



# Bering Sea Fishery Ecosystem Plan: Module to Develop Protocols for Local Knowledge, Traditional Knowledge, and Subsistence

## Action Module Workplan

### Contents

Action Module Purpose	1
Background	2
Introduction of Concepts and Terminology	2
Taskforce Goals and Objectives	4
Action Module Work Streams and Work Products	6
Taskforce Ground Rules	7
Proposed Timeline	9
Membership	9
Appendix 1. Glossary of Terms for Taskforce	10
Appendix 2. List of Acronyms	12
Appendix 3. Action Module Scoping Summary from Core BS FEP	13
Appendix 4. Action Module Project Ideas from Core BS FEP	14
Part A        Operationalizing LK and TK in the Council Process	14
Part B        Subsistence	17
References	20

## Action Module Purpose

The purpose of this Action Module is to develop protocols for incorporating and considering Local Knowledge (LK), Traditional Knowledge (TK), and subsistence information in the Council's decision-making process. More specifically, this Action Module aims to provide a roadmap for operationalizing LK and TK (potentially through processes like Co-Production of Knowledge) in the short- to long-term, as well as to formulate methods for assessing the likelihood a given action by the North Pacific Fishery Management Council (Council) may affect subsistence resources, the ability of users to access those resources, or impact subsistence practices. The outcomes of the Action Module are expected to inform where and how these types of knowledge and information could consistently enter the Council's existing decision-making process.

## Background

This Action Module is meant to positively inform the overall Council process and decision-making structure, and it is most responsive to BS FEP Research Objective 4 which aims to identify and develop interdisciplinary conceptual model(s) of the connected Bering Sea ecosystem components to respond to specific management questions (NPFMC 2019, 23). Research Objective 4 in the BS FEP is directly linked

to Process Objective 6 which seeks to facilitate and organize communication of ecosystem science, LK, TK, and relevant Council policy between scientists, communities, and decision-makers (see Chapter 2 of the [Core BS FEP](#) document for a full list of the Research and Process Objectives). This Action Model can inform many of the other BS FEP Research and Process Objectives, as well.

The completed work aims to provide a framework for the Council and analysts to consider how to include and better use non-economic social science data, particularly as they relate to LK, TK, and subsistence. In addition, this Action Module provides opportunity for the Council to operationalize plans for strengthening partnerships with bearers of LK and TK, subsistence users, and organizations that represent and work with these groups. This project will guide the use of subsistence data in analyses and is expected to help the Council be increasingly responsive to National Standards 2 and 8, which relate to conservation and management being based on the best scientific information available and that conservation and management measures take into account the importance of fishery resources to communities, respectively. In sum, this Action Module will facilitate informed Council decision-making by providing the Council pathways to access and consider human dimension linkages and effects within the Bering Sea ecosystem in line with a robust ecosystem-based approach to fisheries management.

## Introduction of Concepts and Terminology

**Local Knowledge** broadly includes the observations and experiences of local people in a region as well as people with significant experience or expertise related to a particular location, species, or fishery.<sup>1</sup> LK can evolve over time, and it is often acquired over the course of a few generations or less, but it is inherently the product of knowledge formation and dissemination based on personal, shared and inherited experience (Martin et al. 2007). It is recognized that bearers of LK are often relatively small groups of people, living in or connected to, a common geographic location who actively engage with the environment through local harvest of wild resources. However, these people may or may not be Indigenous to the area or base their understandings on knowledge that evolves over many generations (PFRCC 2011). For example, within the Bering Sea region, LK holders might include commercial Bering Sea fishermen who spend considerable time in the region, and are possibly intergenerational participants in the fishery, but reside (at least part of the year) outside the region (i.e., in Lower 48 ports such as Seattle or Astoria). LK is commonly solicited in the current Council process via voluntary public testimony from skippers, coastal community residents, etc., and stakeholder interactions with Plan Teams.

**Traditional Knowledge** is also experience-based, but it is inherently deeply embedded in cultures who have dwelled in a landscape since time immemorial (Berkes 1999, 8; Ingold 2000, 43). TK is more than information about the ecosystem and its components (i.e., species abundance or movement patterns) as it refers more specifically to knowledge held by Indigenous people which is inseparable from particular values. Specifically, the Bering Sea FEP (2019, 16) recognizes that TK is:

*“A living body of knowledge which pertains to explaining and understanding the universe and living and acting within it. It is acquired and utilized by Indigenous communities and individuals in and through long-term sociocultural, spiritual and environmental engagement. [Traditional knowledge] is an integral part of the broader knowledge system of Indigenous communities, is transmitted intergenerationally, is practically and widely applicable, and integrates personal*

---

<sup>1</sup> At its first meeting, the LK, TK, and Subsistence Taskforce discussed the importance of gaining a common understanding of terminology as they provide key reference points for future work. The discussion on LK and TK presented here draws from the Bering Sea Fishery Ecosystem Plan (2019, 16).

