



# Bering Sea Fishery Ecosystem Plan

## Ecosystem Health Report Card Workshop

BS FEP Team, May 3, 2021



# Agenda

- Welcome and outlining of workshop goals
- FEP Team Discussion
  - History of the Ecosystem Status Reports (20 mins)
  - Review Council Ecosystem Goals and FEP Ecosystem Objectives (10 mins)
  - Who is the target audience for the EHRC? (20 mins)
  - What should it be called and what format should it take? (15 mins)
  - What is the goal of the Report Card? (20 minutes)
  - Report timeline (20 mins)

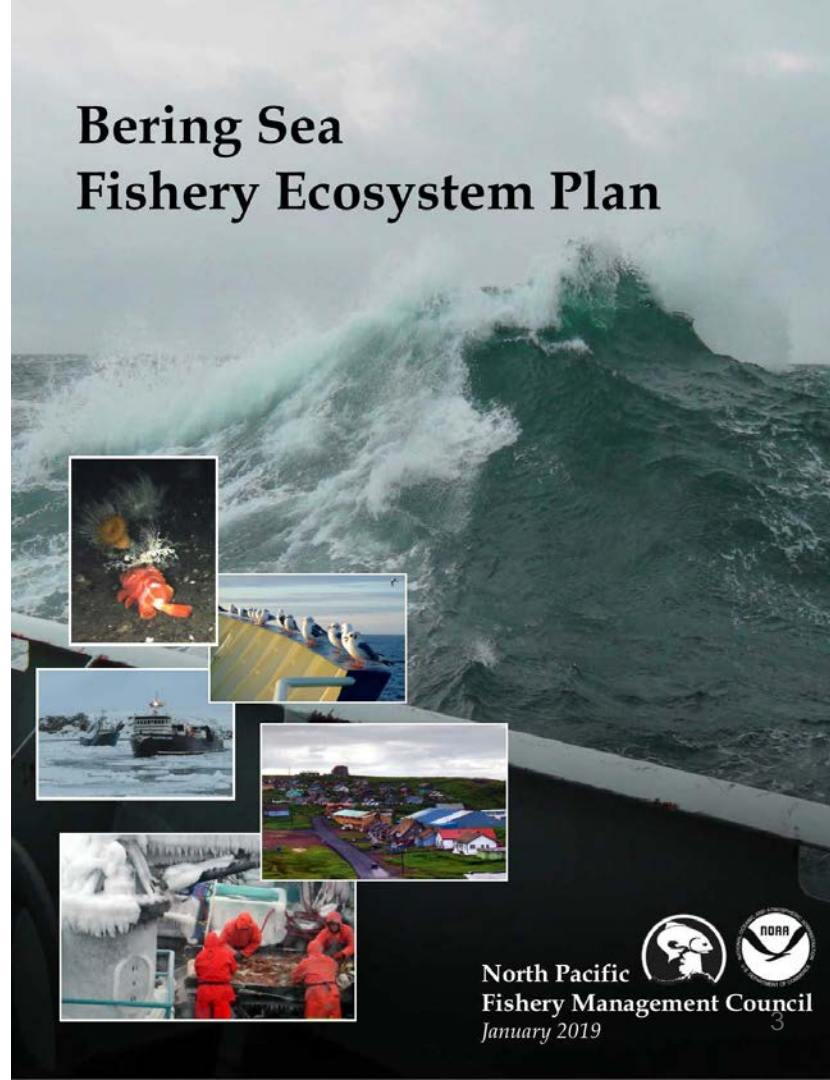
## LUNCH BREAK

- Breakout sessions by FEP objective suites
- Large group share-out
- Wrap up and next steps

# BS FEP Refresher

- FEP formalizes the Council's EBFM approach for the Bering Sea
- Sets goals and objectives for the Bering Sea ecosystem to guide the process by which the Council:
  - Manages fisheries
  - Monitors the ecosystem
  - Prioritizes new research for the Bering Sea through identification of action modules
- FEP prioritizes information exchange, 2-way communication, diverse perspectives
- FEP is action informing not action forcing

