



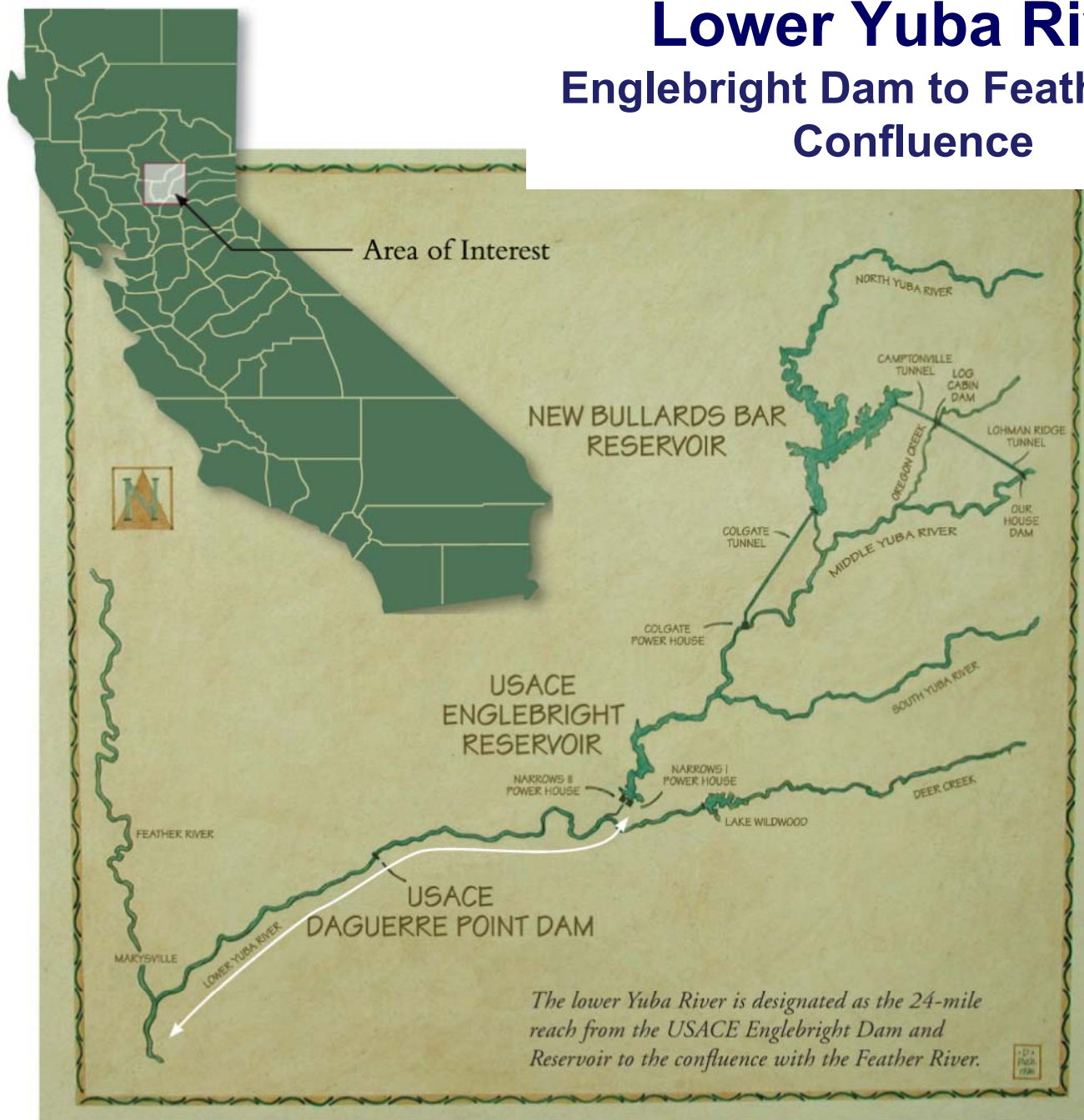
Overview of the Lower Yuba River

Existing Information & Ongoing Studies



May 24, 2010

Lower Yuba River Englebright Dam to Feather River Confluence





Control point for the
Lower Yuba

USACE
Englebright
Dam &
Narrows 2
Powerhouse









Origin of The Yuba Goldfields

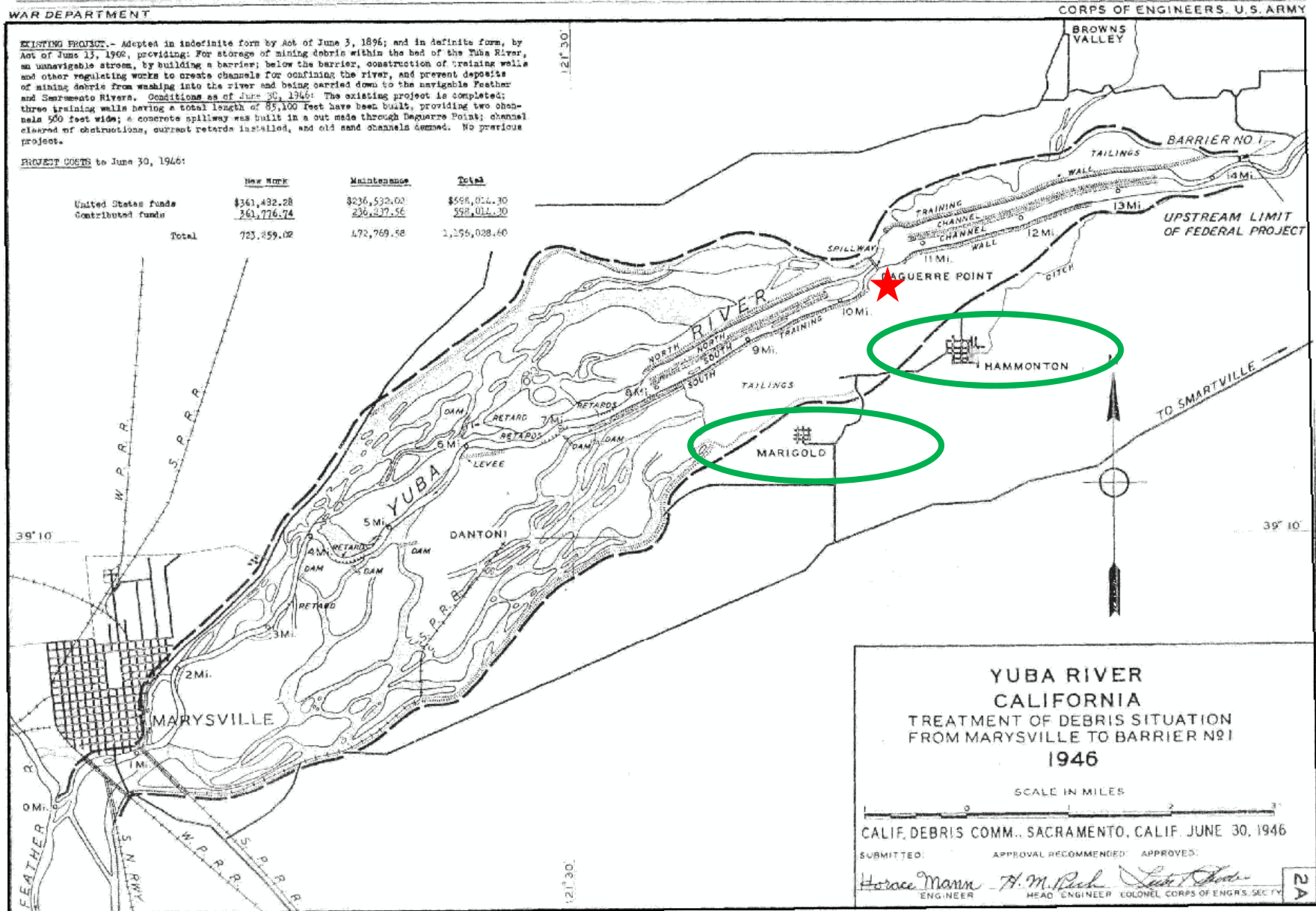
- Hydraulic mining between 1852 & 1893 changed and defined the current Goldfields area
- Yuba Goldfields are dominated by dredger tailings reworked from hydraulic mine waste
- Dredging gold from the hydraulic waste began in 1902