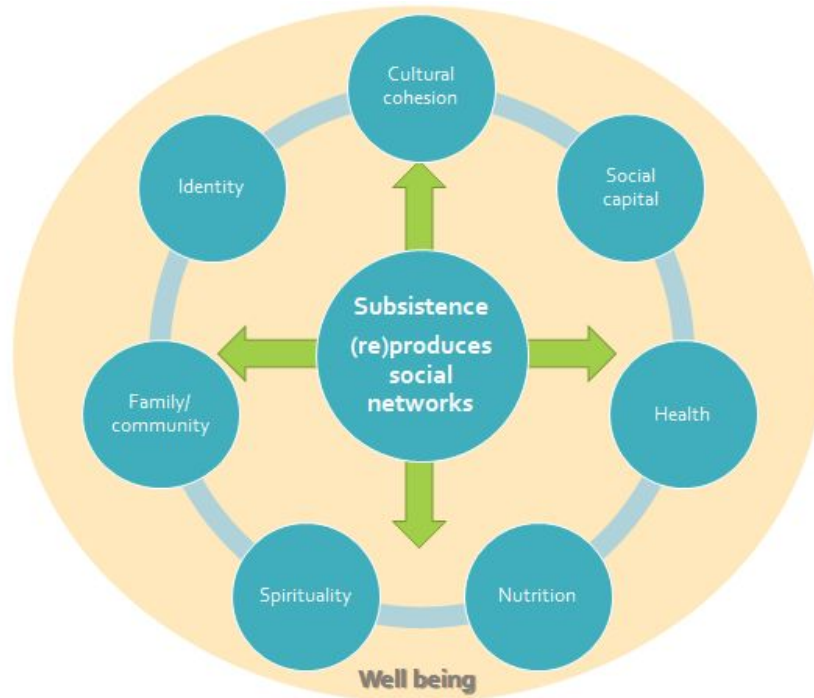
*experience with oral traditions. It provides perspectives applicable to an array of human and nonhuman phenomena. It is deeply rooted in history, time, and place, while also being rich, adaptable, and dynamic, all of which keep it relevant and useful in contemporary life. This knowledge is part of, and used in, everyday life, and is inextricably intertwined with peoples' identity, cosmology, values, and way of life. Tradition – and [traditional knowledge] – does not preclude change, nor does it equal only 'the past'; in fact, it inherently entails change.”* (Raymond-Yakoubian et al., 2017).

LK and TK are relevant to all fisheries sectors (i.e., commercial, recreational, and subsistence) and all aspects of fishery management in the Bering Sea Ecosystem. Finding pathways to incorporate LK, TK, and subsistence information into the Council's existing processes can provide an opportunity for the Council to be more responsive to ecosystem-based fishery management (EBFM) and climate change impacts throughout the Bering Sea region. For example, people who are intimately familiar with a particular landscape have knowledge about the past and present conditions of commercial and non-commercial fish species and could be the first to notice changes in resource abundance, species presence, or habitat destruction (Gadamus and Raymond-Yakoubian 2015; Clark 2016). For example, as Johannes and Nies (2007, 42) note, communities' or "fishers' knowledge may often be the only source of information on the history of changes in local ecosystems and on their contemporary state that is sufficiently fine scale to help us design ways to protect stock remnants and critical habitats." A practical example of LK with direct relevance to fishery management is that inshore cod fishermen communicated a decrease in the North Atlantic cod spawning stock on their fishing grounds prior to the biological collapse of the cod fishery (Johannes et al., 2000).

Incorporating LK and TK into the Council's existing processes could increase institutional effectiveness by improving local buy-in to specific management actions and the Council's decision-making more broadly, which could mitigate resource and policy conflicts over the long-run. Providing the Council these types of information expand the suite of usable scientific knowledge, though it is recognized that this information is both additive and complementary to other forms of science and information currently utilized in the Council process.

**Subsistence.** There are different ways of understanding of defining subsistence in Alaska, and those understandings influence how communities access resources and engage a subsistence way of life. For example, the State of Alaska has historically approached defining subsistence as traditional or customary use of resources, and the value of subsistence is communicated via commercialized indices that quantify resource consumption rates and utilizing comparative cost estimates. Federal policy, as designated under the Alaska National Interest Land Conservation Act of 1980, establishes a “rural preference” for subsistence rights for resource access and use on federal lands (Anderson 2016). Another understanding of subsistence, however, is from the "Indigenous perspective [that] encompasses hunting and gathering related activities which have a deep connection to history, culture, and tradition, and which are primarily understood to be separate from commercial activities" (Raymond-Yakoubian, Raymond-Yakoubian, Monicreiff 2017). Yet it is also important to note that Alaska Native people across different regions of the state deliberately engage in commercial and market-oriented economies while maintaining subsistence practices (Langdon 1991), and that contemporary cash economies play a critical role in supporting subsistence lifestyles (Reedy-Maschner 2009). The importance of subsistence for Alaska Native communities, and the continuation of subsistence-related practices, is that it is a critical linkage to linguistic and cultural survival (Active 1999). As such, subsistence practices are meaningful beyond the harvest of nutritional and cultural goods as they create and reproduce linkages across multiple social and ecological domains.

**Figure 1. Domains of Subsistence Engagement**



## Taskforce Goals and Objectives

**Related to LK and TK**, the overarching goal of this Action Module is to create processes and protocols through which the Council can identify, analyze, and consistently incorporate TK and LK, and the social science of TK and LK, into Council decision-making processes to support the use of best available scientific information in EBFM (Goal 1). **Regarding subsistence**, the overarching goal of this Action Module is to create a protocol and develop recommendations through which the Council can define and incorporate subsistence information into analyses and decision-making (Goal 2). Guided by these two overarching goals, the Taskforce collectively determined the following five objectives<sup>2</sup>:

1. *Over the next 2-3 years the Taskforce will identify and define sources of LK and TK, and the social science of LK and TK, to support the use of best scientific information available in Council decision-making.* Objective 1 reflects the Taskforce's opportunity to support the Council in being more responsive to National Standard 2 and 8 by incorporating LK and TK in its analyses. Doing so will provide a more complete picture of the human dimensions of the Bering Sea region to support EBFM, and a better understanding the effects of climate change on the Bering Sea ecosystem. It is important to note that Objectives 1-3 make an important distinction between LK

<sup>2</sup> The Taskforce came to a consensus on Objectives 1-5 at its first meeting in January 2020 in Anchorage, Alaska. For additional materials and resources from this meeting, visit the eAgenda: <https://meetings.npfinc.org/Meeting/Details/1223>.

and TK, and the social science of LK and TK. The Taskforce agreed on this distinction because LK and TK exist regardless of whether social science has been conducted to understand, analyze, or synthesize them.

