

CWT Workgroup Action Plan

Progress Report

Presented to Mark Committee in April, 2007.

Presentation initially made to PSC Commissioners in January, 2007.

CWT Workgroup Progress Report

- CWT Workgroup
- Expert Panel Findings and Recommendations
- Basis for EP Findings and Recommendations
- Recommendations 1-3 and 4
- Schedule

CWT Workgroup Progress Report

- The Work Group consists of a subset of the Expert Panel
 - Gary Morishima (Quinault Indian Nation)
 - Brian Riddell (CDFO)
- and other agency representatives identified by the Commission
 - Marianna Alexandersdottir (NWFIC)
 - Pat Pattillo (WDFW)
 - Annette Hoffmann (WDFW)
 - Chuck Parken (CDFO)
 - Gayle Brown (CDFO)
 - Scott McPherson (ADFG)
 - Ron Josephson (ADFG)
 - Mike Matelywich (CRITFC)
 - Ethan Clemons (ODFW)
 - Allen Grover (CDFG)

CWT Workgroup Instructions

- *The Work Group will initially address the short-term tasks related to recommendations of the Expert Panel.*
 - The highest priority will be placed on those tasks that need immediate action. Accordingly, the initial emphasis of the Action Plan will be identifying options to address current deficiencies in the CWT program (recommendations #1-4).

CWT Workgroup Progress

- *Workgroup has had two meetings*
 - *Focus has been on Recommendations 1-3*
 - *Accomplished bulk of the work, the report is incomplete*

Expert Panel Report

■ Importance of the CWT Tag Recovery System

- *Finding 1. The CWT system is the only technology that is currently capable of providing the data required by the PSC's Chinook and Coho Technical committees.....*

Basis for EP Findings and Recommendations

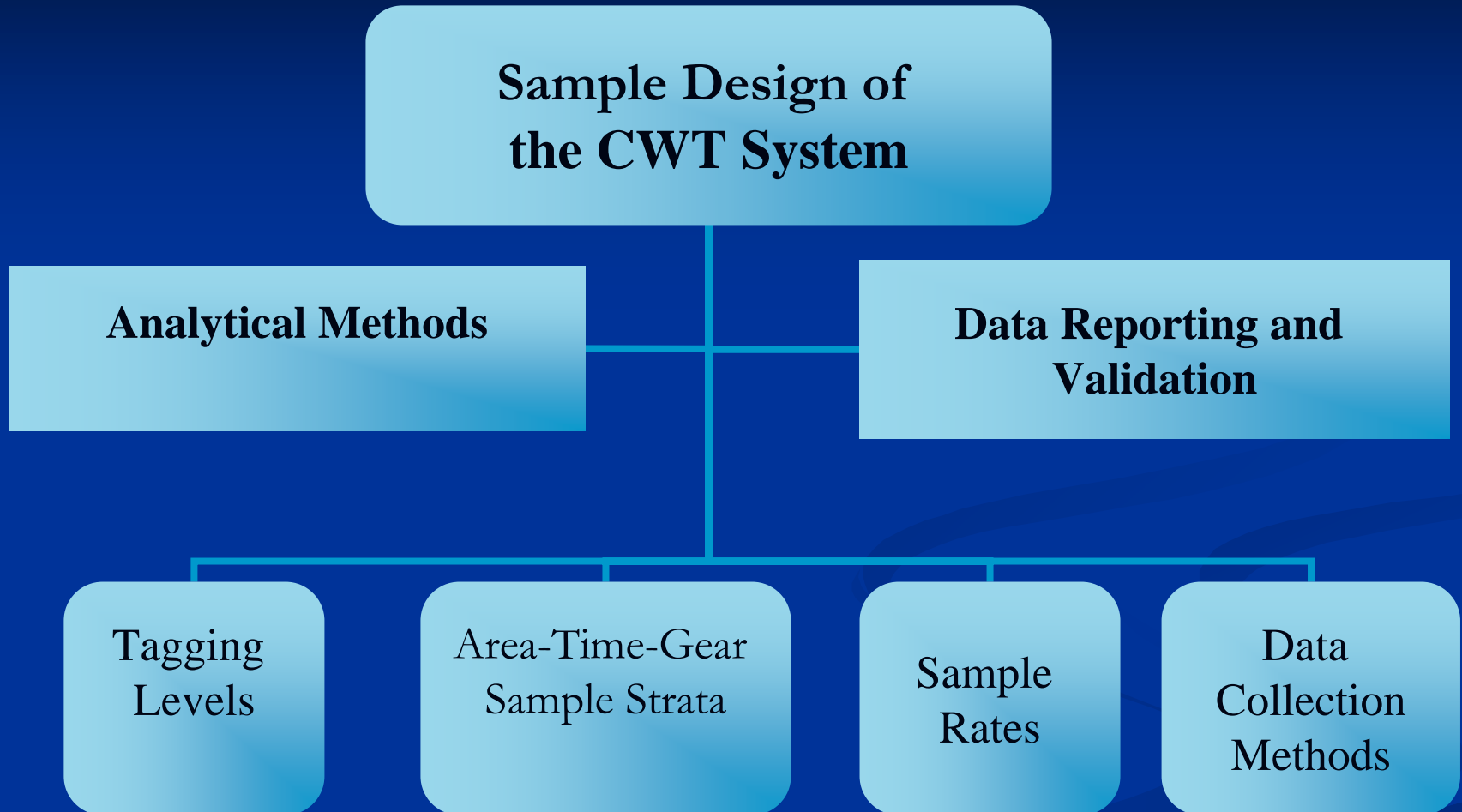
- Current management system based on stock, age and fishery specific exploitation rates (ERs)
- CTC and CoTC use tagged groups to provide information needed for estimation of stock, age and fishery specific ERs

