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2023 Annual Deployment Plan (ADP)

Council Motion - June, 2022

The Council supports maintaining the stratification and allocation strategy from the 2022 ADP in 2023.

The Council also supports:

1. Additional fixed gear EM vessels (30% coverage) in the EM pool in 2023 (up to 200 total vessels) provided they opt-in prior to November 1, 2022, additional funding for EM equipment is secured, and they meet the criteria in the ADP; and

2. Continuation of the pelagic trawl EM project with 100% at-sea monitoring in addition to shoreside observer coverage.

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2023 ADP (carries forward all elements of 2022 ADP)

Observer Trip-Selection Pools

- Three observer coverage strata defined by gear (hook-and-line, pot, and trawl)
- Allocate observer deployment using a 15% hurdle plus optimization
    - Optimization based on discarded groundfish, Pacific halibut PSC, and Chinook salmon PSC

Fixed-Gear EM Pool

- Up to 170 fixed gear vessels, which maintains the size of the EM pool from 2022. Trip selection at 30% coverage
- As new additional funds become available, the number of EM boats could increase up to Council's recommendation of 30 additional vessels.
- NMFS will prioritize vessels based on: vessel size, fishing effort, minimizing data gaps, and cost efficiency
    - If a vessel operator had repeated problems with EM system reliability or video quality or has failed to comply with the requirements in their Vessel Monitoring Plan, NMFS may disapprove a Vessel Monitoring Plan and the vessel may be removed from the EM pool.

Trawl EM Pool

- Continue pelagic trawl EM EFP in 2023. EFP trips have 100% at-sea monitoring plus shoreside observer coverage (30% in GOA, 100% in BSAI).
- NMFS supports increasing the number of participants and continuing efforts to improve processor participation.

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Fixed Gear EM Opt-In/Opt-Out

- Opt-in/Opt-out period: Sept. 1st - **Nov. 1, 2022**
  - Only for new vessels requesting to opt-in to EM or existing EM vessels opting out (i.e., returning to the observer pool)
  - Vessels currently in EM and wanting to stay don't need to do anything
- Request through Observer Declare and Deploy System (ODDS) at https://odds.afsc.noaa.gov
- Questions? Contact ODDS.Help@noaa.gov

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Trawl Catcher Vessel - Full Coverage Request

- Opt-in period for placement into full coverage for trawl vessels fishing in the BSAI: **closes October 15**
- Request through Observer Declare and Deploy System (ODDS) at https://odds.afsc.noaa.gov
- Questions? Contact ODDS.Help@noaa.gov
- Electronic monitoring used for the Trawl EM EFP cannot be used in lieu of full or partial observer coverage in any non-pollock fishing activity

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2023 ADP Preliminary Budget

Partial Coverage Observer Contract - Option Yr. 3

- Began mid-August 2022
- Observer fees collected from 2021 effort: $1,484,481
- Federal funds from FY22 appropriations: $905,000
- Carried forward from Option Yr. 2: $3,538,949

Total Available Funds: **$5,928,430**

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2023 ADP Preliminary Budget

Electronic Monitoring - Pacific States

- New budget period began July 1, 2022
- Federal funds from FY22 appropriations: $1,579,769*

Community Directed Spending - Pacific States

- Federal funds from FY22 appropriations: $2,000,000
- Begins January 2023; new 5 year grant
- Install new systems on accepted opt-in vessels
- Support one-time costs for end-of-life replacement systems on existing EM pool

*Costs could have been supported by observer fee, but they were allocated too late for this acquisition

