



January 21, 2009  
File No. 01030A  
**Electronically Filed**

The Honorable Kimberly D. Bose, Secretary  
Federal Energy Regulatory Commission  
888 First Street, NE  
Washington, D.C. 20426

Re: 2008 Study Implementation Progress Report for the Middle Fork American River Project (FERC Project No. 2079) per 18 CFR § 5.15 (c)(1)

Dear Secretary Bose:

The Placer County Water Agency (PCWA) is submitting this progress report to provide the Federal Energy Regulatory Commission (FERC or Commission) and the stakeholders identified in Attachment A with an update regarding progress made in implementing 28 Technical Study Plans (TSPs) associated with the relicensing of the Middle Fork American River Project (MFP or Project). As required in 18 CFR § 5.15 (c)(1), this report summarizes PCWA's overall progress to date, any variances from the study plans and schedule in implementing the study plans, and any modifications to ongoing studies or new studies proposed by PCWA. This report documents work completed in 2008 and supplements the information provided to the Commission in PCWA's 2007 Study Implementation Progress Report, which was filed on January 22, 2008.

## **Background**

PCWA developed 28 TSPs in collaboration with the stakeholders. The stakeholder-approved TSPs were included in PCWA's Pre-Application Document (PAD), which was filed with the FERC on December 13, 2007 and concurrently distributed to the stakeholders. PCWA received seven comment letters on the PAD. In addition, oral comments on the PAD were provided to PCWA during PCWA's 2007 Study Implementation Progress Report Meeting (February 4, 2008) and during the FERC's Public Scoping Meeting (March 4, 2008). These comments resulted in revisions to one of the 28 TSPs, the AQ 1 - Instream Flow TSP. The revised AQ 1 - Instream Flow TSP was filed with the FERC and concurrently distributed to the stakeholders on May 23, 2008, along with PCWA's responses to comments on the PAD and responses to FERC's Request for Additional Information.

On May 23, 2008, PCWA filed a request to expedite the Study Plan Determination Process and to waive the Commission's regulations in 18 CFR § 5.11. On June 2, 2008, the FERC issued a request for comments on PCWA's request. No comments were received. Therefore, the FERC granted PCWA's waiver request by letter dated June 18, 2008. On July 18, 2008, the FERC issued a study plan determination. Specifically, the FERC approved the TSPs included in the PAD, the revised Instream Flow TSP, and Part 1 of the LAND 1 - Transportation System TSP. Parts of the LAND 1 TSP that pertain to non-Project general access roads were excluded from the FERC's approval because the FERC does not consider them part of the Project.

## **Study Implementation Progress**

Study progress in 2008 is summarized in Attachment B. Attachment B is organized by TSP and describes: 1) study elements completed/data collected; 2) any technical study plan variances; 3) outstanding study elements; 4) proposed modifications; and 5) proposed new studies. In addition, Attachment B includes a "Work Group Update" column that describes what type of study information has been shared with the Technical Working Groups (TWGs) to date, and when the information was provided. Attachment B also includes information that was presented in the 2007 Study Implementation Progress Report for reference and context. The rows in the table containing 2007 information are shaded grey.

The TSP schedules are graphically depicted in Attachment C. The TSP schedules were included in the PAD and revised schedules were included in PCWA's 2007 Study Implementation Progress Report. The schedules included in Attachment C have been updated to show how the studies have progressed over time and how PCWA proposes to proceed through May 2010.

With a few exceptions, all of the TSPs are progressing as outlined in the FERC-approved TSPs. Any variances in study plan implementation are summarized in Attachment B and are briefly summarized below, organized by the following three categories: reporting, voluntary enhancements, and study approach refinements. As indicated in Attachment B, PCWA does not propose any modifications to the TSPs or any new studies.

### Reporting

Reporting variances are summarized in Attachment B. In general, reporting variances have occurred because additional time was needed to complete field studies, consult with resource agencies, acquire data from existing sources, or to analyze data. Updated TSP Implementation Schedules are included in Attachment C.

### Voluntary Enhancements

PCWA voluntarily conducted additional study elements that were not identified in the FERC-approved TSPs. These voluntary enhancements are identified in Attachment B under AQ 1 - Instream Flow, AQ 6 - Fish Passage, and TERR 3 - Noxious Weeds.

## Study Approach Refinements

Several minor variances to the overall scope of work outlined in the TSPs or refinements to study approach have occurred. These variances and/or refinements are identified in Attachment B and are briefly explained in the following.

- AQ 3 - Macroinvertebrates and Aquatic Mollusks

*The TSP stated that the macroinvertebrate metrics will be reported as outlined in Rehn et al. (2007). The macroinvertebrate metrics were reported as outlined in an updated study by Rehn (2008).*

- REC 4 - Stream-based Recreation Opportunities

*The REC 4 TSP indicated that PCWA would assemble a group of anglers to assess fishing conditions over a range of flows at specific locations in the peaking reach and on the Rubicon River below Ellicott Bridge. Based on the information developed during an angler focus group session held on May 20, 2008, PCWA proposed to address flow-related fishing issues in the peaking reach by analyzing ramping conditions in the peaking reach in lieu of assembling a group of anglers to assess fishing conditions. PCWA is not proposing to conduct angler flow studies on the Rubicon River below Ellicott Bridge because sufficient information to characterize flow-related impacts to anglers was developed during the angler focus group session.*

*The REC 4 TSP also indicated that PCWA would assemble a group of stream crossing users to assess stream crossing conditions over a range of flows at specific locations in the peaking reach. Based on the information developed during the focus group session held on May 12, 2008, PCWA proposed to develop stage/discharge relationships at each of the stream crossing locations in lieu of assembling a group of stream crossing users to assess crossing conditions. PCWA believes this approach will yield information that more directly addresses the issues associated with stream crossing.*

*These refinements were documented in writing (Attachment D) and provided to the Recreation TWG members by e-mail on July 14, 2008 for review. The refinements were then discussed and supported by the Recreation TWG at the July 21, 2008 meeting.*

- TERR 2 - Special Status Plants

*The TERR 2 TSP indicated that PCWA would conduct special-status fungi surveys. However, surveys for special-status fungi were not conducted because the habitat that they occur in (mature mixed-conifer forests) is not present in the study area where maintenance activities occur or where potential project betterments would be constructed. Information about the vegetation communities present in the study area as determined through mapping performed in conjunction with the TERR 1 TSP, was presented to the Terrestrial TWG on March 3, 2008. Using this information, the TWG determined that it would not be necessary to conduct surveys for special status fungi.*

## Contingency Studies

Eight of the TSPs identified potential contingency studies. To date five of the contingency studies have been initiated. The remaining three contingency studies are under consideration pending the results of ongoing studies and/or consultation with the stakeholders. The following briefly describes the status of each of the contingency studies. This information is also included in Attachments B and C.

- AQ 2 – Fish Population

*As outlined in the AQ 2 – Fish Population TSP, fish population sampling was conducted in 2007 to identify the spatial distribution and abundance of fish species, and again in 2008 to identify the temporal abundance of fish species. The AQ 2 TSP indicated that a third year of population sampling would be conducted, depending upon the 2007 and 2008 fish population sampling results. The 2007 and 2008 data are currently under review and PCWA will consult with the Aquatic TWG in March 2009 to determine if additional sampling is necessary.*

- AQ 7 - Entrainment

*The AQ 7 - Entrainment TSP specified a process for the Aquatic TWG to collaboratively determine if direct sampling of entrainment was needed to supplement the indirect (potential) entrainment estimates developed at Project facilities. During the July 8, 2008 meeting, the Aquatic TWG determined that direct entrainment sampling was necessary to complete the AQ 7 -TSP. PCWA, in collaboration with the Aquatic TWG, developed a scope of work and schedule for direct entrainment sampling. The final draft scope of work was discussed at the September 8, 2008 TWG. It was then revised to reflect comments discussed during the meeting and then distributed to the Aquatics TWG by e-mail on September 16, 2008 for review and approval. No comments were received. Accordingly, as agreed to by the Aquatics TWG, the scope of work was deemed final and is included in Attachment E for reference. Direct sampling is proceeding as outlined in the study plan. A draft report documenting the results of this effort will be distributed to the stakeholders for review and comment in August 2009.*

- AQ 9 – Geomorphology

*The AQ 9 – Geomorphology TSP indicated that PCWA would consult with the Aquatic TWG to determine if additional empirical studies are necessary to characterize sediment transport under different flow regimes. If empirical studies are warranted, PCWA will develop the scope of the studies in consultation with the Aquatic TWG. The study methods are likely to include one or a combination of the following approaches: (1) placement and monitoring of tracer gravels; (2) installation and monitoring of pit traps; and/or (3) installation and monitoring of scour chains. If determined to be necessary, these studies would be initiated in April 2009.*

- AQ 11 - Water Quality

*The AQ 11 - Water Quality study was implemented during the spring and fall, 2007. Among other things, the study included a screening level assessment of methylmercury concentrations in sport fish muscle tissue at four Project reservoirs and in the Middle*

Fork American River downstream of Oxbow Powerhouse. The AQ -11 Water Quality TSP specified a contingency study process that would be implemented if methylmercury concentrations exceeded screening guidelines.

After reviewing the results of studies conducted in spring and fall of 2007, the Aquatic TWG determined that additional fish tissue methylmercury sampling was warranted. Accordingly, PCWA developed a study plan describing the scope of work for additional sampling of sport fish muscle tissue for methylmercury analysis. The draft scope of work was discussed at the September 8, 2008 TWG. It was revised to reflect comments discussed during the meeting and then distributed to the Aquatics TWG by e-mail on September 16, 2008 for review and approval. No comments were received. Accordingly, as agreed to by the Aquatics TWG, the scope of work was deemed final and is included in Attachment F for reference.

Field work associated with this effort was conducted during the fall of 2008 and a draft report documenting the results of this effort will be distributed to the stakeholders for review and comment by April 30, 2009.

- AQ 12 - Special Status Amphibian and Aquatic Reptiles

The AQ 12 – Special Status Amphibian and Aquatic Reptiles TSP included a contingency study to conduct additional FYLF surveys in 2008 depending upon the results of surveys conducted in 2007. After reviewing the results of the 2007 AQ 12 - Special Status Amphibian and Aquatic Reptile TSP, the Aquatic TWG determined that it was only necessary to develop additional FYLF breeding timing data at the 2D modeling validation study sites. This data was collected during the spring of 2008 and will be reported in the AQ 1 - Instream Flow TSR, a draft of which is scheduled to be distributed in June 2009.

- CUL 1 - Cultural Resources

The CUL 1 – Cultural Resources TSP included a contingency to conduct studies to determine whether any of the resources identified through field surveys are eligible for inclusion on the National Register of Historic Places (NRHP). After consulting with the stakeholders, PCWA determined that eligibility studies are necessary at select sites. PCWA developed a CUL 1 - Cultural Resources Evaluation Plan and distributed it to the stakeholders for review and comment on June 18, 2008. The final plan was distributed to the stakeholders on August 28, 2008 and is included in Attachment G for reference, excluding confidential material. Field work associated with this effort was completed during the summer and fall of 2008 and research is ongoing. The eligibility results will be documented in a draft report that will be distributed to the stakeholders for review and comment by April 1, 2009.

- REC 4 – Stream-based Recreation Opportunities

The REC 4 TSP indicated that PCWA would determine the need for flow studies in the bypass reaches based on information developed through the focus group and other sources. Boating opportunities in the bypass reaches were discussed during a whitewater boating focus group session held on April 23, 2008. PCWA is continuing to interview boaters to refine the boatable flow ranges expressed by the focus group participants to develop additional information about the opportunities in the bypass

reaches, including boatable flow ranges, if available. In addition, PCWA is compiling hydrologic information that can be used in conjunction with the boatable flow ranges expressed by the focus group participants to determine how Project operations do or do not affect boating opportunities in the bypass reaches. The results of this assessment will be discussed with the Recreation TWG in April 2009 to determine if whitewater boating studies on any of the bypass reaches are necessary.

- REC 5 - Visual Quality Assessment

*This TSP included a contingency study involving the photo-documentation of water level changes at Ralston Afterbay. This effort was contingent upon summarizing water level changes at Ralston Afterbay based upon the hydrologic record. PCWA decided to photograph the afterbay at various water levels in addition to summarizing the reservoir hydrology. The results of this effort will be documented in the REC 5 - Visual Quality Assessment TSR, a draft of which will be distributed in February 2009.*

### Next Steps

PCWA will provide a study implementation progress report update during the Plenary meeting to be held from 10:00 AM to 12:00 PM on February 2, 2009 at the Canyon View Community Center (Foothills Room) located at 471 Maidu Rd, Auburn, California. During this meeting, PCWA will discuss overall progress of study plan implementation and address any stakeholder comments. PCWA does not propose any study plan modifications but will provide the stakeholders with an opportunity to discuss any proposed modifications during the meeting.

PCWA will distribute a meeting summary to the Commission and stakeholders for review by February 17, 2009. Any participant or the Commission staff may file comments on PCWA's meeting summary within 30 days, setting forth any disagreement and any modification to ongoing studies or new studies proposed.

PCWA looks forward to working with Commission staff and MFP stakeholders as the relicensing proceeds. If you have any questions regarding the enclosed information, please contact Mal Toy, MFP Relicensing Manager, at (530) 823-4889.

