

CBFWA Collaborative, Systemwide Monitoring and Evaluation Program (CSMEP)

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What is CSMEP?

A co-ordinated effort to collaboratively improve:

1. the quality and consistency of fish monitoring data, and
2. the methods used to evaluate these data,

to better answer key questions relevant to major decisions in the Columbia Basin.

Evolution of CSMEP

- Grew out of NOAA Fisheries Service/ USFWS / Action Agency needs for RME, articulated in Feb 2002
- Further developed through collaborative efforts of federal, state, tribal agencies; NPCC
- Endorsed by ISRP, CBFWA, NPCC in Mainstem/Systemwide Review (fall 2002)
- Funded in October 2003 by BPA
- Designed to co-evolve with other M&E entities

Who's involved in CSMEP?

- key entities doing fish monitoring in the Columbia Basin:
 - CBFWA
 - NOAA-Fisheries Service, USFWS
 - ODFW, WDFW, IDFG
 - CRITFC, Nez Perce, Yakima & Colville tribes
 - StreamNet, Fish Passage Center
 - ESSA Technologies (facilitators), Eco Logical Research, KWA, Quantitative Consultants, Paulsen Env. Research
 - EPA EMAP staff

CSMEP Objectives

- **Serve M&E needs** of NOAA-Fisheries Service & USFWS (Biological Opinions, Recovery Plans), NPCC Fish & Wildlife Program
- **Document, integrate, make available** existing fish monitoring data (salmon, steelhead, bull trout, other species);
- **Critically assess strengths and weaknesses** of these data for answering key questions at three tiers;
- **Collaboratively design and implement improved monitoring and evaluation methods** to fill information gaps, provide better input to key decisions.

CSMEP focuses on Questions at 3 Tiers

Tier 1. What are spatial distributions of stocks in the Columbia River Basin? How are these distributions changing over time? How do they relate to overall ecosystem status?

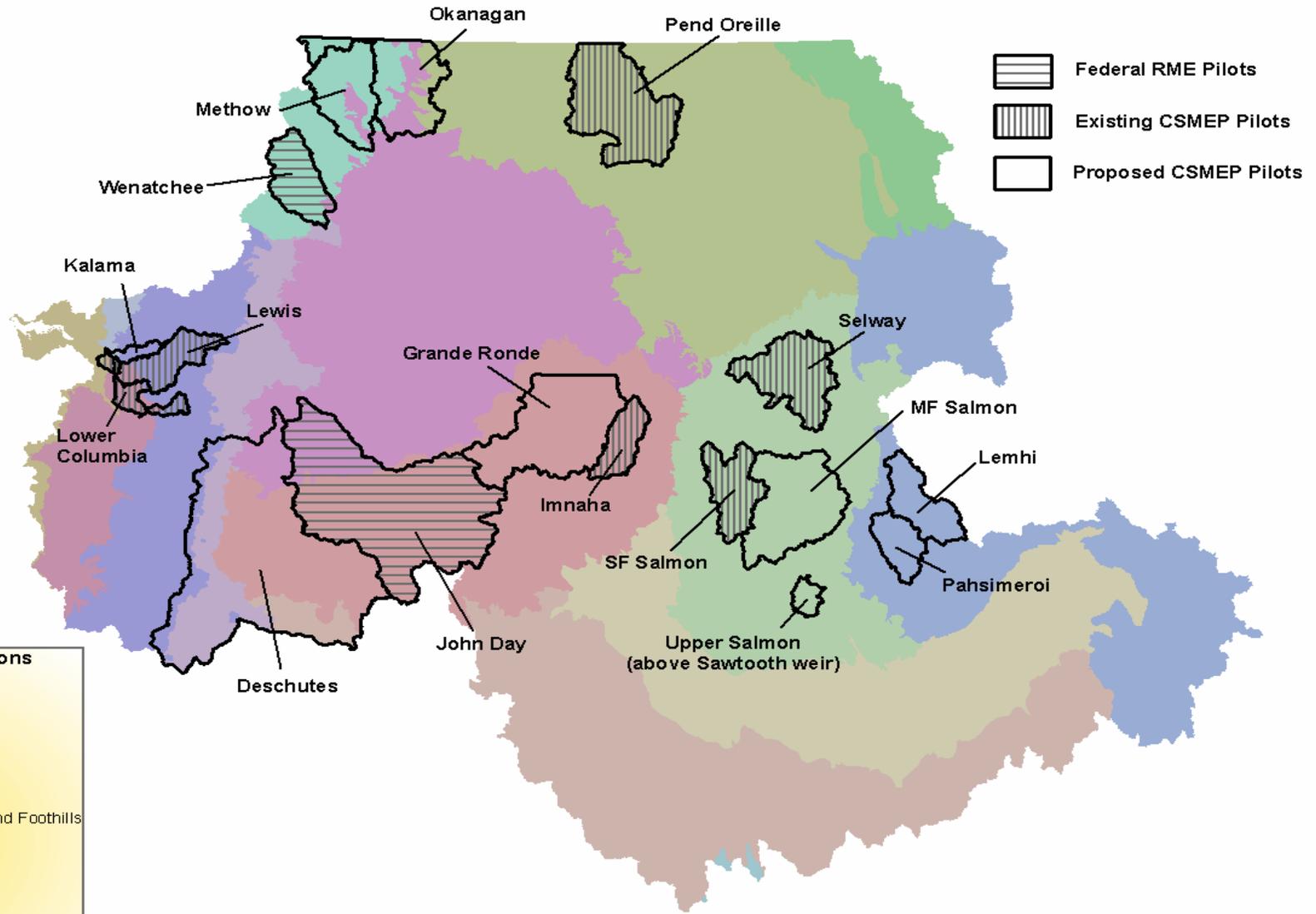
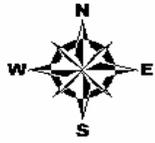
Tier 2. What are trends in stock abundance, condition and survival over whole life cycles, and at different life history stages? How do these relate to habitat and climate?