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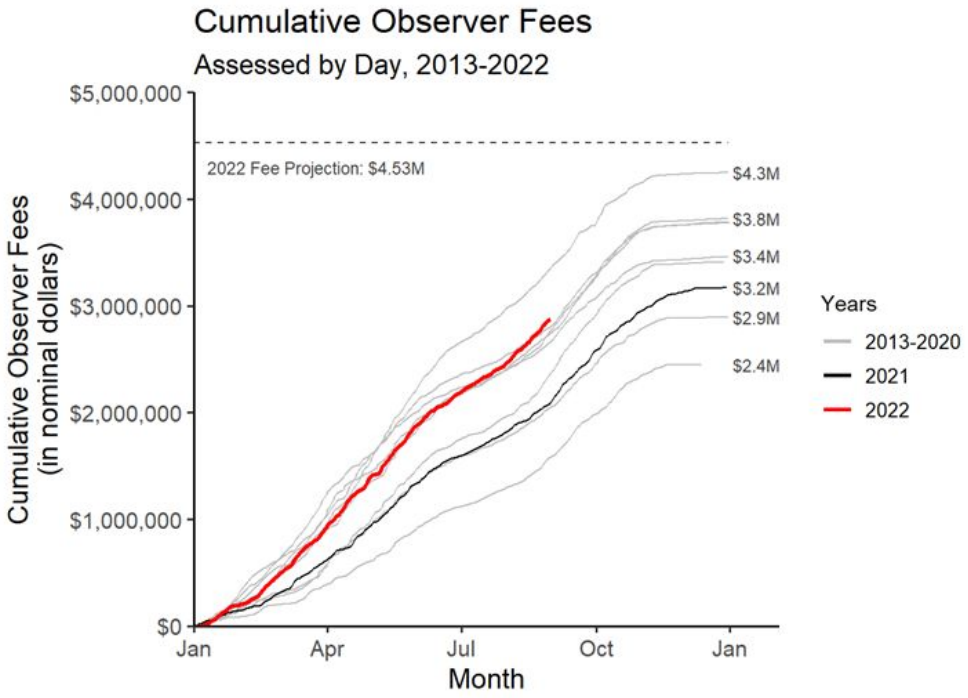
Projected Observer fees

- Preliminary observer fee projection from 2022 landings: **$4.53M**
  - Based on projections of catch for halibut, sablefish, Pacific cod, and Pollock; published standard prices; and 1.65% fee percentage.
- Observer fees assessed to-date for landings in 2022: $2,869,865 (as of 9/1/2022). This compares to $2,093,164 at the same point last year.



2022 fee projection is larger than 2021 fees because:

- Increases to both halibut IFQ allocation and halibut standard prices.
- Even though sablefish standard prices are lower for most ports, increase to sablefish IFQ allocation results in higher projected ex-vessel value and observer fees.
- Both allocations and standard prices of Pacific cod are higher in BS and GOA than 2021.
- Allocations of GOA Pollock are higher in 2022 and trawl standard prices in the Central Gulf are higher than in 2021.

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Update on Partial Coverage Cost Efficiencies and Integrated Analysis

Outline

- Purpose
- Elements of a design
- The designs being considered
- How we will compare designs

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Analytic Team - Focus

- Design a monitoring program that collects **credible**, **statistically rigorous scientific data**

- Collect the **best** and **most** data for a given budget
  - Samples are collected **randomly**
  - Quantity of data is sufficient to support CAS and Stock Assessments
  - Allocate sampling effort where it provides the most benefit

  How do we do this?
  - **Stratification** - grouping similar types of fishing effort
  - **Allocation** - deciding how much we sample each of our strata
  - Investigate changes to the monitoring program that may improve data quantity/quality

- **Design** several monitoring programs and then **compare** their performance

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What are the elements of a design?