Sincerely,  
PLACER COUNTY WATER AGENCY



Mal Toy  
MFP Relicensing Manager

Attachments:

- Attachment A - PCWA Progress Report Distribution List
- Attachment B - 2008 Technical Study Plan Progress Report Summary Table
- Attachment C - Technical Study Plan Implementation Schedules
- Attachment D - July 1, 2008 Update on the REC 4 - Stream Based Opportunities  
Technical Study Plan Focus Group Sessions and Refined Flow Study  
Approaches
- Attachment E - AQ 7 - Entrainment Direct Sampling Approach (Contingency Study)
- Attachment F - AQ 11 - Water Quality Contingency Sampling Protocol (Contingency  
Study)
- Attachment G - Final Cultural Resources Evaluation Plan (August 28, 2008),  
Excluding Privileged Information

**ATTACHMENT A**  
**PCWA Progress Report Distribution List**



## FERC Service List

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**Washoe Tribe of Nevada and California**

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**Loomis Basin Horsemen's Association  
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Patricia Gibbs  
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**Non-Governmental Organizations (continued)**

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**Natural Heritage Institute**

Elizabeth Soderstrom  
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Kevin Goishi  
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Auburn, CA 95603

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**Pacific Gas & Electric**

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**Protect American River Canyons**

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**Sierra Club - Mother Lode Chapter**

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**SARSAS**

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**Northern California Council, Federation of Fly Fishers**

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**Pacific Gas & Electric**

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**Non-Governmental Organizations (continued)**

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**Western States Trail Foundation**

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**Western States Trail Foundation**

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**Public**

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**Northern California Fly Fishing**  
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**ATTACHMENT B**

**2008 Technical Study Plan Progress Report Summary Table**

**Attachment B. 2008 Technical Study Plan Progress Report Summary**

Technical Study Plan	Study Elements Completed/ Data Collected	Work Group Update	Technical Study Plan Variances	Outstanding Study Elements (Data analysis and reporting schedules are shown on the implementation schedules provided in Attachment C.)	Proposed Modifications	Proposed New Studies
<b>AQ 1 - Instream Flow</b>						
<b>2007 Activities</b>	<ul style="list-style-type: none"> <li>Selected instream flow modeling sites and transects in collaboration with the Aquatic Technical Working Group (TWG) at 12 sites. Also installed transect-locator pins to prepare sites for data collection in 2008.</li> <li>Selected habitat units to be modeled for amphibians (in addition to fish) at 4 instream flow modeling sites. Selected transects on 2 comparison streams for amphibian habitat stage-discharge modeling (AQ 12 - Special-Status Amphibian and Aquatic Reptile).</li> <li>Selected transects on 5 comparison reaches for riparian studies (AQ 10 - Riparian Resources).</li> <li>Selected special purpose geomorphology gravel mobility cross-sections at all instream flow modeling sites (AQ 9 - Geomorphology).</li> <li>Installed 5 pressure transducers and collected data in the peaking reach for stage-discharge and travel time measurements (removed in the winter).</li> </ul>	<ul style="list-style-type: none"> <li>Aug 6-10 and 13-17, 2007: Conducted site visit with Aquatic TWG to select instream flow modeling sites and transects.</li> <li>Nov 5, 2007: Updated Aquatic TWG on 2007 field studies instream flow releases for instream flow modeling.</li> <li>Jan 15-16, 2008: Met with Aquatic TWG to discuss habitat suitability criteria, lifestage periodicity charts, and habitat modeling methods.</li> </ul>	None	<ul style="list-style-type: none"> <li>Collect data for instream flow modeling (topography, water surface elevations, velocities, substrate, and cover).</li> <li>Conduct a one-time stranding evaluation downstream of Ralston Afterbay.</li> <li>Conduct hydrodynamics and habitat modeling.</li> <li>Develop technical memo describing results and suggestions regarding potential modeling approaches for large, slow-water pools.</li> </ul>	None	None
<b>2008 Activities</b>	<p><b>Instream Flow</b></p> <ul style="list-style-type: none"> <li>Developed HSC curves for rainbow trout (juvenile, adult, and spawning), and hardhead and pikeminnow (juvenile and adult).</li> <li>Developed life stage periodicity chart for fish species.</li> <li>Collected data for instream flow modeling (topography, water surface elevations, velocities, substrate, and vegetation cover) in bypass, peaking, and comparison reaches (12 sites).</li> <li>Collected travel time data in the peaking reach.</li> </ul> <p><b>Stranding</b></p> <ul style="list-style-type: none"> <li>Conducted a one-time stranding evaluation downstream of Ralston Afterbay near Otter Creek and immediately downstream from Ralston Afterbay (June 2008).</li> <li>Installed pressure transducer at Horseshoe Bar to monitor water surface elevations and surveyed Horseshoe Bar channel topography.</li> </ul> <p><b>Algae</b></p> <ul style="list-style-type: none"> <li>Collected algae samples for <i>Didymosphenia</i> analyses at instream flow sites.</li> </ul>	<ul style="list-style-type: none"> <li>Jan 15-16, 2008. Discussed Instream Flow Habitat Suitability Criteria (HSC)</li> <li>Feb 4, 2008. Discussed HSC for foothill-yellow legged frog and adult rainbow trout.</li> <li>Mar 10, 2008. Provided update on Instream Flow HSC progress.</li> <li>Apr 21, 2008. Discussed HSC and additions to AQ 1 - Instream Flow Technical Study Plan.</li> <li>May 6, 2008. Discussed HSC</li> <li>Jun 2, 2008. Provided update on peaking reach stranding study. Discussed substrate codes for instream flow data collection.</li> </ul>	<p><u>Voluntary Enhancements</u></p> <ul style="list-style-type: none"> <li>PCWA collected flow and stranding data at Gray Eagle Bar in the peaking reach during November 2008 to adequately characterize resource conditions.</li> </ul>	<ul style="list-style-type: none"> <li>Develop a technical memo describing results and suggestions regarding potential modeling approaches for large, slow-water pools.</li> <li>Complete hydrodynamics and habitat modeling.</li> <li>Analyze algae samples to document presence and abundance of <i>Didymosphenia</i>.</li> <li>Prepare and distribute AQ 1 - Instream Flow Technical Study Report (TSR).</li> </ul>	None	None
<b>AQ 2 - Fish Population</b>						
<b>2007 Activities</b>	<ul style="list-style-type: none"> <li>Conducted qualitative surveys for fry emergence at sites on Duncan and North and South Forks of Long Canyon creeks, and the Rubicon and Middle Fork American rivers upstream of Ralston Afterbay.</li> <li>Conducted quantitative river sampling (electrofishing and/or snorkeling) at 19 sites.</li> <li>Compared snorkeling and electrofishing sampling methods at 3 sites.</li> <li>Sampled fish upstream of diversions to determine distribution limits of trout on North and South Forks of Long Canyon and Duncan creeks.</li> <li>Conducted fish sampling (gillnetting) on Project reservoirs (Hell Hole, French Meadows, Ralston Afterbay, and Middle Fork Interbay).</li> <li>Snorkeled Duncan Creek, North Fork Long Canyon Creek, and South Fork Long Canyon Creek diversion pools.</li> <li>Collected rainbow trout, brown trout, and hardhead scales from fish, where present.</li> </ul>	<ul style="list-style-type: none"> <li>Nov 5, 2007: Updated Aquatic TWG on 2007 field studies.</li> </ul>	None	<ul style="list-style-type: none"> <li>Meet with Aquatic TWG to select appropriate fish standing crop comparison datasets.</li> <li>Conduct Ralston Afterbay fish sampling in 2008.</li> <li>Review river sampling data with the Aquatic TWG to determine which sites will be sampled in year two (2008) and possibly in year three (2009) to identify the temporal abundance of fish species.</li> <li>Conduct 2008 river fish population sampling.</li> </ul>	None	None

**Attachment B. 2008 Technical Study Plan Progress Report Summary**

Technical Study Plan	Study Elements Completed/ Data Collected	Work Group Update	Technical Study Plan Variances	Outstanding Study Elements (Data analysis and reporting schedules are shown on the implementation schedules provided in Attachment C.)	Proposed Modifications	Proposed New Studies
<b>AQ 2 - Fish Population (continued)</b>						
<b>2008 Activities</b>	<p><b>Fish Population</b></p> <ul style="list-style-type: none"> <li>Conducted Ralston Afterbay fish sampling in June and September 2008.</li> <li>Reviewed river sampling data with the Aquatic TWG to determine which sites will be sampled in year two (2008) to identify the temporal abundance of fish species.</li> <li>Conducted 2008 river fish population sampling.</li> </ul> <p><b>Reporting</b></p> <ul style="list-style-type: none"> <li>Distributed Draft AQ 2 - Fish Population TSR - 2007 for review and comment on March 11, 2008.</li> <li>Distributed Final AQ 2 - Fish Population TSR - 2007 on July 15, 2008.</li> </ul>	<ul style="list-style-type: none"> <li>Mar 10, 2008. Presented and discussed AQ 2 - Fish Population Technical Study Report - 2007.</li> <li>May 5, 2008. Identified 2008 fish population sampling sites.</li> <li>Jun 2, 2008. Discussed 2008 fish population sampling sites.</li> </ul>	None	<ul style="list-style-type: none"> <li>Meet with Aquatic TWG to select appropriate fish standing crop comparison datasets.</li> <li>Analyze 2008 data and prepare and distribute 2008 AQ 2 - Fish Population TSR.</li> </ul> <p><u>Contingency Study</u></p> <ul style="list-style-type: none"> <li>Review river sampling data with the Aquatic TWG to determine which sites will possibly be sampled in year three (2009) to identify the temporal abundance of fish species.</li> </ul>	None	None
<b>AQ 3 - Macroinvertebrate and Aquatic Mollusk</b>						
<b>2007 Activities</b>	<ul style="list-style-type: none"> <li>Collected drift samples at 9 sites at 3 different times of the year (Jun, Aug, and Oct).</li> <li>Collected Surface Water Ambient Monitoring Program (SWAMP) benthic samples and inventory data at 14 sites.</li> <li>Sampled 7 California Stream Bioassessment Procedure (CSBP) long-term sampling locations at the Ralston Sediment Management Project sampling sites.</li> <li>Submitted the benthic samples to the laboratory for identification.</li> </ul>	<ul style="list-style-type: none"> <li>Nov 5, 2007: Updated Aquatic TWG on 2007 field studies.</li> </ul>	None	<ul style="list-style-type: none"> <li>Compare SWAMP and CSBP benthic sampling results between reaches and with data reported in the literature.</li> <li>Determine if 2008 macroinvertebrate contingency studies are needed.</li> <li>Conduct special-status aquatic mollusk sampling in 2008.</li> <li>Document the benthic macroinvertebrate community in areas with known water quality issues, if any, as determined in the AQ 11 - Water Quality Study.</li> <li>Complete drift sample analysis for inclusion into the Bioenergetics Study (AQ 5 - Bioenergetics).</li> </ul>	None	None
<b>2008 Activities</b>	<p><b>Macroinvertebrates</b></p> <ul style="list-style-type: none"> <li>Compared SWAMP and CSBP benthic sampling results between reaches and with data reported in the literature.</li> <li>Determined that 2008 macroinvertebrate contingency studies were not needed in consultation with the Aquatic TWG.</li> <li>Based on AQ 11 Water Quality Study results, determined in consultation with the Aquatic TWG that there are no water quality issues that require additional macroinvertebrate sampling.</li> </ul> <p><b>Mollusks</b></p> <ul style="list-style-type: none"> <li>Conducted special-status aquatic mollusk field sampling in 2008.</li> </ul> <p><b>Reporting</b></p> <ul style="list-style-type: none"> <li>Distributed Draft AQ 3 - Macroinvertebrate and Aquatic Mollusk TSR for review and comment on May 19, 2008.</li> <li>Distributed Final AQ 3 - Macroinvertebrate and Aquatic Mollusk TSR on August 1, 2008.</li> </ul>	<ul style="list-style-type: none"> <li>Apr 21, 2008. Presented and discussed results to be included in AQ 3 - Macroinvertebrate and Aquatic Mollusk TSR - 2007. Provided overview of 2008 TSP implementation.</li> </ul>	<p><u>Approach Refinement</u></p> <ul style="list-style-type: none"> <li>The TSP states that the macroinvertebrate metrics will be reported as outlined in Rehn et al. (2007). The macroinvertebrate metrics were reported as outlined in an updated study by Rehn (2008).</li> </ul>	<ul style="list-style-type: none"> <li>Complete drift sample analysis and incorporate data into the AQ 5 - Bioenergetics TSR.</li> <li>Analyze special-status mollusk data and prepare and distribute AQ 3 - Aquatic Mollusks TSR.</li> </ul>	None	None

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Technical Study Plan	Study Elements Completed/ Data Collected	Work Group Update	Technical Study Plan Variances	Outstanding Study Elements (Data analysis and reporting schedules are shown on the implementation schedules provided in Attachment C.)	Proposed Modifications	Proposed New Studies
<b>AQ 4 - Water Temperature Modeling</b>						
<b>2007 Activities</b>	None	N/A	None	<ul style="list-style-type: none"> <li>Collect water temperature and meteorological data (2008).</li> <li>Collect water temperature data at selected tributary inflows and deep pools in the lower Rubicon and Middle Fork American rivers.</li> <li>Establish Water Temperature Modeling Subgroup.</li> <li>Select reservoir and river water temperature models for the specific study reaches.</li> <li>Summarize existing water temperature and meteorological data.</li> <li>Summarize thermal profiles in Project reservoirs.</li> <li>Collect/develop model inputs (i.e. topographic and riparian shading, air temperature, wind speed, relative humidity, solar radiation, and boundary condition flow and water temperature data) for modeled river reaches and reservoirs.</li> <li>Develop reservoir and water temperature models for the specific study reaches.</li> <li>Characterize modeled water temperatures for existing, unimpaired, and alternative flow conditions.</li> <li>Consider predictions of changes in air temperature resulting from global warming in 2 or 3 of the model runs.</li> <li>Model potential effects of Project betterments on reservoir temperature regimes and associated instream release temperatures.</li> </ul>	None	None
<b>2008 Activities</b>	<p><b>Model Input</b></p> <ul style="list-style-type: none"> <li>Collected water temperature and meteorological data (2008).</li> <li>Selected tributary inflows and deep pools in the lower Rubicon River near Pilot Creek and Long Canyon and collected water temperature data.</li> <li>Established Water Temperature Modeling Subgroup.</li> <li>Selected reservoir and river water temperature models for the specific study reaches.</li> <li>Summarized existing water temperature and meteorological data.</li> <li>Summarized thermal profiles in Project reservoirs.</li> </ul>	<ul style="list-style-type: none"> <li>May 3, 2008. Technical Subgroup Meeting - Provided overview of AQ 4 - Water Temperature Modeling TSP. Reviewed available data and discussed appropriate models for temperature modeling.</li> <li>Jul 16, 2008. Technical Subgroup Meeting. Discussed status of report and water temperature modeling efforts.</li> <li>Sep 9, 2008. Technical Subgroup Meeting. Provided progress report on water temperature model development.</li> <li>Nov 4, 2008. Technical Subgroup Meeting. Provided progress report on water temperature model development.</li> </ul>	None	<ul style="list-style-type: none"> <li>Summarize 2008 water temperature and meteorological data.</li> <li>Summarize 2008 thermal profiles in Project reservoirs.</li> <li>Develop model inputs (i.e. topographic and riparian shading, air temperature, wind speed, relative humidity, solar radiation, and bound condition flow and water temperature data) for modeled river reaches and reservoirs.</li> <li>Develop reservoir and water temperature models for the specific study reaches.</li> <li>Characterize modeled water temperatures for existing, unimpaired, and alternative flow conditions.</li> <li>Consider predictions of changes in air temperature resulting from global warming in 2 or 3 of the model runs.</li> <li>Model potential effects of Project betterments on reservoir temperature regimes and associated instream release temperatures.</li> <li>Prepare and distribute AQ 4 - Water Temperature Modeling TSR.</li> </ul>	None	None
<b>AQ 5 - Bioenergetics</b>						
<b>2007 Activities</b>	None	N/A	None	<ul style="list-style-type: none"> <li>Analyze growth and water temperature relationships in the Rubicon River and the peaking reach using a salmonid bioenergetics model.</li> <li>Quantify the amount and quality of habitat for salmonids using a bioenergetics foraging model.</li> <li>Determine availability of bioenergetics data for hardhead to determine feasibility of addressing water temperature and/or food availability through modeling and complete modeling if sufficient information is available and deemed appropriate.</li> </ul>	None	None
<b>2008 Activities</b>	None	N/A	None	<ul style="list-style-type: none"> <li>Analyze growth and water temperature relationships in the Rubicon River and the peaking reach using a salmonid bioenergetics model.</li> <li>Quantify the amount and quality of habitat for salmonids using a bioenergetics foraging model.</li> <li>Determine availability of bioenergetics data for hardhead to determine feasibility of addressing water temperature and/or food availability through modeling and complete modeling if sufficient information is available and deemed appropriate.</li> <li>Prepare and distribute AQ 5 - Bioenergetics TSR.</li> </ul>	None	None