2. *The Taskforce will provide guidance and analytical protocols to the Council on how to evaluate and analyze LK and TK, and the social science of LK and TK.* Taskforce members recognized the importance of providing the Council and staff direction on how to analyze LK and TK for the purpose of incorporating them into Council documents and decision-making as appropriate. Taskforce discussion on Objective 2 emphasized the importance of utilizing social science and Indigenous methodologies and best practices. These protocols will give guidance with a set of best practices for considering and evaluating LK and TK, and the social science of LK and TK for both discrete actions and the Council process more broadly.
3. *The Taskforce will provide guidance on how LK and TK, and the social science of LK and TK, could be incorporated into Council decision-making processes.* Objective 3 reflects Taskforce discussion and consensus on finding “onramps,” or points of entry (e.g., social impact assessments or public testimony), for LK and TK, and the social science of LK and TK, into the Council’s decision-making process. One question related to Objective 3 was: Where can LK and TK be utilized in existing Council processes? Objective 3 aims to facilitate the Council’s decision-making as it relates to EBFM by finding the appropriate and most useful onramps for LK and TK, and the social science of LK and TK.
4. *Over the next 2-3 years the Taskforce will identify relevant and appropriate sources of subsistence data and information to use in Council decision-making processes.* To achieve Goal 2, the Taskforce agreed that identifying sources of subsistence information is a crucial step, and recognized that reports produced by the Subsistence Division of the Alaska Department of Fish and Game (ADFG), among others (e.g. work done by the Aleut Community of St. Paul’s Ecosystem Conservation Office), are valuable resources in this respect. However, as described above, the Taskforce also agreed that subsistence, within the context of the Council, should be considered beyond species harvest numbers and beyond the economic value of particular resources. Identifying sources for subsistence information and gaining permission for the use of such sources as appropriate (e.g., for spatial data from Tribes), is expected to be an ongoing process for the Taskforce.
5. *The Taskforce will provide guidance on how subsistence data and information can be incorporated into Council decision-making processes.* Taskforce members came to an agreement on Objective 5 recognizing the importance of providing guidance to staff and the Council with respect to analyzing various forms of subsistence data.

## Action Module Work Streams and Work Products

This Action Module will result in multiple protocols which contain recommendations and “best practices” for the Council and staff with respect to soliciting, analyzing, and incorporating LK, TK, the social science of LK and TK, and subsistence information into the Council’s existing process.

### Taskforce Work Streams

Reflecting the multi-year process of establishing the Bering Sea FEP, stakeholder and staff dialogue on this Action Module has often separated the anticipated work into separate streams. *The Taskforce has proposed separating this Action Module work into two primary:*

1. Processes for incorporating LK, TK, and the social science of LK and TK
2. Processing for incorporating subsistence data and understanding impacts of Council actions on subsistence

Reflecting Goal 1, **Part A** of this work will focus on developing methods and guidelines for identifying or soliciting, evaluating and incorporating LK and TK, and the social science of LK and TK, into Council documents and processes on an ongoing basis. Part A of this Action Module will also include pathways for strengthening relationships with bearers of LK and TK (and their representatives and organizations) and better capturing LK and TK in Council analyses. Reflecting Goal 2, **Part B** will develop a protocol for the Council to consider subsistence and potential sources of subsistence information in its existing decision-making processes. Part B will result in a protocol that incorporates methods and guidelines for incorporating subsistence data into Council analyses. Part B will ultimately develop a process for better understanding and considering how removals from commercially important fish stocks may affect subsistence resources important to Alaska Native communities or affect resource use patterns of those communities.

Separating this Action Module into “parts” is not meant to detract from the linkages across each part. This separation reflects acknowledgement of differences in the current state of incorporating LK, TK, the social science of LK and TK, and subsistence information in the Council process, as well as the need for different methods to strengthen each one. The three subtopics are grouped under one Action Module to promote a holistic approach that allows for connectivity and leveraging of progress across the LK, TK, and subsistence work. Progress on each part is expected to occur at differing timescales, but through a single Taskforce group.

### Taskforce Work Products

At the February 2020 Council meeting, the Council took action to task the Taskforce with creating the following work products<sup>3</sup>:

1. Create a glossary of terms to be included in the Taskforce’s workplan.

---

<sup>3</sup> Council Motion on D3 Bering Sea Fishery Ecosystem Plan Action Modules:  
<https://meetings.npfmc.org/CommentReview/DownloadFile?p=ce213a15-6672-4d0b-9fad-6b0719388804.pdf&file Name=D3%20MOTION%20.pdf>.

2. Identify potential “onramps,” or points of entry, within the Council process (e.g., public testimony or analyses) for the Taskforce’s work.
3. Develop a protocol outlining the best practices for soliciting LK and TK, and a protocol for the Council to identify, analyze, and incorporate TK and LK into Council decision-making documents as appropriate.
4. Develop guidelines or protocols for Council staff for soliciting/identifying, analyzing, and using subsistence data and information in analyses.
5. Prepare a final report for the Council.

This action reflects a broader suite of potential work products contained in the Taskforce’s report from its January 2020 meeting.<sup>4</sup> It is anticipated that these five work products will positively inform the Council process by identifying the appropriate sources of LK, TK, and the social science of LK and TK, and subsistence information, providing guidance on best practices and methodologies for using these data, and where such analyses might be best suited for incorporation into the Council’s existing process.

This Action Module work will likely function across multiple timescales, with multiple bounded projects to be determined through Action Planning after members have been appointed to the Taskforce and at upcoming Taskforce meetings. Upon completion of work, the Taskforce will be expected to present ideas and its work products to Committees and Plan Teams (e.g., the FEP Team) and the Council. The FEP Team will play a particularly active role in the Action Module Taskforce’s process by developing recommendations for the Council based on ideas and work from the Taskforce. The Council will then hear recommendations from the FEP Team and take regulatory or non-regulatory action as necessary.

This Action Module is meant to positively inform the overall Council process and decision-making structure. The completed work will provide a framework and data for analysts to consider ways to make better use of non-economic social science data in the form of, and regarding, LK and TK along with outcomes from engagement actions, as well as whether fishery activities or changes in regulation are likely to impact subsistence resources or patterns of subsistence use. It is anticipated that incorporating subsistence data into the Council process would involve adding a section to future analyses. If included in the discussion paper and preliminary draft stages of an action, it is expected that subsistence data would be considered during development of alternatives for specific actions. Impacts to subsistence resources or use will thus be considered throughout the Council process.