Goldfields -1906



Goldfields -1946



Goldfields -2005



USACE Daguerre Dam





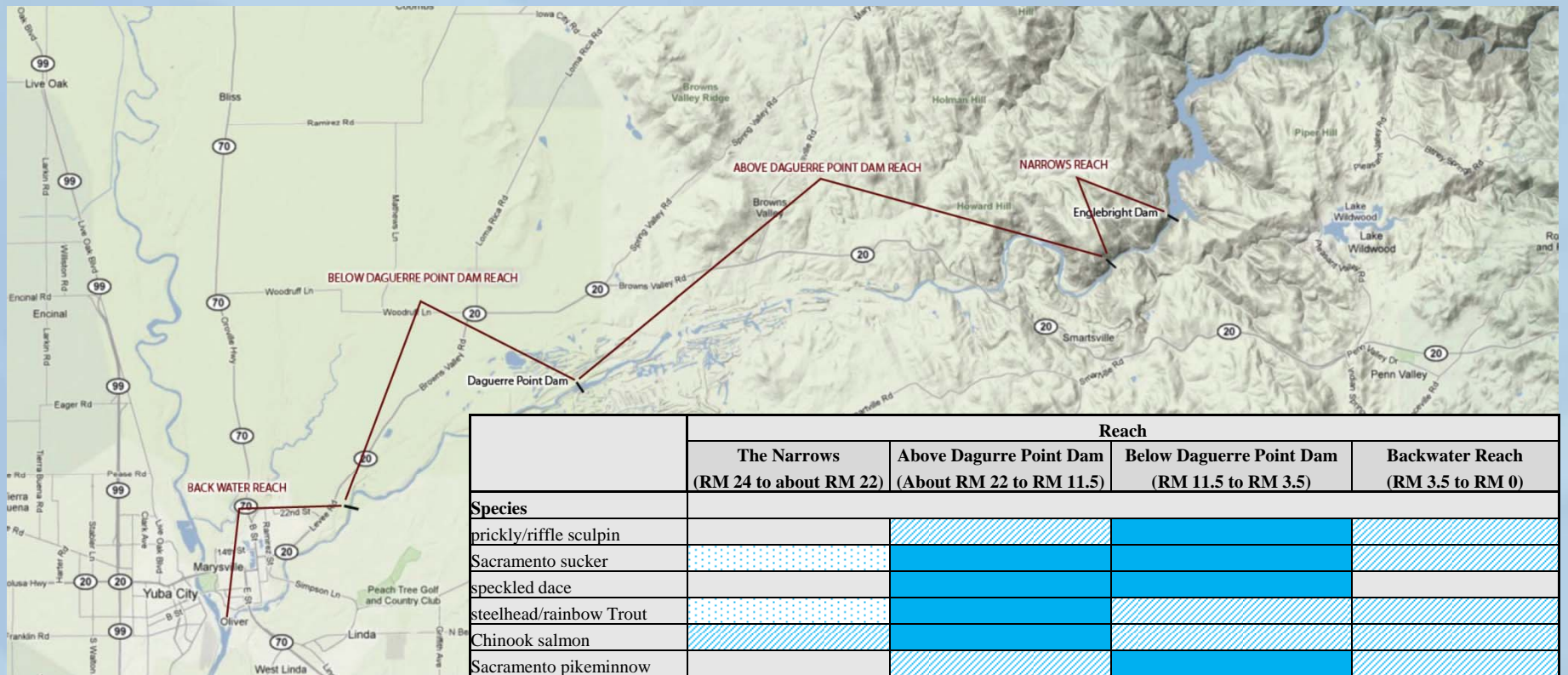


Fish Community of the Lower Yuba River

- 22 native and introduced fish species
- Threatened and endangered anadromous fish species
 - spring-run chinook salmon
 - steelhead
 - green sturgeon
- Special Status Species
 - hardhead
 - Sacramento splittail
 - Sacramento-San Joaquin roach
- Recreationally important species
 - fall-run Chinook salmon
 - rainbow trout
 - American shad
 - striped bass



Fish Community of the Lower Yuba River



	Reach			
	The Narrows (RM 24 to about RM 22)	Above Daguerre Point Dam (About RM 22 to RM 11.5)	Below Daguerre Point Dam (RM 11.5 to RM 3.5)	Backwater Reach (RM 3.5 to RM 0)
Species				
prickly/riffle sculpin		Abundant	Abundant	Abundant
Sacramento sucker	Rare	Abundant	Abundant	Abundant
speckled dace		Abundant	Abundant	Abundant
steelhead/rainbow Trout	Rare	Abundant	Abundant	Abundant
Chinook salmon	Abundant	Abundant	Abundant	Abundant
Sacramento pikeminnow		Abundant	Abundant	Abundant
American shad			Abundant	Abundant
tule perch			Abundant	Abundant
striped bass			Rare	Abundant
Pacific lamprey		Abundant	Abundant	Abundant
hardhead		Abundant	Abundant	Abundant
green sunfish	Rare	Abundant	Abundant	Abundant
bluegill		Rare	Abundant	Abundant
mosquitofish				Abundant
redeer sunfish			Abundant	Abundant
California roach		Abundant	Abundant	Abundant
smallmouth bass		Abundant	Abundant	Abundant

Legend	
Abundant	Most Abundant
Abundant	Abundant
Rare	Rare
Not Present	Not Present

Draft Salmonid Populations Downstream of USACE's Englebright Dam

- The attachment includes and summarily describes 22 available field studies and data collection reports, 20 other relevant documents (plans, policies, historical accounts, and regulatory compliance), 14 ongoing data collection, monitoring and evaluation activities for the lower Yuba River Accord Monitoring and Evaluation Program (M&E Program), and 4 other data collection and monitoring programs.



Draft Existing Information Attachment

Salmonid Populations

Downstream of USACE's Englebright Dam

Available Field Studies and Data Collection Reports

- **CDFG. 1978.** *Yuba River Steelhead, Yuba County.* Technical Memorandum, prepared by R. Rogers, CDFG Region 2, Rancho Cordova, California.
- **CDFG. 1984.** *Yuba River Steelhead Run During Winter of 1976-77.* Technical Memorandum, prepared by R. Rogers, CDFG Region 2, Rancho Cordova, California.
- **Beak Consultants Inc. 1989.** *Yuba River Fisheries Investigations, 1986-88.* Final report prepared for the State of California Resources Agency, Department of Fish and Game, Sacramento, CA.
- **CDFG. 1991.** *The Lower Yuba River Fisheries Management Plan Final Report.* The Resources Agency, CDFG, Stream Evaluation Report No. 91-1. February 1991.
- **SWRI, JSA, and BE. 2000.** *Hearing Exhibit S-YCWA-19. Expert Testimony on Yuba River Fisheries Issues.* Prepared for the California State Water Resources Control Board Water Rights Hearing on Lower Yuba River February 22-25 and March 6-9, 2000.



Draft Existing Information Attachment (cont.)

- **CDFG. 2002.** *Sacramento River Spring-run Chinook Salmon. 2001 Annual Report.* Prepared for the Fish and Game Commission. Habitat Conservation Division, Native Anadromous Fish and Watershed Branch. October 2002.

Lower Yuba River Water Transfer Monitoring Reports 2001-2004

- **YCWA and SWRCB. 2001.** *Environmental Assessment: Proposed Temporary Transfer of Water From Yuba County Water Agency to DWR, Year 2001.* Prepared for Yuba County Water Agency and the State Water Resources Control Board by EDAW.
- **YCWA. 2003.** *Draft Evaluation of 2002 Yuba River Water Transfers.* Prepared for Yuba County Water Agency by Surface Water Resources, Inc. January 28, 2003.
- **YCWA. 2005.** *Evaluation of the 2004 Yuba River Water Transfers, Draft.* Prepared for Yuba County Water Agency by Surface Water Resources, Inc.
- **JSA. 2003, 2007, and 2008.** *Lower Yuba River Redd Dewatering and Fry Stranding Monitoring and Evaluation Plan.* November 2003. *Lower Yuba River Redd Dewatering and Fry Stranding Study 2007 Annual Report (JSA 2007)* and *Lower Yuba River Redd Dewatering and Fry Stranding Study 2008 Annual Report (JSA 2008).*



Draft Existing Information Attachment (cont.)

- **Massa, D. 2004.** *Yuba River Juvenile Chinook Salmon (*Oncorhynchus tshawytscha*), and Juvenile Central Valley Steelhead Trout (*Oncorhynchus mykiss*), Life History Survey: Annual Data Report 2003-2004.* CDFG Annual Report, Rancho Cordova, CA.
- **Kozlowski, J.F. 2004.** *Summer Distribution, Abundance, and Movements of Rainbow Trout (*Oncorhynchus mykiss*) and other Fishes in the Lower Yuba River, California.* UC Davis Thesis.
- **Massa, D. and C. McKibbin. 2005.** *Yuba River Juvenile Chinook Salmon (*Oncorhynchus tshawytscha*), and Juvenile Central Valley Steelhead Trout (*Oncorhynchus mykiss*), Life History Survey: Annual Data Report 2004-2005.* CDFG Annual Report, Rancho Cordova, CA.
- **JSA. 2006.** *2003 Fall-run Chinook salmon spawning escapement in the Yuba River.* Prepared for Yuba County Water Agency by Jones and Stokes Associates, Inc.
- **Grover, A. and B. Kormos. (undated).** *The 2006 Central Valley Chinook Age Specific Run Size Estimates.* Scale Aging Program, CDFG.
- **Grover, A. and B. Kormos. (undated).** *The 2007 Central Valley Chinook Age Specific Run Size Estimates.* Scale Aging Program, CDFG



Draft Existing Information Attachment (cont.)

- **NMFS. 2007.** *Biological Opinion on the Operation of Englebright and Daguerre Point Dam on the Yuba River, California.* File Number 151422-SWR-2006-SA00071:MET (PCTS # 2007/01232). November 21, 2007.
- **Massa, D. 2008.** *Lower Yuba River Chinook Salmon Escapement Survey: October 2007 – January 2008.* California Department of Fish and Game Annual Report, North Central Region, Chico, CA.
- **Zimmerman, C., G. Edwards, and K. Perry. 2009.** *Maternal Origin and Migratory History of Steelhead and Rainbow Trout Captured in Rivers of the Central Valley, California.* Trans. of the Amer. Fish. Soc. 138:280-291. February 23, 2009.
- **Mitchell, W.T. 2010.** *Age, Growth, and Life History of Steelhead Rainbow Trout (*Oncorhynchus mykiss*) in the Lower Yuba River, California.* ICF International. March 2010.
- **Garza, J.C. and D.E. Pearse. (undated).** *Population Genetic Structure of *Oncorhynchus mykiss* in the California Central Valley.* Final report for California Department of Fish and Game Contract # PO485303. University of California, Santa Cruz and NOAA Southwest Fisheries Science Center.