**Attachment B. 2008 Technical Study Plan Progress Report Summary**

Technical Study Plan	Study Elements Completed/ Data Collected	Work Group Update	Technical Study Plan Variances	Outstanding Study Elements (Data analysis and reporting schedules are shown on the implementation schedules provided in Attachment C.)	Proposed Modifications	Proposed New Studies
<b>AQ 6 - Fish Passage</b>						
<b>2007 Activities</b>	<ul style="list-style-type: none"> <li>Identified and classified potential tributary barriers within the reservoir inlet areas (Hell Hole, French Meadows, Ralston Afterbay and Middle Fork Interbay).</li> <li>Identified and classified potential tributary junction barriers along mainstem river reaches.</li> <li>Identified and classified potential Project facilities (e.g. diversion structure, tunnel crossings, gage weirs) and did helicopter surveys of potential hardhead barriers upstream of Ralston Afterbay.</li> </ul>	<ul style="list-style-type: none"> <li>Nov 5, 2007: Updated Aquatic TWG on 2007 field studies.</li> </ul>	None	<ul style="list-style-type: none"> <li>Quantitatively evaluate fish passage at potential Project-related fish barriers during base flow (low flow) releases.</li> <li>Qualitatively assess whether low flow barriers have the potential to become passable at flows higher than base flow.</li> <li>Evaluate fish passage at Project diversion dams and determine if hydrodynamics modeling is needed to assess fish passage in collaboration with the Aquatic TWG.</li> </ul>	None	None
<b>2008 Activities</b>	<ul style="list-style-type: none"> <li>Quantitatively evaluated fish passage at potential Project-related fish barriers during base flow (low flow) releases.</li> <li>Qualitatively assessed whether low flow barriers have the potential to become passable at flows higher than base flow.</li> </ul>	<ul style="list-style-type: none"> <li>Jul 8, 2008. Presented and discussed AQ 6 - Fish Passage Technical Study Report results</li> </ul>	<p><u>Voluntary Enhancements</u></p> <ul style="list-style-type: none"> <li>PCWA surveyed two inaccessible river reaches for passage barriers using low elevation helicopter fly-overs on the Middle Fork American River and the Rubicon River upstream from Ralston Afterbay.</li> <li>PCWA revisited several potential barriers that were identified during the 2005-2006 mesohabitat mapping to collect detailed measurements to better quantify fish passage.</li> <li>PCWA surveyed several potential barriers that were identified during other field studies (e.g. fish population sampling), but were not located during the 2005-2006 mesohabitat field mapping and collected detailed measurements at the potential barriers to calculate fish passage.</li> </ul> <p><u>Reporting Variance</u></p> <ul style="list-style-type: none"> <li>Timing of the distribution of the draft 2008 AQ 6 - Fish Passage TSR was delayed because additional time was needed to conduct field surveys and to analyze study data. The updated schedule is shown on the Implementation Schedule included in Attachment C.</li> </ul>	<ul style="list-style-type: none"> <li>Complete and distribute 2008 AQ 6 - Fish Passage TSR.</li> <li>Evaluate fish passage at Project diversion dams and determine if hydrodynamics modeling is needed to assess fish passage in collaboration with the Aquatic TWG.</li> </ul>	None	None
<b>AQ 7 - Entrainment</b>						
<b>2007 Activities</b>	None	N/A	None	<ul style="list-style-type: none"> <li>Meet with Aquatic TWG to fully develop fish entrainment threshold calculation approach.</li> <li>Summarize literature and fish population data.</li> <li>Characterize Project diversion structures and intakes, diversion operations, and powerhouse turbines.</li> <li>Develop information necessary to assess the feasibility of screening intake structures, including feasibility level estimates of screen and screen installation costs.</li> <li>Indirectly estimate entrainment and mortality potential.</li> <li>Collaborate with Aquatic TWG to determine whether or not direct measurements of entrainment and mortality are warranted.</li> </ul>	None	None

**Attachment B. 2008 Technical Study Plan Progress Report Summary**

Technical Study Plan	Study Elements Completed/ Data Collected	Work Group Update	Technical Study Plan Variances	Outstanding Study Elements (Data analysis and reporting schedules are shown on the implementation schedules provided in Attachment C.)	Proposed Modifications	Proposed New Studies
<b>AQ 7 - Entrainment (continued)</b>						
<b>2008 Activities</b>	<p><b>Entrainment Indirect Calculations</b></p> <ul style="list-style-type: none"> <li>• Met with Aquatic TWG to develop fish entrainment threshold calculation approach.</li> <li>• Summarized literature and fish population data.</li> <li>• Characterized Project diversion structures and intakes, diversion operations, and powerhouse turbines.</li> <li>• Developed information necessary to assess the feasibility of screening intake structures, including feasibility level estimates of screen and screen installation costs.</li> <li>• Indirectly estimated entrainment and mortality potential.</li> <li>• Collaborated with Aquatic TWG to determine direct measurements of entrainment and mortality are warranted.</li> <li>• Distributed white paper study approach for entrainment for discussion at July 8, 2008 TWG.</li> </ul> <p><b>Entrainment Direct Sampling Contingency Study</b></p> <ul style="list-style-type: none"> <li>• Developed and distributed Entrainment Direct Sampling Approach</li> <li>• At Duncan Creek upstream of the diversion, collected fish and implanted PIT tags (998 fish).</li> <li>• Installed automatic PIT tag reader at the Duncan Creek diversion intake to record the number of PIT tagged fish passing through the diversion during the diversion season (December 2008 - June 2009).</li> <li>• Sampled fish distribution and abundance during the fall throughout water column near the French Meadows-Hell Hole Tunnel Intake in French Meadows Reservoir and near the Hell Hole-Middle Fork Tunnel Intake in Hell Hole Reservoir.</li> </ul>	<ul style="list-style-type: none"> <li>• Jun 2, 2008. Reviewed white paper approach for entrainment.</li> <li>• Jul 8, 2008. Reviewed white paper approach for entrainment</li> <li>• Sept. 2008. Discussed entrainment study approach</li> </ul>	None	<p><b>Entrainment Direct Sampling</b></p> <ul style="list-style-type: none"> <li>• Sample fish distribution and abundance during three representative time periods throughout water column near the French Meadows-Hell Hole Tunnel Intake in French Meadows Reservoir and near the Hell Hole-Middle Fork Tunnel Intake in Hell Hole Reservoir.</li> <li>• Directly sample entrainment using split-beam sonar at the Middle Fork-Ralston Tunnel Intake (Middle Fork Interbay) and the Ralston-Oxbow Tunnel Intake (Ralston Afterbay) from February through November 2009.</li> <li>• Monitor young-of-the-year trout timing and abundance on Duncan Creek upstream of the diversion on four occasions in the May and June time period.</li> <li>• Analyze data from Duncan Creek PIT tagging entrainment study, YOY abundance and timing, sonar in reservoirs, and direct entrainment sampling at the power intakes</li> <li>• Prepare and distribute report AQ 7 - Entrainment TSR.</li> </ul>	None	None
<b>AQ 8 - Reservoir Fish Habitat</b>						
<b>2007 Activities</b>	None	N/A	None	<ul style="list-style-type: none"> <li>• Summarize current fish species assemblage data, stocking records, and fish success for each Project reservoir.</li> <li>• Characterize daily water surface elevation patterns and approximate pool volumes at each reservoir over the period of record.</li> <li>• Characterize historical hourly water surface elevation patterns and approximate pool volumes at Ralston Afterbay over the period of record.</li> <li>• Install a water surface elevation monitor or obtain access to existing water surface elevation data to record within-day fluctuations at Ralston Afterbay.</li> <li>• Characterize daily water surface elevation patterns and approximate pool volumes of each reservoir and Ralston Afterbay with potential Project betterments using the Project Operations Model.</li> <li>• Summarize water quality information (thermocline location, epilimnion and hypolimnion water temperatures and dissolved oxygen concentrations) for each Project reservoir under existing operations and under potential Project betterment operations.</li> </ul>	None	None



Attachment B. 2008 Technical Study Plan Progress Report Summary

Technical Study Plan	Study Elements Completed/ Data Collected	Work Group Update	Technical Study Plan Variances	Outstanding Study Elements (Data analysis and reporting schedules are shown on the implementation schedules provided in Attachment C.)	Proposed Modifications	Proposed New Studies
<b>AQ 8 - Reservoir Fish Habitat (continued)</b>						
<b>2008 Activities</b>	None	N/A	None	<ul style="list-style-type: none"> <li>Summarize current fish species assemblage data, stocking records, and fish success for each Project reservoir.</li> <li>Characterize daily water surface elevation patterns and approximate pool volumes at each reservoir over the period of record.</li> <li>Characterize historical hourly water surface elevation patterns and approximate pool volumes at Ralston Afterbay over the period of record.</li> <li>Install a water surface elevation monitor or obtain access to existing water surface elevation data to record within-day fluctuations at Ralston Afterbay.</li> <li>Characterize daily water surface elevation patterns and approximate pool volumes of each reservoir and Ralston Afterbay with potential Project betterments using the Project Operations Model.</li> <li>Summarize water quality information (thermocline location, epilimnion and hypolimnion water temperatures and dissolved oxygen concentrations) for each Project reservoir under existing operations and under potential Project betterment operations.</li> <li>Prepare and distribute AQ 8 - Reservoir Fish Habitat TSR.</li> </ul>	None	None
<b>AQ 9 - Geomorphology</b>						
<b>2007 Activities</b>	<ul style="list-style-type: none"> <li>Selected geomorphic transects at instream flow modeling study sites.</li> <li>Conducted V* visual estimates at 109 pools located at 14 different study sites along the bypass and peaking reaches, and two comparison streams.</li> <li>Collected 57 bulk samples at 14 study sites at hydraulic modeling transects (AQ 1 - Instream Flow).</li> <li>Completed large woody debris capture field surveys at all Project reservoirs and diversions.</li> <li>Surveyed French Meadows and Hell Hole reservoirs using aerial photogrammetry with ground-control surveys, and aerial observations with photo-documentation.</li> <li>Located pre-dam topography of French Meadows and Hell Hole reservoirs for comparative assessment of pre-dam and post-dam 2007 topography.</li> <li>Completed particle size sampling at Hell Hole Reservoir.</li> <li>Surveyed Duncan Creek diversion pool to provide estimate of total volume of sediment load.</li> </ul>	<ul style="list-style-type: none"> <li>Aug 6-10 and 13-17, 2007: Conducted site visit with Aquatic TWG to select geomorphic transects at instream flow modeling sites.</li> <li>Nov 5, 2007: Updated Aquatic TWG on 2007 field studies.</li> </ul>	<p><b>V* Sampling</b></p> <ul style="list-style-type: none"> <li>The TSP indicates that V* estimates would be performed at a total of 125 sites located along the bypass and peaking reaches, and two comparison reaches. Of these, 17 sites were not surveyed due to inaccessibility, excessive travel time, or active suction dredge mining in pools. These 17 sites will not be surveyed during future sampling efforts.</li> </ul>	<ul style="list-style-type: none"> <li>Analyze V* field data.</li> <li>Complete particle size sampling at French Meadows Reservoir, Duncan Creek Diversion Pool in fall 2008, and at Middle Fork Interbay and Ralston Afterbay if it is determined that there is insufficient data collected from previous studies for sediment management.</li> <li>Calculate particle size composition and estimate sediment loads captured at Project reservoirs and diversion pools.</li> <li>Analyze and summarize particle size composition of bulk spawning gravels collected at hydraulic modeling sites.</li> <li>Compare particle size composition and fine sediment content to standards from the scientific literature.</li> <li>Summarize information on PCWA's sediment management practices.</li> <li>Estimate erosion and potential sediment loading along the shoreline of Hell Hole Reservoir associated with the Hell Hole Reservoir Seasonal Storage Increase Betterment.</li> <li>Identify flows necessary to maintain geomorphic processes in bypass and peaking reaches.</li> <li>Characterize the amount of LWD captured in Project reservoirs and diversion pools, and relative extent to which LWD capture may effect its recruitment in downstream reaches.</li> <li>Collect high flow calibration data during 2008 runoff period.</li> </ul>	None	None

