch. Similarly, performance standards that don't work (i.e., pelagic trawl), fail to provide vessels incentive to move away from PSC hot spots.

N022	Expand routine fish, crab, and oceanographic surveys in the adjacent areas to the north (northern Bering Sea, Chukchi Sea, and Beaufort Sea) - Monitoring shifts in groundfish and shellfish distributions related to ecosystem changes and responses to climate change is important for ecosystem-based management considerations. Part of this research should build on prioritizing ongoing sampling in the northern Bering Sea (NBS) as further expansion of a future climate-ready survey strategy. As stocks show evidence of range expansion or retraction, likely driven by climate change, additional areas should be built into expanded survey strategies to understand spatial stock connectivity of species in the NBS and Arctic and assess probable climate-driven changes.	Climate change is prompting shifts in crab habitats, making it essential to expand survey efforts to areas adjacent to regularly surveyed regions. The NBS is an important habitat component of the Bering Sea snow crab stock, and as temperatures become more variable in the Bering Sea, the EBS snow crab stock may shift or retract further in the near future. While NMFS conducts surveys in the NBS, Chukchi, and Beaufort Sea, the frequency and scope of these surveys need to be increased. Short-term plans should focus on understanding habitat connectivity extending north into the Arctic. This will provide a more accurate picture of stock dynamics and habitat utilization, which is crucial for adaptive management strategies in the face of rapid environmental changes.
N023	Crab growth rates - Seasonal BSAI growth data for crab species has been influential and variable in stock assessment models. Because crab cannot be aged, the stock assessment models are size-structured and are sensitive to molt increment data. Growth data has been collected in recent years and implemented into assessment models, but continued research is urgently needed to increase sample sizes, and fill gaps in specific size classes of crab (notably the pre-terminal molt sizes in snow and Tanner crab). This research involves collecting pre-molt crab and holding them until they molt to quantify their growth rates.	Crab growth data collection efforts are ongoing, and directly support the stock assessment model process. Gaps or low sample sizes in these data compromise the accuracy of stock assessments and corresponding management targets. Furthermore, there are uncertainties about the effect of temperature on growth rates for all crab species, and the relationship of temperature to terminal molt sizes for snow and Tanner crab, which stop molting after reaching sexual maturity. Terminal molt sizes directly relate to legal and preferred size classes and harvest, which impacts directed fishery discards of mature, but sub-legal animals. Temperature effects are increasingly relevant given recent environmental changes and the prevalence of marine heatwaves. Spatial considerations are also critical for assessing variability in growth, especially for district-level management considerations for Tanner crab in the Bering Sea, and golden king crab in the Aleutian Islands. Research to update crab growth data is essential for refining stock assessments, informing harvest control rules, and contributing to ecosystem-based management strategies.

N024	Increased research attention towards the goal of rapid implementation of real-time salmon bycatch genetics data in the pollock fleet's fishing seasons.	Bycatch continues to be a significant area of concern for Kawerak and Tribes of the region. This is a critical issue for NPFMC management of pollock fishing. Salmon bycatch genetic identification is one important way to understand species distribution as well as spatiotemporal dimensions of bycatch. The ability to process and ue this data in real-time can potentially enable a significant advance in management structures and fishery behavior as pertains to avoiding bycatch of salmon stocks with particular origins. Work on this would also enhance work on other existing research priorities, such as 155 (Evaluation of salmon PSC mitigation measures), 156 (Improve knowledge for salmon PSC impact assessment), 157 (Improve methods of monitoring fishery interactions), and 182 (Evaluate the effectiveness of current and alternative Council PSC/bycatch reduction initiatives).
N025	Research on the cumulative impacts of bycatch and habitat damage, including in the context of climate change (e.g. effects to genetic diversity and resilience within species, effects across species, cumulative impacts from updated understandings of bottom contact from pollock trawling, etc.). This should also include the impacts of unobserved mortality, conceptualized either as bycatch or fully incorporated via some other metric/mechanism.	There is a research need for understanding the potential cumulative effects of bycatch both at the individual species level as well as the ecosystem level, over time and within the context of changing environmental conditions. For example, do bycatch withdrawals have amplified and cascading effects on highly climate-vulnerable species, e.g. in terms of weakening the genetic pool and diversity which may have otherwise contributed to climate resilience? Similar research should also be directed at cumulative impacts to habitat. For example, the significant extent of bottom contact from pollock pelagic trawling is becoming better understood. Considering the footprint of the pollock fishery, and decades of seafloor contact, it is critical to comprehensively understand the impacts of this for designing a sustainably-managed fishery. Such (and other) bottom contact likely has impacts to benthic communities, including snow and red king crab, that are currently not accounted for in assessment and management of pelagic trawling, and may be misdiagnosed as climate-related.