Expert Panel Report

Major Recommendations

- **Correct Current Deficiencies in CWT System –**
 - *Recommendations 1-3 and 4*
- *Workgroup was instructed to focus on these recommendations*

Correct Current Deficiencies in CWT System



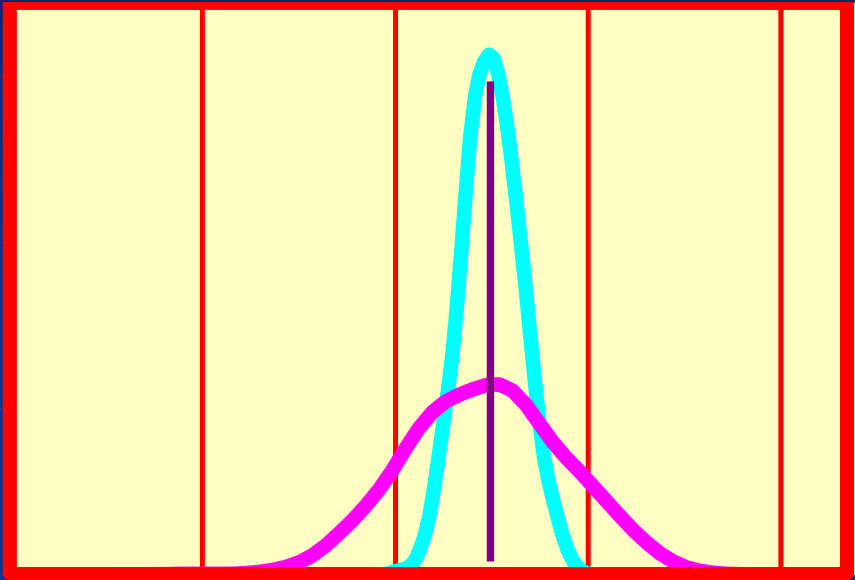
Correct Current Deficiencies in CWT System

- Uncertainty – Precision and Accuracy measured by mean squared error (MSE)

$$\text{MSE} = \text{Variance} + \text{Bias}^2$$

- Variance (precision) is a function of the number of tagged fish observed in a sample
- Bias (accuracy) is a function of assumptions of analysis and sample design.