Attachment B. 2008 Technical Study Plan Progress Report Summary

Technical Study Plan	Study Elements Completed/ Data Collected	Work Group Update	Technical Study Plan Variances	Outstanding Study Elements (Data analysis and reporting schedules are shown on the implementation schedules provided in Attachment C.)	Proposed Modifications	Proposed New Studies
<b>AQ 9 - Geomorphology (continued)</b>						
<b>2008 Activities</b>	<p><b>River Sediment Transport</b></p> <ul style="list-style-type: none"> <li>Analyzed V* field data to characterize amount and distribution of residual pool fine sediment.</li> <li>Analyzed and summarized particle size composition of bulk spawning gravels collected at hydraulic modeling sites.</li> <li>Compared particle size composition and fine sediment content to standards from the scientific literature.</li> </ul> <p><b>Reservoir Sediment</b></p> <ul style="list-style-type: none"> <li>Quantified and characterized sediment capture, including particle size composition, at Hell Hole Reservoir, Ralston Afterbay, Middle Fork Interbay, North Fork Long Canyon, and South Fork Long Canyon.</li> <li>Summarized information on PCWA's sediment management practices at Project diversion pools, Ralston Afterbay, and Middle Fork Interbay.</li> <li>Estimated erosion and potential sediment loading along the shoreline of Hell Hole Reservoir associated with the Hell Hole Reservoir Seasonal Storage Increase Betterment.</li> <li>Compared impaired and unimpaired hydrologic regimes in bypass and peaking reaches from existing gage records and evaluated applicability of existing USGS Regional Flood Frequency equations for application to the Middle Fork American River watershed.</li> </ul> <p><b>Large Woody Debris</b></p> <ul style="list-style-type: none"> <li>Described historical and current PCWA LWD management practices and characterized the amount of LWD captured in Project reservoirs and diversion pools, and relative extent to which LWD capture may effect its recruitment to downstream reaches.</li> </ul> <p><b>Reporting</b></p> <ul style="list-style-type: none"> <li>Distributed Draft 2008 AQ 9 - Geomorphology TSR for review and comment on December 9, 2008.</li> </ul>	N/A	None	<ul style="list-style-type: none"> <li>Quantify and characterize sediment load and particle size composition of sediment captured at French Meadows Reservoir and Duncan Creek Diversion Pool during low-pool in fall 2009.</li> <li>Identify flows necessary to maintain geomorphic processes in bypass and peaking reaches.</li> <li>Collect high flow calibration data during 2009 runoff period, if flows are available.</li> <li>Evaluate sediment transport conditions under different flow regimes at selected instream flow study site locations using the hydraulic models developed for the AQ 1 - Instream Flow Technical Study Plan.</li> <li>Develop a regional flood frequency curve, in consultation with Aquatic TWG, to determine the magnitude and frequency of unimpaired flows for ungaged locations or locations within insufficient gaging records. Compare unimpaired peak flow derived from regional curves with impaired peak flow from gaging records.</li> <li>Apply the procedures as outlined in Grant et al (2003) for predicting the geomorphic response of study rivers and streams to Project dams.</li> <li>Finalize and distribute 2008 AQ 9 - Geomorphology TSR.</li> <li>Prepare and distribute 2009 AQ 9 - Geomorphology TSR.</li> </ul> <p><u>Contingency Study</u></p> <ul style="list-style-type: none"> <li>Consult with the Aquatic TWG to determine if additional empirical studies are necessary to characterize sediment transport under different flow regimes.</li> </ul>	None	None
<b>AQ 10 - Riparian Resources</b>						
<b>2007 Activities</b>	<ul style="list-style-type: none"> <li>Selected 6 sites and/or transects on 5 comparison streams, in coordination with AQ 1 - Instream Flow and in consultation with Aquatic TWG.</li> <li>Conducted quantitative studies at each of the comparison stream sites (plots and line-intercept surveys along transects perpendicular to the channel, greenline surveys, and regeneration surveys).</li> <li>Conducted line-intercept surveys upstream and downstream of the diversions on North and South Forks of Long Canyon Creek.</li> <li>Collected tree cores at 2 comparison stream sites.</li> <li>Completed riparian surveys at Project reservoirs, Ralston Afterbay, and Middle Fork Interbay.</li> </ul>	<ul style="list-style-type: none"> <li>Aug 6-10 and 13-17, 2007: Conducted site visit with Aquatic TWG to select riparian transects at instream flow modeling sites.</li> <li>Nov 5, 2007: Updated Aquatic TWG on 2007 field studies.</li> </ul>	None	<ul style="list-style-type: none"> <li>Summarize riparian resources along the selected comparison stream reaches.</li> <li>Summarize the distribution, characteristics, and condition of the riparian resources in relation to the life history strategies of the dominant species and fluvial geomorphic processes along bypass reaches, the peaking reach, and comparison reaches.</li> <li>Characterize the relationship between historic and existing land uses, recreation activities, and riparian resources.</li> <li>Develop indicators for riparian health in consultation with the Aquatic TWG.</li> <li>Summarize the distribution, characteristics, and condition of the riparian resources at Project reservoirs in relation to WSE fluctuations.</li> <li>Identify and map the distribution of riparian resources at proposed Project betterments, construction and staging, and new inundation areas.</li> <li>Collect detailed riparian information at the mouth of Five Lakes Creek and Upper Hell Hole Reservoir following review of photogrammetry elevation layers.</li> <li>Collect high flow calibration data during 2008-9 runoff period.</li> </ul>	None	None

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Technical Study Plan	Study Elements Completed/ Data Collected	Work Group Update	Technical Study Plan Variances	Outstanding Study Elements (Data analysis and reporting schedules are shown on the implementation schedules provided in Attachment C.)	Proposed Modifications	Proposed New Studies
<b>AQ 10 - Riparian Resources (continued)</b>						
<b>2008 Activities</b>	<ul style="list-style-type: none"> <li>Identified and mapped the distribution of riparian resources at proposed Project betterments, construction and staging, and new inundation areas.</li> <li>Collected detailed riparian information at the mouth of Five Lakes Creek and Upper Hell Hole Reservoir following review of photogrammetry elevation layers.</li> <li>Collected and dated riparian tree cores from the instream flow study site immediately downstream from Hell Hole Reservoir and Five Lakes Creek.</li> <li>Collected data for instream flow modeling at instream flow and comparison study sites.</li> </ul>	N/A	None	<ul style="list-style-type: none"> <li>Summarize riparian resources along the selected comparison stream reaches.</li> <li>Summarize the distribution, characteristics, and condition of the riparian resources in relation to the life history strategies of the dominant species and fluvial geomorphic processes along bypass reaches, the peaking reach, and comparison reaches.</li> <li>Characterize the relationship between historic and existing land uses, recreation activities, and riparian resources.</li> <li>Develop indicators for riparian health in consultation with the Aquatic TWG.</li> <li>Summarize the distribution, characteristics, and condition of the riparian resources at Project reservoirs in relation to WSE fluctuations.</li> <li>Collect high flow calibration data during 2009 runoff period, if flows are available.</li> <li>Prepare and distribute AQ 10 - Riparian TSR.</li> </ul>	None	None
<b>AQ 11 - Water Quality</b>						
<b>2007 Activities</b>	<ul style="list-style-type: none"> <li>Collected in-situ and general water quality measurements on the bypass reaches, peaking reaches, reservoirs, and diversion pools in spring (39 locations) and fall (36 locations).</li> <li>Collected fecal coliform samples at 17 sites.</li> <li>Collected fish samples at Project reservoirs (Hell Hole, French Meadows, Ralston Afterbay, Middle Fork Interbay) and at one river site (Middle Fork American River downstream of Ralston Afterbay) for mercury fish tissue analyses.</li> <li>Provided water quality samples to State-certified laboratories approved by the State Water Resources Control Board for chemical analyses.</li> <li>Compared water quality results to the CVRWQCB Basin Plan objectives and water quality standards (CVRWQCB, Fourth Edition revised February 2007).</li> <li>Compared fish tissue results to the OEHHA guidelines.</li> </ul>	<ul style="list-style-type: none"> <li>Nov 5, 2007: Updated Aquatic TWG on 2007 field studies.</li> </ul>	<p><b>Fish Tissue Sampling</b></p> <ul style="list-style-type: none"> <li>Five of the 10 recommended fish caught at French Meadows Reservoir (two brown trout and three rainbow trout) were analyzed for individual methyl mercury concentrations in the fish muscle tissue. The remaining five fish (brown trout) that were caught should have been analyzed individually. However, these 5 fish were analyzed as a composite sample due to a laboratory error.</li> </ul> <p><u>Voluntary Enhancements</u></p> <ul style="list-style-type: none"> <li>In addition to the ten fish caught at Hell Hole Reservoir (brown trout, rainbow trout, and lake trout that were analyzed for individual methyl mercury concentration), five additional fish (brown trout) were caught and analyzed as a composite sample.</li> </ul> <p><b>General Water Quality Sampling</b></p> <ul style="list-style-type: none"> <li>Water quality samples were not collected during high and low flow events along the peaking reach of the Middle Fork American River during the spring and fall sampling events. Water quality samples were collected once during the spring and fall sampling events at various locations and flows throughout the peaking reach.</li> <li>One metal (manganese) was not analyzed during the spring sampling event due to a transcription error. Manganese was sampled during the fall sampling event.</li> </ul> <p><u>Voluntary Enhancements</u></p> <ul style="list-style-type: none"> <li>In-situ measurements were taken and water samples were collected and analyzed for dissolved metals and total mercury at 3 additional locations (leakage channels and main channel) downstream of Hell Hole Reservoir and 5 additional locations (leakage channels and main channel) downstream of French Meadows Reservoir.</li> <li>The TSP states that the water quality analytical results would be compared to the Water Quality Control Plan (Basin Plan) for the California Regional Water Quality Control Board Central Valley Region, Fourth Edition, published in September 1998. The analytical results were compared to the most recent version of the Basin Plan, which was updated with amendments in Feb 2007.</li> </ul> <p><b>Fecal Coliform Sampling</b></p> <ul style="list-style-type: none"> <li>According to the fecal coliform sampling protocols, fecal samples were to be collected five times within a 30 day period between July 4 and Labor Day. Two of the fecal coliform sampling locations were sampled the week after Labor Day (the fifth sample in 30 days) because of a sampling location change late in the summer.</li> </ul>	<ul style="list-style-type: none"> <li>Consult with Aquatic TWG to discuss contingency water quality related studies.</li> </ul>	None	None

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<b>AQ 11 - Water Quality (continued)</b>						
<b>2008 Activities</b>	<p><b>Reporting</b></p> <ul style="list-style-type: none"> <li>Distributed Draft AQ 11 - Water Quality Technical Study Report - 2007 on February 1, 2008.</li> <li>Distributed Final AQ 11 - Water Quality Technical Study Report - 2007 on June 30, 2008.</li> </ul> <p><b>Methylmercury Sampling Contingency Study</b></p> <ul style="list-style-type: none"> <li>Consulted with Aquatic TWG to discuss contingency water quality related studies (May 5, 2008).</li> <li>Developed and distributed a Water Quality Contingency Sampling Protocol (Contingency Study) to collect additional methylmercury concentrations in sport fish muscle tissue (September 2008).</li> <li>Collected sport fish samples from Hell Hole and French Meadows reservoirs, Ralston Afterbay, Middle Fork Interbay, and the Middle Fork American River near Otter Creek.</li> <li>Collected crayfish samples from Hell Hole and French Meadows reservoirs.</li> <li>Provided fish and crayfish samples to State-certified laboratory approved by the State Water Resources Control Board for methylmercury analyses.</li> </ul>	<ul style="list-style-type: none"> <li>Mar 10, 2008. Presented and discussed results of 2007 water quality studies and AQ 11 - Water Quality Technical Study Report.</li> <li>May 5, 2008. Discussed AQ 11 contingency studies (BMI sampling and mercury)</li> <li>Jun 2, 2008. Discussed fish tissue mercury sampling.</li> <li>Sep 8, 2008. Discussed mercury fish tissue sampling protocol</li> </ul>	None	<p><b>Methylmercury Sampling Contingency Study</b></p> <ul style="list-style-type: none"> <li>Analyze and compare fish and crayfish tissue results to the OEHHA guidelines, and prepare and distribute results.</li> <li>Consult with Aquatic TWG to determine how to proceed for locations where the target numbers of fish were not obtained.</li> <li>Prepare and distribute AQ 11 - Methylmercury Sampling TSR.</li> </ul>	None	None
<b>AQ 12 - Special-Status Amphibian and Aquatic Reptile</b>						
<b>2007 Activities</b>	<p><b>Foothill Yellow-legged Frog (FYLF)</b></p> <ul style="list-style-type: none"> <li>Identified and mapped potential breeding and rearing habitat in the study area.</li> <li>Document the distribution and abundance of FYLF populations in the study area.</li> <li>Documented the timing and length of FYLF breeding season.</li> <li>Identified existing data and obtain new data necessary to develop HSC for FYLF.</li> <li>Selected FYLF modeling sites in coordination with the Aquatic TWG.</li> </ul> <p><b>California Red-legged Frog (CRLF)</b></p> <ul style="list-style-type: none"> <li>Conducted USFWS CRLF site3 assessment.</li> <li>Identified and mapped potential CRLF habitat in the study area.</li> <li>Documented the distribution and abundance of CRLF in the study area.</li> </ul> <p><b>Western Pond Turtle (WPT)</b></p> <ul style="list-style-type: none"> <li>Documented the presence of WPT during CRLF and FYLF surveys.</li> <li>Mapped potential WPT nesting habitat in study area.</li> <li>Documented the presence of potential WPT nesting habitat near Project reservoirs and potential Project betterment inundation zones.</li> <li>Verified WPT habitat around Project reservoirs with ground surveys.</li> </ul>	<ul style="list-style-type: none"> <li>Aug 6-10 and 13-17, 2007. Conducted site visit with Aquatic TWG to selected FYLF modeling sites.</li> <li>Nov 5, 2007: Updated Aquatic TWG on 2007 field studies.</li> <li>Jan 15-16, 2008: Presented FYLF draft HSC data from study streams.</li> </ul>	<p><b>FYLF</b> <u>Voluntary Enhancements</u></p> <ul style="list-style-type: none"> <li>Several perennial tributary survey sites were added to the study plan as either qualitative sampling or an incidental one-time site visit location (confluence of American Canyon Creek, Pond Creek, and Jesse Creek with the Middle Fork American River and Wallace Canyon Creek, tributary to Long Canyon Creek).</li> </ul>	<p><b>FYLF</b></p> <ul style="list-style-type: none"> <li>Meet with Aquatic TWG to discuss FYLF survey results and determine if additional limited scope surveys (i.e., distribution and abundance or timing and length of breeding season) are needed in 2008. This consultation with the Aquatic TWG will be completed in early 2008. Contingency studies, if needed, will be completed in 2008 and reported in the 2008 AQ 12 - TSR, as described in the study plan.</li> <li>Collect FYLF egg validation data at instream flow modeling sites in spring 2008. This information will be reported in the 2009 AQ 1 - Instream Flow TSR.</li> <li>Develop HSC for eggs and tadpoles in consultation with the Aquatic TWG, based on data collected during surveys and existing information sources. This information will be developed in 2008 and reported in the 2009 AQ 1 - Instream Flow TSR.</li> <li>Develop a life stage periodicity chart for FYLF that identifies the season of the year (time period) when each life stage is likely to be present within the Project area. This data will be used to determine when the HSC information is applicable in evaluating effects of flow alterations on potential FYLF habitat. This information will be developed in 2008 and reported in the 2009 AQ 1 - Instream Flow TSR.</li> <li>Characterize the water stage and velocity under different flow regimes as it relates to FYLF habitat in coordination with the instream flow study. Water stage and velocity information under different flow regimes will be analyzed and reported in the 2009 AQ 1 - Instream Flow TSR.</li> </ul> <p><b>FYLF and WPT</b></p> <ul style="list-style-type: none"> <li>Characterize instream temperatures under different flow regimes as it relates to FYLF and WPT habitat through coordination with the water temperature study. Temperature information under different flow regimes will be analyzed and reported in the 2009 AQ 4 - Water Temp Modeling TSR.</li> </ul> <p><b>CRLF</b></p> <ul style="list-style-type: none"> <li>If determined necessary by USFWS, conduct protocol-level CRLF surveys in accordance with the Revised Guidance on Site Assessments and Field Surveys for the California Red-legged Frog, August 2005. This contingency study, if needed, will be completed in 2008 and reported in the 2008 AQ 12 - TSR, as described in the study plan.</li> </ul>	None	None