N026	Retrospective analysis of whether and how social science is or is not used regarding predictions of changed fishing behavior in light of proposed changes to management structures.	Fishery management is fundamentally about managing human behavior. Many Council-body discussions pertaining to management actions revolve around discussions of fishing behaviors which may or may not occur in light or proposed changes to management structures. However, it is often unclear whether these assessments are well-grounded in the analysis based on the best scientific information available. Social science would be the key scientific discipline associated with providing relevant analytical insights.
N027	Retrospective and meta- analysis regarding whether, how, when and why objectives and goals of fishery management plans are or are not achieved over time. In light of the PEIS discussion, a fruitful first focus would be the existing BSAI groundfish FMP.	Changes to fishery management plan structures may be beneficial in light of changing conditions, updated information, and changing approaches to fishery management. However, such work should be prefaced by analyzing whether, how, when and why objectives and goals of previous/existing structures are or are not achieved over time. Failure to do so risks, among other things, misunderstandings of the rationales for structural changes and misapplication of effort towards requisite changes (e.g. modifying goals and objectives vs modifying the implementation of such goals and objectives).
N028	On behalf of Aleut Community of St. Paul Island Tribal government. Research on the cumulative impacts of bycatch and habitat damage, including in the context of climate change (e.g. effects to genetic diversity and resilience within species, effects across species, cumulative impacts from updated understandings of bottom contact from pollock trawling, etc.). This should also include the impacts of unobserved mortality, conceptualized either a bycatch or fully incorporated via some other metric/mechanism.	There is a research need for understanding the potential cumulative effects of bycatch both at the individual species level as well as the ecosystem level, over time and within the context of changing environmental conditions. For example, do bycatch withdrawals have amplified and cascading effects on highly climate-vulnerable species, e.g. in terms of weakening the genetic pool and diversity which may have otherwise contributed to climate resilience? Similar research should also be directed at cumulative impacts to habitat. For example, the significant extent of bottom contact from pollock pelagic trawling is becoming better understood. Considering the footprint of the pollock fishery, and decades of unmitigated seafloor contact, it is critical to comprehensively understand the impacts of this for designing a sustainably-managed fishery. Such bottom contact likely has impacts to benthic communities, including snow and red king crab, that are currently not accounted for in assessment and management of pelagic trawling, and may be misdiagnosed as climate-related.

N029	Development of new genetic tools to improve delineation of chum salmon stocks in western Alaska would provide for improved management of Chum salmon bycatch in the BSAI pollock fishery. Whole genome resequencing would increase the number of genetic markers used to differentiate stocks by orders of magnitude compared to current approaches, but these methods have not been applied to Alaska salmon. Successful development and implementation of these new tools would have immediate impact on fisheries management but also provide the means to conserve Western Alaska salmon biodiversity over the long-term.	Fishery management concern addressed is the identified need to reduce bycatch of Coastal Western Alaska chum salmon in the BSAI pollock fishery.
N030	Evaluation of the potential efficacy of various forms of real-time sensory instruments on/for pelagic trawl nets for understanding and avoiding bottom contact.	Management needs to reconsider the accuracy of historical calculations/assumptions regarding pelagic trawling bottom contact and related habitat disturbance. Research/analysis re: real-time sensory instrumentation on/for pelagic trawl nets would be beneficial, to assist in best collecting data and best directly depicting bottom contact and its impacts, and in assisting in development of mechanisms by which bottom contact can be accurately detected and fishing behavior altered in real-time to avoid further bottom contact. This can inform the NPFMC and ensure on-going habitat and ecosystem impacts are addressed and managed. This proposed priority can also be seen as related to research priorities 164 (Effects of trawling on crab and benthic communities) and 217 (Impact of fisheries on benthic habitat and trophic interactions), but applied to pelagic trawling.
N031	To support development of a chum cap to reduce bycatch of Coastal Western Alaska chum salmon in the BSAI pollock fishery we recommend research to develop a marine-based juvenile chum index to be combined with a Western Alaska rivers three area index (as is used in the W. AK Chinook bycatch measures). Aim would be to build a time series of oceanographic variables and juvenile abundance indices for CWAK chum salmon, similar to NOAA's Southeast Alaska Coastal Monitoring program, which assesses the status of juvenile salmon in the coastal waters of the Gulf of Alaska ecosystem.	The Fishery management concern addressed by his research priority is the need identified by the NPFMC to reduce bycatch of Coastal Western Alaska chum salmon in the BSAI pollock fishery.