$$\text{MSE} = \text{Variance} + \text{Bias}^2$$

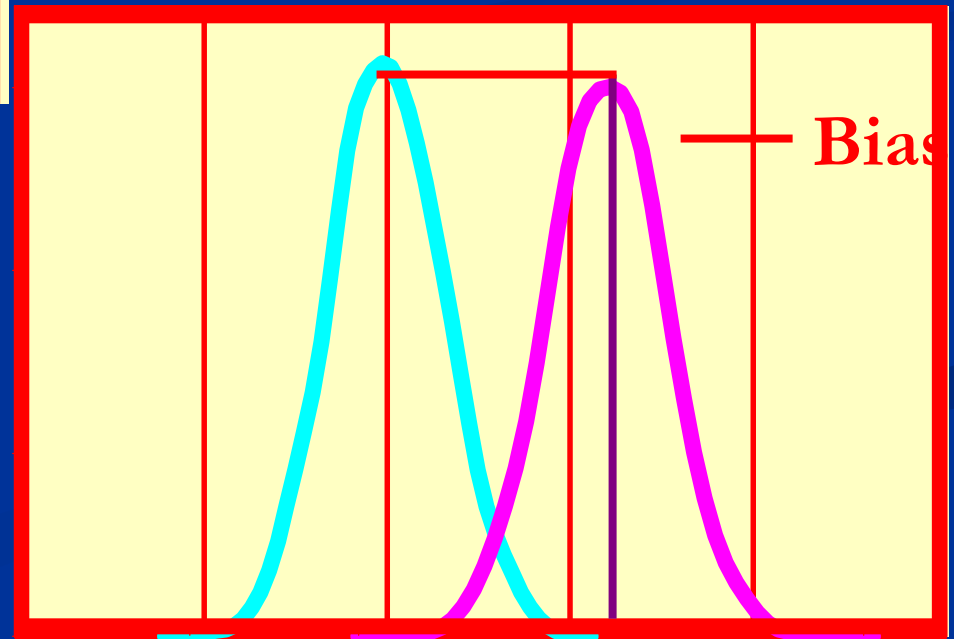


Variance – Precision

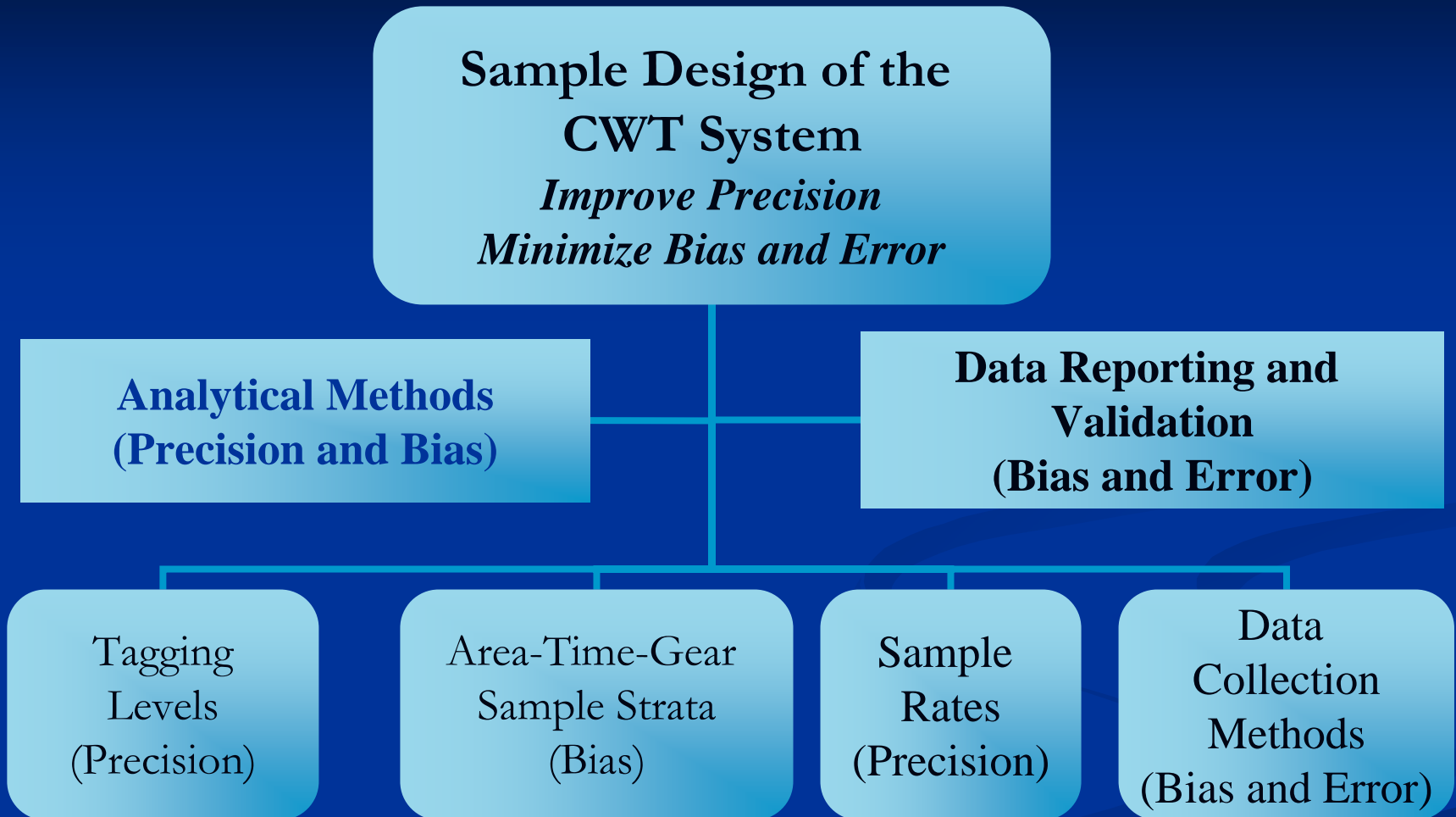
We can measure variance

Bias – Accuracy

We cannot measure bias



Correct Current Deficiencies in CWT System



RECOMMENDATION 1

Quality assurance and control

- **Quality assurance** encompasses all activities necessary to provide confidence that a monitoring program will meet its stated objectives within the standards set for the program.
 - Standards – statistical criteria, management requirements
 - Sample Design (Tagging levels, sample rates, stratification of sampling into areas and periods)