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<b>AQ 12 - Special-Status Amphibian and Aquatic Reptile (continued)</b>						
<b>2008 Activities</b>	<p><b>FYLF</b></p> <ul style="list-style-type: none"> <li>• Distributed Draft Foothill Yellow Legged Frog Technical Study Report for review and comment on February 5, 2008.</li> <li>• Distributed Final Foothill Yellow Legged Frog Technical Study Report on June 30, 2008.</li> <li>• Collected FYLF egg and tadpole 2D model validation data at instream flow modeling sites in spring 2008.</li> <li>• Developed HSC for eggs and tadpoles in consultation with the Aquatic TWG, based on data collected during surveys and existing information sources.</li> <li>• Developed a life stage periodicity chart for FYLF that identifies the season of the year (time period) when each life stage is likely to be present within the Project area. This data will be used to determine when the HSC information is applicable in evaluating effects of flow alterations on potential FYLF habitat.</li> </ul> <p><u>Contingency Study</u></p> <ul style="list-style-type: none"> <li>• Met with Aquatic TWG and determined that the only FYLF contingency data necessary was 2008 breeding timing data at the 2D modeling validation study sites.</li> </ul> <p><b>CRLF</b></p> <ul style="list-style-type: none"> <li>• Submitted CRLF Site Assessment to USFWS for review on February 19, 2008. Requested determination if protocol-level surveys are necessary.</li> <li>• Distributed Draft CRLF TSR for review and comment on February 20, 2008.</li> <li>• Received letter of determination from USFWS regarding CRLF Site Assessment on Mar 27, 2008</li> <li>• Distributed Final CRLF TSR on June 30, 2008.</li> </ul>	<ul style="list-style-type: none"> <li>• Jan 15-16, 2008. Discussed Instream Flow Habitat Suitability Criteria (HSC) approach for FYLF</li> <li>• Feb 4, 2008. Discussed HSC for FYLF.</li> <li>• Mar 7, 2008. Consulted with USFWS regarding CRLF Site Assessment.</li> <li>• Mar 10, 2008. Presented and discussed AQ 12 - Special-Status Amphibian and Aquatic Reptile Technical Study Report - 2007, including FYLF survey results and CRLF site assessment. Provided update on Instream Flow HSC progress.</li> <li>• Mar 11, 2008. Consulted with USFWS regarding CRLF Site Assessment.</li> <li>• May 5, 2008. Discussed AQ 12 contingency studies.</li> </ul>	<p><u>Reporting Variance</u></p> <ul style="list-style-type: none"> <li>• Timing of the distribution of the 2007 AQ 12 Special-Status Amphibian and Aquatic Reptile TSR was delayed slightly to allow for consultation with the USFWS.</li> </ul>	<p><b>FYLF</b></p> <ul style="list-style-type: none"> <li>• Characterize the water stage and velocity under different flow regimes as it relates to FYLF habitat in coordination with the instream flow study. Water stage and velocity information under different flow regimes will be analyzed and reported in the 2009 AQ 1 - Instream Flow TSR.</li> <li>• Report FYLF egg and tadpole 2D model validation data at instream flow modeling sites in the 2009 AQ 1 - Instream Flow TSR.</li> </ul> <p><u>Contingency Study</u></p> <ul style="list-style-type: none"> <li>• Report breeding timing data in the 2009 AQ 1 - Instream Flow TSR.</li> </ul> <p><b>FYLF and WPT</b></p> <ul style="list-style-type: none"> <li>• Characterize instream temperatures under different flow regimes as it relates to FYLF and WPT habitat in coordination with the water temperature modeling study. Temperature information under different flow regimes will be reported in the 2009 AQ 4 - Water Temperature Modeling TSR.</li> </ul> <p><b>CRLF</b></p> <ul style="list-style-type: none"> <li>• Conduct protocol-level CRLF surveys (May 1 through Sep 30, 2009). The survey results will be reported in the 2009 AQ 12 TSR.</li> </ul>	None	None

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<b>CUL 1 - Cultural Resources</b>						
<b>2007 Activities</b>	<p><b>Phase 1 - Summary of Existing Cultural Resources Information</b></p> <ul style="list-style-type: none"> <li>Completed in 2005 and documented in 2005 Cultural Resources Inventory Study Report (PCWA 2006).</li> </ul> <p><b>Phase 2 - Verification of Known Cultural Resources and Identification of Unknown Sites</b></p> <ul style="list-style-type: none"> <li>Field surveys initiated in 2006 and continued through 2007.</li> <li>Work completed in 2006 is documented in 2006 Cultural Resources Inventory Report (PCWA 2007).</li> <li>Work completed in 2007 is documented in Draft CUL 1 - Cultural Resources Technical Study Report - 2007, which was distributed to stakeholders in December 2007.</li> <li>Majority of study area has been surveyed.</li> </ul>	<ul style="list-style-type: none"> <li>Nov 27, 2007. Updated TWG on 2007 field activities and study results.</li> </ul>	<p><b>Identification of Unknown Sites</b></p> <ul style="list-style-type: none"> <li>The cultural resources inventory field work was not completed in 2007 as outlined in the study plan. Outstanding field surveys will be completed in 2008. A supplemental report will be distributed to the stakeholders in 2008, as shown on Attachment C.</li> </ul>	<ul style="list-style-type: none"> <li>Finalize CUL 1 - Cultural Resources Technical Study Report - 2007, incorporating stakeholder comments.</li> <li>Complete field surveys to identify unknown sites in the study area.</li> <li>Prepare and distribute a Supplemental Report documenting the results of field surveys conducted in 2008.</li> <li>Develop recommendations regarding need for eligibility studies.</li> <li>Prepare eligibility evaluation study plan, if needed.</li> <li>Amend AI permit to cover Evaluation studies, if needed.</li> <li>Conduct eligibility assessment(s), if needed.</li> <li>If additional Project facilities, features, recreation facilities or dispersed concentrated use areas are identified, these areas will be surveyed consistent with the study plan.</li> </ul>	None	None
<b>2008 Activities</b>	<p><b>Cultural Resources Inventory</b></p> <ul style="list-style-type: none"> <li>Finalized the CUL 1 - Cultural Resources Technical Study Report - 2007, incorporating stakeholder comments. The report was distributed to the stakeholders on April 25, 2008.</li> <li>Completed field surveys to identify unknown sites in the study area, including at Project Snow Courses that were added to the Project Description in 2008.</li> <li>Prepared a CUL 1 - Cultural Resources Technical Study Report - 2008 documenting the results of field surveys conducted in 2008. The Draft report was distributed to the stakeholders for review and comment on December 12, 2008.</li> </ul> <p><b>NRHP Eligibility Contingency Study</b></p> <ul style="list-style-type: none"> <li>Developed recommendations regarding need for eligibility studies.</li> <li>Prepared a CUL 1 - Cultural Resources Evaluation Plan. The draft plan was distributed to the stakeholders on June 18, 2008 and the final plan was distributed on August 28, 2008.</li> <li>Amended the ARPA permit to cover NRHP Eligibility Evaluation studies.</li> <li>Conducted field surveys and research as outlined in the CUL 1 - Cultural Resources Evaluation Plan.</li> </ul>	<ul style="list-style-type: none"> <li>Feb 26, 2008. Updated TWG on relicensing process activities. Provided an overview of the CUL -1 Cultural Resources Technical Study Report - 2007. Discussed cultural resources NRHP eligibility evaluation study process.</li> <li>Nov. 18, 2008. Provided TWG with overview of 2008 Cultural Resources Inventory Study results. Updated TWG on the implementation of Cultural Resources Eligibility studies.</li> </ul>	<p><b>Cultural Resources Inventory Reporting Variance</b></p> <ul style="list-style-type: none"> <li>Timing of the distribution of the draft CUL 1 -Cultural Resources TSR - 2008 was delayed because additional time was needed to conduct field surveys. The updated schedule is shown on the Implementation Schedule included in Attachment C.</li> </ul> <p><b>NRHP Eligibility Reporting Variance</b></p> <ul style="list-style-type: none"> <li>Timing of the distribution of the CUL 1 - Cultural Resources Evaluation plan was delayed slightly to allow for consultation with the USFS prior to distribution of the plan. The updated schedule is shown on the Implementation Schedule included in Attachment C.</li> </ul>	<p><b>Cultural Resources Inventory</b></p> <ul style="list-style-type: none"> <li>Finalize CUL 1 - Cultural Resources TSR - 2008</li> <li>Continue consultation with Tribes to identify any currently unidentified resources and/or characterize known resources.</li> </ul> <p><b>NRHP Eligibility Contingency Study</b></p> <ul style="list-style-type: none"> <li>Distribute Draft Supplemental Evaluation Plan to stakeholders for review and comment. This plan will cover resources that were identified in 2008, after the original CUL 1 - Cultural Resources Evaluation Plan was distributed.</li> <li>Complete NRHP eligibility evaluation studies.</li> <li>Consult with Tribes and USDA-FS regarding resource eligibility.</li> <li>Prepare and distribute a report documenting the results of NRHP eligibility evaluation studies.</li> <li>Initiate consultation with the State Historic Preservation Officer (SHPO) regarding potential effects to historic properties.</li> </ul>	None	None

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Technical Study Plan	Study Elements Completed/ Data Collected	Work Group Update	Technical Study Plan Variances	Outstanding Study Elements (Data analysis and reporting schedules are shown on the implementation schedules provided in Attachment C.)	Proposed Modifications	Proposed New Studies
<b>LAND 1 - Transportation System</b>						
<b>2007 Activities</b>	None	N/A	None	<ul style="list-style-type: none"> <li>• Identify and map Project roads and trails used by PCWA to access Project facilities and Project Recreation facilities and by the public to access dispersed concentrated use areas.</li> <li>• Conduct road assessment to characterize the current condition of Project roads and trails, and associated drainage features.</li> <li>• Inventory the location and condition of safety, traffic control and information signs and access control features along Project roads and trails.</li> <li>• Identify potential natural resource issues that occur along Project roads and trails.</li> <li>• Identify and characterize potential traffic safety concerns.</li> <li>• Identify and characterize current maintenance practices, schedules and responsibilities for Project roads and trails and non-Project general access roads.</li> <li>• Identify and map the locations of existing legal easements and right-of-ways associated with Project roads and trails.</li> <li>• Identify the location and condition of helicopter landing sites that are used to operate and maintain the MFP.</li> <li>• Identify and map non-Project General Access roads and trails used by the PCWA and the public to access Project facilities and non-Project recreation areas.</li> <li>• Characterize the general characteristics of non-Project General Access roads.</li> <li>• Identify and map Project related signs located along non-Project general access roads and trails.</li> <li>• Characterize use of non-Project General Access roads and trails.</li> <li>• Identify and map the location of areas that may be at risk to damage from natural events.</li> <li>• Identify and describe the location of any new roads or trails associated with Project betterments.</li> <li>• Determine whether the timing or level of road and trail use will change as a result of potential changes in MFP operation or maintenance activities.</li> </ul>	None	None
<b>2008 Activities</b>	<ul style="list-style-type: none"> <li>• Identified and mapped Project roads and trails used by PCWA to access Project facilities and Project Recreation facilities and by the public to access dispersed concentrated use areas.</li> <li>• Conducted field work associated with road assessment to characterize the current condition of Project roads and trails, and associated drainage features.</li> <li>• Inventoried the location and condition of safety, traffic control, and information signs and access control features along Project roads and trails.</li> <li>• Identified existing legal easements and right-of-ways associated with Project roads and trails.</li> <li>• Identified and mapped non-Project General Access roads and trails used by the PCWA and the public to access Project facilities and Project recreation areas.</li> <li>• Characterized the general characteristics of non-Project General Access roads.</li> <li>• Identified and photographed Project-related signs located along non-Project general access roads and trails.</li> <li>• Characterized use of non-Project General Access roads and trails by PCWA for operations and maintenance.</li> <li>• Identified and described the location of any new roads or trails associated with Project betterments.</li> </ul>	N/A	None	<ul style="list-style-type: none"> <li>• Complete maps and tables using data collected as part of the road assessment to characterize the current condition of Project roads and trails, and associated drainage features.</li> <li>• Identify potential natural resource issues that occur along Project roads and trails.</li> <li>• Identify and characterize potential traffic safety concerns.</li> <li>• Identify and characterize current maintenance practices, schedules and responsibilities for Project roads and trails and non-Project general access roads.</li> <li>• Map the locations of existing legal easements and right of ways associated with Project roads and trails.</li> <li>• Identify the location and condition of helicopter landing sites that are used to operate and maintain the MFP.</li> <li>• Complete maps of locations of Project-related signs located along non-Project General Access roads and trails.</li> <li>• Characterize use of non-Project General Access roads and trails by entities other than PCWA. Produce map of level of use of Non-project roads for PCWA operations and maintenance.</li> <li>• Identify and map the location of areas that may be at risk to damage from natural events.</li> <li>• Determine whether the timing or level of road and trail use will change as a result of potential changes in MFP operation or maintenance activities.</li> <li>• Prepare and distribute a report documenting the results of the transportation system studies.</li> </ul>	None	None