Tier 3. How do stock and habitat indicators respond to specific classes of management actions? ***the 4 Hs – Habitat, Hydro, Harvest and Hatchery actions***

What improvements in M & E are needed to give more reliable answers to these questions?

CSMEP Data Inventories

- Undertook intensive inventory in a few pilot sub-basins; now expanding (StreamNet critical in this role)
- Focused on fish performance measures for Abundance, Survival, Distribution, Genetics, Life History
- CSMEP catalogs provide metadata on what's available in each subbasin and point to where original data can be found
- Metadata stored in an Internet-accessible database (over 1000 records currently)



Pilot Subbasins (Active and Proposed) in Relation to Columbia Basin Ecoregions

CSMEP Data Assessments

- CSMEP analysts then made detailed assessments of the strengths and weaknesses of subbasin data for answering key CSMEP questions at relevant space/time scales (available on CSMEP website)
- Now using these continuing assessments to determine what critical improvements are needed for M & E in the Columbia Basin – *as CSMEP enters its monitoring design phase*

CSMEP Task 2
Data Inventories
for Pilot Subbasins



CSMEP Task 4
Strengths and
Weaknesses
Assessment for
Pilot Subbasins



Sub-Basin Plans
for Pilot Subbasins



2004 Design Workshops: Learn from Others

- NOAA-Fish / AA Pilot Projects; RME Plan
- Upper Columbia River Monitoring Strategy
- Bull Trout RMEG
- Oregon Coastal Coho EMAP, other EMAP
- RME Action Effectiveness Guidelines
- NOAA-Fish/USFS explorations of alternative designs
- PNAMP, other comparisons of protocols

