Stanislaus, Tuolumne, and Merced Working Group Meeting

Revised Draft Initial Biological Goals Abundance and Diversity

CALIFORNIA
Water Boards

Division of Water Rights, November 21, 2022

Welcoming Remarks

- Staff introductions
- This meeting is being recorded
- The presentation slides and the recording will be available by contacting STM-WorkingGroup@waterboards.ca.gov
- For more information visit the Lower San Joaquin River Flows Implementation Activities webpage: bit.ly/baydelta_LSJ
- Need assistance or have questions
  - Facilitating today is Molly Williams of Office of Public Participation
  - Zoom chat, Raise hand, or
  - Email STM-WorkingGroup@waterboards.ca.gov

Welcoming Remarks – Background

- 2018 Bay-Delta Plan & Lower San Joaquin River Flows
  - Requires Biological Goals & STM Working Group
  - Seek recommendations from the STM Working Group
- 2019 Draft Biological Goals developed and released
  - STM Working Group Coordinator
  - Public comment
- 2022 Revised Draft Biological Goals & form initial membership of STM Working Group
- STM Working Group Meetings – seeking recommendations on draft revised Biological Goals

Agenda

- Meeting Objectives, Format, and Ground Rules
- Member Introductions
- Viable Salmonid Population Parameters
- Abundance Goals

Break (Lunch Period)

- Genetic and Life-history Diversity Goals
- Recap Recommendations
- Closing Remarks

Meeting Objectives

- Seek recommendations to develop Biological Goals pursuant to Bay-Delta Plan requirements
- Overall Role of Stanislaus, Tuolumne, and Merced Working Group (STM) membership
  - Assist with the implementation, monitoring and effectiveness assessment
  - Work as a watershed group and forum to coordinate implementation activities
- STM members role specific to draft revised Biological Goals
  - Focus on technical topics including but not limited to metrics, data availability, achievability, and adequacy
  - Recommendations for biological goals that represent viable salmonid populations

Format & Ground Rules

- Staff will review the components of each goal
- Facilitator will solicit recommendations from STM members
- Questions can be asked verbally or using the Q&A feature
- Non-STM Members will have a chance to provide input
- Keep comments on point and concise
  - Keep comments succinct and specific to the Biological Goals
  - Avoid repeating recommendations provided in written comments
  - Respect staff and fellow attendees, even if their ideas differ from yours

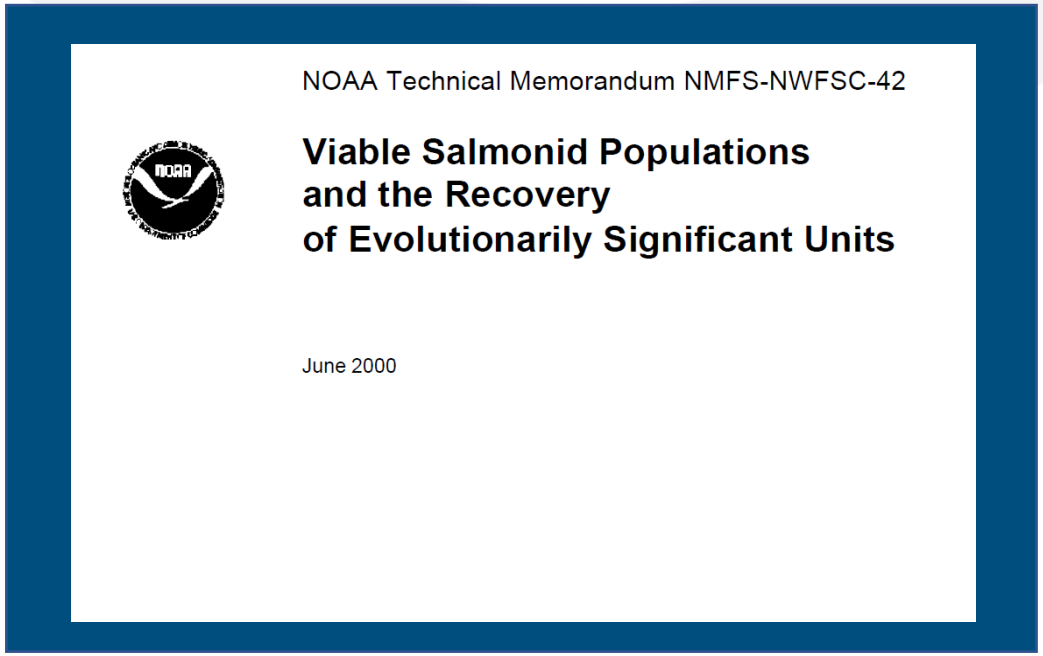
STM Member Introductions

- California Department of Fish & Wildlife
- Central Sierra Environmental Resource Center
- Department of the Interior, US Bureau of Reclamation
- Merced Irrigation District
- Merced River Conservation District
- Modesto Irrigation District
- National Marine Fisheries Service
- Oakdale and South San Joaquin Irrigation Districts
- San Francisco Baykeeper
- San Francisco Public Utilities Commission
- South San Joaquin Irrigation District
- Stanford University
- State Water Board
- Stockton East Water District
- The Nature Conservancy
- Tuolumne Utilities District
- Turlock Irrigation District
- US Fish & Wildlife Service
- Unaffiliated – William Martin
- Unaffiliated – Richard Morat
- Valley Water

Viable Salmonid Population (VSP) Parameters

…Indicators of viability include population abundance, spatial extent, distribution, structure, genetic and life history diversity, and productivity.