**Attachment B. 2008 Technical Study Plan Progress Report Summary**

Technical Study Plan	Study Elements Completed/ Data Collected	Work Group Update	Technical Study Plan Variances	Outstanding Study Elements (Data analysis and reporting schedules are shown on the implementation schedules provided in Attachment C.)	Proposed Modifications	Proposed New Studies
<b>LAND 2 - Fire Prevention and Response</b>						
<b>2007 Activities</b>	None	N/A	None	<ul style="list-style-type: none"> <li>Identify and describe applicable federal, state and local fire prevention and management regulations, fuel treatment plans and agreements relevant to fire prevention on lands within the FERC Project boundary and within the Watershed.</li> <li>Identify and map fuel and facility conditions.</li> <li>Identify defense zones.</li> <li>Identify and describe PCWA's existing and proposed fire prevention measures.</li> <li>Identify and describe PCWA's fire resources and procedures.</li> </ul>	None	None
<b>2008 Activities</b>	<ul style="list-style-type: none"> <li>Identified and described applicable federal, state, and local fire prevention and management regulations, fuel treatment plans and agreements relevant to fire prevention on lands within the FERC Project boundary and within the watershed, where appropriate.</li> <li>Completed field work related to assessment of fuel conditions around Project facilities and roads. Described facility conditions.</li> <li>Identified and described PCWA's existing and proposed fire prevention measures.</li> <li>Identified and described PCWA's fire resources and procedures.</li> </ul>	<ul style="list-style-type: none"> <li>Updated LAND TWG on study progress and requested approval of fuel condition mapping methods by e-mail dated November 14, 2008.</li> </ul>	<u>Reporting Variance</u> <ul style="list-style-type: none"> <li>Timing of the distribution of the draft Land 2 Fire Prevention and Response Report has been delayed because additional time is needed to obtain data from the USDA-FS and to complete the fuels condition mapping effort. The updated schedule is shown on the Implementation Schedule included in Attachment C.</li> </ul>	<ul style="list-style-type: none"> <li>Digitize and produce maps of fuel conditions around Project facilities and roads.</li> <li>Obtain defense zone GIS maps from USDA-FS.</li> <li>Prepare and distribute LAND 2 TSR.</li> </ul>	None	None
<b>LAND 3 - Emergency Action and Public Safety</b>						
<b>2007 Activities</b>	None	N/A	None	<ul style="list-style-type: none"> <li>Describe PCWA's Emergency Action Plan (EAP) and how the EAP is updated.</li> <li>Describe PCWA's planning efforts and response activities related to emergency situations not covered under the EAP.</li> <li>Describe how PCWA communicates and coordinates with state, federal, and local agencies during emergency events in the vicinity of the MFP.</li> <li>Describe PCWA's public and worker safety measures.</li> <li>Describe PCWA's planning efforts and response activities related to incidents or emergencies involving the public, employees, or contractors.</li> <li>Characterize the number, type and location of incidents and associated emergency response efforts that have occurred in the vicinity of the MFP.</li> </ul>	None	None
<b>2008 Activities</b>	<ul style="list-style-type: none"> <li>Described PCWA's Emergency Action Plan (EAP) and how the EAP is updated.</li> <li>Described PCWA's planning efforts and response activities related to emergency situations not covered under the EAP.</li> <li>Described how PCWA communicates and coordinates with state, federal, and local agencies during emergency events in the vicinity of the MFP.</li> <li>Described PCWA's public and worker safety measures and surveyed (recorded locations and obtained descriptions) of signs, alarms, booms, and buoys.</li> <li>Described PCWA's planning efforts and response activities related to incidents or emergencies involving the public, employees, or contractors.</li> <li>Characterized the number, type, and location of incidents and associated emergency response efforts that have occurred in the vicinity of the MFP using 2006/2007 data provided by Placer County Sheriff's Department, State Parks, and Foresthill Fire Department.</li> </ul>	N/A	<u>Reporting Variance</u> <ul style="list-style-type: none"> <li>Timing of the distribution of the draft Land 3 - Emergency Action and Public Safety Report has been delayed because additional time is needed to obtain emergency incident data from responding agencies. The updated schedule is shown on the Implementation Schedule included in Attachment C.</li> </ul>	<ul style="list-style-type: none"> <li>Obtain and characterize data for emergency incidents in 2006/2007 from CALFIRE, El Dorado County, and the USDA-FS.</li> <li>Prepare and distribute LAND 3 - TSR.</li> </ul>	None	None



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Technical Study Plan	Study Elements Completed/ Data Collected	Work Group Update	Technical Study Plan Variances	Outstanding Study Elements (Data analysis and reporting schedules are shown on the implementation schedules provided in Attachment C.)	Proposed Modifications	Proposed New Studies
<b>LAND 4 - FERC Boundary and Authorization</b>						
<b>2007 Activities</b>		N/A	None	<ul style="list-style-type: none"> <li>• Identify and map the location of all existing Project facilities, roads, trails, etc. in relation to the FERC Project boundary.</li> <li>• Identify Project facilities that lie outside the current FERC Project boundary.</li> <li>• Identify and map legal easements and ROWs associated with the MFP.</li> <li>• Compile and summarized current authorizations and other Project-related agreements.</li> <li>• Identify and map proposed facilities and inundation areas associated with proposed Project betterments in relation to the current FERC Project boundary.</li> <li>• Identify and map the location of construction, staging, and disposal areas in relation to the current FERC Project boundary.</li> </ul>	None	None
<b>2008 Activities</b>	<ul style="list-style-type: none"> <li>• Identified and mapped the location of all existing Project facilities, roads, trails, etc. in relation to the FERC Project boundary.</li> <li>• Identified Project facilities that lie outside the current FERC Project boundary.</li> <li>• Identified legal easements and ROWs associated with the MFP.</li> <li>• Compiled and summarized current authorizations and other Project-related agreements.</li> <li>• Identified and mapped proposed facilities and inundation areas associated with proposed Project betterments in relation to the current FERC Project boundary.</li> <li>• Identified and mapped the location of construction, staging, and disposal areas in relation to the current FERC Project boundary.</li> </ul>	N/A	<p><u>Reporting Variance</u></p> <ul style="list-style-type: none"> <li>• Timing of the distribution of the draft Land 4 - FERC Boundary and Authorization Report has been delayed because additional time is needed to process data from responding agencies and generate maps. The updated schedule is shown on the Implementation Schedule included in Attachment C.</li> </ul>	<ul style="list-style-type: none"> <li>• Prepare and distribute LAND 4 TSR.</li> </ul>	None	None

**Attachment B. 2008 Technical Study Plan Progress Report Summary**

Technical Study Plan	Study Elements Completed/ Data Collected	Work Group Update	Technical Study Plan Variances	Outstanding Study Elements (Data analysis and reporting schedules are shown on the implementation schedules provided in Attachment C.)	Proposed Modifications	Proposed New Studies
<b>REC 1 - Recreation Use and Facilities Assessment</b>						
<b>2007 Activities</b>	<ul style="list-style-type: none"> <li>Vehicle counts initiated in May 2007.</li> <li>Acquisition of existing use data available from USFS and ASRA in progress.</li> <li>Data compilation, tabulation, and evaluation in progress.</li> </ul>	<ul style="list-style-type: none"> <li>Jan 15, 2008: Distributed vehicle count data and summary to TWG.</li> </ul>	None	<ul style="list-style-type: none"> <li>Continue vehicle counts through May 2008.</li> <li>Continue acquisition of existing use data.</li> <li>Compile and evaluate vehicle count data.</li> <li>Conduct facility assessments.</li> </ul>	None	None
<b>2008 Activities</b>	<p><b>Recreation Use</b></p> <ul style="list-style-type: none"> <li>Concluded vehicle counts in May 2008.</li> <li>Acquired existing use data.</li> <li>Compiled and evaluated vehicle count data.</li> </ul> <p><b>Recreation Facility Assessment</b></p> <ul style="list-style-type: none"> <li>Acquired facility inventory information from USDA-FS.</li> <li>Conducted assessments of developed recreation facilities managed by USDA-FS.</li> <li>Conducted detailed assessment of select roads in ASRA.</li> </ul>	<ul style="list-style-type: none"> <li>Jan 15, 2008: Distributed summer vehicle count preliminary data and summary to TWG.</li> <li>Mar 26, 2008. Provided overview of fall vehicle count preliminary data.</li> <li>Apr 8, 2008. Reviewed fall vehicle count data. Provided update on REC 1 study status.</li> <li>May 29, 2008. Updated TWG on status of vehicle counts, which concluded on Memorial Day.</li> <li>Sep 22, 2008. Provided update on implementation of REC 1 TSP. Distributed winter/spring vehicle count preliminary data.</li> </ul>	None	<p><b>Recreation Use</b></p> <ul style="list-style-type: none"> <li>Continue to acquire and compile use data from USDA-FS and ASRA.</li> <li>Estimate future recreation use in the vicinity of the MFP.</li> </ul> <p><b>Recreation Facility Assessment</b></p> <ul style="list-style-type: none"> <li>Conduct assessment of recreation facilities located in ASRA and characterize use.</li> </ul> <p><b>Reporting</b></p> <ul style="list-style-type: none"> <li>Prepare and distribute REC 1 - Recreation Use and Facility Assessment TSR.</li> </ul>	None	None
<b>REC 2 - Recreation Visitor Surveys</b>						
<b>2007 Activities</b>	<ul style="list-style-type: none"> <li>Developed draft general visitor survey instrument in consultation with TWG.</li> <li>Assessed vehicle count data to support development of general visitor survey sampling strategy.</li> </ul>	<ul style="list-style-type: none"> <li>Oct 1-2, 2007: Discussed and refined draft general visitor survey instrument.</li> <li>Dec 10, 2007: Discussed and refined draft general visitor survey instrument.</li> </ul>	None	<ul style="list-style-type: none"> <li>Finalize general visitor survey instrument in consultation with TWG.</li> <li>Develop survey protocols and procedures based on vehicle count data.</li> <li>General visitor surveys to be administered during the summer of 2008.</li> </ul>	None	None
<b>2008 Activities</b>	<ul style="list-style-type: none"> <li>Finalized general visitor survey instruments (Form A and Form B) in consultation with TWG.</li> <li>Developed survey protocols and procedures based on vehicle count data.</li> <li>Administered General Visitor Surveys and Reservoir Angler Surveys from Memorial Day through Labor Day, 2008.</li> </ul>	<ul style="list-style-type: none"> <li>Jan 29, 2008. Discussed General Visitor Survey Instruments and sampling strategy.</li> <li>Feb 19, 2008. Finalized General Visitor Survey Instruments and discussed survey protocols.</li> <li>Mar 6, 2008. Discussed General Visitor Survey protocols and pre-test schedule and process.</li> <li>Mar. 26, 2008. Discussed revisions to general visitor survey instrument based on pre-test results. Finalized survey protocols.</li> <li>Apr 8, 2008. Reviewed general visitor survey form and log and discussed sampling schedule. Provided update on REC 2 study status.</li> <li>May 29, 2008. Updated TWG on General Visitor Surveys, which were initiated on Memorial Day weekend.</li> <li>Jul 21, 2008. Provided overview of number of surveys completed and participant feedback.</li> <li>Sep 22, 2008. Provided update on implementation of REC 2 TSP.</li> </ul>	None	<ul style="list-style-type: none"> <li>Prepare and distribute REC 2 - Recreation Visitor Surveys TSR.</li> </ul>	None	None
<b>REC 3 - Reservoir Recreation Opportunities</b>						
<b>2007 Activities</b>	None	N/A	None	<ul style="list-style-type: none"> <li>Characterize existing recreation opportunities.</li> <li>Characterize the relationship between reservoir water surface elevation (WSE) and current and future reservoir-based recreation opportunities.</li> <li>Characterize existing and future WSE-related operational constraints.</li> <li>Identify assess access and safety concerns.</li> <li>Develop information about potential user conflicts.</li> </ul>	None	None
<b>2008 Activities</b>	<ul style="list-style-type: none"> <li>Collected information as part of REC 1, REC 2, and LAND 3 studies to:                             <ul style="list-style-type: none"> <li>Characterize existing recreation opportunities</li> <li>Characterize the relationship between reservoir water surface elevation (WSE) and current and future reservoir-based recreation opportunities</li> <li>Identify and assess access and safety concerns</li> <li>Identify potential user conflicts.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Apr 8, 2008. Provided update on REC 3 study status.</li> <li>Sep 22, 2008. Provided update on implementation of REC 3 TSP.</li> </ul>	None	<ul style="list-style-type: none"> <li>Prepare and distribute REC 3 - Reservoir Recreation Opportunities TSR.</li> </ul>	None	None

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<b>REC 4 - Stream-based Recreation Opportunities</b>						
<b>2007 Activities</b>	<ul style="list-style-type: none"> <li>Acquisition of existing recreation information and hydrologic data in progress.</li> </ul>	N/A	None	<ul style="list-style-type: none"> <li>Establish focus groups.</li> <li>Develop questions for focus group discussions.</li> <li>Conduct focus group interviews during spring of 2008.</li> <li>Establish flow study groups.</li> <li>Develop flow study survey instruments.</li> <li>Conduct angling, stream crossing, and boating flow studies during spring and summer of 2008, in coordination with implementation of AQ 1 - Instream Flow TSP.</li> </ul>	None	None
<b>2008 Activities</b>	<ul style="list-style-type: none"> <li>Established three focus groups (angler, trail user/stream crossing, whitewater boating).</li> <li>Developed questions for focus group discussions.</li> <li>Conducted focus group interviews.</li> <li>Established flow study groups.</li> <li>Developed flow study survey instruments.</li> <li>Identified primary stream crossing locations in peaking reach.</li> <li>Collected information to develop stage/discharge relationships at each stream crossing location.</li> <li>Conducted whitewater boating flow studies in the peaking reach.</li> </ul>	<ul style="list-style-type: none"> <li>Jan. 29, 2008. Provided overview of focus group and flow study processes.</li> <li>Feb 19, 2008. Discussed focus group and flow study implementation and timeline.</li> <li>Mar 6, 2008. Discussed invitation letter to potential focus group participants and discussed proposed questions for structured focused groups. Discussed flow study timing, target flows, and whitewater survey form.</li> <li>Mar. 26, 2008. Reviewed focus group materials and logistics. Reviewed flow study survey forms.</li> <li>Apr 8, 2008. Reviewed flow study survey forms, profiles and logs. Provided update on REC 4 study status.</li> <li>May 29, 2008. Updated TWG on focus group sessions. Discussed flow studies with respect to focus group feedback.</li> <li>Jul 21, 2008. Discussed and refined flow study approaches.</li> <li>Sep 22, 2008. Provided update on implementation of REC 4 TSP.</li> </ul>	<p><b>Angling Flow Studies</b> <u>Approach Refinement</u></p> <ul style="list-style-type: none"> <li>The REC 4 TSP indicated that PCWA would assemble a group of anglers to assess fishing conditions over a range of flows at specific locations in the peaking reach and on the Rubicon River below Ellicott Bridge. Based on the information developed during the focus group session, PCWA proposed to address flow-related fishing issues in the peaking reach by analyzing ramping conditions in the peaking reach in lieu of assembling a group of anglers to assess fishing conditions. PCWA will characterize the frequency, timing and duration of ramping at various locations in the peaking reach under current Project operations. This information will then be used to determine how current ramping scenarios affect fishing opportunities in the peaking reach. PCWA does not propose to conduct angler flow studies on the Rubicon River below Ellicott Bridge because sufficient Information to characterize flow-related impacts to anglers was developed during the angler focus group session. These refinements were discussed with and supported by the TWG.</li> </ul> <p><b>Stream Crossing Flow Studies</b> <u>Approach Refinement</u></p> <ul style="list-style-type: none"> <li>The REC 4 TSP indicated that PCWA would assemble a group of stream crossing users to assess stream crossing conditions over a range of flows at specific locations in the peaking reach. Based on the information developed during the focus group session, PCWA proposed to develop stage/discharge relationships at each of the stream crossing locations in lieu of assembling a group of stream crossing users to assess crossing conditions. PCWA believes this approach will yield information that more directly addresses the issues associated with stream crossing. These refinements were discussed with and supported by the TWG.</li> </ul>	<ul style="list-style-type: none"> <li>Summarize hydrologic information to describe flows under impaired and unimpaired conditions.</li> <li>Determine flow travel times as part of AQ 1 - Instream Flow study.</li> <li>Consult with stream-based users to identify target reaches or locations where flow information may enhance stream-based opportunities.</li> <li>Prepare and distribute REC 4 - Stream-based opportunities TSR.</li> </ul> <p><b>Whitewater Boating Studies</b> <u>Contingency Study</u></p> <ul style="list-style-type: none"> <li>Consult with TWG to determine whether whitewater boating flow studies on the runs in the bypass reaches are necessary.</li> </ul>	None	None
<b>REC 5 - Visual Quality Assessment</b>						
<b>2007 Activities</b>	<ul style="list-style-type: none"> <li>Identified Key Observation Points (KOPs) with USFS in October 2007.</li> <li>Photo-documented low water visual conditions at Hell Hole and French Meadows reservoirs in October 2007.</li> </ul>	N/A	None	<ul style="list-style-type: none"> <li>Photo-document high water conditions at Hell Hole and French Meadows reservoirs in July 2008.</li> <li>Conduct Visual Management System inventory.</li> <li>Document existing visual condition of all existing Project facilities.</li> </ul>	None	None