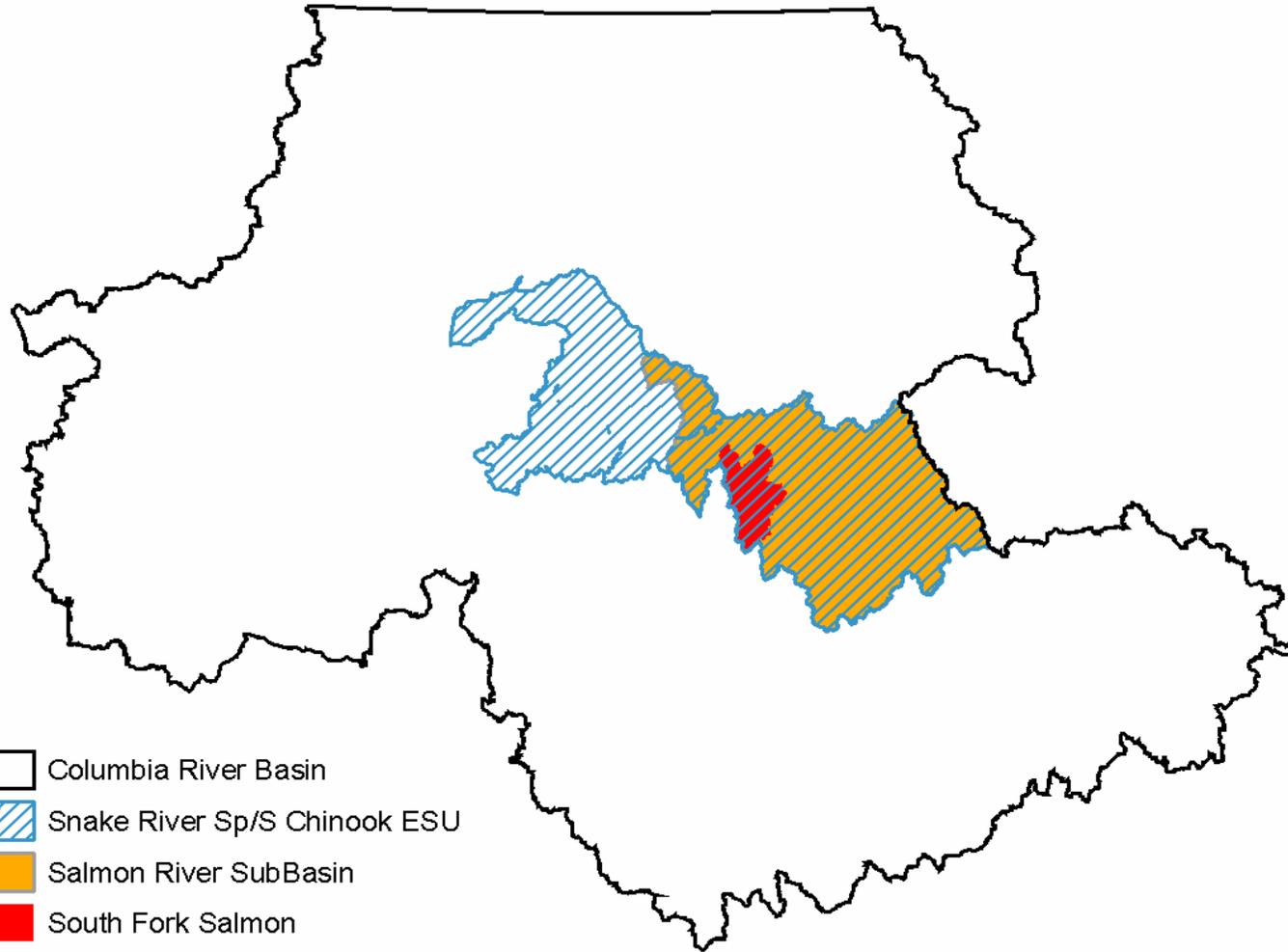


CSMEP Task 5 Pilot Design
Development / Evaluation of
Alternative M&E Designs for **Snake
River Subbasins**; Tradeoffs



Client
Feedback





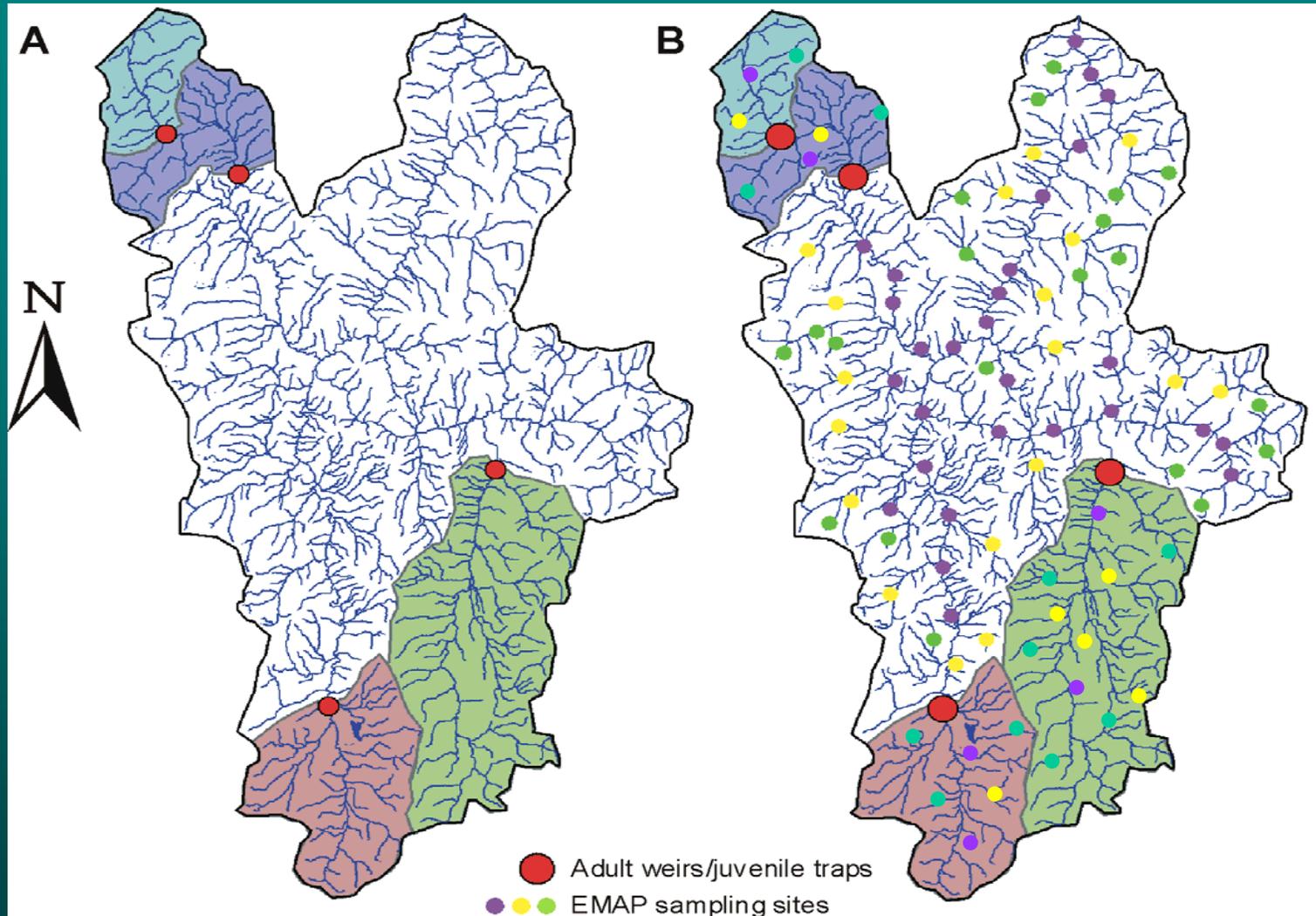
Relevant scales for monitoring (example)