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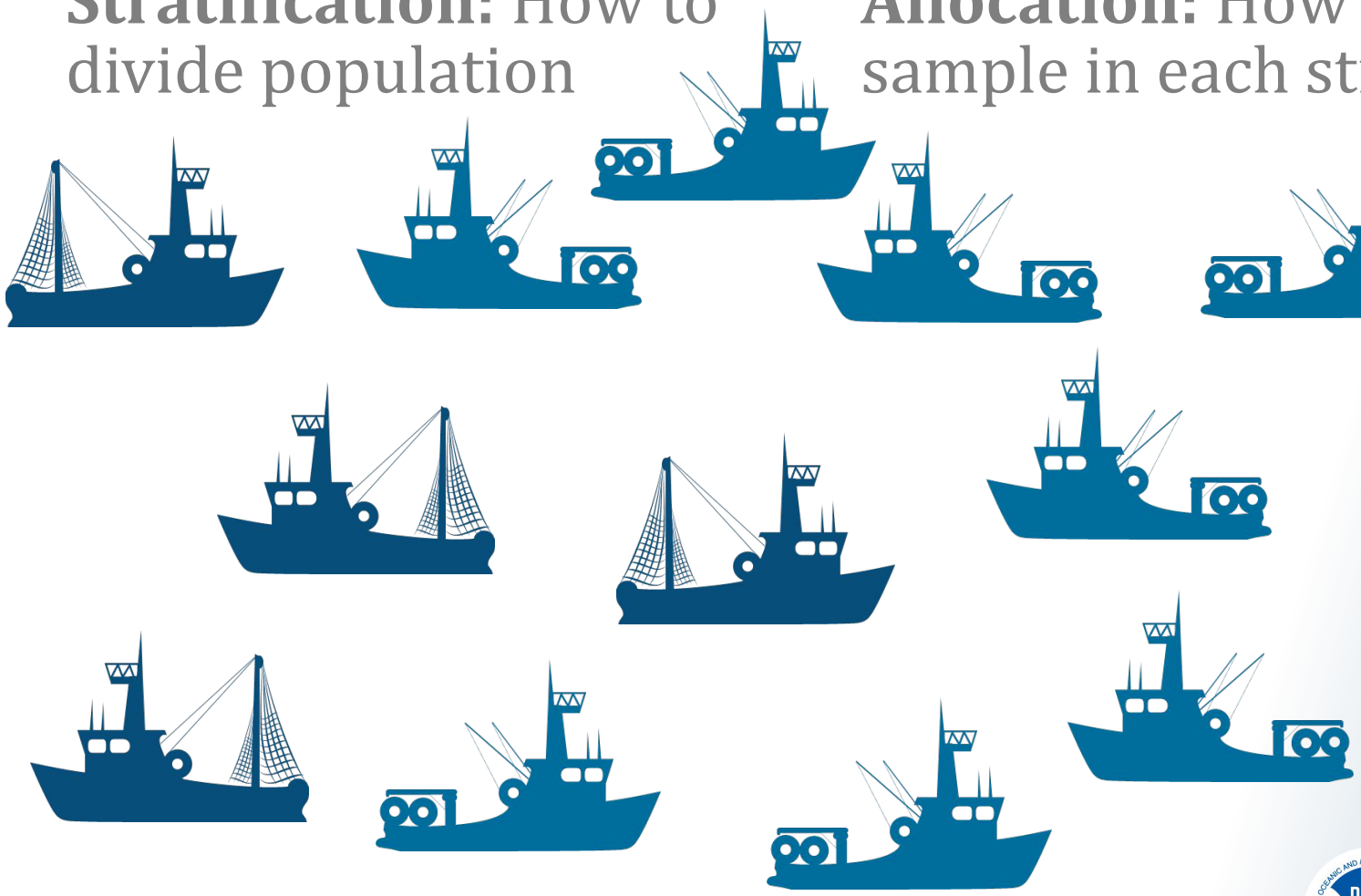
Deployment Design Elements