## Bering Sea Fishery Ecosystem Plan



## Alaska-wide

Council's  
Ecosystem Vision  
Statement

Ecosystem Goals  
1-6



**Process objectives**



**Research objectives**



**Ecosystem objectives**

## Specific to the Bering Sea FEP

*How do we want to achieve Ecosystem Goals for Bering Sea management through the FEP?*

*What do we want to do first? How do we prioritize among possible Action Modules?*

*How do we monitor and measure progress towards meeting Bering Sea Ecosystem Goals?*

Diana

# Why are we developing this report?

- FEP Process Objective #9:
  - Maintain and enhance systematic status and trend monitoring of Bering Sea ecosystem processes and status relative to ecosystem objectives, to detect change
- Also Process Objective #10:
  - Create and track performance metrics to evaluate the ecosystem effects of specific management actions
- FEP Team tasked with providing strategic guidance for monitoring BS ecosystem status
  - *develop and keep current an appropriate suite of ecosystem indicators specific to the FEP's Ecosystem Objectives* (FEP Team Terms of Reference)
  - Originally intended to be tracked in the ESR, but thinking has evolved

# Workshop Goals

Diana

## Goals to achieve today:

- How will we frame and structure this report?
  - What is its goal? Who is the audience? What do we call it? What will it look like?
- Organize how we will do the work to design this report
  - Assign subgroups - by ecosystem goal?
  - Identify partners to provide additional expertise (e.g. FEP taskforces, Social Science Planning Team)
- Begin work on populating the report (in breakout groups)
  - What indicators do we track already that might fit with this report?
  - What other available or ideal indicators should be included?

## Goals to achieve by the May 24-25 FEP Team meeting:

- Solid progress with developing the report
- Highlight any clarifications, adjustments, difficulties to resolve with the concept
- Identify timeframe/resources needed to complete task

# The AK Ecosystem Status Report history

- Began in 1996 - “Ecosystem Considerations Chapter” in groundfish SAFE.
  - Ecosystem status and trends - trend summary but not synthesis.
- Added "Ecosystem Assessment" section in 2003.
  - As a result of Groundfish PSEIS, focused on cumulative effects.
  - Initially divided between **fisheries effects on the ecosystem** and **ecosystem effects on the fisheries** .
  - Refined into 4 ecosystem objectives (cited in 2003 - 2012 reports).

# From 2012 Ecosystem Assessment

Table 1. Objectives, drivers, pressures, effects and indicators, significance thresholds and indicators for fishery and climate induced effects on ecosystem attributes.

