Fish Committee
Fish & Wildlife Commission Meeting
Willapa Bay Salmon Management Policy Update

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Cle Elum, WA

Marlene Wagner, Toby Harbison, Jan Ohlberger, & Ken Warheit

Washington Department of FISH and WILDLIFE

Presentation Overview

Willapa Bay Salmon Management Policy Review

- Revised policy direction
- Review of 2024 season

Management Strategy Evaluation (MSE) Process & Update

- IPM and MSE models (tool development)
- Performance metrics
- Public input survey and meeting approach

Hatchery Management Plan (HMP) Development Update

- Technical Procedures Document (TPD)

Willapa Bay Salmon Management Policy Review

Willapa Bay Salmon Management Policy

Revised policy implemented in September 2023

- Replaced initial policy adopted in 2014

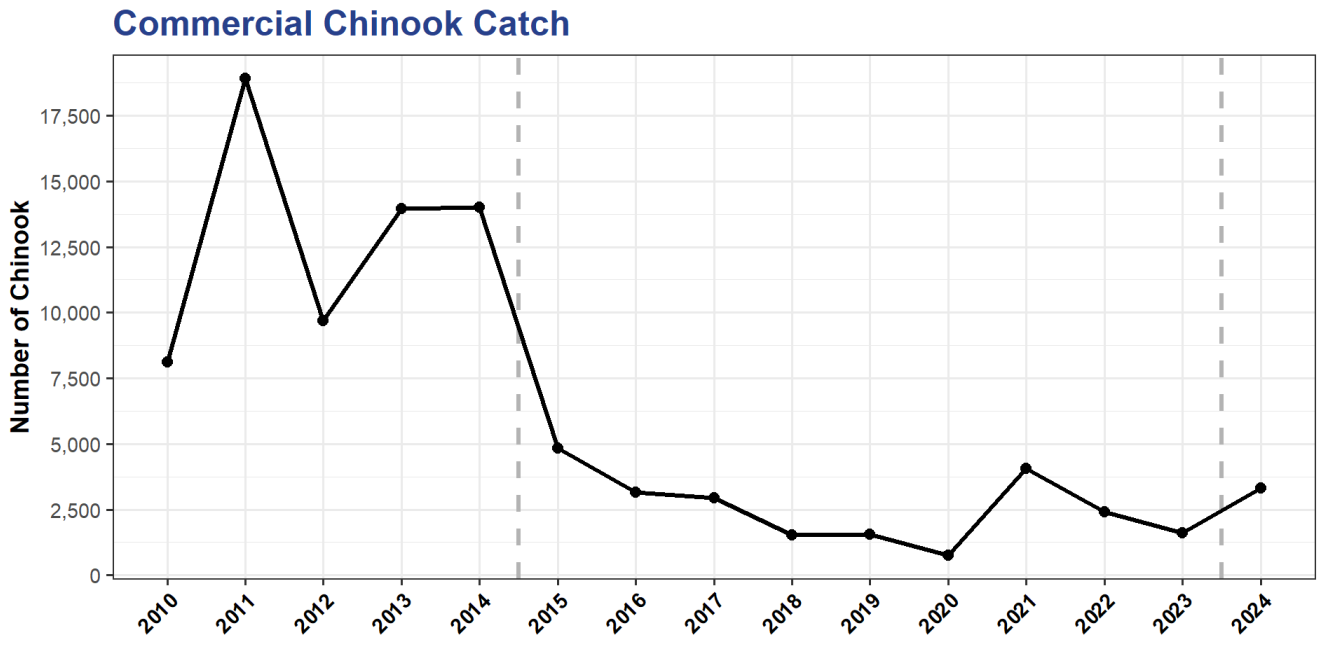
Major revisions

- Modified time and area restrictions for commercial fisheries
- Develop new harvest control rules using Management Strategy Evaluations (MSEs) for all species of salmon in the bay
- Hatchery production levels removed, and Hatchery Management Plan (HMPs) developed for each program under Commissioner Policy C-3624

2024 Willapa Bay Commercial Fisheries

Chinook Policy Objectives:

- Natural-origin escapement goal: 4,353
- Mark-selective fishery
- General priority for recreational fisheries but provide meaningful fishing opportunity for both recreational and commercial fisheries
- Natural-origin impact rate not to exceed 20% in Willapa and Naselle Rivers
  - ➢ Preseason modeled impact rates:
    - Willapa River (13.7%)
    - Naselle River (18.0%)