Stratification: How to divide population

Allocation: How much to sample in each stratum



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Deployment Design Elements

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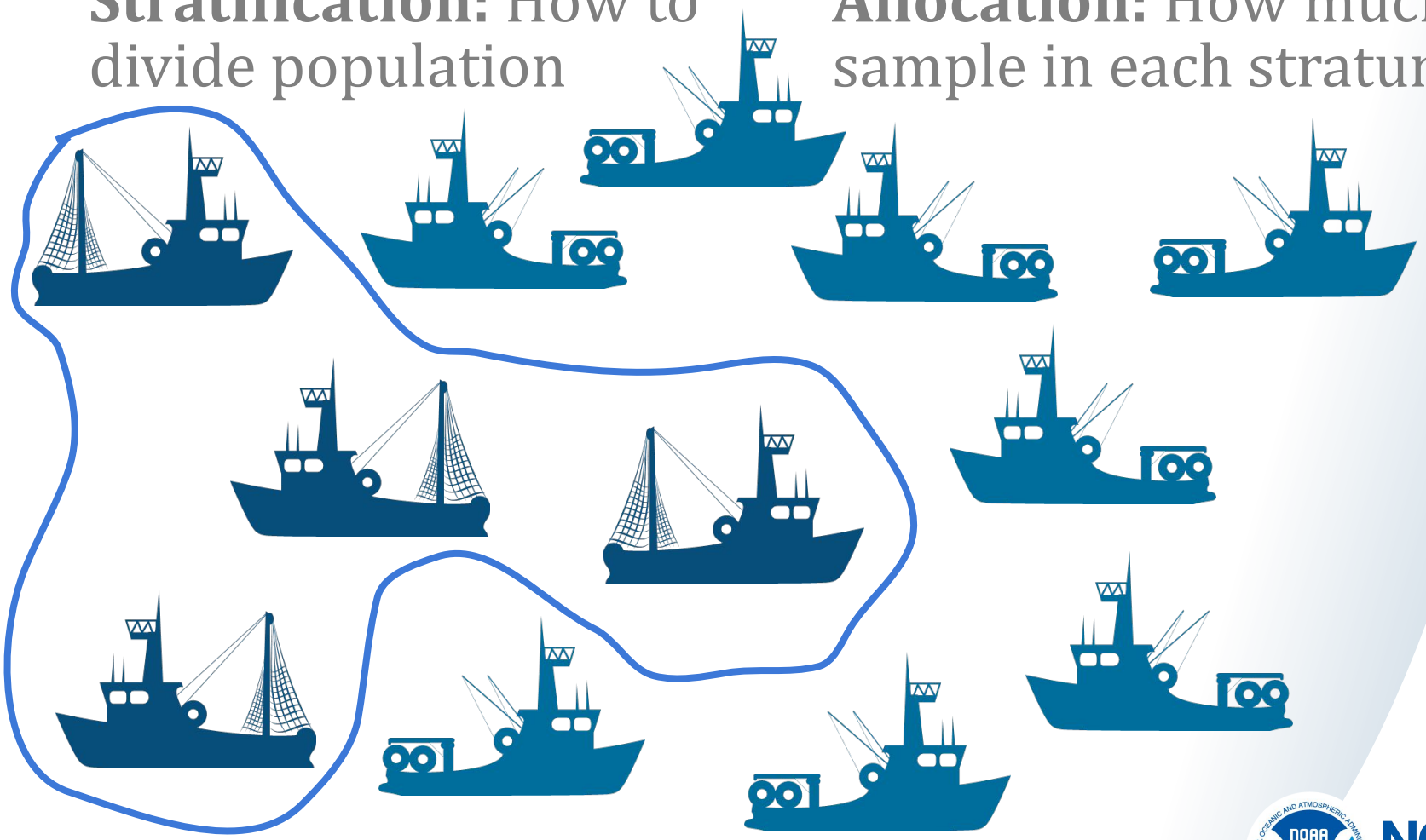