CSMEP Design Objectives

- **High Inferential Ability**
 - answer questions at appropriate scale, meet client needs
- **High Statistical Reliability**
 - precision, accuracy/bias, coverage, statistical power
- **Reasonable Cost**
 - cost/year, precision/cost, ability to leverage other funding
- **Logistically Feasible**
 - safe, flexible, integrated with other programs
- **Minimal Environmental Impact**

Design Challenges / Implications

- Relative priority of monitoring questions differs among agencies
 - explore tradeoffs among questions of different designs
- Spatial / temporal scales, effect sizes, error risks not defined
 - explore costs/benefits of wide range of options
- Many PMs; not feasible to measure everything everywhere
 - explore mixed approach - many PMs monitored at few intensive sites; critical PMs monitored at many representative sites
- Monitoring sites often not randomly selected; different methods employed
 - broad surveys to supplement systems represented by intensive sites; compare methods (*PNAMP exercise*)
- Costs are a big concern
 - explore cost-sharing opportunities across agencies



Current monitoring coverage in the SF Salmon (A) and hypothetical supplementation with EMAP sampling (B)

Potential designs for CSMEP to explore:

- **Hybrid approach** as for OR Coastal coho: EMAP rotating panel + intensive life cycle monitoring sites
- **Universal sampling frame** to allow multiple entities to monitor, share data (based on EMAP)
- **Weighted stratified sampling** that builds on historical index sites (NOAA-Fish, USFS, Montana)
- **Patch-based stratification** for distribution issues (Bull trout RMEG)
- **Nested approach** for different questions (Bull trout RMEG)

Evaluation of Alternative Designs

- Cast as a multi-objective decision analysis
- **PrOACT** framework (Hammond et al.):
 - Problem definition (decisions, key CSMEP questions);
 - Specifying Objectives, evaluative criteria (e.g. cost, precision);
 - Designing Alternatives (sampling and response designs);
 - Evaluating Consequences (apply models to simulate designs);
 - Making Tradeoffs (which questions are best answered?)
- Start with best designs; show risks as you drop things
- Iterate through internal reviews and client feedback

Conclusions so far

- CSMEP is working - useful products beginning to emerge
- Coordination with PNAMP and other entities ensures no duplication of effort
- Testing all methods in a pilot manner has been helpful
- All interim products publicly available - CSMEP website
- Presenting our final design ideas to policy / programmatic levels will be a big test of the process

For more information

- Columbia Basin Collaborative Systemwide Monitoring and Evaluation Project (CSMEP):

www.cbfwa.org/Committees/CSMEP

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CSMEP

PNAMP

Scale	Columbia River Basin	All of Pacific Northwest
Level	Technical	Programmatic & Policy Co-ordination, some Technical
Entities Involved	NOAA-Fish, USFWS, CBFWA, State & Tribal Fish Agencies, FPC, BPA, StreamNet	Federal & State resource management agencies; CBFWA
M & E Focus	Improve ability to address key Tier 1-3 questions for salmon, steelhead, bull trout and their habitats	Establish standardized sampling frames and protocols for aquatic habitat and populations
Co-ordination	Overlapping membership, shared workplan development, exchange of work products	