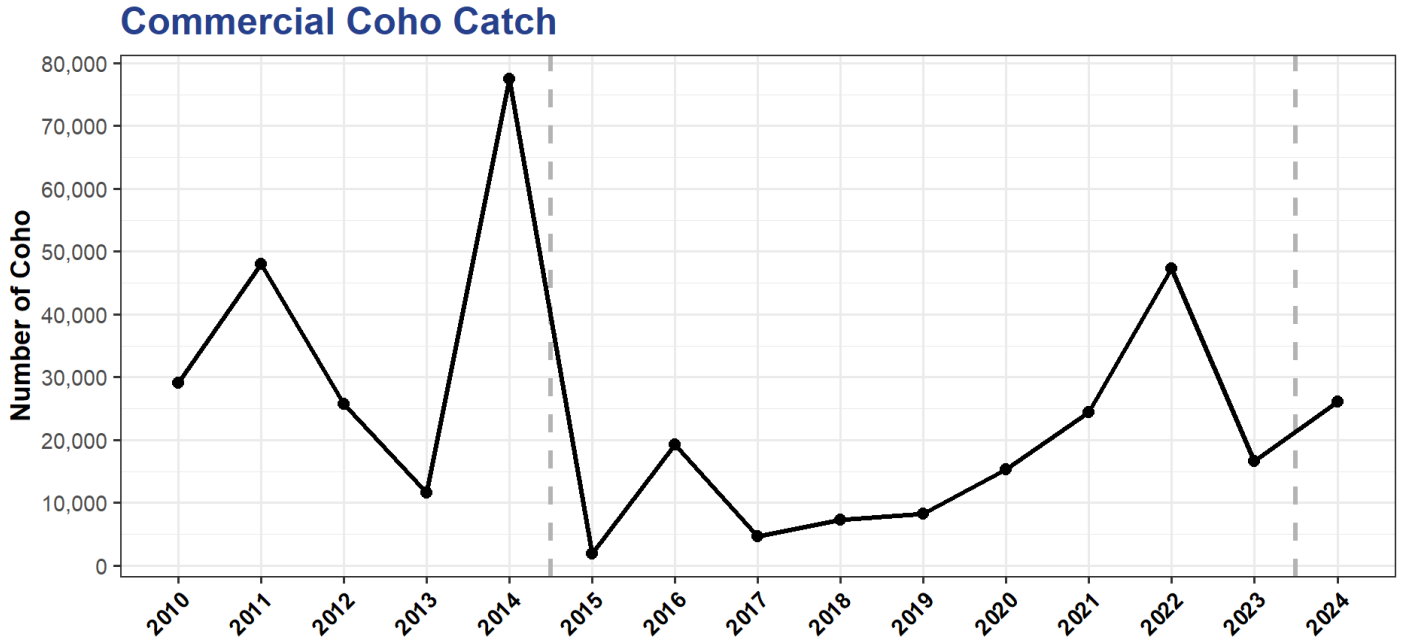


Preseason expected commercial catch: 4,201
Final commercial catch: 3,321 (79% of preseason expectations)

2024 Willapa Bay Commercial Fisheries

Coho Policy Objectives:

- Manage to an aggregate natural-origin escapement goal of 13,600
- General priority for commercial fisheries but provide meaningful fishing opportunity for both recreational and commercial fisheries
- Impact rate not to exceed 10% of natural-origin fish if forecast is less than the escapement goal or escapement goal has not been met in 3 of the last 5 years