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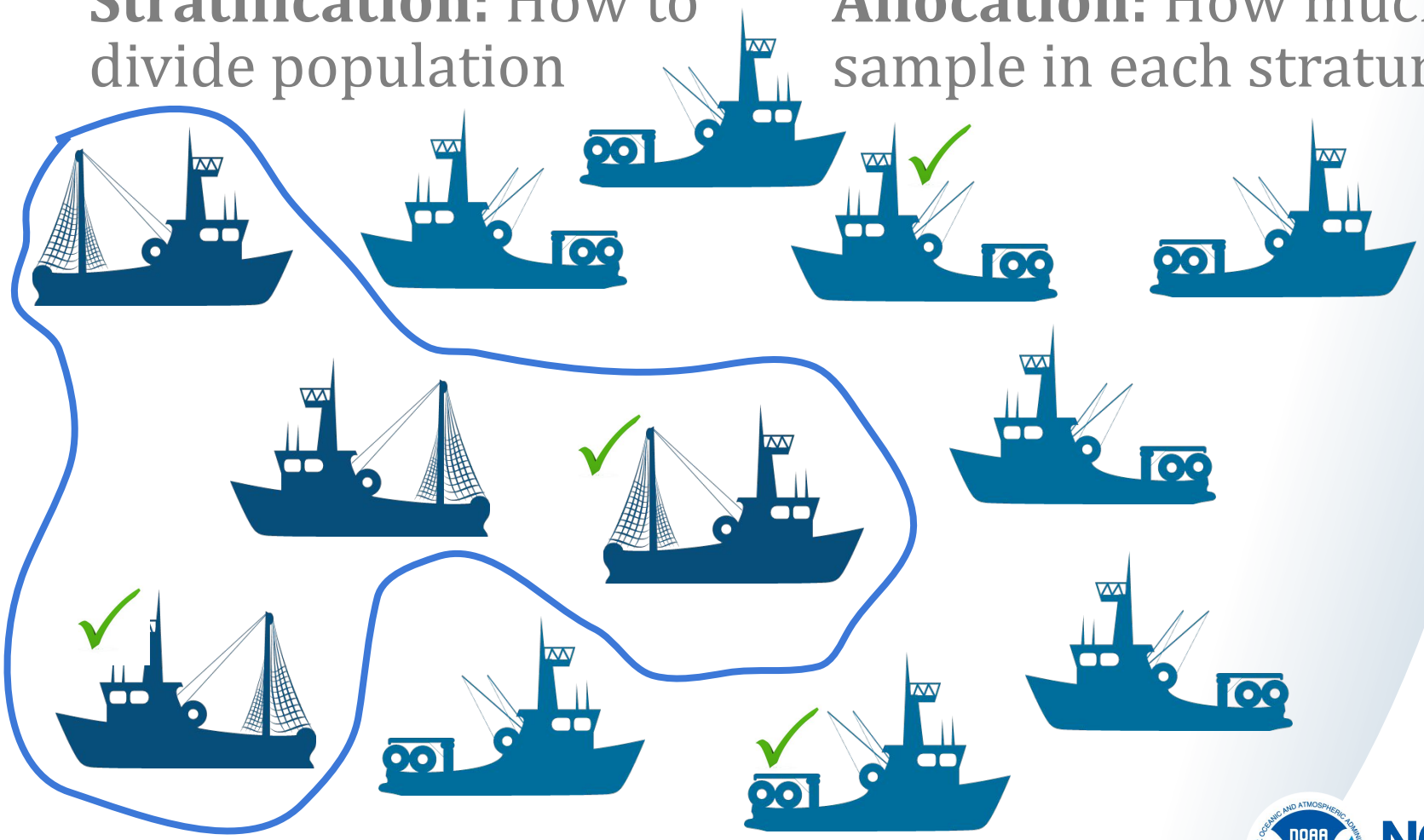
Deployment Design Elements

Stratification: How to divide population

Allocation: How much to sample in each stratum



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Stratification

Each sample unit *in only one* stratum
Stratum estimates are combined to total

Allows for different

- sample unit definition - trips, deliveries
- sample or estimation methods - trawl, EM
- sample rates - allocation

Used to

- simplify logistics
- reduce uncertainty (when strata differ relative to what is being estimated)

Often confused with post-stratification

- used to control variance in estimation

Allocation

Determines how much to sample in each stratum

Many methods

- equal number of samples
- proportional number of samples (equal rate)
- minimize parameter or estimate of interest
  - variance
  - costs
  - number subpopulations without data (minimize gaps)
  - weighted minimization of parameter (e.g., Neyman allocation minimizes variance of parameter while controlling costs)
  - chances of failing to detect an event

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Method depends on what you want to achieve

Allocation

Determines how much to sample in each stratum

Many methods

- equal number samples
- proportional number samples (same rate)
- minimize parameter or estimate of interest
  - variance
  - costs
  - ***number subpopulations without data (minimize gaps)***
  - ***weighted minimization of parameter (e.g., Neyman allocation minimizes variance of parameter while controlling costs)***
  - chances of failing to detect an event

Method depends on what you want to achieve

What are the proposed designs?