Objective	Drivers	Pressures/Effects	Significance Threshold	Indicators
Maintain predator-prey relationships and Energy flow	Need for fishing; per capita seafood demand	Availability, removal, or shift in ratio between critical functional guilds	Fishery induced changes outside the natural level of abundance or variability, taking into account ecosystem services and system-level characteristics and catch levels high enough to cause the biomass of one or more guilds to fall below minimum biologically acceptable limits. Long-term changes in system function outside the range of natural variability due to fishery discarding and offal production practices:	Trophic level of the catch Trends in catch, bycatch, discards, and offal production by guild and for entire ecosystem Sensitive species catch levels Population status and trends of each guild and within each guild Production rates and between-guild production ratios ("balance") <i>Scavenger population trends relative to discard and offal production levels.</i> Bottom gear effort (proxy for unobserved gear mortality on bottom organisms)
		Spatial/ temporal concentration of fishery impact on forage	Fishery concentration levels high enough to impair long term viability of ecologically important, nonresource species such as marine mammals & birds	<i>Degree of spatial/temporal concentration of fishery on pollock, Atka mackerel, herring, squid and forage species (qualitative)</i>
		Introduction of nonnative species	Fishery vessel ballast water and hull fouling organism exchange levels high enough to cause viable introduction of one or more nonnative species, invasive	Total catch levels Invasive species observations
Maintain diversity	Need for fishing; per capita seafood demand	Effects on species diversity	Catch removals high enough to cause the biomass of one or more species (target, nontarget) to fall below or to be kept from recovering from levels below minimum biologically acceptable limits	Species richness and diversity Population levels of target, nontarget species relative to MSST or ESA listing thresholds, linked to fishing removals (qualitative) Number of ESA listed marine species Trends for key protected species.
		Effects on functional (trophic, structural habitat) diversity	Catch removals high enough to cause a change in functional diversity outside the range of natural variability observed for the system	Guild diversity or size diversity changes linked to fishing removals (qualitative) Bottom gear effort (measure of benthic guild disturbance) HAPC biota bycatch
		Effects on genetic diversity	Catch removals high enough to cause a loss or change in one or more genetic components of a stock that would cause the stock biomass to fall below minimum biologically acceptable limits	Community size diversity Degree of fishing on spawning aggregations or larger fish (qualitative) Older age group abundances of target groundfish stocks
Maintain habitat	Need for fishing; per capita seafood demand	Habitat loss/ degradation due to fishing gear effects on benthic habitat, HAPC biota, and other species	Catch removals high enough or damage caused by fishing gear high enough to cause a loss or change in HAPC biota that would cause a stock biomass to fall below minimum biologically acceptable limits.	Areas closed to bottom trawling Fishing effort (bottom trawl, longline, pot) HAPC biota catch HAPC biota survey CPUE
Incorporate/ Monitor effects of climate change	Concern about climate change	Change in atmospheric forcing resulting in changes in the ocean temperatures, currents, ice extent and resulting effects on production and recruitment	Changes in climate that result in changes in productivity and/or recruitment of stocks	North Pacific climate and SST indices (PDO, AO, NPI, and NINO 3.4) Combined standardized indices of groundfish recruitment and survival Ice indices (retreat index, extent) Volume of cold pool



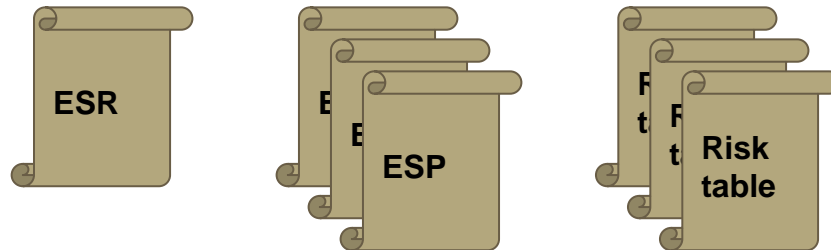
## From 2012 Ecosystem Assessment

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		Spatial./ temporal concentration of fishery impact on forage	Fishery concentration levels high enough to impair long term viability of ecologically important, nonresource species such as marine mammals & birds	<i>Degree of spatial/temporal concentration of fishery on pollock, Atka mackerel, herring, squid and forage species (qualitative)</i>

# The AK Ecosystem Status Report history

- 2006- present: towards informing single -species tactical decisions
  - Honed indicator attention to give information in direct stock context ("ecosystem effects on fisheries") for tactical management decisions (December Council meeting).
  - More single -species indicators (e.g. direct correlates of recruitment).
  - Products focused on single species decision points (first cited in 2006 reduction of pollock ABC).



# Fisheries effects on the ecosystem??

- Cumulative, multi -species effects (synthesis needed)
- Informs management strategy, not tactical management decisions
- Diversity of audiences
- Monitors success of EBFM management actions (progress towards goals and objectives)
- *Without* overwhelming

# So where is our starting point?

Kerim

- Focus of FEP is strategic
  - Strategic versus Tactical advice led to development of this new product to deliver longer-term strategic advice rather than the near-term tactical advice contained in the ESRs.
  - Purpose in FEP: to allow fishery management to more explicitly take into account and be responsive to changes in the ecosystem
- Six ecosystem goals are overarching; FEP associates them with one or more strategic Ecosystem Objectives
- FEP process objective 9 calls for status and trend monitoring of BS ecosystem to detect change
  - Task: to identify appropriate indicators for all of the strategic Ecosystem Objectives
- Also FEP process objective 10: performance metrics to evaluate the ecosystem effects of specific management actions
  - can we see impacts of management decisions in objective indicators? Should we be including this in the report?