Draft Existing Information Attachment (cont.)

Other Relevant Documents

- **CDFG. 1993.** *Restoring Central Valley streams: A plan for action.* The Resources Agency, CDFG, Sacramento, California. November 1993.
- **Yoshiyama, R.M., E.R. Gerstung, F.W. Fisher, and P.B. Moyle. 1996.** *Historical and present distribution of Chinook salmon in the Central Valley Drainage of California.* In: Sierra Nevada Ecosystem Project, Final Report to Congress, vol. 111, Assessments, Commissioned Reports, and Background Information (University of California, Davis, Centers for Water and Wildland Resources, 1996).
- **CDFG. 1996.** *Steelhead Restoration and Management Plan for California.* Prepared by D. McEwan and T. Jackson. Inland Fisheries Division, Sacramento, CA.
- **CDFG. 1998.** *A Status Review of the Spring-Run Chinook Salmon (*Oncorhynchus tshawytscha*) in the Sacramento River Drainage.* Candidate Species Status Report 98-01. CDFG, Sacramento, CA.
- **YCWA. 2000.** *Draft Environmental Evaluation Report, Yuba County Water Agency, Yuba River Development Project (FERC No. 2246).* Prepared by Yuba County Water Agency, Surface Water Resources Inc., and Jones and Stokes Associates. December 2000.



Draft Existing Information Attachment (cont.)

- **Yoshiyama, R.M., E.R. Gerstung, F.W. Fisher, and P.B. Moyle. 2001.** *Historical and Present Distribution of Chinook Salmon in the Central Valley Drainage of California.* In Contributions to the Biology of Central Valley Salmonids, California Fish and Game, Bulletin 179, Volume 1. Salmonid Symposium, Bodega Bay, California. October 22-24, 1997, Randall Brown, editor.
- **CDWR and USACE. 2003a.** *Daguerre Point Dam Fish Passage Improvement Project 2002 Fisheries Studies – Analysis of Potential Benefits to Salmon and Steelhead from Improved Fish Passage at Daguerre Point Dam.* Prepared for CDWR and USACE by ENTRIX, Inc. and J. Monroe. March 2003.
- **CDWR and USACE. 2003b.** *Daguerre Point dam fish passage improvement project 2002 water resources studies.* Prepared for CDWR and USACE by ENTRIX, Inc. June 2003.
- **USACE. 2003.** *Daguerre Point Dam Fish Passage Improvement Project – Alternative Concepts Evaluation.* Prepared for ENTRIX, Inc. by W. Rodgers, Inc. September 2003.
- **YCWA. 2003.** *Initial Study/Proposed Mitigated Negative Declaration for the Narrows 2 Powerplant Flow Bypass System Project.* November 2003.



Draft Existing Information Attachment (cont.)

- **YCWA, FERC, and NMFS. 2003.** *Biological Assessment, Yuba River Development Project* (FERC No. 2246) Proposed License Amendment. Prepared for Yuba County Water Agency, Federal Energy Regulatory Commission, and National Marine Fisheries Services by Surface Water Resources, Inc.
- **CALFED and YCWA. 2005.** *Draft Implementation Plan for the Lower Yuba River Anadromous Fish Habitat Restoration: Multi-Agency Plan to Direct Near-Term Implementation of Prioritized Restoration and Enhancement Actions and Studies to Achieve Long-Term Ecosystem and Watershed Management Goals.* Prepared by Lower Yuba River Fisheries Technical Working Group. Funded by CALFED and Yuba County Water Agency. October 2005.
- **NMFS. 2005.** *Preliminary Biological Opinion Based on Review of the Proposed Yuba River Development Project License Amendment for Federal Energy Regulatory Commission License No. 2246, Located on the Yuba River in Yuba County, California, and Its Effects on Threatened Central Valley Spring-Run Chinook Salmon (*Oncorhynchus Tshawytscha*) and Central Valley Steelhead (*O. Mykiss*), in Accordance With Section 7 of the Endangered Species Act of 1973, As Amended.* November 4, 2005.



Draft Existing Information Attachment (cont.)

- **Gard, M. 2007.** *Flow-habitat relationships for spring and fall-run Chinook salmon and steelhead/rainbow trout spawning in the Yuba River.* Draft report prepared by the Energy Planning and Instream Flow Branch of the USFWS, Sacramento, CA. April 19, 2007.
- **Lindley, S., R. Schick, E. Mora, P. B. Adams, J. J. Anderson, S. Greene, C. Hanson, B. P. May, D. McEwan, R. B. MacFarlane, C. Swanson, and J. G. Williams. 2007.** *Framework for Assessing Viability of Threatened and Endangered Chinook Salmon and Steelhead in the Sacramento-San Joaquin Basin.* San Francisco Estuary & Watershed Science Volume 5: California Bay-Delta Authority Science Program and the John Muir Institute of the Environment.
- **YCWA. 2007.** *Draft Environmental Impact Report/Environmental Impact Statement for the Proposed Lower Yuba River Accord.* Prepared for the Department of Water Resources, Bureau of Reclamation and Yuba County Water Agency by HDR|SWRI. June 2007.
- **Gard, M. 2008a.** *Flow-habitat relationships for juvenile spring/fall-run Chinook salmon and steelhead/rainbow trout rearing in the Yuba River.* Draft report prepared by the Energy Planning and Instream Flow Branch of the U.S. Fish and Wildlife Service, Sacramento, CA, dated August 12, 2008.



Draft Existing Information Attachment (cont.)

- **Gard, M. 2008b.** *Sensitivity analysis for flow-habitat relationships for steelhead/rainbow trout spawning in the Yuba River. Draft report prepared by the Energy Planning and Instream Flow Branch of the U.S. Fish and Wildlife Service, Sacramento, CA, dated October 17, 2008.*
- **NMFS. 2009.** *Draft Recovery Plan for the Evolutionarily Significant Units of Sacramento River Winter-run Chinook Salmon and Central Valley Spring-run Chinook Salmon, and the Distinct Population Segment of Central Valley Steelhead. National Marine Fisheries Service, Southwest Regional Office, Sacramento, California. October 2009.*
- **CDFG and PG&E. 2009.** *Draft Habitat Expansion Agreement for Central Valley Spring-Run Chinook Salmon and California Central Valley Steelhead. November 2009.*



Draft Existing Information Attachment (cont.)

Ongoing Data Collection, and Monitoring and Evaluation Activities

- Lower Yuba River Monitoring and Evaluation Program (M&E Program)
- CDFG Scale Aging Program
- CDFG Angler Surveys
- YCWA Lower Yuba River Redd Dewatering and Fry Stranding Monitoring and Evaluation
- CDFG Steelhead/Rainbow Trout Acoustic Tagging and Tracking Survey



Lower Yuba Accord Agreements

The Lower Yuba River Accord

Three Distinct, but Inseparable Agreements

Fisheries Agreement

Lower Yuba River fisheries
protection and enhancement

Water Purchase
Agreement

Supplemental water supply for
EWA, DWR, and Reclamation

Conjunctive Use
Agreements

Enhanced integration of New
Bullards Bar Reservoir and local
water district operations



Accord Agreement Structure

Fisheries Agreement Overview - RMT



- RMT structure
 - YCWA funding of RMF (\$6,000,000)
 - All parties will participate in RMT (CDFG, NMFS, PG&E, NGO's, USFWS, YCWA, and occasionally DWR)
 - RMT members will participate in Yuba River Project operations decisions
 - All parties will cooperate in designs of fisheries studies, data collection actions and habitat-enhancement projects
 - Parties will work cooperatively to try to craft a FERC relicensing flow proposal by 2016



RMT Infrastructure & Programs

Summary – May 2010

Programs

- RMT meetings: bi-monthly
- M&E Framework Document – living document
- Study Plans, developed or in development:
 - VAKI, RST's, Escapement, Redd surveys, Otoliths, Mesohabitat, Substrate & Cover, Riparian, Acoustic tagging underway
 - Genetics, snorkel survey in development
- Grants: Mapping, CDFG secured, looking for more
- Outreach: Conferences, dedicated seminars (RMT Symposium June 29), web site
- Oversight & participation in other Lower Yuba issues:
 - RMT consultations on flow changes & flow schedules
 - RMT review & comment on other YCWA studies
 - RMT participation in collaborative studies (Lower Yuba sonar/LIDAR mapping with PG&E & YCWA)



RMT Infrastructure & Programs Summary – May 2010

Infrastructure

- Web sites: Internal (RMT only), and external
- Office (approx 1000 sf), Shop 40 x 60 + yard, near Yuba/Daguerre
- Server-supported computer system, VPN + workstations
- Multiple trucks, boats, kayaks, rafts, small gear
- Dedicated budget (in reserved account)
- PSMFC supported staffing & minor purchases
- Reasonably streamlined admin, reporting, accounting & contracting system