## **Taskforce Ground Rules**

At the Taskforce’s inaugural meeting in January 2020, the Taskforce outlined a pathway forward for their work. The Taskforce will meet three times per year over the next two years, leaving open the possibility for additional meetings if work still needs to be achieved in the third year. Noting potential funding constraints, the Taskforce determined that one meeting will occur in-person, one meeting will occur via teleconference, and the format of the third meeting is yet to be decided. Due to the importance of subsistence activities for multiple Taskforce members, and the need to prioritize various hunting and fishing seasons, the Taskforce identified January, April, and October (2020-2021) as tentative months for these three yearly meetings to occur. The Taskforce agreed to meet via teleconference in April 2020 to address immediate next steps and continue their work.

---

<sup>4</sup> LK, TK, and Subsistence Taskforce Report from the January 2020 meeting:  
<https://meetings.npfmc.org/CommentReview/DownloadFile?p=be755528-f73c-4b89-a6c3-e8fffb65d77c.pdf&fileName=D3%20Report%20of%20LK%20TK%20and%20Subsistence%20Taskforce.pdf>.

*The Taskforce established the following ground rules for their meetings:*

1. Taskforce co-chairs will solicit Taskforce members' availability and notice for the meeting.
2. Stakeholders requested, and the Taskforce expressed their support, to maximize accessibility for extensive community engagement with Taskforce meetings by holding a meeting in a rural community where funding allows.
3. The Taskforce agreed that a brief summary of the public testimony received at each meeting will be provided in the Taskforce report.
4. The Taskforce agreed that members of the public, those present in-person and participating via teleconference, should be invited to participate in Taskforce discussions when feasible and appropriate. This will be determined on a meeting-by-meeting basis, but it is meant to create an inclusive environment, and this practice acknowledges that the nature of the Taskforce's work could be greatly benefitted by additional expertise in the room. This could be particularly relevant if the Taskforce meets in a rural community.
5. The co-chairs will provide the opportunity for the Taskforce to review and give feedback on draft minutes and reports prior to their posting.

Cultivating an inclusive process is important for the Taskforce to engage all potentially relevant stakeholders as there is likely diverse constituent bodies (e.g., Bering Sea fishermen, subsistence resource users, Tribal governments, villages, boroughs, and more) who can contribute to the development of the LK, TK, and subsistence protocols, including the verification of data, outputs, and methods to use in the Council process.

A key accomplishment of BS FEP work related to LK, TK, and subsistence to date has been collaboration early and often with stakeholder individuals and groups in the BS FEP geographic area. This organizational model based on transparency and consensus was adopted early and helped to establish a cohesive and highly motivated Taskforce. By documenting this collaborative method throughout the process, the Taskforce can become a working model of a transdisciplinary and diverse partnership and can be considered a work product in and of itself. Often taking the form of both formal and informal conversations and comments, deep levels of communication have been achieved between Council staff and regional stakeholders with the goal of ensuring that LK, TK, and subsistence are approached in a regionally appropriate manner. Consistent and meaningful communication between Council staff, the FEP Team, and regional stakeholders will be a critical method to carry forward through forming a Taskforce and completing this Action Module work. While it has been acknowledged that it is not always possible to get regular feedback from all stakeholders in the region—and to date there has not been fully representative feedback from all communities in the expansive BS FEP area—taking the time to solicit and incorporate feedback and advice from regional stakeholders is critical for the success of this Action Module. This approach can be time consuming, but staff have described this as a “no steps back” approach. With a “no steps back” approach, progress may not always occur swiftly or in a large-scale way, but the goal is to ensure that trust and collaboration between staff and stakeholders grow stronger throughout this work.

Related, stakeholders have requested, and the Taskforce agreed at its first meeting, that effort should be made to maximize all possibilities for stakeholders to access the Taskforce's meetings and to have at least one meeting in a Bering Sea village, where funding allows. In addition, staff have proposed consideration of a non-typical meeting format to allow for Taskforce meetings to involve a subgroup of Taskforce members flying or driving to a rural community in the Bering Sea region to visit the community, meet



with community members, and host a teleconference or video conference meeting for the full Taskforce. This structure might alleviate some timing and funding constraints of attempting to convene the full Taskforce in remote locations, while allowing a two-way communication and collaboration processes to reach a broader geographical area.

## Proposed Timeline

All Action Module Taskforces are meant to be temporary groups, with members who work to achieve the objectives of each Action Module within its scope as defined by the Council. As such, they are anticipated to have finite timelines. This Action Module work will likely function across multiple timescales, with multiple bounded projects (i.e., protocol for LK and TK as well as subsistence). Upon completion of work, the Taskforce will present its work to the FEP Team and give a final report to the Council. This report is meant to be encompassing and retrospective in nature to provide potential insights to the Council should it initiate work on other Action Modules in the future. The FEP Team will develop recommendations for the Council based on ideas from the Taskforce. The Council will then hear recommendations from the FEP Team and take regulatory or non-regulatory action as necessary. A preliminary timeline for the LK, TK, and Subsistence Action Modules is outlined below.

Dec 2018	Council adopts BS FEP Core Document and prioritizes two Action Modules.
Jan - May 2019	Action Module Workplan drafting
May 2019	FEP Team meeting, Seattle; FEP Team finalizes draft Action Module workplans to forward to the Council/advisory bodies
June 2019	Council reviews workplans presented by the FEP Team, institutes a process for forming the Taskforces, and takes action as necessary
Fall 2019	Formation of Taskforces for prioritized Action Modules
January 2020	First LK, TK, and Subsistence Taskforce meeting
April 2020	Second LK, TK, and Subsistence Taskforce meeting
October 2020	Third LK, TK, and Subsistence Taskforce meeting
2021-2023 (T)	Action Module Taskforces complete work and achieve objectives within the scope of their workplans; Taskforces disband.