# Council's Ecosystem Goals

1. Maintain, rebuild, and restore fish stocks at levels sufficient to protect, maintain, and restore food web structure and function
2. Protect, restore, and maintain the ecological processes, trophic levels, diversity, and overall productive capacity of the system
3. Conserve habitats for fish and other wildlife
4. Provide for subsistence, commercial, recreational, and non-consumptive uses of the marine environment
5. Avoid irreversible or long-term adverse effects on fishery resources and the marine environment
6. Provide a legacy of healthy ecosystems for future generations

# FEP Ecosystem Objectives

**Ecosystem Goal 1: Maintain, rebuild, and restore fish stocks at levels sufficient to protect, maintain, and restore food web structure and function**

1. Maintain target biomass levels for target species, consistent with optimum yield, using available tools.
2. Maintain healthy populations and function of non-target and forage species.
3. Adjust fishing-related mortality from the system to be commensurate with total productivity and continue to limit optimum yield to 2 million metric tons for the BSAI groundfish fisheries.

# FEP Ecosystem Objectives

**Ecosystem Goal 2: Protect, restore, and maintain the ecological processes, trophic levels, diversity, and overall productive capacity of the system**

4. Maintain key predator/prey relationships.
5. Conserve structure and function of ecosystem components.

**Ecosystem Goal 3: Conserve habitats for fish and other wildlife**

6. Minimize adverse impacts to essential fish habitat, to the extent practicable.
7. Minimize and/or avoid impacts to ecologically-sensitive habitat, including habitat areas of particular concern.
8. Minimize and/or avoid impacts to seabirds, marine mammals, and protected species.

# FEP Ecosystem Objectives

## **Ecosystem Goal 4: Provide for subsistence, commercial, recreational, and non-consumptive uses of the marine environment**

9. Support benefits in the Bering Sea fishery and fishery-related industries.
10. Provide opportunities for new entrants in federal fisheries.
11. Promote economic and community stability to all commercial harvesting and processing sectors.
12. Promote sustainable opportunities and community resilience for subsistence users and Alaska Native communities.
13. Provide for directed fisheries including subsistence fisheries by minimizing bycatch mortality, to the extent practicable.
14. Preserve the ability for stakeholders to derive non-consumptive and cultural value from the Bering Sea ecosystem.



# FEP Ecosystem Objectives

**Ecosystem Goal 5: Avoid irreversible or long-term adverse effects on fishery resources and the marine environment**

**Ecosystem Goal 6: Provide a legacy of healthy ecosystems for future generations**

15. Establish appropriate thresholds to minimize risk of crossing ecosystem tipping points caused by fishery or other human activity.
16. Encourage responsible parties to minimize adverse impacts to fish and other wildlife associated with changes in shipping activity, tourism, energy, and other types of development.
17. Ensure that fishery management is sufficiently adaptive to account for the effects of climate change or other ecosystem changes, including loss of sea ice and ocean acidification.

# Who is the target audience for the EHR? Ebett

## ACTIVITY:

We will conduct a round-robin poll of FEP members' ideas on:

- Who is the target audience?
- How will they use the information?

## DISCUSSION:

We will work towards consensus agreement on who the target audience is.

Example topic: Is there a distinction between audience members who need the information in order to make decisions versus audience members who have a vested interest in the information?



# What do we call this?

Andy

What do we mean by “health”?

- Do we need to define health?
- “State of the Ecosystem”
- Condition?