Personnel

- Regular RMT Participation: YCWA, CDFG, NMFS, USFWS, SYRCL (for NGO's), PG&E
- Staffing - PSMFC staff including:
 - Project Manager
 - Biologists
 - Crew Lead, full time field staff
 - Seasonal Field Staff
 - Total 9 FTE's

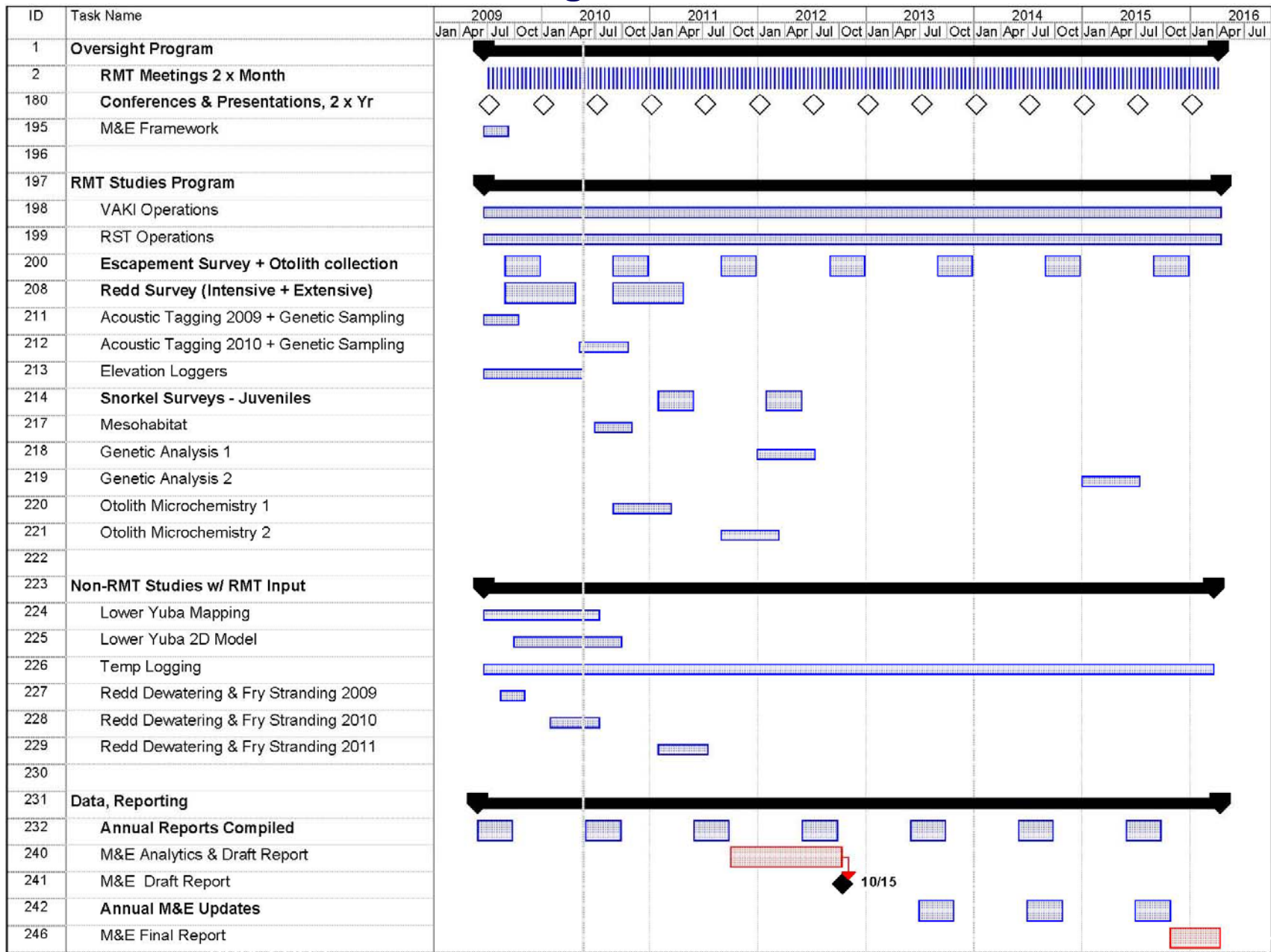


Current Tasks and Work in Progress

- Studies – Summer 2010
 - VAKI Riverwatcher
 - Acoustic tracking, Genetic Samples
 - Substrate mapping
 - Riparian mapping
 - Mesohabitat mapping
- Studies – Fall 2010, add:
 - Escapement survey & otolith collection
 - Redd surveys
- Other Tasks
 - Deep water redd methodology testing
 - VAKI system upgrades
 - Map compilation & completion, additional tasks
 - Annual reports (5)
 - Updates to field study protocols
 - Outline restoration pilots



Draft Long Term Work Plan



10/15

Monitoring & Evaluation Plan

Goals

- Evaluate whether implementation of the Yuba Accord
 - Maintains fish in **good condition**
 - Promotes **viable salmonid populations**
- Identify and Evaluate
 - Flow and water temperature relationships with
 - Fish populations
 - Aquatic habitat attributes



Monitoring & Evaluation Plan

Framework

California Fish & Game Code § 5937

*“...sufficient water at all times to pass through a fishway... over, around, or through the dam, to keep in **good condition** any fish that may be planted or exist below the dam.”*

The critical term “**good condition**” is not defined in the Fish and Game Code

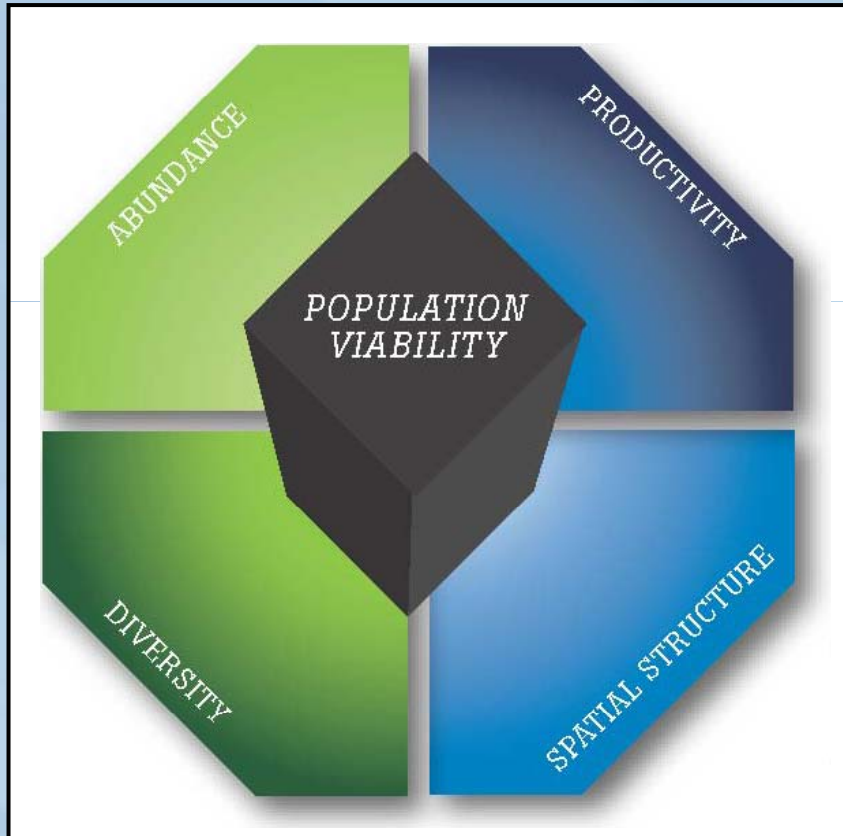
Previous definitions of “good condition”

- Within the context of adjudication of instream flows (Putah Creek)
- SWRCB proceedings (Streams That Are Tributary to Mono Lake)