- Quantitative criteria to track fall-run Chinook salmon
- Based on McElhaney et al. 2000
- Required by Bay-Delta Plan
- ISAP recommended



Today's Discussion of Biological Goals

Abundance: Escapement

Genetic Diversity: Proportion of Hatchery Origin Spawners (pHOS)

Life History Diversity: Emigration Timing and Size Classes at Migration

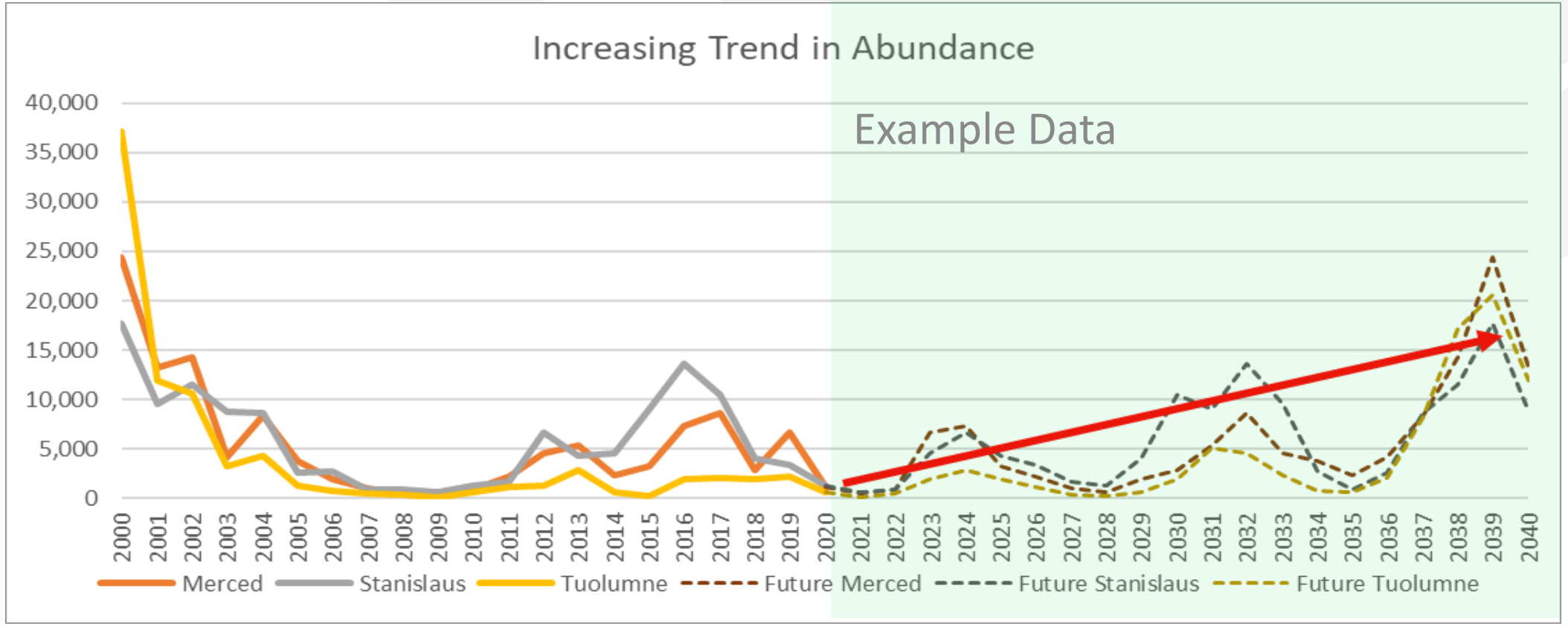
Abundance Goal

- Trend
- Metric
- Value
- Hatchery Spawners
- Timeline

River	Escapement Goal as a 5-Year Running Average	Progress Assessment
All	Positive generational trend in escapement, measured as a 5-year geometric mean	Until numeric abundance goals are met
Stanislaus River	9,600	Year 6, measurable progress Year 9, substantial progress Year 15, achieve the goal
Tuolumne River	17,800	
Merced River	8,000	

Abundance Goal – Trend

Please Provide Recommendations



Positive generational trend in abundance, measured as a 5-year geometric mean

Abundance Goal – Metric
Please Provide Recommendations

- Abundance Metric
  - Spawner Escapement
    - Reliably measured
    - Long-term record
    - ISAP – “key VSP parameter and important metric for tracking status and trends”
    - Used to estimate ocean production
  - Ocean Production
    - Most directly related to salmon doubling goal
  - Other

Abundance Goals – Value
Please Provide Recommendations

- Program of implementation requires goals to contribute to meeting salmon doubling objective
- Any alternative goal value should be a reasonable estimate comparable or equivalent to the salmon protection objective