Format

- What do we want this to look like?
- “Report card” synonymous with ‘grading’, pass/fail, letter grades
- How do we sum up indicators across 17 objectives in a “report card”?
- Stop light, letter grades, rosette, time series

# GULF of MEXICO Coral Reef

PRELIMINARY REPORT CARD

## Scale Description

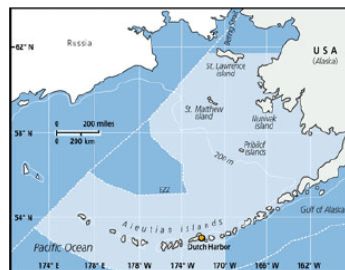


To describe the perceived condition of the reefs in the Gulf of Mexico, we used a spectrum of colors that ranges from green to red.



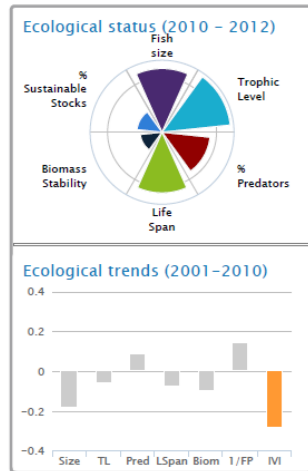
[coris.noaa.gov/activities/gulf-of-mexico-coral-reef/welcome.html](http://coris.noaa.gov/activities/gulf-of-mexico-coral-reef/welcome.html)

## Bering Sea, Aleutian Islands

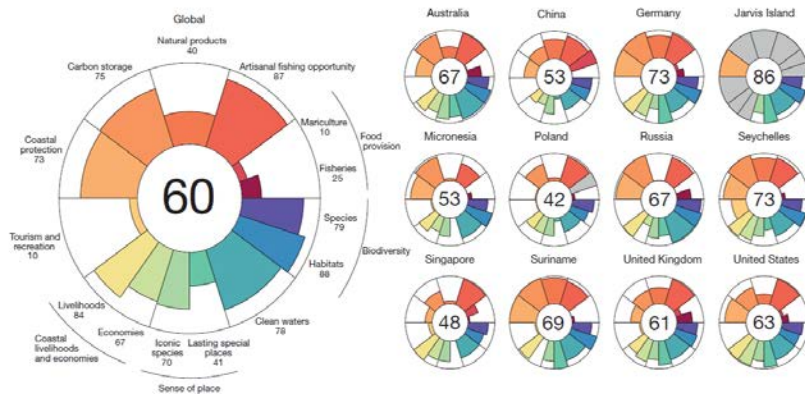


The 1980s-70s was a period of high exploitation, particularly for yellowfin sole, Pacific ocean perch, walleye pollock. Since the 80s, the total allowable catch has been capped at 2 MT, which has been consistently lower than the sum of species quotas; so catch has been very stable and, while some species are considered fully exploited, the ecosystem has not shown patterns of overfishing. Over half of the total catch has been pollock, a mid-trophic level species. It also dominates the surveyed biomass, so the indicators tend to follow the variable recruitment of pollock, possibly explaining non-significant trends for 1998-2005. Longer-term positive trends in fish size and lifespan were due in part to longer-lived flatfish, which experienced strong recruitment in the 80s possibly due to beneficial climate conditions.

by Kerim Aydin, Sheila JJ Heymans



indiseas.org



**Table ES.1** Indicative assessment of key status and outlook for healthy, clean, and productive seas, plus supporting information

Healthy seas?	Status: ecosystem characteristics	5-10 year outlook	Information availability and quality	Read more in Section
Seabed habitats				3.2
Water column habitats				3.3
Marine invertebrates				3.4
Marine fish				3.5
Turtles				3.6
Seabirds and waterbirds				3.7
Marine mammals				3.8
Ecosystem processes and functions				3.9, 3.10
Clean and undisturbed seas?	Status: pressure	5-10 year outlook	Information availability and quality	Read more in Section
Physical disturbance of seafloor				4.2
Extraction of fish and shellfish				4.3
Non-indigenous species				4.4
Eutrophication				4.5
Contamination				4.6
Marine litter				4.7
Underwater noise and other forms of energy input				4.8
Climate change				4.9
Productive seas?	Direct dependency on healthy seas	Activity 5-10 year outlook	Information availability and quality	Read more in Section
Land-based activities	X	-		5.2
Extraction of living resources	✓	⚡		5.3
Production of living resources	✓	⚡		5.4
Extraction of non-living resources and disposal of waste	X	⚡		5.5
Transport and shipbuilding	X	⚡		5.6
Tourism and recreation	✓	⚡		5.7
Man-made structures	X	⚡		5.8
Energy production	X	⚡		5.9, 5.10
Research and survey	X	⚡		5.11
Military	X	⚡		5.12