Monitoring & Evaluation Plan

Viable Salmonid Populations

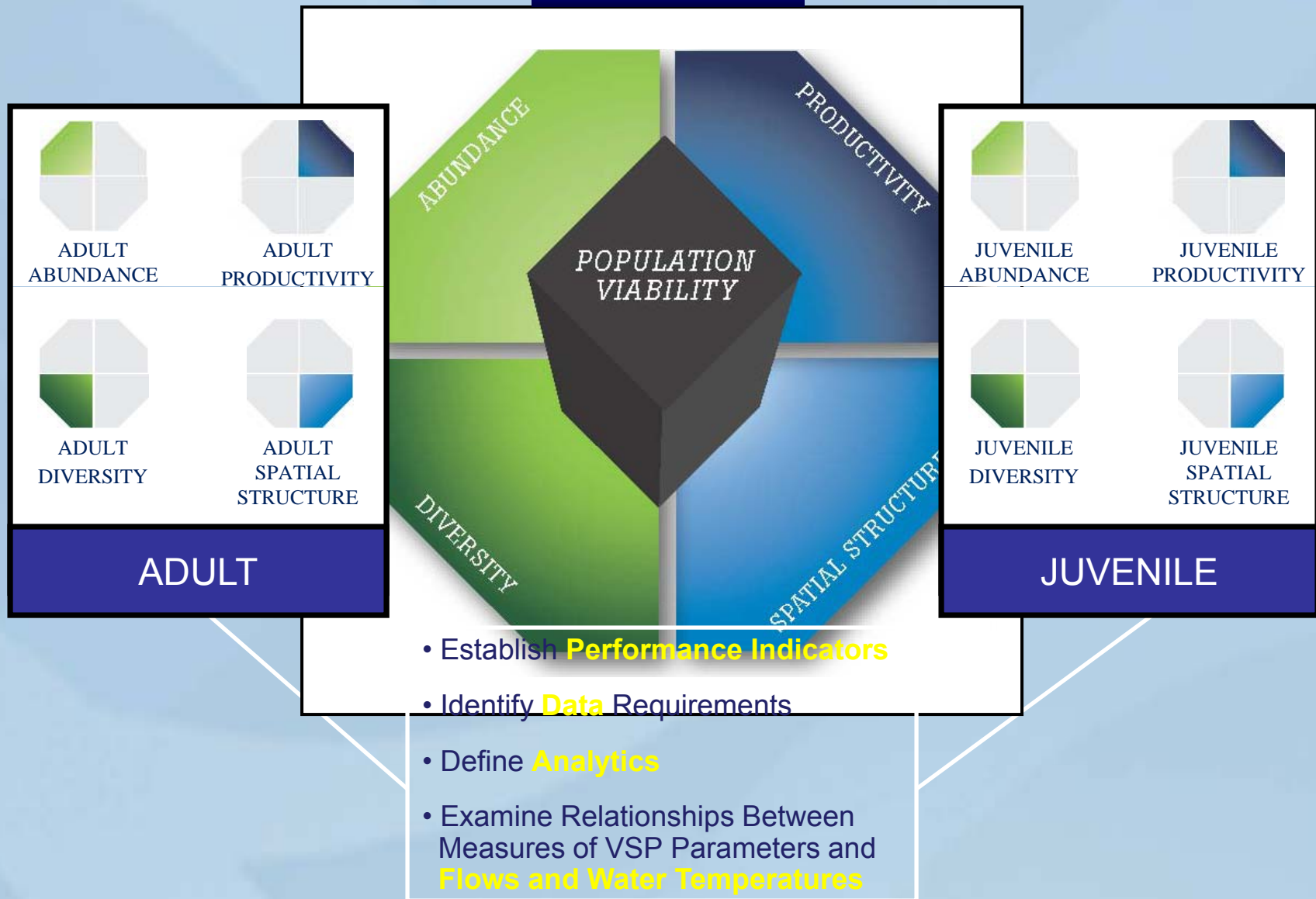


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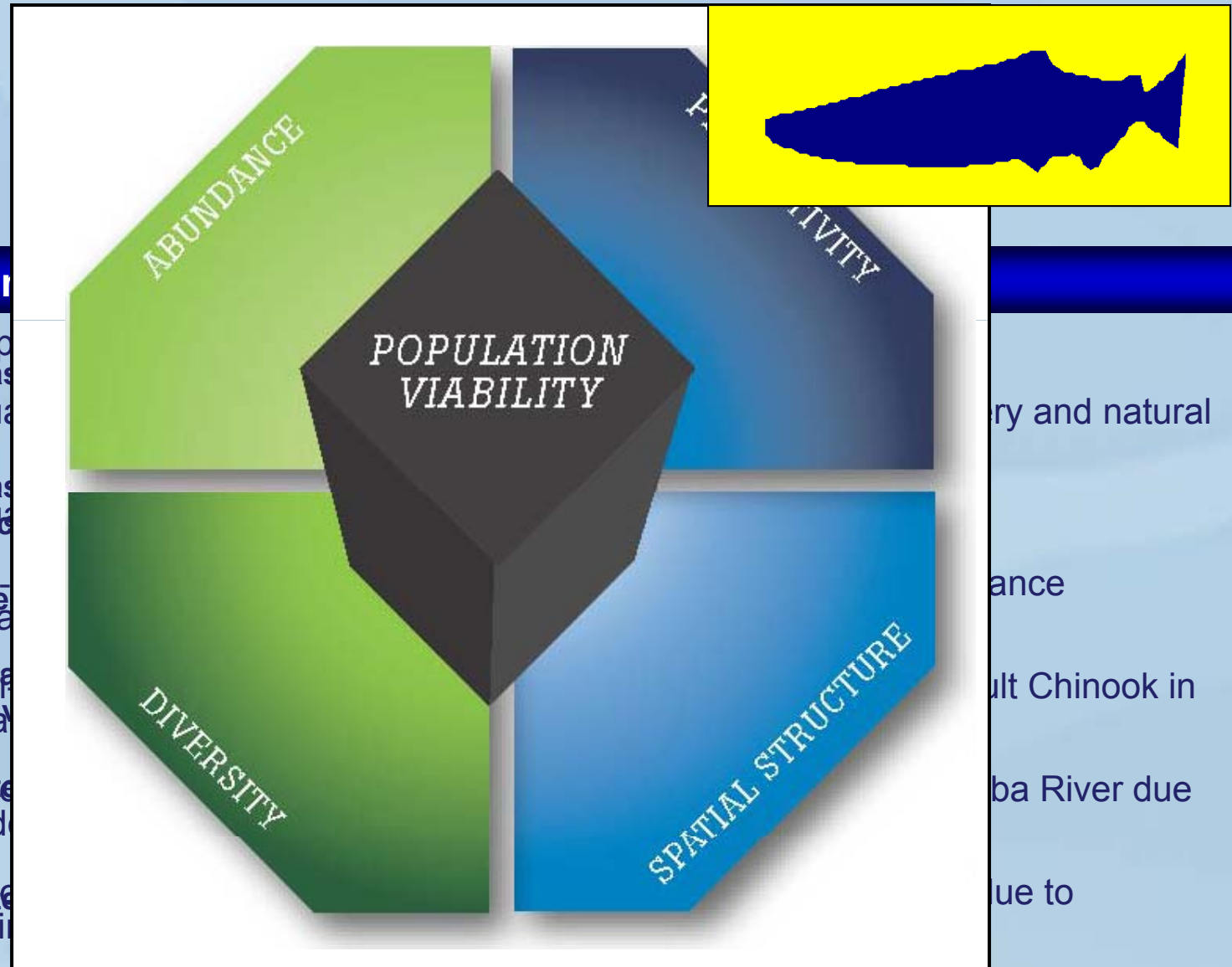


Viable Salmonid Populations

PROCESS



Viability Salmonid Populations



Relevance In

- 1) Differentiate sp
 - 1) Stable or increas
 - 2) Estimate annual
 - 2) Stable or increas
 - 3) Estimate annual
 - 4) Examine multi-
 - 3) No sustained de
 - 4) Multi-year annual
 - 5) Compare multi-
 - 6) Evaluate moderate
 - 7) Evaluate extreme
- (Lindley et al. 2007).

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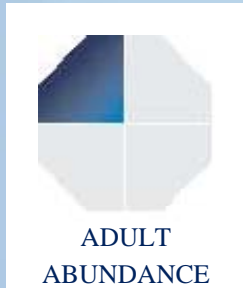
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Viable Salmonid Populations



Analytics

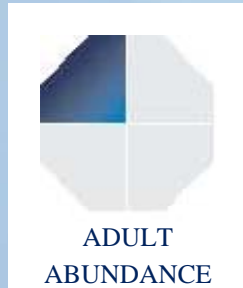
2) Estimate annual abundance of spring-, fall-, and late fall-run Chinook of hatchery and natural origin

Estimate the annual **abundance of spring-run and fall-run Chinook** using the modified Schaefer method and run differentiation (**Carcass Survey**), and harvest (**Angler Survey**).

Use **otolith microstructure and microchemistry, and CWT analyses** (**Carcass Survey**) to calculate the proportion of hatchery-origin spring- and fall-run Chinook, applied to abundance estimates.

Estimate the **abundance of hatchery-origin late fall-run Chinook** immigrating past DPD using the annual abundance estimate and observed adipose fin-clipped fish (**Vaki Riverwatcher System**).

Viabile Salmonid Populations



Analytics

3) Estimate the annual abundance of steelhead of hatchery and natural-origin

Estimate the **annual abundance** by summing the number of steelhead passing DPD (**Vaki Riverwatcher System**), redds below DPD (**Redd Survey**) and applied **spawner / redd ratio**, and harvest (**Angler Survey**).

Estimate the **abundance of hatchery-origin** steelhead by applying the proportion of adipose fin-clipped steelhead observed (**Vaki Riverwatcher System**) to the annual abundance estimate.



Viabile Salmonid Populations



Analytics

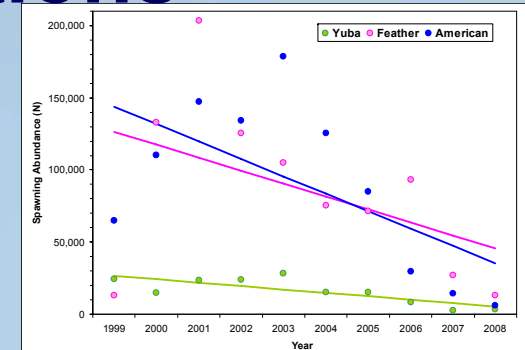
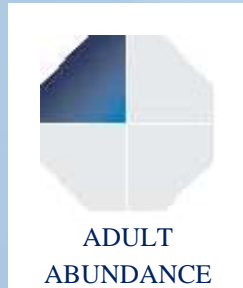
- 4) Examine multi-year trends in the total, and hatchery and natural-origin abundance estimates of each run of Chinook and steelhead

Examine whether the total, and hatchery and natural-origin abundance estimates change over time using **linear regression**.