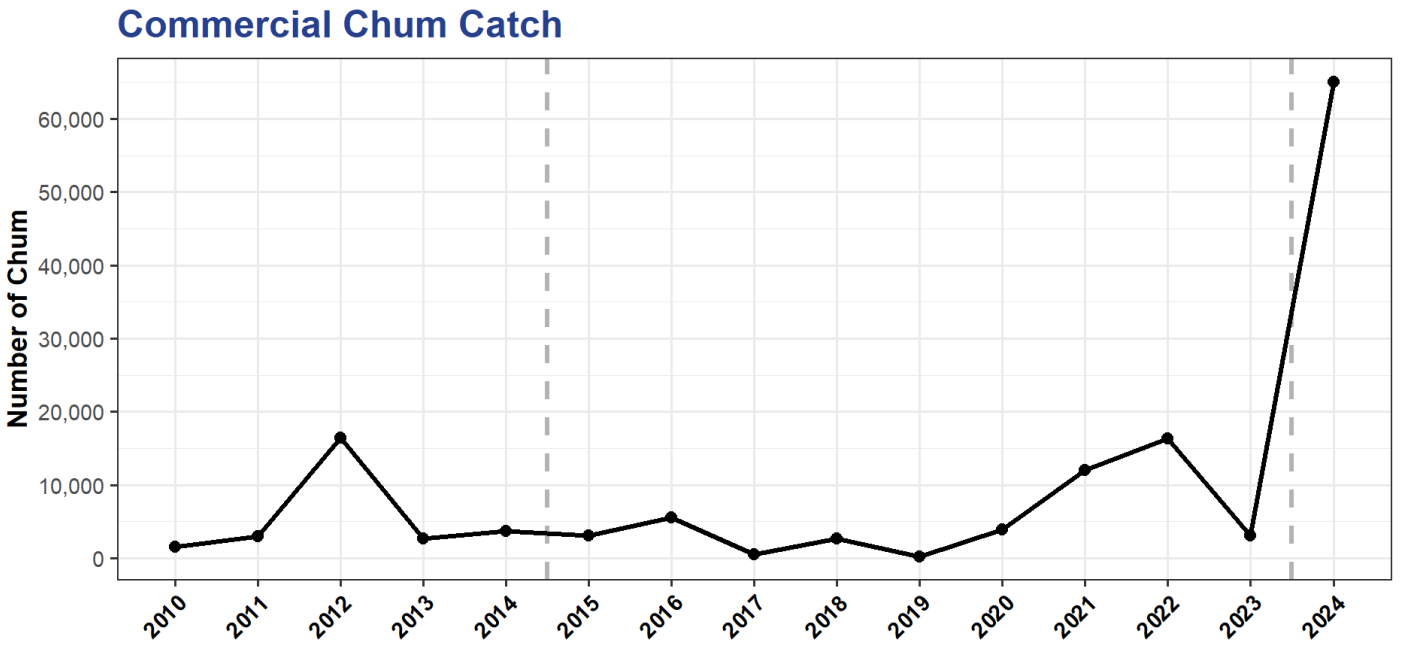


Preseason expected commercial catch: 31,128
Final commercial catch: 26,242 (84% of preseason expectations)

2024 Willapa Bay Commercial Fisheries

Chum Policy Objectives:

- Manage to aggregate escapement goal of 35,400
- General priority for commercial fisheries but provide meaningful fishing opportunity for both recreational and commercial fisheries
- Total impact rate not to exceed 10% of fish if forecast is less than the escapement goal or escapement goal has not met in 3 of the last 5 years

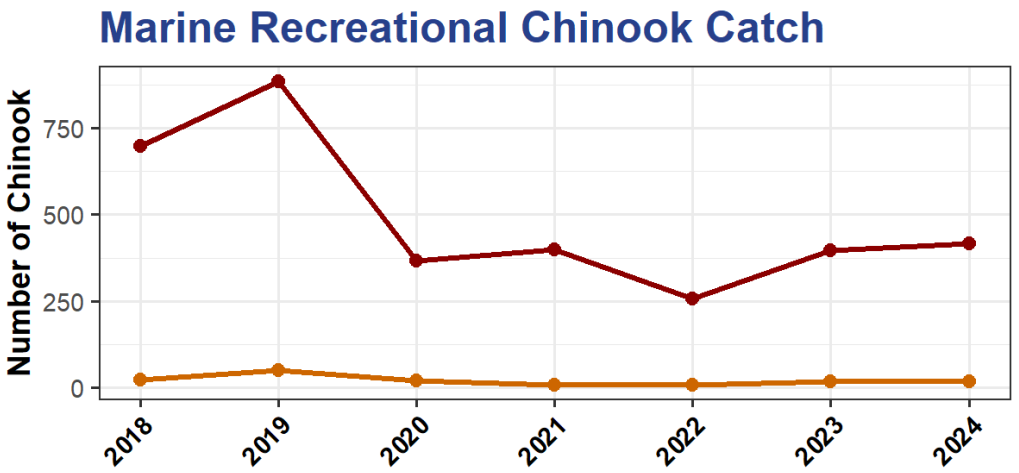


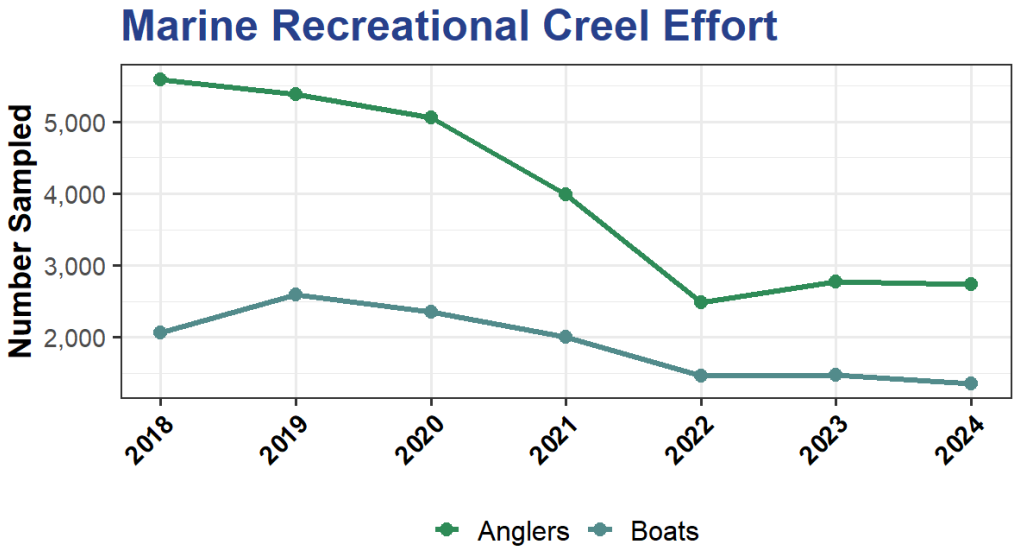
Preseason expected commercial catch: 31,933