## Membership

The membership of the LK, TK, and Subsistence Taskforce reflects the criteria outlined in the draft Action Module workplan which was presented before the Council in June 2019.<sup>5</sup> Specifically, reflecting stakeholder recommendations, the Council appointed 11 individuals based on nominations with various expertise ranging from being TK or LK holders, expert subsistence practitioners, and social scientists with expertise with LK, TK, or working with a wide variety of LK, TK and subsistence information and data. The resulting Taskforce is a diverse group of individuals that are geographically representative of the entire BS FEP Area. Taskforce members are expected to lead progress on the objectives of each Action Module within the defined scope. Members are expected to maintain an ongoing timeline in their workplan, to be presented to the FEP Team (and by the FEP Team to the Council) as necessary. Pending

<sup>5</sup> Agenda Item D6, Draft Action Module Workplan:

<https://meetings.npfmc.org/CommentReview/DownloadFile?p=65ddcb5a-2df2-4930-a4ca-dbd1d7386941.pdf&file Name=D6%20LKTK%20Action%20Module%20Draft%20Workplan%20May%202019.pdf>.

funding constraints, the Council will pay travel costs for non-Federal members of the project Taskforce to noticed Taskforce meetings.

## Appendix 1. Glossary of Terms for Taskforce

<b>Term</b>	<b>Definition</b>	<b>Citation</b>
Local Knowledge	Local Knowledge includes the observations and experiences of local people in a region, and people with significant experience or expertise related to a region, species, or fishery (e.g., people from outside the Bering Sea region may be considered Local Knowledge holders). Local Knowledge is often acquired over the course of a few generations or less, and it is the product of knowledge formation and dissemination based on personal, shared and inherited experience.	Definition agreed upon by Taskforce members
Traditional Knowledge	“A living body of knowledge which pertains to explaining and understanding the universe and living and acting within it. It is acquired and utilized by Indigenous communities and individuals in and through long-term sociocultural, spiritual and environmental engagement. [Traditional knowledge] is an integral part of the broader knowledge system of Indigenous communities, is transmitted intergenerationally, is practically and widely applicable, and integrates personal experience with oral traditions. It provides perspectives applicable to an array of human and nonhuman phenomena. It is deeply rooted in history, time, and place, while also being rich, adaptable, and dynamic, all of which keep it relevant and useful in contemporary life. This knowledge is part of, and used in, everyday life, and is inextricably intertwined with peoples' identity, cosmology, values, and way of life. Tradition – and [traditional knowledge] – does not preclude change, nor does it equal only 'the past'; in fact, it inherently entails change.”	Raymond-Yakoubian et al., 2017
Subsistence	Subsistence is the harvesting and processing of wild foods, the practices of which are deeply rooted in history, culture, tradition, and place; it encompasses hunting, fishing, and gathering activities. Subsistence is, generally, separated from commercial activities though cash economies can, and do, support subsistence engagement.	Active 1999; Gadamus and Raymond-Yakoubian 2015; Raymond-Yakoubian, Raymond-Yakoubian, Monicreiff 2017
Subsistence Data	Information which can be, or has been, observed and recorded as it relates to subsistence. Recorded subsistence data may include oral, written, or living memories of values and practices.	Definition agreed upon by Taskforce members
Protocol	A framework which articulates a series of steps (or procedures) to be followed in each situation; in the	

	context of the Council, a protocol may explicate a series of best analytical practices or describe etiquette with respect to engaging human subjects.	
Consent (for research or data use)	In the Council context, consent is a voluntary acknowledgment and agreement to participate in research, or to have one's information available or used, for analysis in decision-making. Consent is a process where the participant (i.e., individual or entity) is informed of both potential risks and benefits.	

## Appendix 2. List of Acronyms

### Term

Alaska Department Fish and Game  
Ecosystem Based Fishery Management  
Fishery Ecosystem Plan  
Local Knowledge  
Traditional Knowledge

### Acronym

ADFG  
EBFM  
FEP  
LK  
TK

## Appendix 3. Action Module Scoping Summary from Core BS FEP

<p>1. Synopsis including how it will be accomplished</p>	<p>This Action Module has two parts. In Part A, methods for integrating/incorporating LK and TK into Council processes in the short- to long-term will be addressed. In Part B, a methodology will be developed for how the Council can consider potential impacts to subsistence species, habitats that support those species, and access to subsistence resources. To develop this Action Module, the Council will strengthen and broaden ties with Alaska Native organizations, organizations that are familiar with subsistence data, non-economic social scientists, and agency scientists. Through collaboration with LK, TK, and subsistence experts, a protocol will be developed to ensure Council analysts know how to review and utilize LK, TK, and subsistence information successfully in analyses.</p>
<p>2. Purpose relationship to the BS FEP's strategic objectives</p>	<p>This Action Module is most responsive to BS FEP Research Objective 4, which links directly to Process Objective 6. As relates to Part A, the Council is interested in strengthening relationships with bearers of LK and TK and better capturing LK and TK in Council analyses. As relates to Part B, the Council is interested in developing a process for better understanding and considering how removals from commercially important fish stocks may affect subsistence resources important to Alaska Native communities or affect resource use patterns of those communities.</p>
<p>3. How it will inform the Council process</p>	<p>This Action Module will improve Council decision-making by giving the Council access to a more complete picture of the ecosystem and the potential impacts of their actions. This Action Module aims to provide a roadmap for operationalizing LK, TK and potentially processes like Co-Production of Knowledge (CPK) in the short- to long-term, as well as formulate a method for assessing the likelihood a given Council action may affect subsistence resources or the ability of users to access those resources. This project will guide the use of subsistence data in analyses and is expected to help the Council be increasingly responsive to National Standards 2 and 8.</p>
<p>4. How it will be integrated in the Council process</p>	<p>This Action Module is meant to positively inform the overall Council process and decision-making structure. The completed work will provide a framework and data for analysts to consider ways to make better use of non-economic social science data in the form of LK and TK along with outcomes from engagement actions (e.g., CPK processes), as well as whether fishery activities or changes in regulation are likely to impact subsistence resources or patterns of subsistence use. It is anticipated that incorporating subsistence data in to the Council process would involve adding a section to future analyses. If included in the discussion paper and preliminary draft stages, it is expected that subsistence data would be considered during development of alternatives for specific actions. Impacts to subsistence resources or use will thus be considered throughout the Council process.</p>
<p>5. Estimate of time and staff resources</p>	<p>This is expected to be an ongoing process to cultivate relationships, with short- to medium-term goals including gathering existing data about specific issues. Once protocols for reviewing and using LK, TK, and subsistence use information are in a format that can be accessed and used by analysts, there may be limited commitment of Council time or staff resources to incorporate that information into analyses. Regular staff time would be required to maintain ongoing relationships and update descriptions in the BS FEP.</p>
<p>6. Plan for public involvement</p>	<p>As described above, the Council is reliant on partnering with other organizations to create an environment conducive to processes like CPK, as well as identifying and using subsistence data in analyses. It is anticipated that LK, TK, and subsistence experts would need to be actively involved on the development team for this Action Module. Outreach to partner</p>