Determine if the **slope parameter** of the multi-year annual run size regression analysis is **significantly $\neq 0$** for each run of hatchery and natural-origin Chinook and steelhead.



Viabile Salmonid Populations



Analytics

5) Compare multi-year trends in annual abundance estimates of each run of adult Chinook in the lower Yuba River with other Central Valley rivers

Obtain **annual abundance estimates** of each run in Central Valley rivers from GRANDTAB.

Examine **multi-year trends** for each run in Central Valley rivers using linear regression analysis.

Test for **significant differences in slope parameters** of the regression analyses for each run using an Analysis of Covariance approach.



Viable Salmonid Populations



Analytics

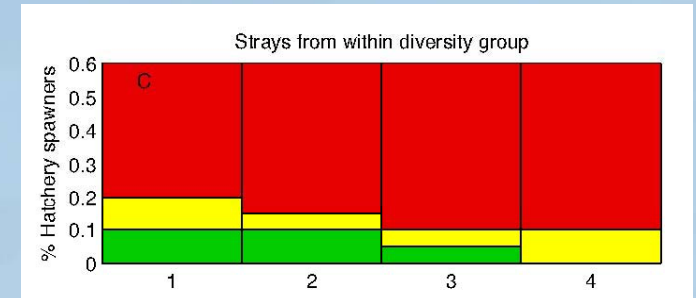
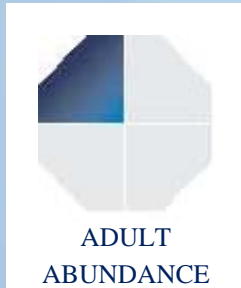
6) Evaluate extinction risk of Chinook and steelhead populations in the lower Yuba River due to population decline

Evaluate **extinction risk** based on **population decline criteria**, incorporating **growth rate** (percent per year) and **population size** (Lindley *et al.* 2007).

- High risk :** Run size ≤ 250 or precipitous decline (decline within last 2 generations to ≤ 500 , or > 500 but declining at a rate $\geq 10\%$ per year)
- Moderate risk :** $250 < \text{run size} \leq 2,500$ or chronic declining trend or depression (decline in run size ≤ 500 but now stable)
- Low risk :** Run size $> 2,500$ and no declining trend apparent or probable



Viable Salmonid Populations



Analytics

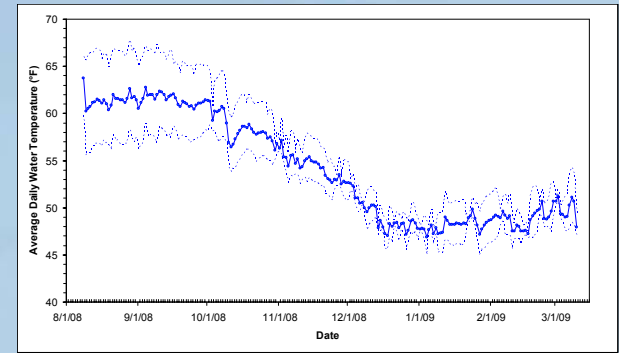
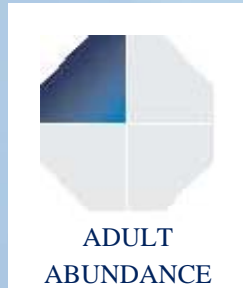
- 7) Evaluate extinction risk of natural-origin Chinook and steelhead populations due to hatchery straying (Lindley *et al.* 2007)

Calculate the **average fraction of naturally-spawning fish of hatchery- origin** over 1-4 generations.

Compare average fractions to those fractions that indicate the **extinction risk** for the natural-origin population **based upon specific hatchery and geographic origin**.



Viabile Salmonid Populations



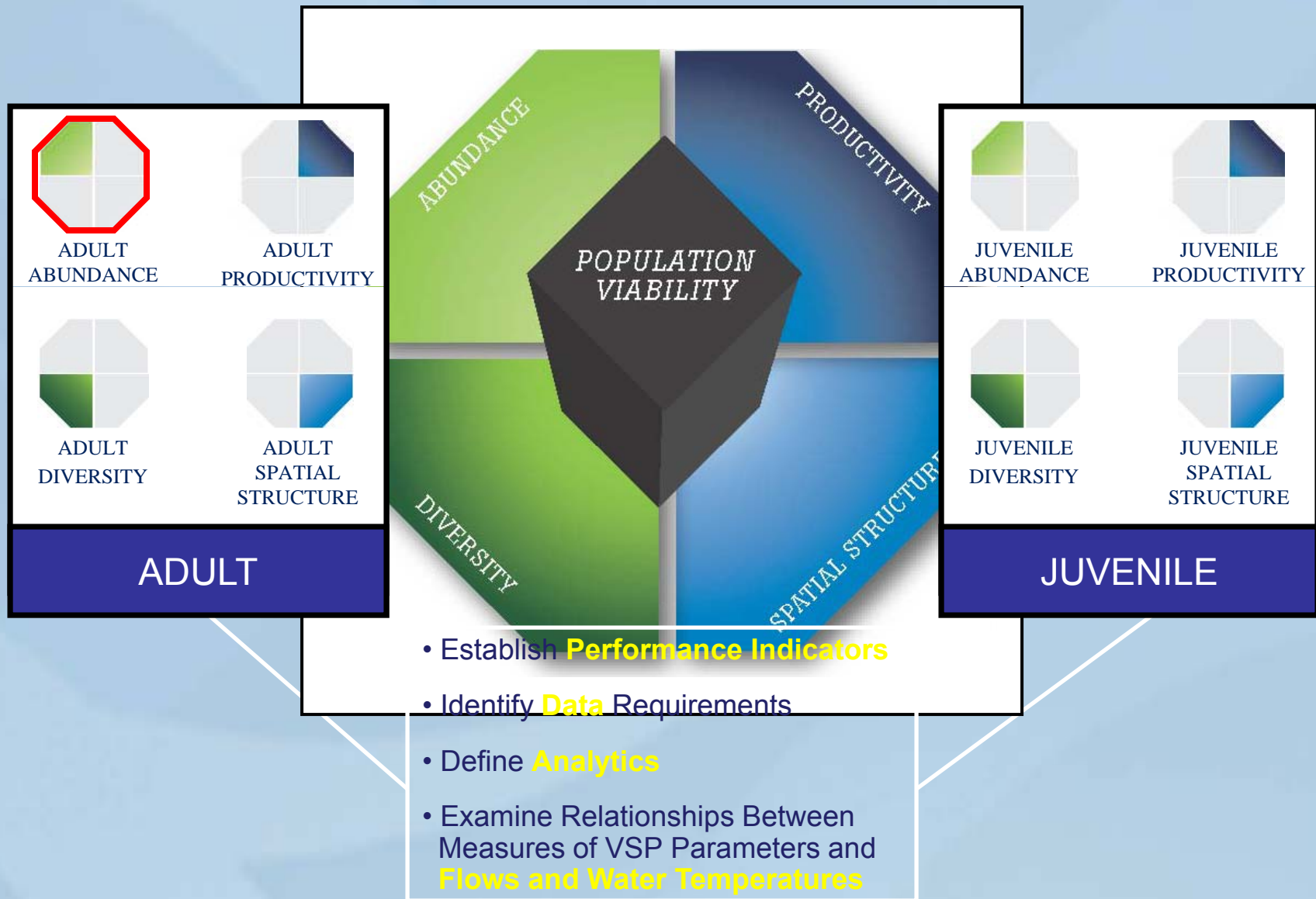
Flow and Temperature Relationships

- 1) Evaluate “attraction” flows and water temperatures on the straying of salmonids (Vaki Riverwatcher System, Carcass Surveys)
- 2) Compare the magnitude of flows and water temperatures with
 - Timing of salmonid immigration (Vaki Riverwatcher System)
 - Timing and distribution of salmonid spawning (Redd Surveys)
 - Annual total number of redds and redd superimposition indices (Redd Surveys)
- 3) Compare water temperatures to water temperature suitability index values for immigration, spawning and embryo incubation (Vaki Riverwatcher System, Redd Surveys)