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Proposed designs: overview

- ***Equal rates design*:** Selection rates are equal for all strata, including EM.
- ***Status quo design*:** Selection rates are set according to methods most recently described in the 2022 ADP.
- ***The SEA Design*:** Selection rates are such that each stratum has the same minimum % of trips that occur within domains that are likely to have monitoring.
- ***Cost-Weighted Boxes Design*:** Selection rates are such that each stratum has the same # of domains that are likely to have monitoring, while accounting for the unique costs of monitoring each domain.
- ***Shoreside Fixed-Gear EM Design*:** This design uses status quo stratification, and all fixed-gear EM trips are monitored for compliance with maximum retention requirements so that a subset of those trips can be randomly selected to have fish lengths, weights, and biological specimens collected by shoreside observers.
- ***Paired EM with At-sea Observers Design*:** This design uses status quo stratification, except that a subset of fixed-gear EM trips are also sampled by observers at-sea (excluding those vessels unable to accomodate an observer). These observers have sampling duties focused on length-weight, tissue, bird, and marine mammal data collections.

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Proposed designs: rationale

	Rationale
Equal rates	It has been shown in past ADPs that an equal rates design reduces data gaps in time and space when compared to the status quo.
Status quo	By allocating more monitoring to strata that 1) have more variable PSC and discards and/or 2) are less expensive to monitor, precision is increased for a given budget.

Proposed designs: rationale

	Rationale
SEA	The original baseline coverage rate (15%) was the one rate that reduced large gaps in coverage across all strata. This design refines that approach by finding baseline coverage rates for *each stratum* that reduce large gaps in coverage. By being more targeted in reducing gaps, this design may free up samples for other program objectives.
Cost-Weighted Boxes	Like the SEA design, this design seeks to reduce large data gaps in a more targeted way than setting one baseline coverage rate across all strata. Rather than tying baseline coverage rates to the % of trips that occur in domains with a given chance of monitoring, this design counts the domains themselves, thereby weighting domains with few trips equal to those with many trips. This is in recognition that the importance of a fishery isn't necessarily tied to how many trips occur in that fishery.

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Proposed designs: rationale

	Rationale
Shoreside Fixed-Gear EM	Because EM does not collect the full suite of data, expansion of the current fixed-gear EM pool would create data gaps. This design aims to avoid those gaps and use the best tool for the job: many vessels find EM less burdensome than observers for collecting count data, and biological data might be more easily collected shoreside.
Paired EM with At-sea Observers	Like the Shoreside Fixed-Gear EM Design, this design aims to avoid the data gaps that would occur with the expansion of the fixed-gear EM fleet. Rather than utilizing shoreside data collection, this design seeks to achieve that objective by monitoring a subset of fixed-gear EM trips with at-sea observers.

Proposed designs: priorities*

	Support trawl EM	Integrate fixed-gear EM with observers	Re-evaluate zero coverage
Equal rates	🟩	🟨	🟩
Status quo	🟩	⬛	🟩
SEA	🟩	🟨	🟩
Cost-Weighted Boxes	🟩	🟨	🟩
Shoreside Fixed-Gear EM	🟩	🟩	🟩
Paired EM with At-sea Observers	🟩	🟩	🟩

* Cost will be evaluated for all designs and cost efficiency ideas will be discussed in later slides.

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How will we evaluate designs?

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Design Evaluation

- Not easy - we are still working on this.
- Want to avoid doing more harm than good.
- When we don't know what the break-even point is, we are making uninformed decisions.

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Design Evaluation

What's been tried before?

Draft ADPs compare designs

18 comparisons were based on space and time coverage
1 comparison was based on precision

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Design Evaluation

What works and what doesn't

Setting a value for a metric is troublesome (Amendment 16).