N032	Retrospective analysis of whether and how social science is or is not used regarding predictions of changed fishing behavior in light of proposed changes to management structures.	Changes in fisheries management structures have social-economic-cultural impacts towards fishermen, stakeholders, and Tribes. Social science is a tool to understand how behaviors of these groups in fisheries change in response to NPFMC management decisions e.g., bycatch and prohibited species catch limits, gear types, individual fishing quotas, etc. A retrospective analysis of if and/or how social science of fishing behavior is used in informing NPFMC management decisions can benefit future management decisions to have comprehensive understandings and be equitable towards those who are impacted.
N033	Evaluation of the potential efficacy of various forms of real-time sensory instruments on/for pelagic trawl nets for understanding and avoiding bottom contact	Management needs to reconsider the accuracy of historical calculations/assumptions regarding pelagic trawling bottom contact and related habitat disturbance. Research/analysis re: real-time sensory instrumentation on/for pelagic trawl nets would be beneficial, to assist in best collecting data and best directly depicting bottom contact and its impacts, and in assisting in development of mechanisms by which bottom contact can be accurately detected and fishing behavior altered in real-time to avoid further bottom contact. This can inform the NPFMC and ensure on-going habitat and ecosystem impacts are addressed and managed. This proposed priority can also be seen as related to research priorities 164 (Effects of trawling on crab and benthic communities) and 217 (Impact of fisheries on benthic habitat and trophic interactions), but applied to pelagic trawling.
N034	Recommend undertaking adult equivalency analysis (AEQ) of Coastal Western Alaska chum salmon taken as bycatch in the BSAI pollock fishery. The essential missing data necessary to undertake this AEQ analysis is the collection of Coastal Western Alaska chum salmon age composition data. We recommend that this data be collected from BSAI bycatch though observer and short-side sampling program as well as from sample in the South Alaska Peninsula June salmon fishery.	The Fishery management concern addressed by this research priority is the need identified by the NPFMC to reduce bycatch of Coastal Western Alaska chum salmon in the BSAI pollock fishery.

N035a	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.
N035b	Research providing baseline data, and the ability to track change, for crab life cycles, movement patterns, and associated ecosystem characteristics. Emphasized in previous review under priority #148.	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.
N035c	Improved genetic information and sampling processes for salmon PSC.	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.
N035d	Improved mechanisms for estimating unobserved fishing mortality.	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.
N035e	Assessment of habitat and ecosystem impacts from fishing effort, including the cumulative impact of repeated effort over time. This should include benthic structures, habitat damage and disturbance, and "ecosystem component" fauna.	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.

N035f	Post-release mortality studies for discarded species, in which lack of existing research (i.e. crab), or emergence of additional mortality factors (i.e. halibut), indicate that current DMRs may be inaccurately capturing mortality estimates.	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.
N035g	Strategies for precautionary management addressing climate change impacts.	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.
N036a	What is the role pinniped predation has had in recent fishery collapses across Alaska? There is strong correlation between the eastern population growth of Stellar Sea lions and the decline of Chinook ocean survival rates across Alaska. This is of particular concern because of what has been observed in British Columbia and the lower 48. Based on a large body of evidence, a significant source of Chinook decline in BC and the lower 48 is understood to be the unchecked growth of sea lion populations. Supporting this claim is the published works done by the Washington Academy of Sciences on pinniped predation on salmonoids. Further, in a 2021 lecture given by University of British Columbia Dr. Carl Walters, citing published work by Dr. Peter Olesiuk, Dr. Walters pointed out that the current BC pinniped population in 2021 had consumed 300,000 metric tones of prey, ***a harvest greater than all sport take, commercial take and aqua culture production in BC during 2021.*** Please, take a moment and let that fact sink in.	MMPA