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<b>REC 5 - Visual Quality Assessment (continued)</b>						
<b>2008 Activities</b>	<ul style="list-style-type: none"> <li>• Photo-documented high water conditions at Hell Hole and French Meadows reservoirs in June 2008.</li> <li>• Revisited French Meadows Reservoirs in October 2008 to photo-document low water conditions, because water levels receded to levels lower than those observed in 2007.</li> <li>• Conducted Visual Management System inventory.</li> <li>• Documented existing visual condition of all existing Project facilities.</li> <li>• Developed simulations of facilities associated with betterments from Key Observation Points.</li> </ul> <p><b>Water Levels at Ralston Afterbay Contingency Study</b></p> <ul style="list-style-type: none"> <li>• Compiled hydrologic information for Ralston Afterbay.</li> <li>• Photo-documented high, intermediate and low water conditions at Ralston Afterbay in June, October and November, respectively.</li> </ul>	<ul style="list-style-type: none"> <li>• Apr 8, 2008. Reviewed flow study survey forms, profiles and logs. Provided update on REC 5 study status.</li> <li>• Sep 22, 2008. Provided update on implementation of REC 5 TSP.</li> </ul>	<p><u>Reporting Variance</u></p> <ul style="list-style-type: none"> <li>• Timing of the distribution of the draft REC 5 -Visual Quality Assessment TSR - 2008 was delayed because additional time was needed to complete field surveys. The updated schedule is shown on the Implementation Schedule included in Attachment C.</li> </ul>	<ul style="list-style-type: none"> <li>• Complete and distribute REC 5 - Visual Quality Assessment TSR.</li> </ul>	None	None

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<b>TERR 1 - Vegetation Communities and Wildlife Habitat</b>						
<b>2007 Activities</b>	<p><b>Vegetation Communities</b></p> <ul style="list-style-type: none"> <li>Developed preliminary vegetation community maps from available Calveg data.</li> <li>Verified Calveg data against aerial photos and Project video.</li> <li>Conducted ground-truth surveys.</li> <li>Developed final vegetation community maps.</li> </ul> <p><b>Wildlife Habitats</b></p> <ul style="list-style-type: none"> <li>Developed Calveg-CWHR Crosswalk table for the MFP.</li> <li>Developed preliminary vegetation density maps from aerial photos and Project video.</li> <li>Conducted vegetation density ground-truth surveys and collected data on tree size classes.</li> <li>Developed final vegetation density and tree size class maps.</li> </ul>	<ul style="list-style-type: none"> <li>Nov 6, 2007: Provided overview of study results</li> </ul>	<p><b>Reporting</b></p> <ul style="list-style-type: none"> <li>Timing of the distribution of the 2007 draft Technical Study Report was delayed because additional time was needed to complete data analysis and to prepare final vegetation community maps.</li> </ul> <p><b>Vegetation Mapping</b></p> <ul style="list-style-type: none"> <li>A detailed description of the riparian community at the mouth of Five Lakes Creek and at upper Hell Hole Reservoir could not be completed in 2007 because the existing topographic information was insufficient to accurately identify the new inundation area associated with the Hell Hole Reservoir Seasonal Storage Increase betterment. This study element will be completed in 2008 using detailed photogrammetry-based topographic mapping of the inundation zone. A supplemental report documenting the results of this effort will be distributed in late 2008.</li> </ul>	<ul style="list-style-type: none"> <li>Develop detailed descriptions of riparian vegetation communities at the mouth of Five Lakes Creek, and at upper Hell Hole Reservoir (To be completed as part of AQ 10 - Riparian Resources TSP).</li> <li>If additional Project facilities, features, recreation facilities or dispersed concentrated use areas are identified, these areas will be surveyed consistent with the study plan.</li> </ul>	None	None
<b>2008 Activities</b>	<ul style="list-style-type: none"> <li>Distributed Draft TERR 1 - Vegetation Communities and Wildlife Habitat Technical Study Report to the TWG for review and comment on January 31, 2008.</li> <li>Distributed Final TERR 1 - Vegetation Communities and Wildlife Habitat Technical Study Report to the TWG on June 17, 2008.</li> </ul>	<ul style="list-style-type: none"> <li>Jun 3, 2008. Discussed and finalized technical study report.</li> </ul>		<ul style="list-style-type: none"> <li>Develop a Supplemental Report with detailed descriptions of riparian vegetation communities at the mouth of Five Lakes Creek, and at upper Hell Hole Reservoir. This information will be reported in the AQ 10 - Riparian Resources TSR.</li> </ul>	None	None
<b>TERR 2 - Special-Status Plants</b>						
<b>2007 Activities</b>	None	N/A	None	<ul style="list-style-type: none"> <li>Identify and map special-status plants, fungi, and mosses at existing Project facilities, features, recreation facilities, and dispersed concentrated use areas, and at areas associated with proposed Project betterments.</li> <li>Identify and map special-status aquatic and riparian plants and mosses at quantitative geomorphic and riparian sampling sites in bypass and peaking reaches.</li> </ul>	None	None
<b>2008 Activities</b>	<ul style="list-style-type: none"> <li>Conducted field surveys and mapped the locations of terrestrial special-status plants and mosses at existing Project facilities, features, recreation facilities, and dispersed concentrated use areas, and at areas associated with proposed Project betterments.</li> <li>Conducted field surveys and mapped the locations of aquatic and riparian special-status plants and mosses at quantitative geomorphic and riparian sampling sites in bypass and peaking reaches.</li> </ul>	<ul style="list-style-type: none"> <li>Mar 3, 2008. Reviewed and approved list of Special-Status Plants to be included in TERR 2 technical study. Agreed that special-status fungi surveys are not necessary.</li> <li>May 7, 2008. Consulted with agencies regarding blooming periods and verified survey timing through reference population monitoring.</li> <li>Jun 3, 2008. Provided update on TERR 2 TSP implementation.</li> <li>Jul 21, 2008. Consulted with agencies regarding blooming periods and verified survey timing through reference population monitoring.</li> </ul>	<p><u>Reporting Variance</u></p> <ul style="list-style-type: none"> <li>Timing of the distribution of the 2008 draft Technical Study Report was delayed because additional time was needed to complete data analysis and to prepare final special-status plant maps.</li> </ul> <p><b>Special-Status Fungi Surveys</b></p> <p><u>Approach Refinement</u></p> <ul style="list-style-type: none"> <li>Special-status fungi identified as potentially occurring in the study area were not included in the special-status plant surveys. Special status fungi are found only in mature mixed-conifer forests. However, based on a review of vegetation community maps developed for the TERR 1 - TSP, it was determined that no mature mixed conifer forest habitat is present in the study area where maintenance activities occur or where potential project betterments would be constructed. This information was presented to the TWG on March 3, 2008. Using this information, the TWG determined that it would not be necessary to include fungi in the special-status plant surveys conducted for the TERR 2 - TSP.</li> </ul>	<ul style="list-style-type: none"> <li>Complete and distribute 2008 TERR 2 - Special Status Species TSR.</li> </ul>	None	None

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Technical Study Plan	Study Elements Completed/ Data Collected	Work Group Update	Technical Study Plan Variances	Outstanding Study Elements (Data analysis and reporting schedules are shown on the implementation schedules provided in Attachment C.)	Proposed Modifications	Proposed New Studies
<b>TERR 3 - Noxious Weeds</b>						
2007 Activities	None	N/A	None	<ul style="list-style-type: none"> <li>Identify and map known occurrences of noxious weed populations at existing Project facilities and features, recreation facilities, and dispersed concentrated use areas, and at areas associated with proposed Project betterments.</li> <li>Consult with USDA-FS personnel to develop a list of noxious weeds and invasive non-native plants of highest concern in the ENF and TNF.</li> <li>Conduct noxious weed surveys.</li> <li>Develop a GIS map of noxious weeds and invasive non-native plants with respect to the study area.</li> <li>If additional Project facilities, features, recreation facilities or dispersed concentrated use areas are identified, these areas will be surveyed consistent with the study plan.</li> </ul>	None	None
2008 Activities	<ul style="list-style-type: none"> <li>Identified and map known occurrences of noxious weed populations at existing Project facilities and features, recreation facilities, and dispersed concentrated use areas, and at areas associated with proposed Project betterments.</li> <li>Consulted with USDA-FS personnel to develop a list of noxious weeds and invasive non-native plants of highest concern in the ENF and TNF.</li> <li>Conducted noxious weed surveys.</li> <li>Developed a GIS map of noxious weeds and invasive non-native plants with respect to the study area.</li> </ul>	<ul style="list-style-type: none"> <li>Mar 3, 2008. Reviewed and approved list of noxious weeds of highest concern to be included in the TERR 3 technical study.</li> <li>Jun 3, 2008. Provided update on TERR 3 TSP implementation.</li> </ul>	<p><u>Reporting Variance</u></p> <ul style="list-style-type: none"> <li>Timing of the distribution of the 2008 draft TSR was delayed because additional time was needed to complete data analysis and to prepare final noxious weeds maps.</li> </ul> <p><u>Voluntary Enhancement</u></p> <ul style="list-style-type: none"> <li>The study area was expanded to include quantitative geomorphic and riparian sampling sites in bypass and peaking reaches.</li> </ul>	<ul style="list-style-type: none"> <li>Complete and distribute 2008 TERR 3 - Noxious Weeds TSR.</li> </ul>	None	None
<b>TERR 4 - Special-Status Wildlife</b>						
2007 Activities	<ul style="list-style-type: none"> <li>Identified and mapped known occurrences of special-status wildlife species.</li> <li>Determined Project communication line and powerline consistency with APLIC Guidelines.</li> <li>Documented incidental observations of special-status species during Project field surveys in 2007.</li> <li>Obtained USDA-FS GIS data layers of northern goshawk, California spotted owl, Pacific fisher, and pine marten land allocations.</li> <li>Obtained USDA-FS GIS data layers documenting potential willow flycatcher habitat.</li> </ul>	<ul style="list-style-type: none"> <li>Nov 6, 2007: Provided overview of study elements and preliminary results.</li> </ul>	None	<p><b>General Wildlife</b></p> <ul style="list-style-type: none"> <li>Identify and map wildlife species potentially occurring within CWHR designations.</li> <li>Conduct general wildlife surveys at potential Project betterments.</li> <li>If additional Project facilities, features, recreation facilities or dispersed concentrated use areas are identified, these areas will be surveyed consistent with the study plan.</li> </ul> <p><b>Osprey</b></p> <ul style="list-style-type: none"> <li>Conduct osprey nest surveys in conjunction with bald eagle nest surveys.</li> <li>Develop GIS map of osprey occurrences and nests.</li> </ul> <p><b>Northern Goshawk</b></p> <ul style="list-style-type: none"> <li>Develop GIS map of existing northern goshawk information with respect to the study area.</li> <li>Conduct northern goshawk surveys at potential Project betterments.</li> </ul> <p><b>California Spotted Owl</b></p> <ul style="list-style-type: none"> <li>Develop GIS map of California spotted owl land allocations and known occurrences with respect to the study area.</li> </ul> <p><b>Willow Flycatcher</b></p> <ul style="list-style-type: none"> <li>Develop GIS map of willow flycatcher nesting habitat and known occurrences with respect to the study area.</li> </ul> <p><b>Mesocarnivores</b></p> <ul style="list-style-type: none"> <li>Develop GIS map of mesocarnivore land allocations and known occurrences with respect to the study area.</li> </ul> <p><b>Mule Deer</b></p> <ul style="list-style-type: none"> <li>Update GIS map of deer herd migration patterns and important habitats in the MFP watershed.</li> </ul>	None	None

**Attachment B. 2008 Technical Study Plan Progress Report Summary**

Technical Study Plan	Study Elements Completed/ Data Collected	Work Group Update	Technical Study Plan Variances	Outstanding Study Elements (Data analysis and reporting schedules are shown on the implementation schedules provided in Attachment C.)	Proposed Modifications	Proposed New Studies
<b>TERR 4 - Special-Status Wildlife (continued)</b>						
<b>2008 Activities</b>	<p><b>General Wildlife</b></p> <ul style="list-style-type: none"> <li>Identified and mapped wildlife species potentially occurring within CWHR designations.</li> <li>Conducted general wildlife surveys at potential Project betterments.</li> <li>Consulted with resource agencies and PCWA regarding avian electrocutions and mortalities on Project powerlines</li> <li>Assessed consistency of Project communication lines and powerlines with Avian Power Line Interaction Committee (APLIC) guidelines</li> </ul> <p><b>Osprey</b></p> <ul style="list-style-type: none"> <li>Conducted osprey nest surveys in conjunction with bald eagle nest surveys.</li> <li>Developed GIS map of osprey occurrences and nests.</li> </ul> <p><b>Northern Goshawk</b></p> <ul style="list-style-type: none"> <li>Developed GIS map of existing northern goshawk information with respect to the study area.</li> <li>Conducted northern goshawk surveys at potential Project betterments.</li> </ul> <p><b>California Spotted Owl</b></p> <ul style="list-style-type: none"> <li>Developed GIS map of California spotted owl land allocations and known occurrences with respect to the study area.</li> </ul> <p><b>Willow Flycatcher</b></p> <ul style="list-style-type: none"> <li>Developed GIS map of willow flycatcher nesting habitat and known occurrences with respect to the study area.</li> </ul> <p><b>Mesocarnivores</b></p> <ul style="list-style-type: none"> <li>Developed GIS map of mesocarnivore land allocations and known occurrences with respect to the study area.</li> </ul> <p><b>Mule Deer</b></p> <ul style="list-style-type: none"> <li>Updated GIS map of deer herd migration patterns and important habitats</li> </ul> <p><b>Reporting</b></p> <ul style="list-style-type: none"> <li>Distributed Draft TERR 4 - Special Status Wildlife TSR to the TWG for review and comment on November 13, 2008.</li> </ul>	<ul style="list-style-type: none"> <li>Jun 3, 2008. Selected Northern goshawk nesting survey locations in coordination with TWG.</li> </ul>	<p><u>Reporting Variance</u></p> <ul style="list-style-type: none"> <li>Timing of the distribution of the 2008 draft TERR 4 - Special Status Wildlife TSR was delayed because additional time was needed to complete data analysis and to prepare final special-status wildlife maps.</li> </ul>	<ul style="list-style-type: none"> <li>Address stakeholder comments, finalize, and distribute 2008 TERR 4 - Special Status Wildlife TSR.</li> </ul>	None	None
<b>TERR 5 - Bald Eagle</b>						
<b>2007 Activities</b>	<ul style="list-style-type: none"> <li>Conducted December and January winter roost survey.</li> <li>Conducted Project communication line and powerline evaluation.</li> </ul>	N/A	None	<ul style="list-style-type: none"> <li>Conduct February winter roost surveys.</li> <li>Conduct nesting surveys.</li> <li>Develop GIS map documenting bald eagle winter roost and nest sites.</li> </ul>	None	None
<b>2008 Activities</b>	<ul style="list-style-type: none"> <li>Conducted February winter roost surveys.</li> <li>Conducted nesting surveys.</li> <li>Developed GIS map documenting bald eagle winter roost and nest sites.</li> <li>Distributed Draft TERR 5 - Bald Eagle Technical Study Report to the TWG for review and comment on October 31, 2008.</li> </ul>	N/A	None	<ul style="list-style-type: none"> <li>Address stakeholder comments, finalize, and distribute 2008 TERR 5 - Bald Eagle TSR.</li> </ul>	None	None