agencies and their constituents as well as ongoing collaboration with Tribes and communities throughout the Bering Sea region will be important in verifying the data, products, and methods to use in management.

## Appendix 4. Action Module Project Ideas from Core BS FEP

### Part A Operationalizing LK and TK in the Council Process

A BS FEP provides opportunity for the Council to operationalize plans for strengthening partnerships with bearers of LK and TK, as well as developing methodology for integrating LK and TK into management using multiple methods, including Co-Production of Knowledge (CPK). Part A of this Action Module will include guidelines for evaluating and incorporating LK and TK into Council documents and processes on an ongoing basis.

Recent work by Indigenous leaders and Western scientists in Alaska has led to the development of a conceptual framework for carrying out Co-Production of Knowledge (CPK; Behe, Daniel, and Raymond-Yakoubian 2018). CPK is a process for bringing together knowledge-holders from different systems. The CPK conceptual framework is focused on bringing together TK knowledge systems with LK and Western science through an equitable process that strengthens partnerships between these different knowledge systems. Behe, Daniel, and Raymond-Yakoubian (2018) explain CPK is a process for sharing information, values, and ideas, and for conducting research and informing holistic and adaptive decision making and policy. Most examples of knowledge co-production in Alaska to date have been carried out in research. CPK is a potential method for carrying out BS FEP objectives focused on bringing together TK, LK, and Western science for evidence-based decision making and policy. CPK will be considered as a potential method for carrying out LK and TK objectives of this Action Module. The CPK process includes:

#### Equity and Collaboration

##### Characterized by:

- Decolonization  
*(a lot of top down and outside processes have been imposed on Indigenous communities; acknowledge those on an even playing field)*
- Deliberate and intentional  
*(power dynamics should be acknowledged early in the process; issues of power and control need to be discussed clearly and completely at the beginning of any project)*
- Trust and respect
- Capacity  
*(Tribes and Indigenous peoples should have means and ability to participate in the process from beginning to the end, even to data maintenance over time)*
- Sovereignty

#### Co-production of knowledge

##### Leading to:

- Review results
- Access to and control over information
- Define a problem
- Identify questions
- Develop methods
- Gather information
- Conduct analysis and
- Communicate/share results

##### Resulting in:

- Shared knowledge systems

- Ethical
- Real relationships
- Empowerment

*CPK is a process that extends beyond a single, distilled, deliverable research product.* In a true CPK process, TK, LK, and Western science are all respected as different knowledge systems, with each holding unique methodologies, evaluation, and validation processes. With this understanding, the different knowledge systems are not translated into each other, but instead are trusted and respected in their uniqueness. Within a CPK process, participation of all knowledge holders is needed throughout the entire process, from inception through analysis and output.

Co-production requires an understanding that Western science and TK are different knowledge systems often articulated through a cross-cultural setting. The co-production of knowledge “requires the integration of different ways of knowledge to be salient, credible, and legitimate” and the inclusion of actors on both sides of the boundary of decision making for a productive output (Robards et al. 2018,9). TK is not based on the key assumptions of Western science. TK is based on the recognition and understanding of interconnections between systems, whereas Western science is often based on a set of independent facts. Successful co-production of knowledge requires trust in the different knowledge systems, to bring together different questions and different methods for achieving new, unique, co-produced results (e.g. understandings, reports, policies, management strategies, etc.).

CPK is rooted in the concept of equity, as well as environmental and political justice. A primary goal of co-production of knowledge processes that involve Indigenous people, is to have Indigenous perspectives and TK taken seriously from the beginning and to build relationships throughout the process of any work or project. It is important to recognize the self-determination and sovereignty of TK bearers, and to rigorously practice informed consent. Most examples of knowledge co-production in Alaska to date have been carried out in research contexts.

Using a mixture of CPK and other methods, the Council could consider the following short-, medium-, and long-term actions in the process of developing best practices for LK and TK:

***Short-term (require lower level of time/staff commitment)***

- The Council may instruct the BS FEP Team to include Tribal/Indigenous representation to provide input on an ongoing basis.
- The Council may discuss potential mitigation actions regarding internal lack of capacity for conducting LK and TK analyses (and non-economic social science more generally).
- Preliminary guidelines may be laid out regarding how to evaluate LK and TK information/data in Council analyses (and non-economic social science more generally).
- A bibliography of information resources for LK and TK could be prepared and stored at the Council, for use by analysts. Some of these resources are listed in the [Core BS FEP](#) document.
- A question may be added to the analytical template used by Council staff, that reads, “Are there known sources of LK and TK, or the social science of LK and TK, relevant to this topic?”
- The Council may choose to request explicit incorporation of LK and TK, and the social science of LK and TK, into the ecosystem assessment process carried out through NOAA and at the Council.
- The Council may choose to establish explicit support of co-production of knowledge (CPK) approaches to work in the Bering Sea region. Understanding that CPK is a process, and not a product in and of itself, Council support for CPK would indicate a willingness to support



collection and sharing of information and research that typically lies outside the Western scientific paradigm.