What design is *best* is specific to the individual and what they value.

Not a single number.

We won't decide the final design.

We will steer away from designs that have worse outcomes than the current monitoring program.

We will provide a matrix of outcomes to avoid making uninformed decisions.

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Design Evaluation

Table format

	Design 1	Design 2	Design 3	…
Metric 1				
Metric 2				
…				

Design Evaluation Ideas

Concern	Metric	Rationale / **Concern**
Cost	Average cost per primary sample unit	Want to be efficient.
Precision	Variance	Used in optimal allocation/**Variance of what?**
Detection	Probability of detecting a rare event	Rare events, such as whale entanglements, may be of concern; hence want a sample rate that has a minimal chance of detecting important events.
Representativeness of deployments (space and time)	% of trips that occur in a time-area with a > 50% chance of containing one or more monitored trips	Assess whether distribution of samples matches distribution of fishing effort
	Ripley's K or similar spatial statistic	Are monitored trips distributed as expected given fishing?
Representativeness of harvester characteristics	Previously used permutation tests; subject to re-evaluation	Same size of vessels, same catch per trip, etc over all strata relative to total harvest

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Design Evaluation Ideas

Concern	Metric	Rationale / **Concern**
Stock assessment	Proportion of trips and tonnage sampled	Opportunity to collect biological data - speaks to presence/absence and magnitude
Management	Median and mean times between trip landing and data availability	EM data for catch accounting purposes typically takes ~30 days, observers usually just a few days. Some non-PSC species have been placed on prohibs list. / **calculate for what groups? Gear, fisheries?**
	Proportion of CAS estimates that rely on pooled-post-strata	Indicates whether in-season estimates are based on post-strata specific data or data pooled across post-strata / **varies by species**

Design Evaluation Ideas

Concern	Metric	Rationale / **Concern**
Isolation	TBD	Erodes the impartiality of monitors.
Scalable	Qualitative TBD - do programs break at low budgets or have strange behaviors at high budgets?	We don't want to build a program that will fail at large sizes / **(or at low sizes??)**
Equitability	How much *monitoring* and *sampling* do participants have? (Gini index)	Don't want to burden only a few fishermen

Cost Efficiency Ideas Outside Deployment Design

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Other Cost Efficiency Ideas - outside deployment design

- Program elements that provide flexibility to fishery participants but increase cost
- EM Improvements - might also bring some cost efficiency
- Modify biological data collection
- Observer procurement & duties

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Flexibility for fishery participants

No further evaluation planned

Description	Potential cost efficiency	Requires regulations change?	Status
Require vessels to pick up observers in particular ports	Potential cost savings by reducing the number of ports from which observers can deploy.	Yes - would need to be a regulation requiring vessels to pick up observers in, and return them to, one of the ports listed in the ADP.	In March 2022 -- PCFMAC did not support continued evaluation. NMFS not planning to evaluate further.
Instead of selecting one trip at a time for coverage, select multiple trips.	Potentially reduce travel costs for partial coverage observers.	No changes to regulations needed.	In March 2022 -- PCFMAC raised concerns about negative impacts for industry and the potential to introduce bias. NMFS not planning to evaluate further.
Extending the length of the notice for deploying at-sea observers	Potential cost savings by requiring vessels to log fishing trips in ODDS further in advance from their departure date. The 72 hour window is expensive, as it gives both the agency and the observer provider a relatively short advance warning.	Yes - regulations specify the requirement for vessels to register an anticipated trip in ODDS a minimum of 72 hours prior to embarking on each fishing trip.	In Sept 2021, PCMFAC noted the logistical challenges of this idea and did not support it. NMFS not planning to evaluate further.