N036b	Southern Resident Killer Whale(SRKW) prey increase. Simply put, I am embarrassed by the weak ESA mitigation plan for the SRKW prey increase that almost cost us Trollers in SE our season. So, a handful of us trollers came up with our own SRKW prey increase plan that we are not ashamed of and would like the council to consider researching the viability of this draft plan. *(See comment provided as an additional attachment)*	SRKW prey increase
N037a	**Electronic Monitoring (EM)**: 2021 Research ID 712 identified the need for a "Gap analyses of loss of biological samples due to the implementation of EM." In addition to the loss of biological samples, EM implementation has resulted in numerous unintended consequences that should be addressed as Urgent Priorities.	With increases in the proportion of boats using EM and the associated lack of onboard observers, it is not possible to effectively track marine mammal interactions because cameras are not currently designed to monitor marine mammals. In turn, there is a decrease in the amount of data on marine mammal interactions with commercial fisheries, which will increase uncertainty in Mortality and Serious Injury (M&SI) estimates used in marine mammal stock assessments. In light of more frequent marine mammal interaction rates and bycatch in fisheries in recent years, the Council should elevate this concern and the need for tracking this issue as an Urgent Research Priority. At the October 2023 Performance Standard Workshop, it was apparent that EM did not provide species information at the resolution necessary to ensure compliance with bottom-time restrictions for pelagic trawl fisheries. With respect to ensuring pelagic trawl fisheries are off-bottom, both EM limitations and opportunities should be an Important Research Priority throughout this cycle.

N037b	**Marine Mammals:** The limited number of 2021 Research Priorities addressing marine mammals discounts the important ecological role marine mammals play as well as the risks associated with direct and indirect fishery interactions. We urge the Council and associated bodies to review the attached Appendix 1 that includes Research Priorities recommendations from the Alaska Scientific Review Group for Marine Mammal Stock Assessments in their 2022 letter to NMFS. In addition, 2021 Research ID 215 should be prioritized and extended to explicitly address impacts of direct and indirect fishery interactions.	Direct fishery interactions (discard feeding, depredation, bycatch), which pose a serious conservation concern for marine mammals. Better coordination with NMFS, MML and the observer program is needed to ensure timeliness and transparent reporting of marine mammal interactions and bycatch data. A new Urgent Research Priority should be listed in the top 10 this year that evaluates marine mammal-fishery interactions (including feeding on discards) and bycatch spatial and temporal trends and potential mitigation measures. Indirect fishery interactions with marine mammals (prey competition, foraging disruption from vessel noise), which is also an established threat for marine mammals, including declining northern fur seals (Divine & Williams 2022, McHuron et al. 2020, McHuron et al. 2023). The Council should amend Research ID 246 and prioritize an Urgent Research Priority aimed at mitigating the negative effects of fishing on vulnerable and/or declining upper trophic-level predators, such as northern fur seals, through spatial and temporal management measures for relevant fleets.
N037c	**Ecosystem Indicators:** Using indicator species as a proxy for overall ecosystem health and function can be both a cost- and time-efficient measure (Carignan & Villard 2002). This is particularly relevant in biodiverse, species-rich systems like the Eastern Bering Sea, where it is not possible to monitor all taxa (Lindenmayer 1999). The use of indicator species can be used to achieve specific management objectives including assessing the efficacy of management measures and detecting both early stage and long term ecological changes or shifts (Siddig et al. 2016).	We urge the Council to extend the numerous indicator items identified in the 2021 Research Priorities and move beyond monitoring to develop a new Urgent Research Priority that explores management targets, reference points and onramps for ecosystem indicators to inform management action.
N037d	**Traditional Knowledge:** There are numerous ways Traditional Knowledge will strengthen all Research Priorities, including offering new frameworks for analysis; fostering relationships between Indigenous and Western scientific researchers and communities; and filling gaps in existing ecological and social scientific research.	In accordance with the new Local Knowledge Traditional Knowledge Subsistence Protocol, the Council and associated bodies should acknowledge that all 2024 Research Priorities inherently include Traditional Knowledge as a way of knowing and understanding ecosystems to inform the Council's decision-making process at every level.