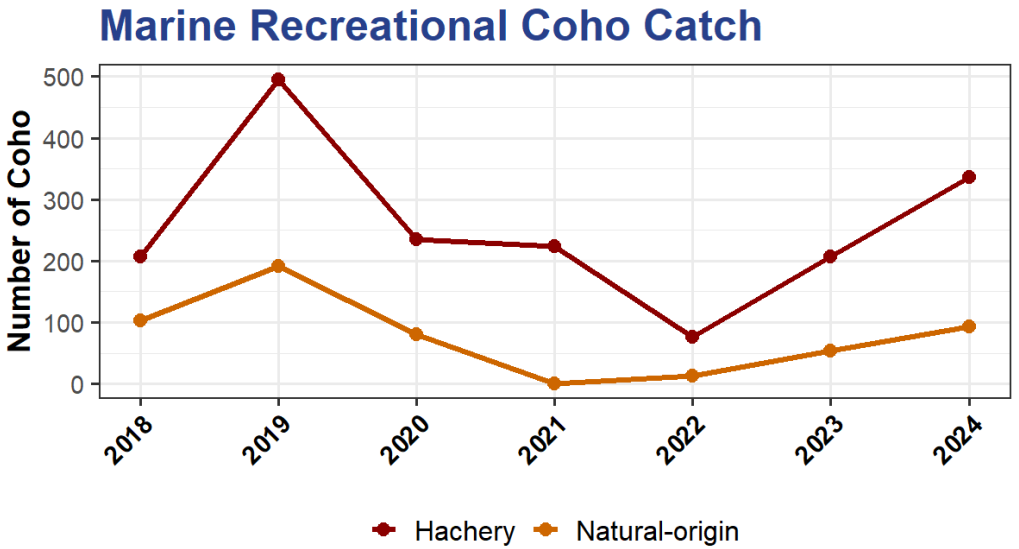
Final commercial catch: 65,057 (204% of preseason expectations)

2024 Willapa Bay Marine Recreational Fisheries

- Policy guidance to provide first opportunity in the northern portion of WB to mixed-stock recreational fishery
- Creel protocol: Sampled 4 days a week in 2 strata







Hatchery Broodstock Goals

Chinook

Facility	Program Release	Total Eggs Needed	Eggs on Hand
Naselle	5,000,000	5,500,000	5,574,000
Nemah	3,300,000	3,630,000	3,699,000
Forks Creek	400,000	440,000	714,000

Coho

Facility	Program Release	Total Eggs Needed	Eggs on Hand
Naselle	1,400,000	1,540,000	1,731,400
Nemah	No Coho program		
Forks Creek	600,000	660,000	503,800

Chum

Facility	Program Release	Total Eggs Needed	Eggs on Hand
Naselle	500,000	550,000	562,500
Nemah	1,500,000	1,650,000	2,127,500
Forks Creek	500,000	550,000	550,000

2024 Willapa Bay Preliminary Escapement Estimates

Species	Preseason Expected Natural-origin Escapement	Total In-season Estimated Escapement (to-date)	Natural-origin Escapement Goal
Chinook	2,972	TBD	4,353
Coho	16,470	~25,000	13,600
Chum	48,350	~55,000	35,400

Annual Willapa Bay Salmon Fisheries Timeline

- **Commercial Fishery:** August 2024 to November 2025
- **Recreational Marine Fishery:** August 2024 to January 2025
- **Freshwater Fishery:** August 2024 to January 2025 (varies depending on system)
- **Spawning ground surveys:**
  - Chinook: August to October 2024
  - Coho: Late December 2024 to February 2025
  - Chum: October to November 2024
- **Coded-wire tags (stock composition) and scale data (age composition):** January 2025
- **Genetics:** February 2025
- **Run Reconstruction:** Early February 2025
- **Catch Record Card data:** August 2025

Management Strategy Evaluation Process and Update

What is an MSE?

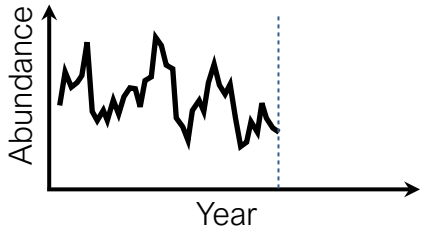
- Evaluates the relative performance of alternative harvest control rules (HCRs)
- Simulates long-term effects of HCRs (that determine total allowable fishing mortality)
- Quantifies performance of HCRs considering biological and socio-economic objectives

Given what we know about a population from our past observations → How might the future look like if we manage using a specific HCR → What does that mean for risks to populations and fishing opportunities?