River	Salmon Protection Objective Doubling Goal Ocean Production	Draft Initial Goal Escapement (Mills and Fisher)	Predicted Escapement to Attain Doubling at indicated Juvenile Freshwater Survival	
			1.1%	2.2%
Tuolumne	38,000	17,800	21,000	10,500
Stanislaus	22,000	9,600	10,500	5,200
Merced	18,000	8,000	8,700	4,300

Abundance Goal – Hatchery Influence

- ISAP identified uncertainty regarding estimates of natural production during the 1967-1991 time period
- Constant Fractional Marking (CFM) Program reports significant pHOS on the tributaries during 2010-2019
- Water management on the tributaries do not impact hatchery stray rates
- Central Valley hatchery production has not changed appreciably since the 1970's
- The number of hatchery strays should be consistent through time

Abundance Goal – Hatchery Influence
Please Provide Recommendations

- Include or exclude hatchery spawners in the abundance goal?
- What are potential methods to account for hatchery spawners?
  - Draft Initial Escapement Goal – inherently accounts for uncertainty around hatchery influences in the past i.e., assumes hatchery strays are constant rates
  - Track both natural and hatchery components in escapement
  - Escapement of natural spawners e.g., subtract the number of hatchery origin spawners annually – how to incorporate past uncertainty in hatchery
  - Ocean Production – use CFM information to adjust past ocean production goals and current production estimates
  - Other options?

Abundance Goal – Timeline

- ISAP – Quantification at the population level should be perceivable within 4-6 generations
- CFM reports vast majority of Central Valley recoveries are 2 to 3-year-olds
- In river spawners are also dominated by 2 to 3-year-olds

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Abundance Goal – Timeline Cont.
Please Provide Recommendations

- Trend assessment annually after 5 years
- Progress toward the final goal sometime after 4-6 generations
- Option to develop the timeline to achieve the goal using survival rates

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 BREAK FOR LUNCH!

Diversity Goals

- The variations in a population that help ensure its survival by contributing to its stability, resilience, and persistence
- More diverse populations are at less risk of extinction, for example from habitat and climate changes
- Initial biological goals include two types:
  - Genetic Diversity
  - Life History Diversity

Genetic Diversity – Hatchery Origin
Please Provide Recommendations

- Genetically inherited traits create differences among salmon that allow populations to adapt
- Reducing the proportion of hatchery origin spawners (pHOS) helps to promote the propensity of locally adapted traits
- Comments and review of Lindley et al. (2007) suggest that pHOS ≤ 10% for the Central Valley ESU

Genetic Diversity Metric	Goal	Progress Assessment
pHOS	Decreasing trend, as a 5-year running average	Assessed on an ongoing basis
pHOS	≤ 50%, as a 3-year running average	Year 9 after beginning of implementation
pHOS	≤ 20%, as a 3-year running average	Year 15 after beginning of implementation

Genetic Diversity – Hatchery Origin Achievable

Constant Fractional Marking (CFM) Program 2010-2019

River	pHOS	Total Escapement	Hatchery Origin	Natural Origin
Merced	61%	1648	1001	647
Tuolumne	51%	692	351	341
Stanislaus	71%	2789	1989	800

*Values represent the geometric mean of 2010-2019 data

Predicted pHOS with attainment of Abundance Goal

River	pHOS	Total Escapement	Hatchery Origin	Natural Origin
Merced	13%	8000	1001	6999
Tuolumne	2%	17800	351	17449
Stanislaus	21%	9600	1989	7611
Cumulative pHOS for all 3 Tributaries = 9%				

Life History Diversity – Emigration Timing
Please Provide Recommendations

- Different life history strategies across a broad migration window
  - Supports population resiliency
  - Good indicator of a supportive environment
  - Flexibility for extreme conditions, e.g., natural temperature conditions would be unsuitable

Juvenile Size Class* (Phenotype)	Positive Detection Each Week near Mouth of Each Tributary	Progress Assessment
Fry	Last week of January to second week of April	Year 6, incremental progress
Parr	First week of February to last week of May	Year 9, additional incremental progress
Smolt	Third week of February to first week of June	Year 15, achieve the goal

* Size classes are defined as fry < 55 millimeters (mm); parr 55 - 75 mm; smolt >75 mm

Life History Diversity – Juvenile Size Classes

Please Provide Recommendations

- Based on the cohort-specific proportions of the size classes (phenotypes) of outmigrating juvenile fish
- Enhance the portfolio effects of diverse life histories

Wet and Above Normal WYs	Below Normal, Dry, and Critical WYs	Progress Assessment
Fry ≥ 20%	Fry ≥ 20%	Year 6, incremental progress
Parr ≥ 20%	Parr ≥ 30%	Year 9, additional incremental progress
Smolt ≥ 10%	Smolt ≥ 20%	Year 15, achieve the goal

Recap of Recommendations

Closing Remarks

- Staff Closing Remarks

- Thank you all for attending and we will see you on December 7th for a discussion of Productivity, Spatial Structure, and Stock Recruitment