EM Improvement Projects

Ongoing work and/or evaluation planned

Description	Potential cost efficiency	Requires regulations change?	Status
EM monitoring in plants	Evaluate the potential cost savings of monitoring fisheries offloads using machine vision and artificial intelligence	Maybe. Might be able to include this as part of CMCPs	Several projects in progress.
Utilize trawl EM equipment on vessels that also fish fixed gear	Vessels in the trawl EM program that already have EM equipment could also use that EM equipment to collect data in fixed-gear fisheries.	No changes to regulations needed. This could be implemented through changes to VMPs and definitions of EM selection pools in the ADP.	Ongoing project: Aleutians East Borough funded through NFWF. Will test EM configurations on vessels that fish using multiple gear types and evaluate catch handling and EM data review protocols for pot vessels
Change catch handling on pot boats to focus data collection on discards only	Reduce video review time and reduce catch handling burden for boats	No changes to regulations needed. This could be implemented through changes to VMP	
Evaluating more cost-effective and mobile EM systems	Development and testing of lower cost EM hardware that could be moved between vessels, which could increase the cost effectiveness of the fixed-gear EM program	No changes to regulations needed.	Ongoing project NPFA and ALFA. Funded through NFWF

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EM Improvement Projects

Ongoing work and/or evaluation planned

Description	Potential cost efficiency	Requires regulations change?	Status
Reduce time delay for EM data	Evaluate cost to get fixed-gear EM data in a timely fashion that is useful for inseason management. Could better leverage EM & reduce data gaps	No changes to regulations needed.	Further evaluation planned
Eligibility to be in the EM pool	Evaluate ways to optimize the fixed gear EM program for cost efficiencies by modifying ongoing eligibility for the fixed-gear EM program to ensure EM equipment is used cost effectively (for example, not installed on vessels not fishing or taking very few trips). Currently once NMFS approves vessel in the EM pool there isn't a mechanism to remove them.	Yes - would require change in regulations. While vessels can be removed for not following their VMP, they can't be removed for being cost inefficient	NMFS could consider as a longer term improvement which is more consistent with Trawl EM.
Require fixed gear EM vessels to run EM system on all trips & post-select trips to be submitted to NMFS	Could better enable space-based strata by determining which strata the boat was in based on what they did on the trip, rather than what they think they are going to do. This approach would eliminate any monitoring effect.	No changes to regulations needed. Vessels could be told in ODDS in advance to run their cameras on all trips, and then be told to mail hard drives only for trips that were selected.	Proposed by NMFS but not supported by PCFMAC nor Council. NMFS would consider if annual report analysis shows evidence of monitoring effect and after evaluating catch handling protocols on pot vessels.

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Modify biological data collection

Some further evaluation planned

Description	Potential cost efficiency	Requires regulations change?	Status
Using survey data for average weights and biological data	Potential method to reduce impact from loss of biological data from EM.	No	NMFS will evaluate -- need stock assessment author(s) assignment
Opportunistically deploy idle observers for focused collection of biological data	No cost efficiencies, but may provide more data for stock assessments.	No	NMFS not planning to evaluate. Opportunistic deployments do not result in the best data. Predicting where and when observers will be 'idle' is challenging and cost of at-sea observer data are more expensive than “idle” days.
Specify differing observer sampling protocols regionally or temporally based on data needs	No cost efficiencies, but may provide more data for stock assessments.	No	NMFS not planning to evaluate. We achieve the highest quality data from standardized sampling protocols and it is most efficient to have observers that with skills that interchangeable. It is inefficient to have specialized observers and this could result in extra costs to get the “right” type of observer to a port.

Observer procurement & duties

Some further evaluation planned

Description	Potential cost efficiency	Requires regulations change?	Status
Voucher Program to procure observers	Allow vessels in partial coverage, once selected in ODDS, to procure observer through current observer companies and then to be reimbursed by NMFS at the end of the season from the observer fees collected.	Yes	In 2017, the OAC reviewed a discussion paper (see section 3.5). No further work planned at this time.
Hire observers (as federal employees and/or contractors) that would live in Alaska ports	Could reduce travel expenses if observers live in communities where fishing occurs	Maybe - needs to be evaluated.	NMFS plans to evaluate with economist assistance
Have observers review EM video	Partial coverage observers could potentially review EM video during “down time” when they are in port.	No	NMFS plans to evaluate with economist assistance

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