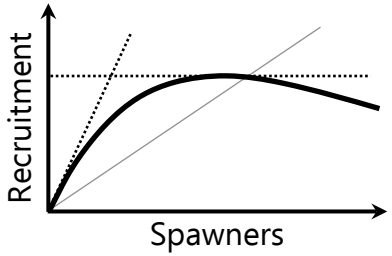
➢ **Compares alternative management strategies to evaluate their relative risks and fishing opportunities**

MSE Process

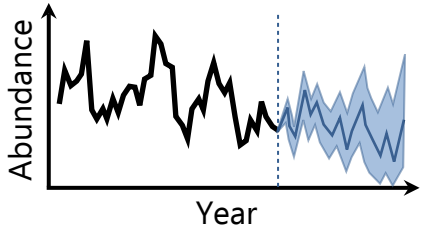
1. Collect available population data



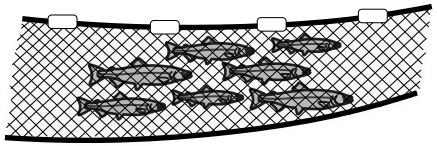
2. Build statistical model given observed data



3. Design harvest control rules (HCRs) and project population forward



4. Quantify performance and trade-offs of each HCR to inform policy and management plan



Population data

Data input

salmonIPM

R package

Parameter estimates

salmonMSE

R package

Performance metrics

Fishery Management Plan

➢ **Generic process applicable to all populations and tools to be published soon**

Data Summarization

- Spawner abundance in each year
- pHOS (percent hatchery-origin spawners)
- Age structure information from scales
- Harvest/exploitation rates
- Hatchery production/removals

Integrated Population Model

Why it is 'state-of-the-art'

- Combines run-reconstruction with stock-recruit model
- Integrates information on abundances and demography (age structure)
- Can incorporate independent prior information (Bayesian approach)
- Allows for sharing of information across populations (hierarchical model)

➢ Estimated parameters capture full uncertainty in the data

MSE Harvest Control Rules

Types of harvest control rules (HCRs)

- Escapement goal (current goal, escapement at MSY, alternative)
- Fixed harvest rate
- Escapement goal with harvest rate below or above goal
- Abundance-based harvest rate tiers (e.g., tied to biological reference points)

MSE Performance Metrics

Conservation/risk metrics

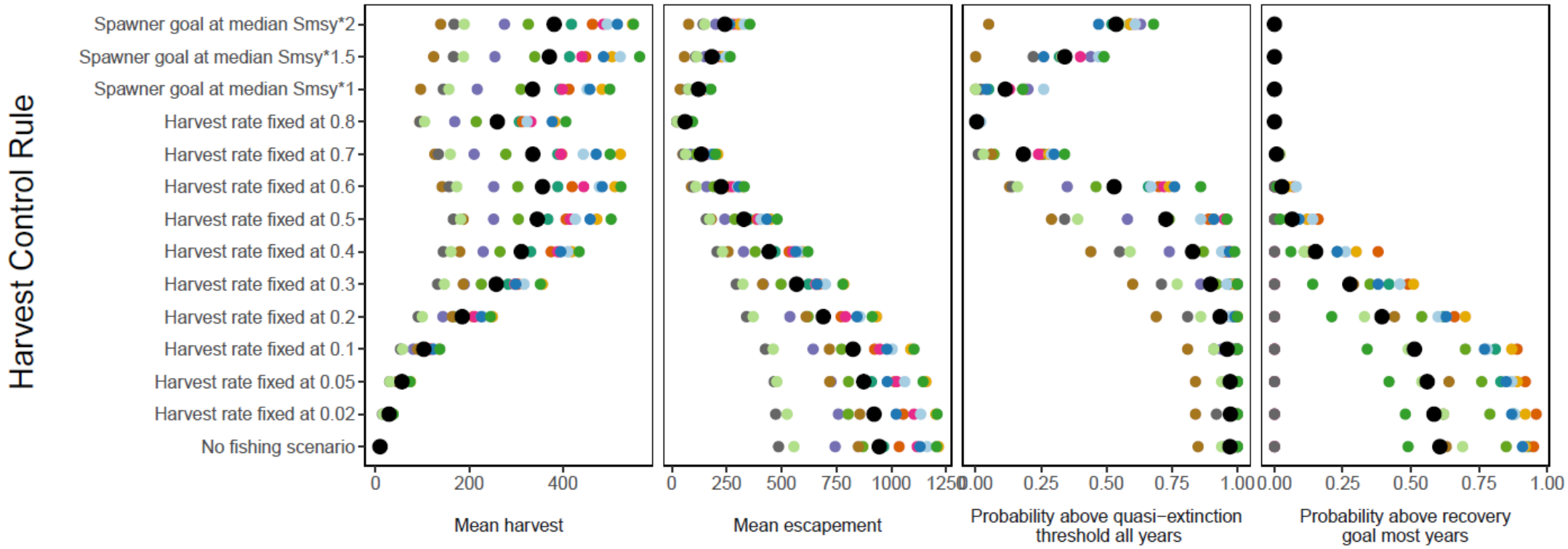
- Mean escapement
- Proportion of years with spawner abundance above conservation goals or risk thresholds (e.g., recovery goal or quasi-extinction risk)
- Proportion of years with spawner abundance above thresholds linked to reference points (e.g., spawners at MSY or at equilibrium)