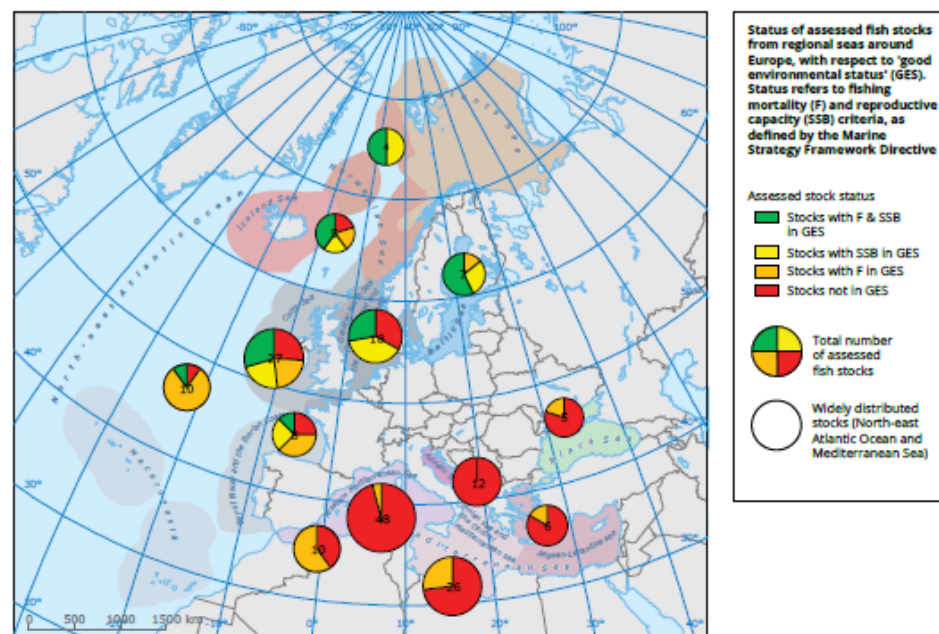
**Legend: Indicative assessment of:**

Status and trends of ecosystem and pressures	Information availability and quality
Status not good/deteriorating trends dominate	Limited information
Status or trends show mixed picture	Sufficient information
Status good/improving trends dominate	Good information

Note The indicative assessment builds on the information analysed in the relevant sections and expert judgement. The sources of information include EU reporting obligations, EEA indicators, EU and regional reports, and peer-reviewed papers.

Note The indicative assessment builds on the availability and quality of the information to make comparable and coherent evaluations at EU level and between regional seas.

**Figure 3.6** Proportion of assessed fish stocks in 'good environmental status'



Source: EEA, 2015b.

Status of Europe's Seas (2015)