N037e	**Bycatch Impacts:** In an increasingly unpredictable and warming climate, anthropogenic activities like bycatch that suppress life-history diversity could have serious consequences, particularly for depressed populations persisting at ecological and physiological limits such as salmon (Sturrock et al. 2019). When considering impacts to communities and climate-vulnerable species, the Council must think more broadly about ecosystem impacts associated with target harvest and bycatch removals from the system.	A new Research Priority should address the impacts of bycatch on genetic diversity and long-term viability for depressed, climate-vulnerable species such as salmon and/or crab (spp.).
N038	Stop or reduce waste of halibut and other species of fish. Cost per pound (at store, restaurant, etc.) is too expensive. 1.Place watchers and or cameras on board all boats fishing for halibut in Alaska waters. 2.Provide an incentive for license holders to institute a percentage of bycatch to food banks and reduced cost to grocers who are limited to the price per pound plus cost of handling only. Require licensee's to be present if fishing in Alaska waters or their direct representative, not subleasing their license. More enforcement of existing regulations and improved legislation to protect the interest of Alaskans who should have access, including maximum benefit for our resources, including halibut, salmon, trout and other species.	I came to Alaska in 1977 and we could find and afford or even fish for halibut close enough to places like Valdez and enjoy the halibut meal weekly. Now after a full career of teaching, retirement and entering into the twilight of my life, on a teacher's nearly non existent retirement, the joy of a halibut meal eludes me save once or twice a year. We save up, reduce other things in our grocery budget and try to find fresh halibut. The $30 plus per pound price is too much. I realize how hard the fisher persons work and the costs associated with what is now a rare delicacy. Then I think about a million pounds of wasted halibut. It's enough to make one cry. How many elderly, homeless, poor, subsistence users could be enriched if this waste was reduced with the goal of eliminating it? Please, choose to be a better steward of what used to be a boundless resource of nutritious food.
N039a	AMCC strongly encourages the completion of the existing research priority: #148: Spatial distribution and movement relative to life history events and fishing: Advisory bodies including the SSC and CPT have elevated this need for years and has been made particularly urgent by crab declines	

N039b	AMCC strongly encourages the completion of the existing research priority: #246: Cooperative research efforts to supplement existing at-sea surveys that provide seasonal, species specific information on upper trophic levels: In conjunction with #189, onramps should be evaluated for the consideration of predator health in determining the impacts of prey removals in the groundfish specifications process; we encourage urgent consideration of this due to fisheries impacts on species protected through the Marine Mammal Protection Act	
N039c	AMCC strongly encourages the completion of the existing research priority: #611: Collection of socio-economic information: A) This should be expanded to include subsistence fisheries as well, utilizing information through the Subsistence Division of the Alaska Department of Fish and Game, as well as information shared through Tribal Consultation and other informal means, to support the development of Social Impact Assessments expected in a variety of upcoming actions; and B)To the extent possible, economic information and analysis regarding the landings values and harvest values of single species harvested through various gear types, i.e. trawl/HAL sablefish, trawl/POT/JIG cod, trawl/gillnet salmon	

N039d	AMCC underscores the urgency of: #164: Effects of trawling on crab and benthic communities: A) Quantification of unobserved mortality must be developed and considered retrospectively, in accordance with National Standard 9; and B) Species identified as benthic habitat in the Essential Fish Habitat review are considered with susceptibility and recovery rates that are arbitrary and do not reflect BSIA; some species named do not exist in the North Pacific, highlighting the problematic nature of borrowing models from a different (i.e. warmer and more fast-growing) ecosystem without diligent and precautionary adjustments; octocorals are evaluated differently from corals that attach to hard substrates, despite having similar susceptibility and recovery rates from disturbance	
N039e	AMCC underscores the urgency of: #244: Collect and maintain time-series data on the community composition, production and biomass of benthic invertebrate and vertebrate fauna: This should be expanded to include sedentary megafauna, which contribute substantially to to ecosystem health and are particularly vulnerable to disturbance	
N039f	AMCC underscores the urgency of: #615: Evaluate the interactions between fisheries and killer whales and sperm whales: Guidance from Groundfish Plan Teams has underscored the need to update DMRs; we are concerned	
N039g	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	