Fishing opportunity metrics

- Mean harvest or catch-and-release encounters
- Stability in harvest or catch-and-release encounters
- Proportion of years with open fisheries
- Relative availability of time on the water

MSE Example

1. Project populations forward based on IPM-estimated parameters
2. Apply alternative HCRs (e.g., escapement goals and harvest rates)
3. Calculate opportunity and conservation/risk metrics for each HCR



➢ **Quantify trade-offs and select HCR that best balances opportunities and risks**

Communications & Public Input Process

- **The MSE process does not select which HCR option to implement -- that decision lies with fisheries managers, within legal bounds, informed by public input**
- **MSE results will be communicated to the public to facilitate public input in a 3-step process**
  1. Blog posts describing the MSE process and its policy application in understandable terms
  2. Public meeting(s) to present the MSE process and results and answer questions, which will be recorded and available online with the public input survey thereafter
  3. An online public input survey

Public Input Survey

- **Public input survey creates a statistically robust, transparent, and repeatable pathway to incorporate public preference into the HCR selection process**
- **The survey will answer the following questions**
  1. How does the public value measures of fishery management performance, both in terms of conservation and opportunity?
     - Measures include factors like extinction risk and availability of time on the water, etc.
  2. Related to those values, which harvest control rules do the public prefer?
  3. Do those values and preferences differ across fishery (e.g., wild steelhead anglers vs. hatchery coho anglers) and demographic groups?
- **HCRs will be presented as options associated with tradeoffs rather than naming the individual HCRs to avoid familiarity bias**
- **Survey results will be statistically evaluated to generate robust information**

Example Survey Question

Question: Rank the follow HCR options from first choice to last choice:

	Population Metrics (Scale of 1 to 10: 1=lowest performance, 10=highest performance)			Fishing Opportunity Metrics		
HCRs	Probability of reaching ESA delisting goal	Proportion of years at or above MSY	Probability of remaining above extinction threshold	Availability of time on the water	Proportion of years the fishery is open	Mean harvest and/or catch and release encounters
Option A	4	2	9	4	8	4
Option B	5	7	6	6	9	3
Option C	10	8	10	3	3	2
Option D	3	2	5	10	7	9
Option E	7	4	8	2	4	6

*These are simulated results generated as an example but are not actual output.

MSE Tool Development Schedule

Models are generally developed in a beta version

- IPM – now includes steelhead model and model for wild vs. hatchery fish
- MSE – suite of HCRs and performance metrics implemented
  - ➢ Currently applying IPM/MSE approach to Lower Columbia River as part of quantitative analyses to inform new FMEPs for all salmon and steelhead
  - ➢ Tools developed in Lower Columbia River will be used as we move to Willapa Bay

Willapa Bay MSE progress

- Currently gathering and formatting necessary data to run IPM and MSE models
- Public input process is developed and will be adapted for Willapa Bay
- Harvest Control Rules considered will be specific to Willapa Bay, depending on unique population and harvest dynamics