Viability Salmonid Populations

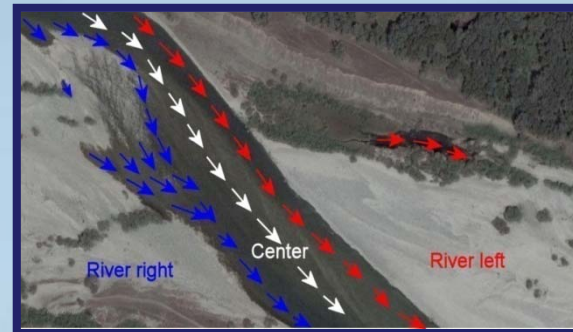
PROCESS



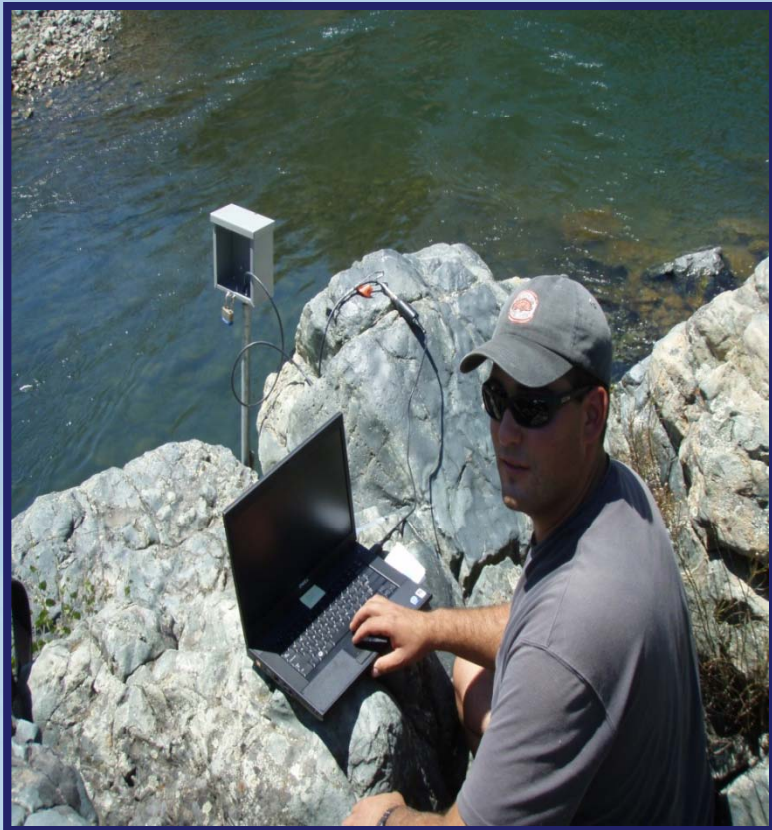
Yuba Accord M&E Program

Study Plans – Data Collection Protocols and Procedures

- Flow & Water Temperature Monitoring
- Morphological Unit & Mesohabitat Classification
- Digital Elevation Model
- 2-D Hydraulic Modeling
- Substrate & Cover Classification & Mapping
- Acoustic Tracking
- Genetic Analyses
- Vaki Riverwatcher System Monitoring
- Chinook Salmon Carcass Surveys
 - Otoliths, Scales, Tissue, CWT Sampling
- Redd Surveys
 - Superimposition
- Juvenile Snorkel Surveys
- Rotary Screw Trapping
- Riparian Vegetation Mapping



Flow and Water Temperature Monitoring



- 13 temperature monitoring stations in lower Yuba River
- USGS gaging stations
 - Smartsville
 - Marysville
- Four level recorder stations



Mesohabitat / Substrate and Cover Mapping

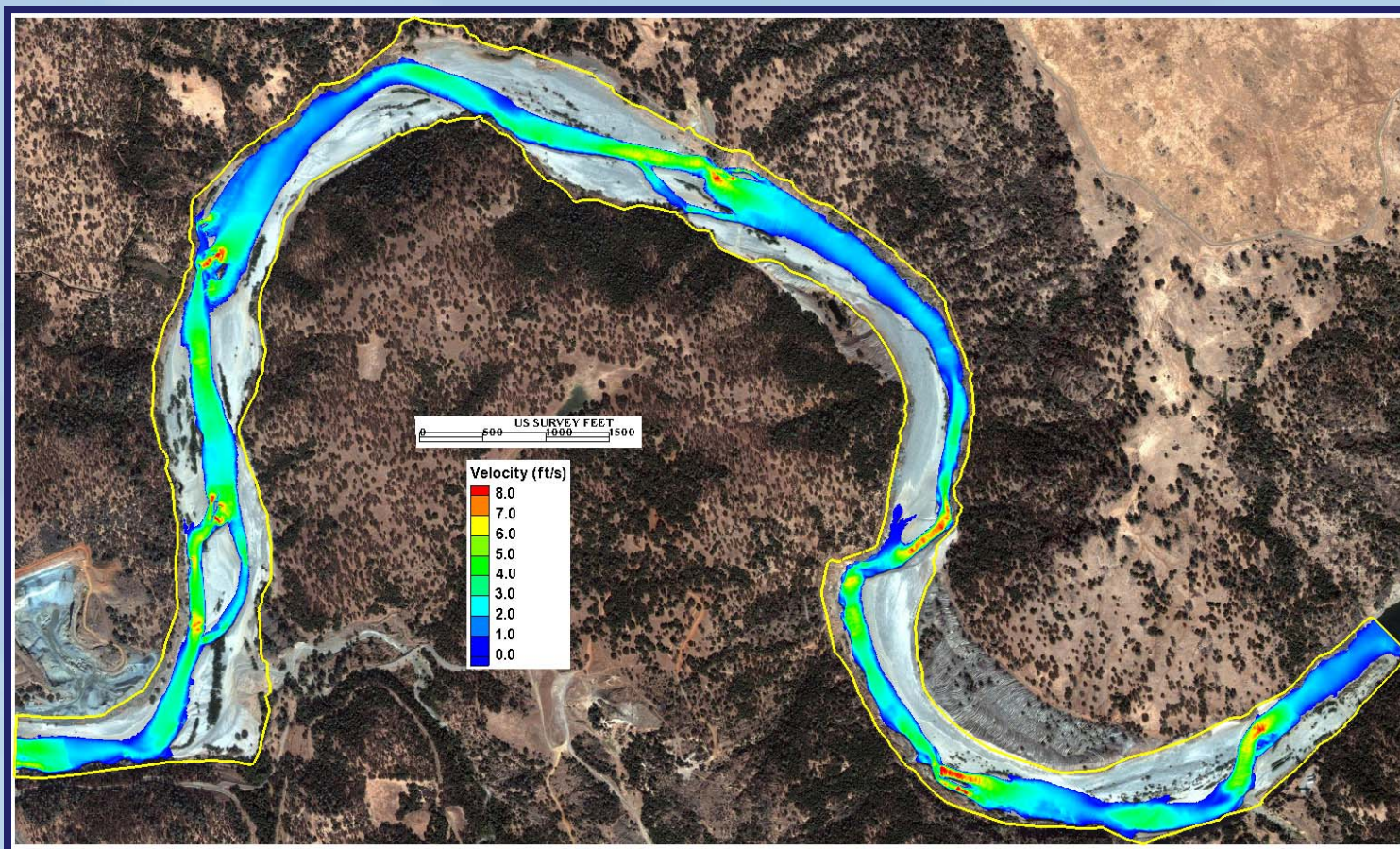


Photo courtesy of Dr. Greg Pasternack, UCD



Acoustic Tagging

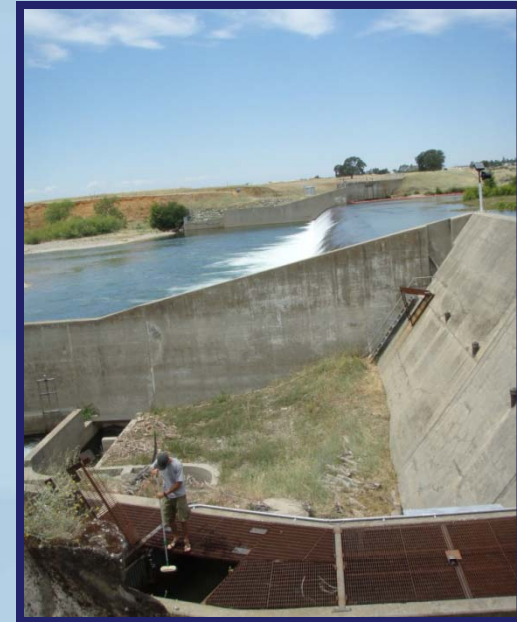


- CDFG grant for \$210,000 for acoustic tagging 2010-11
- Target of 30 spring-run and 30 fall-run Chinook salmon to be acoustic tagged during 2010
- Static and roving surveys
- Coordinating with CDFG, DWR and UC Davis



Vaki Riverwatcher Monitoring

- Upstream and downstream passage at DPD (run timing, migration patterns)
- Data used in conjunction with other monitoring activities



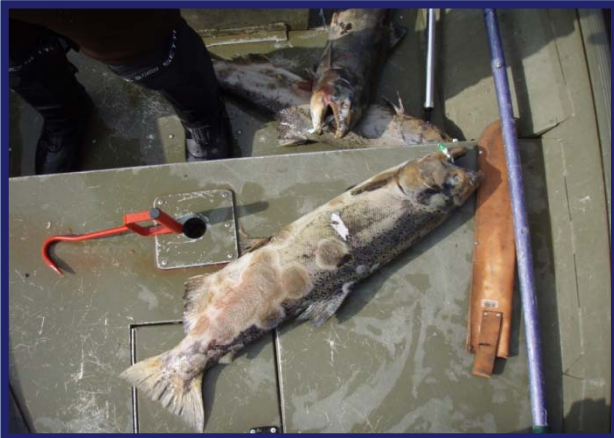
Redd Surveys



- Redd attributes and superimposition
- Spatial and temporal spawning activities
- Habitat utilization