RECOMMENDATION 1

Quality assurance and control

- **Quality control** represents the operational techniques and activities necessary to fulfill requirements of data quality for the monitoring program.
 - Data collection methods, data validation and reporting and database maintenance

RECOMMENDATION 1

Workgroup process

- Workgroup identified several categories of issues:
 - Tagging issues
 - Sampling programs
 - Estimation of total harvest and escapement being sampled (i.e., needed for sample expansions).
 - Data validation and reporting

Tagging issues

- **Important production regions are not represented by indicator stocks - Source of error**
- **Determination of appropriate tagging numbers – Source of imprecision**

Sampling programs

- **Low sample rates in fisheries and or in escapements.** Source of imprecision
- **Non-representative sampling.** Source of bias
- **Incomplete (or no) sampling coverage in a fishery or of escapement on spawning grounds.** Source of bias

Sampling programs

- Sampling methods. Source of bias.
 - Visual vs electronic sampling
 - Voluntary Sampling Programs
 - Awareness factors

Estimation of total being sampled.

- **Uncertainty in estimates of total harvest or total escapements. Source of Imprecision**
- **Bias in estimates of total harvest or total escapements. Source of Bias**

Database Issues

- **Timeliness of reporting.** Inability to meet management needs
- **Completeness of data reporting.** Source of bias
- **Data collection, reporting and validation.** Source of error

RECOMMENDATION 1

Workgroup process

- Fishery Sampling levels
- Identified indicator tag groups (CTC and CoTC)
- Tagging levels
- Tag recovery levels
- Data issues

RECOMMENDATION 1

Workgroup process

- Regional reviews – Agency workgroup members.
 - Identify specific problems with tagging, sampling, and estimation of total and data collection, reporting and maintenance
 - Identify solutions, prioritize and provide cost estimate

RECOMMENDATION 1

Workgroup process

- Incomplete, lack of priorities and costs for some regions
- Working on it!

Expert panel recommendations

RECOMMENDATION 2 – *Explicit criteria should be developed for the precision of statistics to be estimated from CWT recovery data.*

- *Criteria have to take into account:*
 - *Number tags recovered (release number, sample number, etc)*
 - *Representative sampling of catches and escapements*
 - *Consideration of uncertainty in total catches and escapements*

Criteria for precision

Workgroup used several criteria currently in use:

- Release size at or above standard
 - 200,000 per tag group for Chinook salmon
 - 45-75,000 for coho salmon
- Fishery and escapement sampling at or above 20%
- CV of estimate of total escapement or fishery at or below 20%
- Observed tags in fisheries at or above 20 for Chinook (all ages combined) and 10 for coho salmon.
 - Provides estimates number of estimated tags with $CV \leq 30\%$

Precision criteria

Stock Information		Regional Marine Fisheries																										
		Fishery Specific Key Issues																										
		Key Issues																										
Region	Stock	Release	Escapement (Hatchery)	Escapement (Sp Grou	Term Com	Term Native	Term Spt	SEAK TR	SEAK SPT	SEAK Net	NCBC Troll	NCBC Sport	NCBC Net	WCVI Troll	WCVI Sport	Geo Strait Troll	Geo Strait Spt	SBC Net	WAOcn Troll	WA Ocn Sport	PS Sport	WA Net	Col Riv Sport	Col Riv Net	OR Coast Troll	OR Coastal Sport	CA Troll	CA Sport
Washington	GAD						2														2	2						
	GRN																				2							
	GRO																				2							
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Expert panel recommendations

RECOMMENDATION 3 – *Decision-theoretic model*

- Not feasible for workgroup to develop a full-scale decision-theoretic model.
- We have developed:
 - a tool which allows users to evaluate number of tags to release or sample sizes for fisheries and escapement in simpler scenarios, i.e., single stock or single fishery or escapement
 - Preliminary specifications for a more complete model

Expert panel recommendations

- **RECOMMENDATION 4** – *Representativeness of indicator stocks*
 - The workgroup prioritized to first three recommendations. Available information seems to support use of hatchery indicator stocks.

Schedule for completion

- Agency workgroup members completing work on Recommendation 1 and Recommendation 3.
- Intent to produce report within 1-2 months depending on responsiveness of workgroup members.