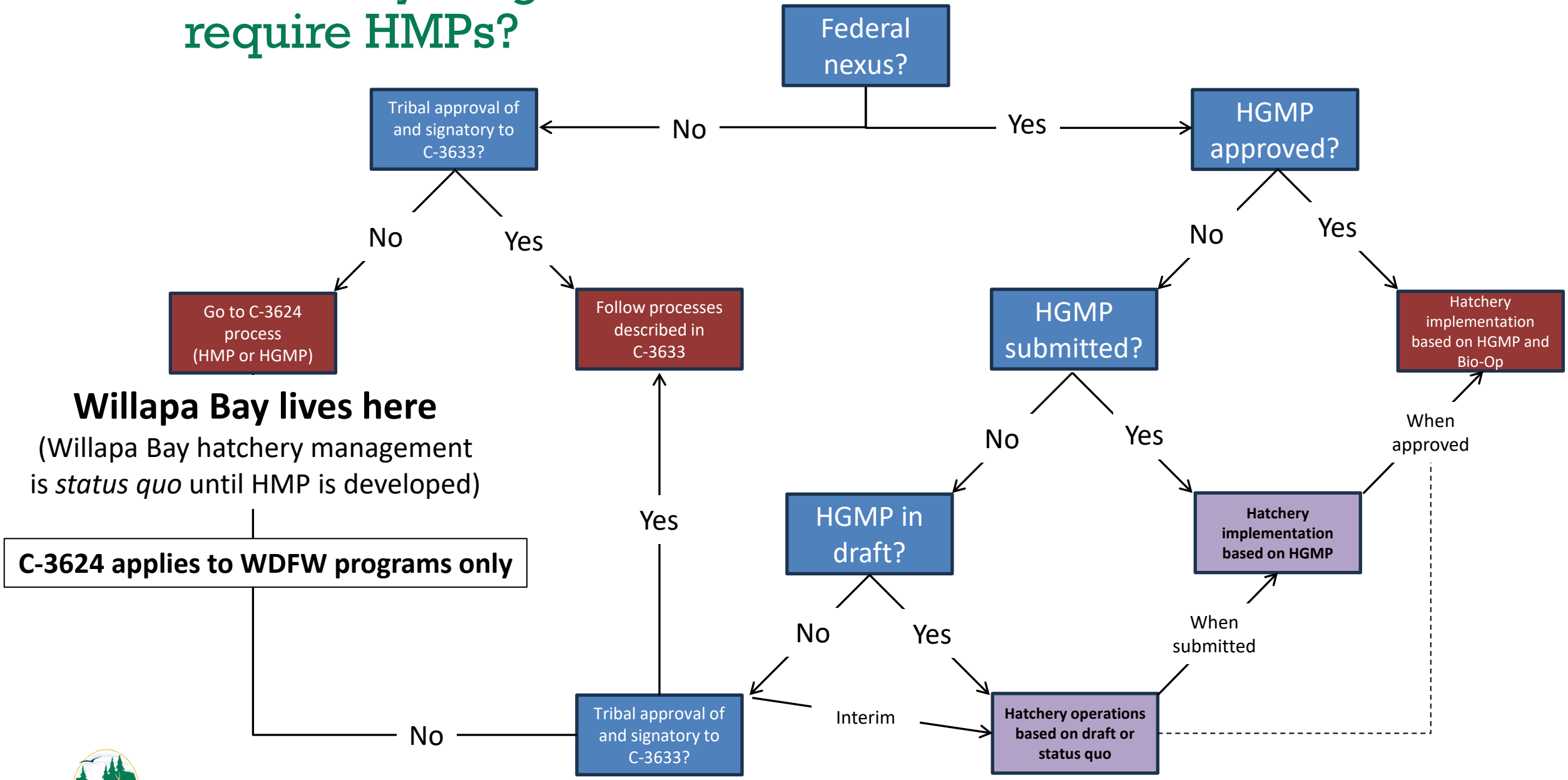
Hatchery Management Plan Update

C-3624: Anadromous Salmon and Steelhead Hatchery Policy – FWC Policy

Hatchery Management Plans (HMPs)

- HMPs developed for all anadromous salmon and steelhead hatchery programs under the authority of C-3624
- Reflect balance between minimizing genetic and ecological risks and providing for the ecological and societal (and cultural) benefits
- Balance will be achieved through a structured decision-making process.
  - Science-based risk management framework
  - Include uncertainties
  - Adaptive management through a monitoring and evaluation program
- Appendix 1 of C-3624 provides a “prototype” of the TOC for the HMPs
  - Roughly equivalent to the TOC of HGMPs
- Technical Procedures Document (TPD)

Which Hatchery Programs require HMPs?