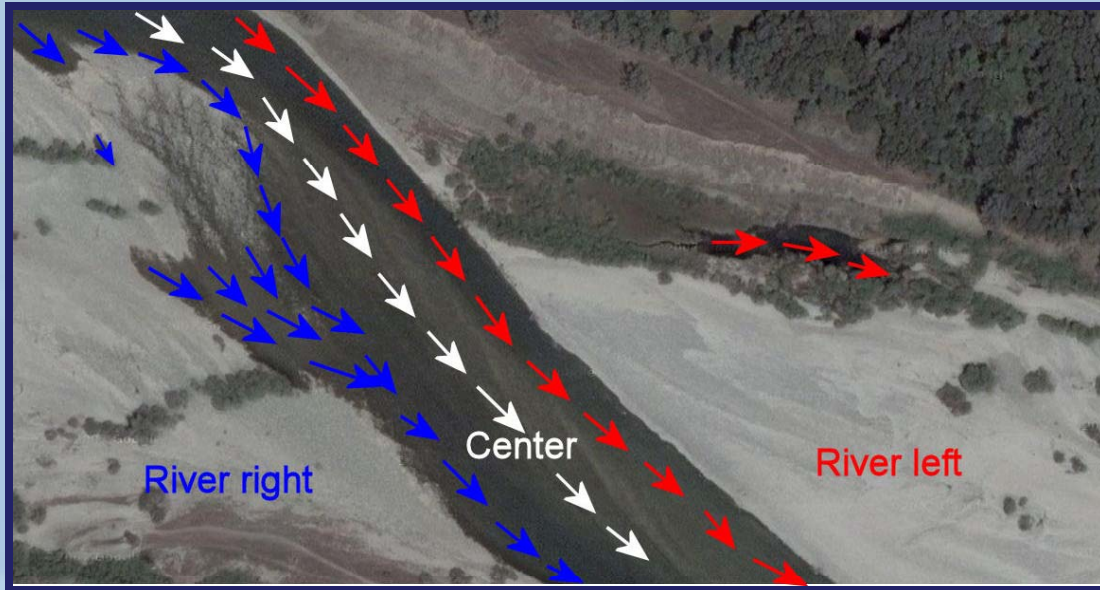
Escapement Survey



- Lower Yuba River surveyed since 1953
- Mark/recapture methodology
- Coded-wire tags
- Scale samples – age structure
- Tissue samples – genetic analyses
- Otolith samples – straying, age and growth



Snorkel Survey



- Protocol and Procedure document in development
- Juvenile abundance, distribution, and habitat utilization



Rotary Screw Trapping

- Fish community of lower Yuba River
- Juvenile salmonid emigration patterns
- Mark/recapture tests for abundance estimation
- Temporarily suspended pending second sampling location



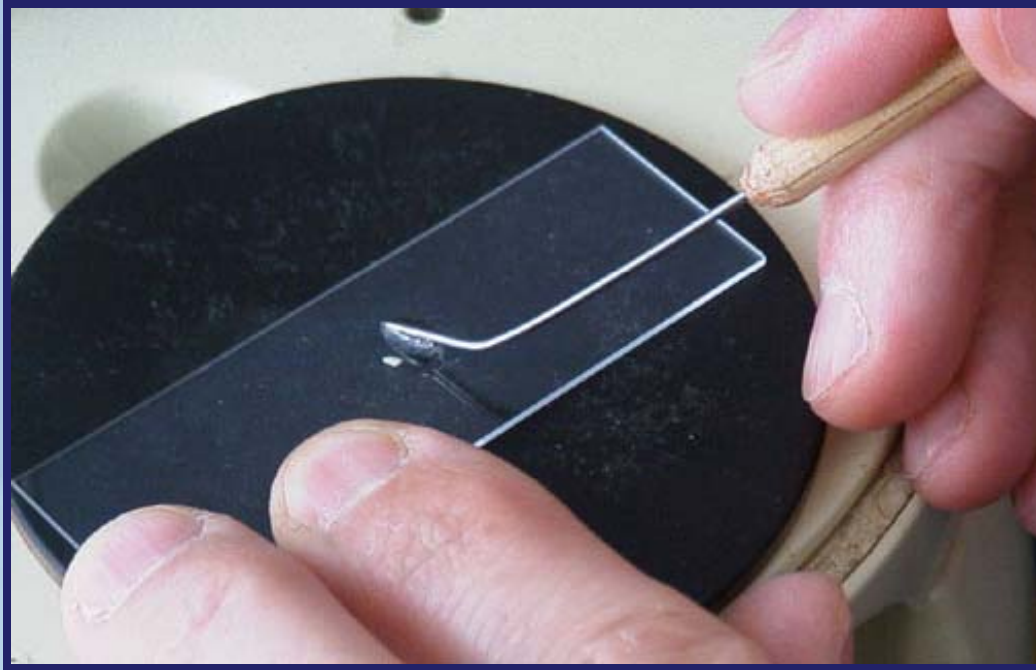
Genetic Sampling



- 43 genetic samples collected during acoustic tagging sampling 2009
- Genetic sampling of all fresh carcasses during entire escapement survey
- Compare genetic structure between Chinook salmon spring- and fall-runs in the Yuba River
- Compare genetic structure of Yuba River Chinook salmon with other Central Valley runs



Otolith Microchemistry

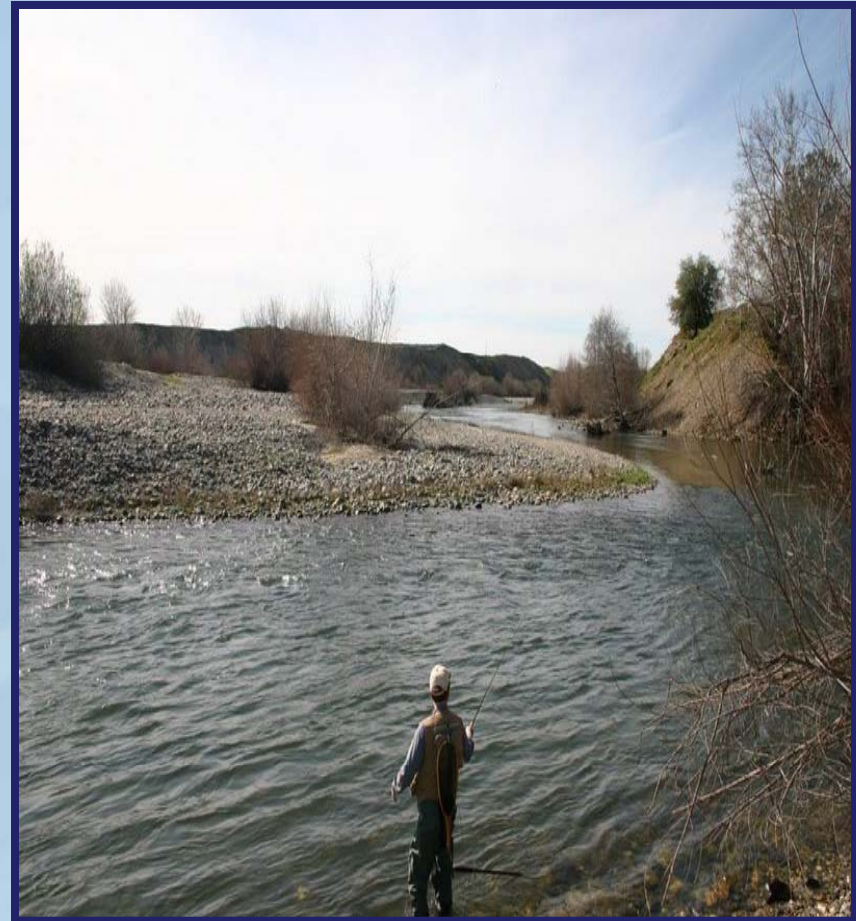


- CDFG grant funding \$100K
- Analysis collaborative effort between RMT & UC Davis
- A minimum of 100 samples per year to be analyzed




Angler Survey


- Coordination with CDFG Central Valley Angler Survey Program
- Incorporate harvest data into estimates of abundance for salmonids



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YRMT Sign In |

 **Lower Yuba River Accord
River Management Team
Planning Group**



[Home](#)

RMT Documents & Data

- Yuba Accord Documents
- Study Protocols
- Annual Reports
- M & E Plan and Analytics
- RMT Photos
- RMT Data

General Lower Yuba Documents & Data

- General Studies & Reports
- General Photos
- General Data

Public Events Calendar

- Lower Yuba River Symposium

PUBLIC WEB SITE FOR THE YUBA RIVER MANAGEMENT TEAM (RMT)

Introduction

Welcome to the web site of the Lower Yuba River Management Team (RMT). The RMT is composed of a Planning and Operations group tasked with implementing a detailed monitoring and evaluation study program for the Lower Yuba River as specified in the Lower Yuba River Accord. The RMT membership is limited to signatories of the Yuba Accord, including the Yuba County Water Agency (YCWA), California Department of Fish & Game (CDFG), National Marine Fisheries Service (NMFS), US Fish & Wildlife Service (FWS), South Yuba River Citizens League (SYRCL), The Bay Institute (TBI), Friends of the River (FOR), Trout Unlimited (TU), Pacific Gas & Electric (PG&E), and the Department of Water Resources (DWR).

Lower Yuba River Accord - Announcements

There are currently no active announcements.

Lower Yuba River Accord - Public Events Calendar

6/29/2010 8:30 AM Second Annual Lower Yuba River Symposium



The Bay Institute

Lower Yuba River Accord - Links

- CDEC Yuba River Gauges
- California Department of Fish and Game
- California Department of Water Resources
- Friends of the River
- NOAA
- PG&E
- The Bay Institute
- Trout Unlimited
- SYRCL
- U.S. Fish & Wildlife Service
- Yuba County Water Agency







Questions?