***Medium-term (require medium level of time/staff commitment)***

- The Council might encourage or voice support for compensated participation of Alaska Native Tribes and Indigenous peoples in monitoring, observation and research of Bering Sea ecosystem issues (outside the Council process).
- A plan may be developed to increase capacity at the Council for working on LK and TK (and non-economic social science more generally). If the Council would like to pursue this idea, the next step would be to determine what type(s) of capacity it would like to increase, before determining whether existing staff might fulfill the desired role(s).
- The Council may choose to develop mitigation measures in collaboration with Tribes and NMFS (in their Tribal Consultation role) for dealing with a lack of capacity for LK and TK (and non-economic social science more generally) in analyses. If the Council would like to pursue this idea, the next step would be to determine what type(s) of capacity it would like to increase, before determining whether existing staff might fulfill the desired role(s).
- The Council could appoint/hire an LK and TK liaison staffer, who would facilitate the inclusion of LK and TK at all levels of the Council process. Some other organizations have dedicated staff liaisons for this purpose (e.g., US Fish and Wildlife Service). If the Council would like to pursue this idea, the next step would be to define roles and responsibilities of such a position.
- The Council may consider formalizing a specific process for inputting LK (and non-economic social science more generally) into existing analyses and assessments.
- The Council may consider formalizing a specific process for inputting TK into existing analyses and assessments (see **\*NOTE** below).
- The Council may task staff or another entity with compiling LK and TK resources (ideally through a CPK process) for use in an early warning model (conceptual or statistical) for ecosystem change, in conjunction with Western science information (e.g., example of sea lions on St. Lawrence Island).
- A subcommittee for LK and TK could be formed within the recently formed Social Science Planning Team (SSPT) or the Community Engagement Committee (CEC), as a potential route for incorporating LK and TK into the Council process in a way that makes use of existing advisory structures. The SSPT or CEC could facilitate meaningful contributions of LK and TK to ongoing analyses, as well as thoughtful review of completed analyses. The SSPT or CEC could further facilitate longer-term goals for LK and TK to take part in evolving the Council management process to reflect EBFM. The SSPT or CEC might also invite a member from an agency (e.g., ADFG) or the public (e.g., active stakeholder group(s) from the region) with expertise in LK and TK work.
- The Council could consider forming an LK and TK Committee to allow for a dedicated space in the existing Council process for LK and TK to inform management.
- As with research priorities, policy priorities and objectives are rooted in a Western science paradigm. The Council may choose to task staff with developing a set of best practices for determining management priorities, alternatives, and tradeoffs through a CPK process, or partnering with Western Alaska Indigenous and community organizations, to answer questions such as:
  - What are local/regional community priorities for Federal fisheries policy?
  - What stories do local/regional community members want to share?

- What kind of spatial data related to subsistence are appropriate to use in public documents/discussions, and how?
- What do regional community members feel are appropriate and ethical ways for non-Indigenous and non-locals to contribute in Federal fisheries policy and decision-making in the Bering Sea region? What are not appropriate or ethical ways?

***Long-term (require significant level of time/staff commitment)***

- The Council may consider composing protocols for long-term and specific data-use agreements with Tribes and communities providing LK and TK information, especially as relates to spatial mapping (see Part B of this Action Module; Note: Not all spatial information documented by Alaska Native organizations is currently available to the public, because specific data-use agreements need to be established for the sharing of much of that data. Additionally, current publicly-available spatial information may not be appropriate for further use without updated permissions and formal consent of the Tribe(s) or community(ies) that initially provided it.).
- The Council might consider formalizing a process for CPK in the Bering Sea region, as it relates to policy and decision-making. This might involve providing regular trainings for staff in LK, TK, and CPK methods, and to have a permanent space on staff for an expert in LK, TK, and/or CPK methods.
- The Council might consider how to shift towards an adaptive co-management approach (Berkes, 2009) that more fully incorporates LK and TK into the process at all stages. One example of this type of approach is the Arctic Borderlands Ecological Knowledge Co-Op<sup>6</sup>.
- The Council might include Tribal membership on all Council committees and plan teams.
- The Council might encourage and facilitate increased TK representation through increased Indigenous/Tribal representation on the Council and Council bodies (e.g., Tribal seats on the Council are desired by Indigenous communities), understanding that a permanent Indigenous/Tribal seat (voting or non-voting) on the Council would require a change to the MSA.

**Part B Subsistence**

This portion of Action Module 4 is expected to identify ways for subsistence data to be incorporated into Council analyses and will describe circumstances in which measures may be necessary to mitigate potential impacts to subsistence resources, or the use of those resources by Alaska Natives. The BS FEP will not automatically require mitigation for circumstances where the potential for impacts exist, nor will the BS FEP limit the sorts of actions that the Council may take. Rather, the BS FEP will provide a roadmap for the Council to follow to assess the likelihood of impacts and develop mitigation measures should they be necessary. This part of the Action Module is responsive to BS FEP Strategic Objectives 1 and 2, to synthesize the current understanding of Bering Sea ecosystem processes and create a cohesive plan for EBFM.

In recent years, potential impacts of commercial fisheries on subsistence resources or use patterns have received increasing attention. The BS FEP provides an opportunity for the Council to outline best practices for how subsistence use data may inform understandings of potential impacts of commercial fisheries on subsistence resources and use and, if appropriate, mitigate those potential impacts to ensure that subsistence use of marine resources continues unabated in the Bering Sea. The Council is interested

---

<sup>6</sup> <https://glosbe.com/en/fr/Arctic%20Borderlands%20Ecological%20Knowledge%20Co-op>;  
<https://www.arcticborderlands.org/about-us>

in understanding ways that removals from commercially important fish stocks may affect the subsistence resources important to Alaska Native communities or affect resource use patterns of those communities. Where subsistence use data are already available, data may be incorporated into existing models that predict fishery behavior or responses to changes in conditions or regulations.