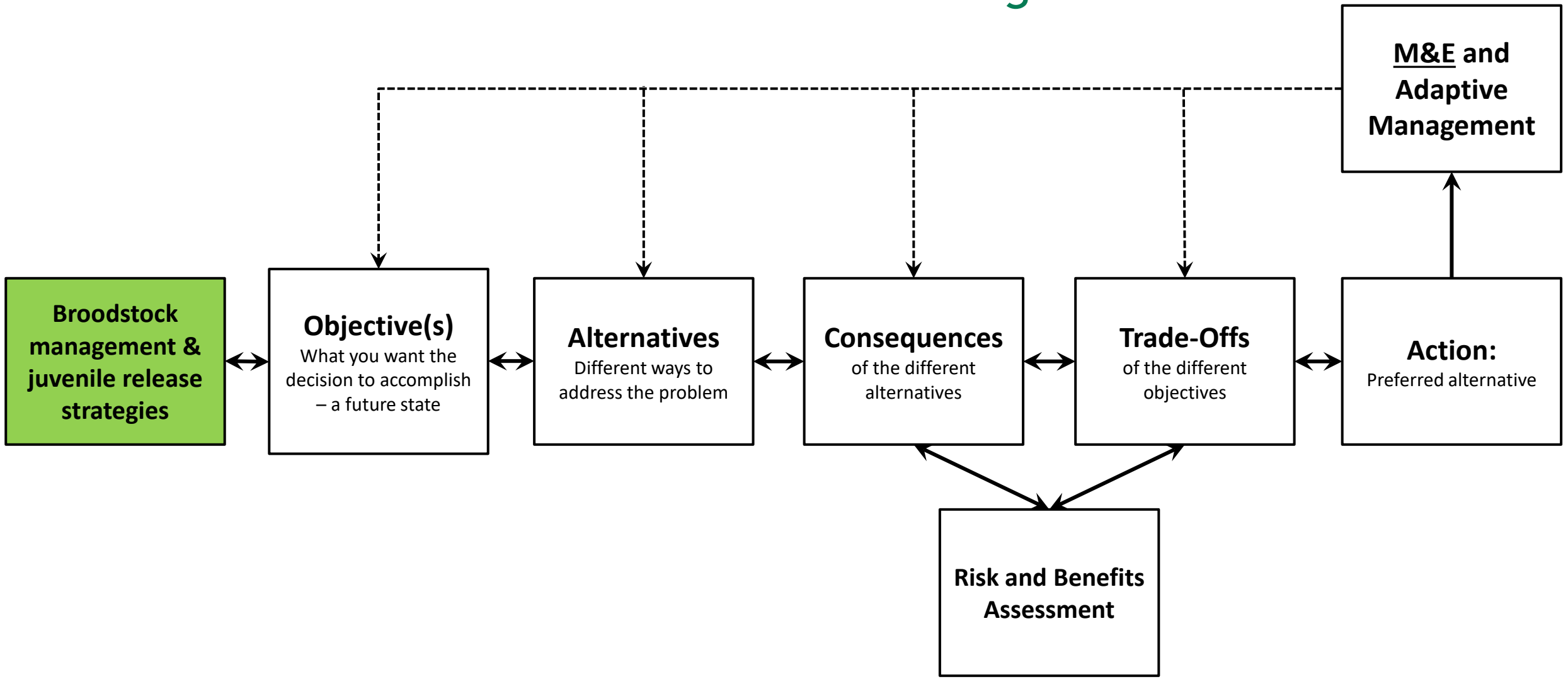


Willapa Bay lives here

(Willapa Bay hatchery management is *status quo* until HMP is developed)

C-3624 applies to WDFW programs only

C-3624 Technical Procedures Process
Structure Decision Making



TPD Details

Broodstock management & juvenile release strategies

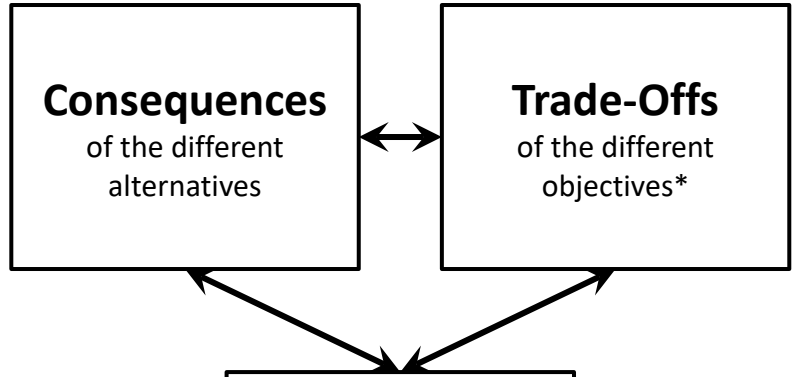
- Develop HMP
- See Appendix 1 in C-3624
- = HGMP (many elements)
- Not entire HMP: Specific elements

Objective(s)
What you want the decision to accomplish – a future state

- Reflection of values (of the public and tribal) and legal requirements
- Tribal Treaty Rights
- Program / Basin specific
- Recovery and harvest need to be considered
- *Need to be paired with performance measures*

Alternatives
Different ways to address the problem

- Alternatives are value/objectives-focused
- Example: complete HMP
  - HMP v1: Production = x
  - HMP v2: Production = y < x
- Range of alternatives should be exhaustive
- More than one alternative is needed



- Comparison of alternatives
- Make use of performance measures
- Modelling can be useful
- Refer to objectives
- Tradeoffs: Alternatives do not address all objectives equally
- Example:
  - HMP v1: Ocean harvest = a, Terminal harvest = b; pHOS = c
  - HMP v2: Ocean harvest = a, Terminal harvest = <b; pHOS = <c

TPD and HMP development schedule

Reminder: Development of HMPs occurs after the TPD is finalized

- Tribal consultation on the development of the TPD is required by C-3624
  - Initial consultation with Tribes: April 17, 2024
  - January 2025: next consultation – needs to be scheduled
- Mid Summer 2025: Final draft of TPD
- Monitoring and Evaluation Program
  - Began in 2023
  - Phase 1 data collection: in-hatchery survival from broodstock to juvenile release
- SEPA review is required (SEPA on C-3624 was phased)
  - TPD document or individual/bundled HMPs

Questions?