<https://www.eea.europa.eu/publications/state-of-europes-seas>

# What is the goal of the EHRC?

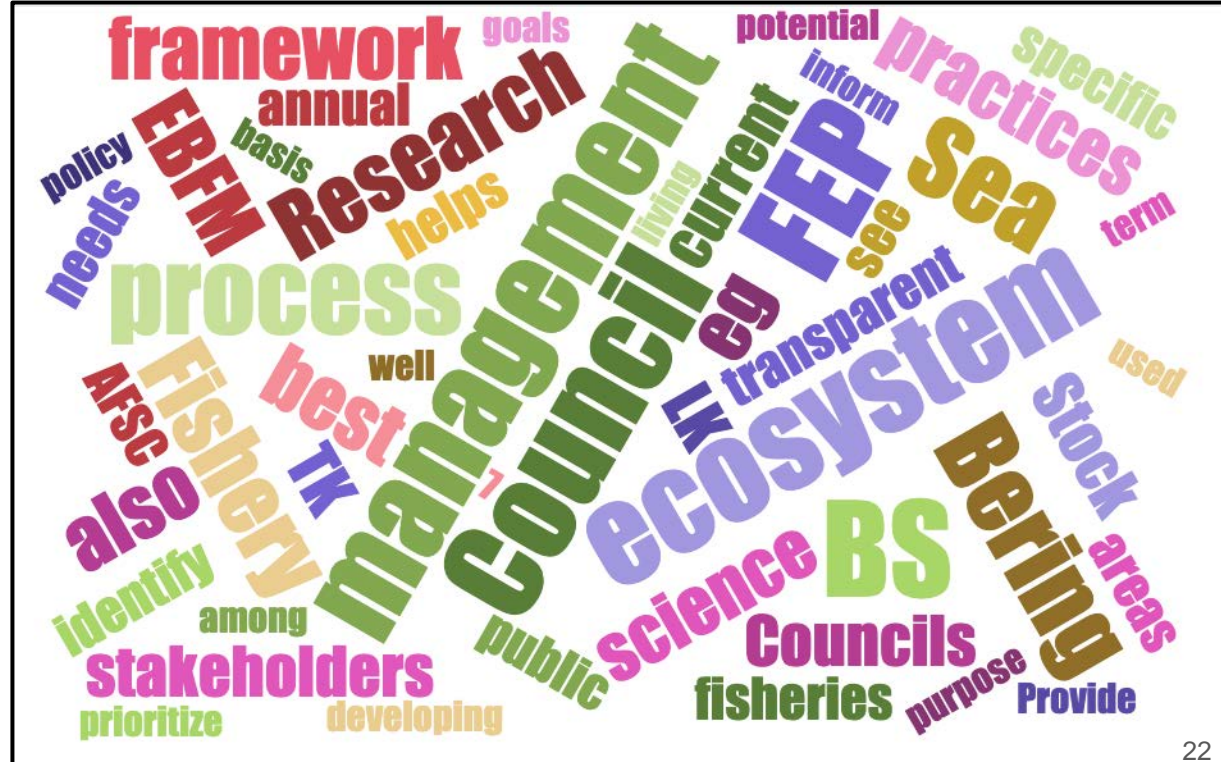
Ebett

ACTIVITY: Create a 'mission statement' for the EHRC.

Round-robin building of a statement. Each member will add ONE word. We will do 3 rounds to gather important themes. Each statement should include:

- (1) WHAT the goal is
- (2) HOW we will accomplish it
- (3) WHY we are doing it

Word cloud from the "Purpose of the Bering Sea FEP"



# Timeline

Some milestones:

- June 2021 - report to Council, Ecosystem Committee, SSC
  - Need to report/get feedback on framework, timeline
- September 2021 - feedback from Groundfish PT?
  - *Also schedule opportunities for Crab PT? SSPT? Taskforces?*
- March 2022 - FEP Team meeting, finalize first iteration of report
- April 2022 - share report with Council, Ecosystem Committee, SSC



# Breakout groups

How divide into groups?

- Idea: 5 groups based on the Council's Ecosystem Goal objective groupings
- Designate an FEP team lead(s) for each group

Tasks:

- What indicators do we have already? (Table 2-1 from the FEP, 2019/20 ESRs)
- Do those get at what we want/need? What would be the ideal indicators?
- What will it take to put together a first cut at this?
  - Timeline
  - Additional partners needed?

Goal: report back to FEP Team at May 24-25 meeting with ongoing progress and a firm plan to complete; any clarifications, adjustments, obstacles



# Breakout groups if by ecosystem goals

1. Fish stocks, food web structure and function
2. Ecological processes, trophic levels, diversity
3. Habitat, seabirds/mammals
4. Fisheries (subsistence, commercial, recreational) and non-consumptive uses
- 5/6. Avoid long-term adverse effects/legacy of healthy ecosystems (ecosystem tipping points, non-fishery activity impacts, climate change)