One hurdle to incorporating subsistence use data into management decisions has been collection of data and preparation of data products for use in current assessment models. Non-governmental and Tribal organizations (corporations, governments, etc.) have been working to describe and document subsistence use patterns of Alaska Native communities throughout the Bering Sea region.<sup>7</sup> In addition to non-governmental and Tribal data sources, the State of Alaska Department of Fish and Game Subsistence Division has ongoing projects to document subsistence use patterns and could provide a wide range of subsistence use data. The State of Alaska Division of Subsistence reports, and the Northern Bering Sea Mapping Project and Bering Strait Marine Life and Subsistence Use Data Synthesis are some examples of products that have made subsistence use and subsistence species occurrence data available to fishery managers. Some subsistence use data are currently available in spatial mapping formats (e.g., in ArcGIS software programs) that allow managers to evaluate them (e.g., for potential conflicts with commercial fisheries). The Council will use subsistence data appropriately as they become available.

Collection and preparation of subsistence data are major undertakings. The Council will work with organizations that collect and prepare subsistence data in the short-term and may wish to prepare a long-term subsistence data use plan in the future. To carry out this part of the Action Module, it is likely the Council will need to develop collaborative relationships with Alaska Native organizations, organizations that are familiar with subsistence data, non-economic social scientists, and agency scientists to ensure data quality and to ensure products are in a form that is useful to fishery analysts as well as subsistence users. This would likely require an initial in-depth process to identify a working list of sources of subsistence use data, and a smaller ongoing commitment to maintain and update that list. Some regular staff time would be required to communicate with collaborating organizations on an ongoing basis (e.g., to update descriptions in the BS FEP).

Outcomes from this part of the Action Module are expected to provide a framework and data for analysts to consider whether fishery activities or changes in regulation over time are likely to impact subsistence resources or patterns of subsistence use. It is anticipated that incorporating subsistence data into the Council process may involve adding a new section to all future analyses. Some actions may require no additional section, for other actions the additional section might be much longer and more involved. If included in the discussion paper and preliminary draft stages, it is likely that subsistence data would be considered during the development of alternatives and impacts to subsistence resources or use would be considered throughout the Council process.

This part of the Action Module is expected to affect the Council's decision-making by providing resources necessary for analysts to determine the likelihood that a Council action would affect subsistence resources or the ability of Alaska Native people to access those resources. This is also expected to provide ready access to subsistence data for use in analyses and provide guidelines for when mitigation may be necessary. Management measures may or may not be changed by consideration of subsistence data.

---

<sup>7</sup> E.g., Northern Bering Sea Mapping Project available at: <http://www.akmarine.org/fisheries-conservation/protect-habitat/northern-bering-sea-initiative/> and Bering Strait Marine Life and Subsistence Use Data Synthesis available at: <http://oceana.org/publications/reports/the-bering-strait-marine-life-and-subsistence-data-synthesis>.

Where management measures may be changed, the Council may, ultimately, be more responsive to National Standards 2 and 8, especially when fishing communities also rely on subsistence resources.

As described above, the Council is reliant on other organizations to collect and prepare subsistence data, and for this part of the Action Module, it is anticipated that subsistence experts would need to be actively involved on any Action Module development team(s). Outreach to agencies and their constituents would be important in verifying the data and products to use in management.

## References

- Active, J. 1999. Why subsistence is a matter of cultural survival: a Yup'ik point of view. Alaska Native Writers, Storytellers & Orators: The expanded Edition.
- Anderson, R. T. 2016. Sovereignty and subsistence: native self-government and rights to hunt, fish, and gather after ANCSA." *Alaska Law Review* 33(2), 187-227.
- Berkes, F. 1999. Sacred ecology: traditional ecological knowledge and resource management. Philadelphia, PA: Taylor & Francis.
- Clark, C. 2016. Here's how Native knowledge could help save salmon. KCET.  
<https://www.kcet.org/shows/tending-the-wild/heres-how-native-knowledge-could-help-save-salmon>
- Gadamas, L., J. Raymond-Yakoubian, R. Ashenfelter, A. Ahmasuk, V. Metcalf, G. Nongwook. 2015. Building an indigenous evidence-base for tribally-led habitat conservation policies. *Marine Policy* 62, 116-124. <http://dx.doi.org/10.1016/j.marpol.2015.09.008>
- Ingold, T. 2000. The perception of the environment: essays in livelihood, dwelling, and skill. London: Routledge.
- Johannes, R.E. and B. Neis. 2007. The value of anecdote. Fishers' knowledge in fisheries science and management, pg. 41-58, UNESCO Publishing.
- Martin, K. S., McCay, B. J., Murray, G. D., Johnson, T. R., & Oles, B. 2007. Communities, knowledge and fisheries of the future. *International Journal of Global Environmental Issues*, 7(2-3), 221-239.
- NPFMC. 2019. Bering Sea Fishery Ecosystem Plan. North Pacific Fishery Management Council 605 W 4<sup>th</sup> Avenue, Suite 306 Anchorage, AK 99501.
- Pacific Fisheries Resource Conservation Council. 2011. Incorporation of traditional and ecological knowledge and values in fisheries management. ESSA Technologies LTd. 1765 West 8<sup>th</sup> Avenue, Vancouver, BC V6J 5C6.
- Raymond-Yakoubian, J., B. Raymond-Yakoubian, and C. Moncrieff. 2017. The incorporation of traditional knowledge into Alaska Federal fisheries management. *Marine Policy* 78, 132–142.
- Reedy-Maschner, K. 2009. "Entangled Livelihoods: Economic Integration and Diversity in the Western Arctic." *Alaska Journal of Anthropology* 7(2), 135-146.
- Reedy, K. and H. Maschner. 2014. Traditional foods, corporate controls: networks of household access to key marine species in southern Bering Sea villages. *Polar Record* 50(255), 364-378.
- Robards, MD, HP Huntington, M. Druckenmiller, J. Lefevre, S.K. Moses, Z. Stevenson, A. Watson, and M. Williams. 2018. "Understanding and Adapting to Observed Changes in the Alaskan Arctic: Actionable Knowledge Co-production with Alaska Native Communities." *Deep Sea Research Part II: Topical Studies in Oceanography* 152: 203-213