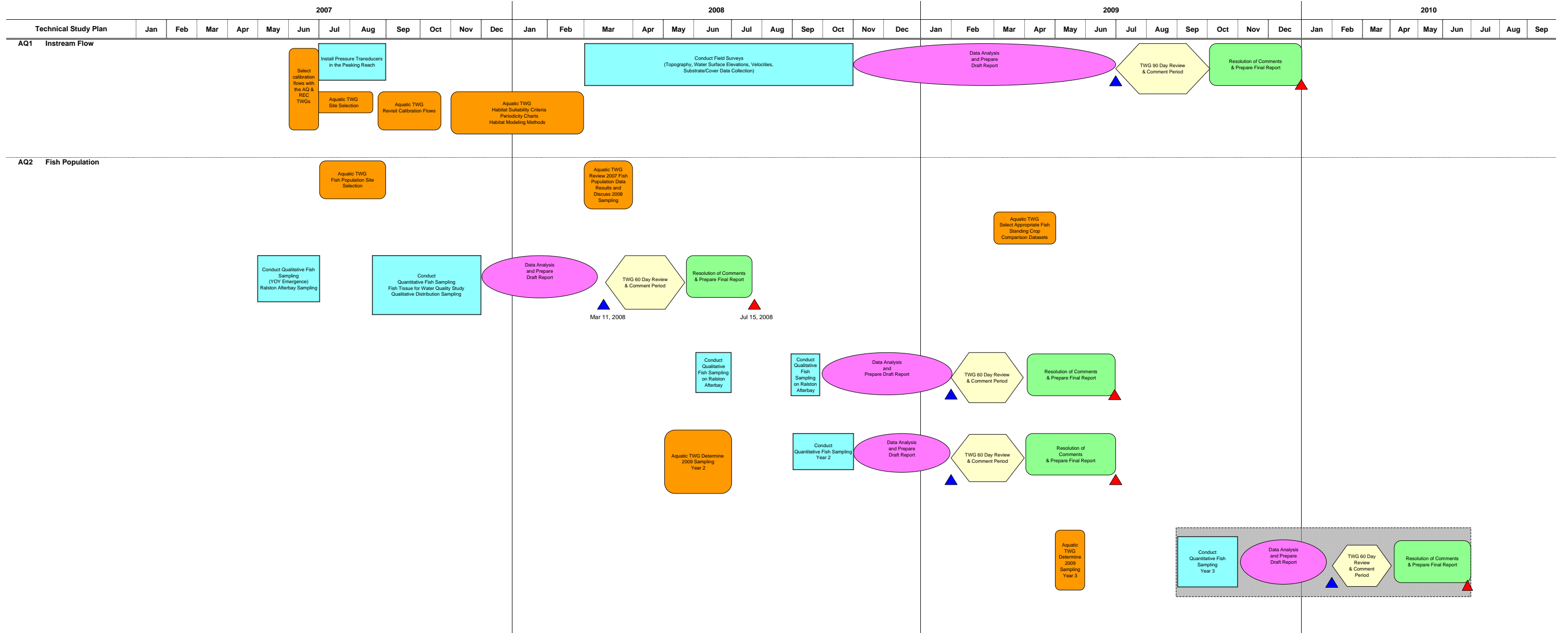
**Attachment B. 2008 Technical Study Plan Progress Report Summary**

Technical Study Plan	Study Elements Completed/ Data Collected	Work Group Update	Technical Study Plan Variances	Outstanding Study Elements (Data analysis and reporting schedules are shown on the implementation schedules provided in Attachment C.)	Proposed Modifications	Proposed New Studies
<b>TERR 6 - Special-Status Bats</b>						
<b>2007 Activities</b>	<ul style="list-style-type: none"> <li>• Developed preliminary map of know occurrences.</li> <li>• Conducted facility assessment.</li> <li>• Selected survey locations.</li> <li>• Conducted reproductive surveys.</li> <li>• Conducted seasonal use surveys.</li> <li>• Developed map of known special-status bat occurrences in the study area.</li> <li>• Development of technical study report in progress.</li> </ul>	<ul style="list-style-type: none"> <li>• Aug 13, 2007: Provided overview of facility assessment results and selected proposed sampling sites and survey methods.</li> </ul>	None	<ul style="list-style-type: none"> <li>• If additional Project facilities, features, recreation facilities or dispersed concentrated use areas are identified, these areas will be surveyed consistent with the study plan.</li> </ul>	None	None
<b>2008 Activities</b>	<ul style="list-style-type: none"> <li>• Distributed Draft TERR 6 - Special Status Bats TSR to the TWG for review and comment on March 5, 2008.</li> <li>• Distributed Final TERR 6 - Special Status Bats TSR to the TWG on June 17, 2008.</li> </ul>	<ul style="list-style-type: none"> <li>• Mar 3, 2008. Provided overview of TERR 6 - Special Status Bats Technical Study Report</li> <li>• Jun 3, 2008. Discussed and finalized technical study report.</li> </ul>	<u>Reporting Variance</u> <ul style="list-style-type: none"> <li>• Timing of the distribution of the 2008 draft TERR 6 - Special Status Bats TSR was delayed because additional time was needed to complete data analysis and to prepare final special-status bat maps.</li> </ul>	None	None	None



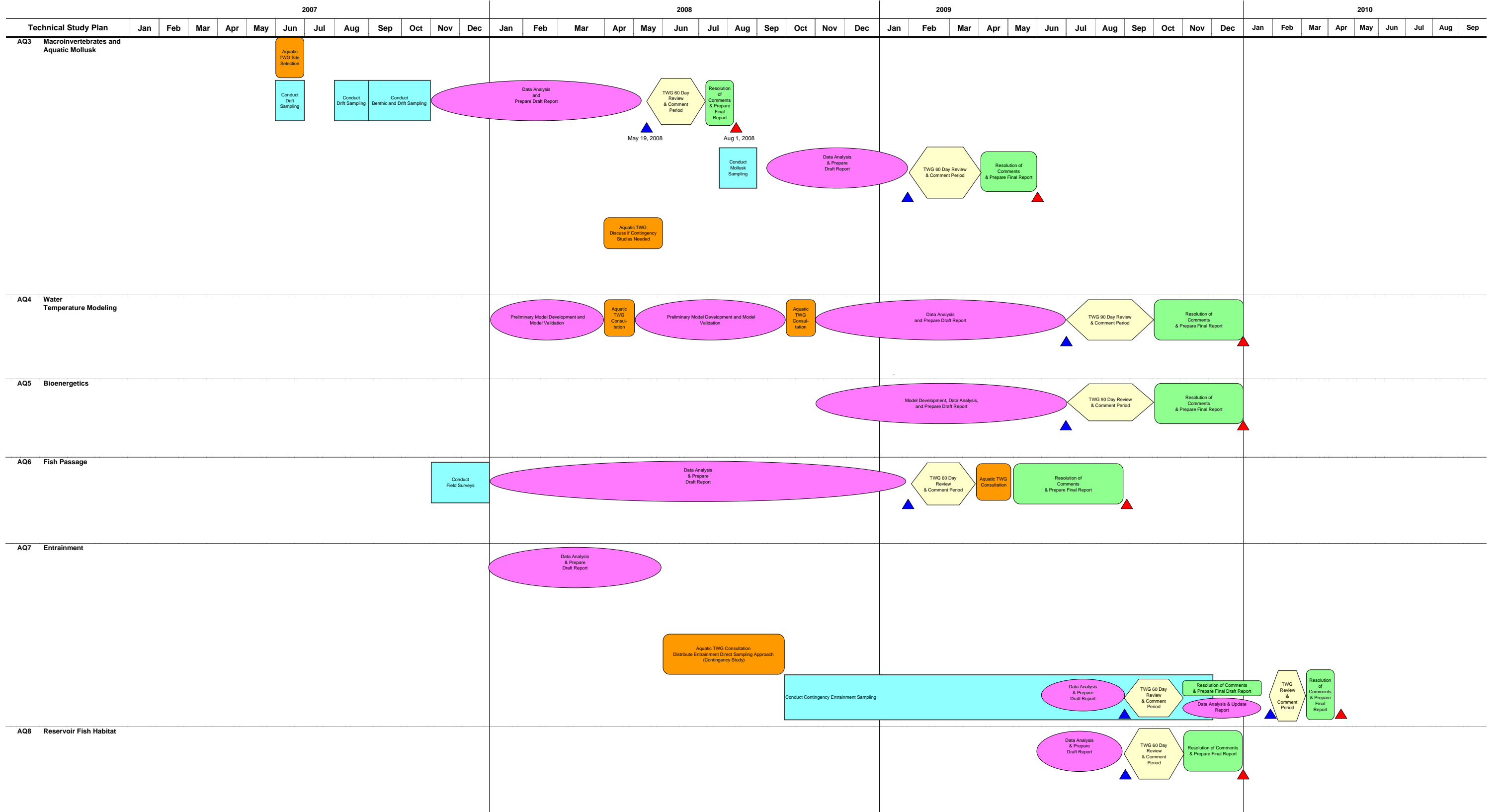
**ATTACHMENT C**  
**Technical Study Plan Implementation Schedules**

**Attachment C. Implementation Schedule for Technical Study Plans as of December 31, 2008.**  
**Aquatic Resources**



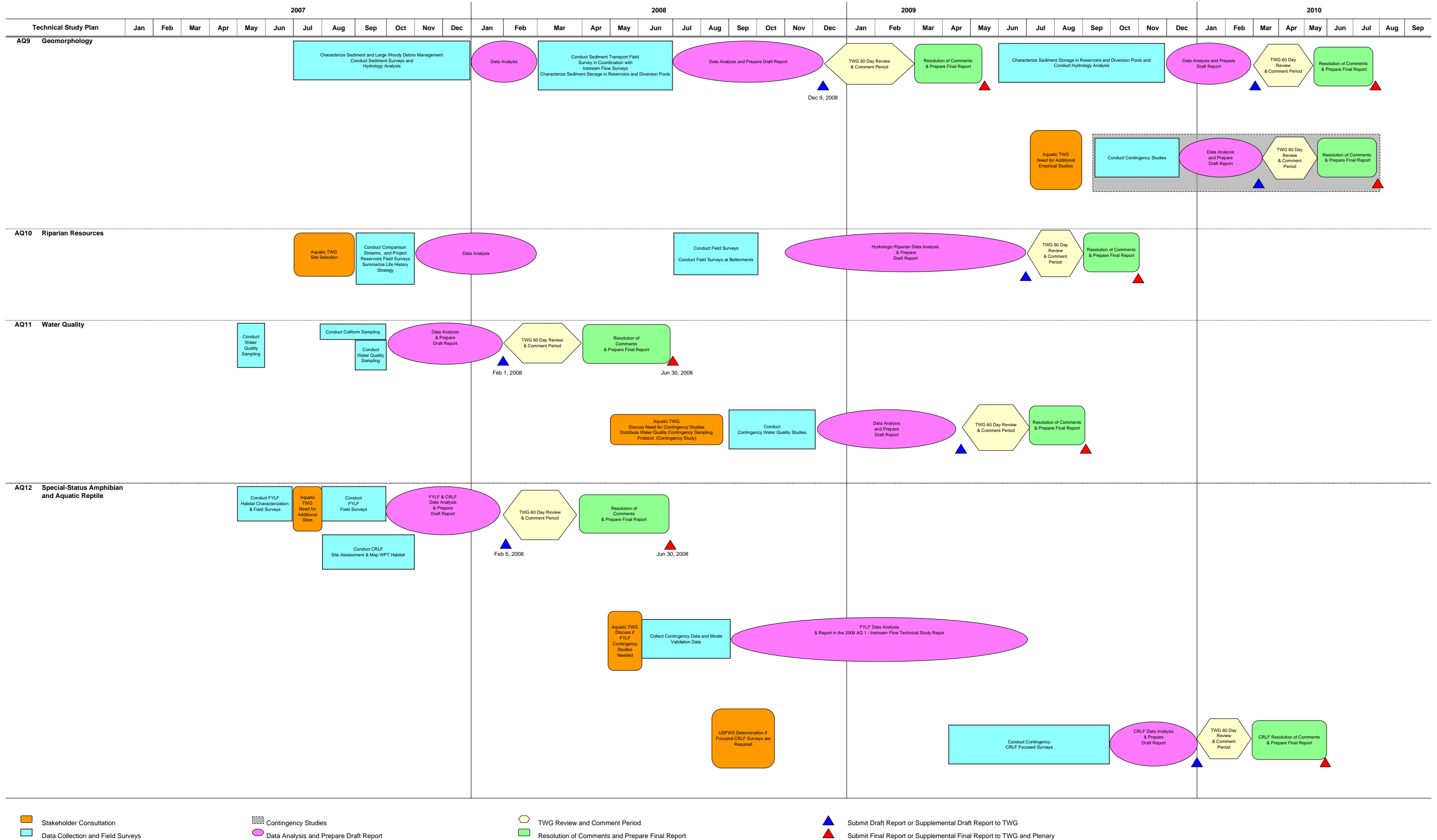
- Stakeholder Consultation
- Data Collection and Field Surveys
- Contingency Studies
- Data Analysis and Prepare Draft Report
- TWG Review and Comment Period
- Resolution of Comments and Prepare Final Report
- Submit Draft Report or Supplemental Draft Report to TWG
- Submit Final Report or Supplemental Final Report to TWG and Plenary

Attachment C. Implementation Schedule for Technical Study Plans as of December 31, 2008 (continued).  
 Aquatic Resources

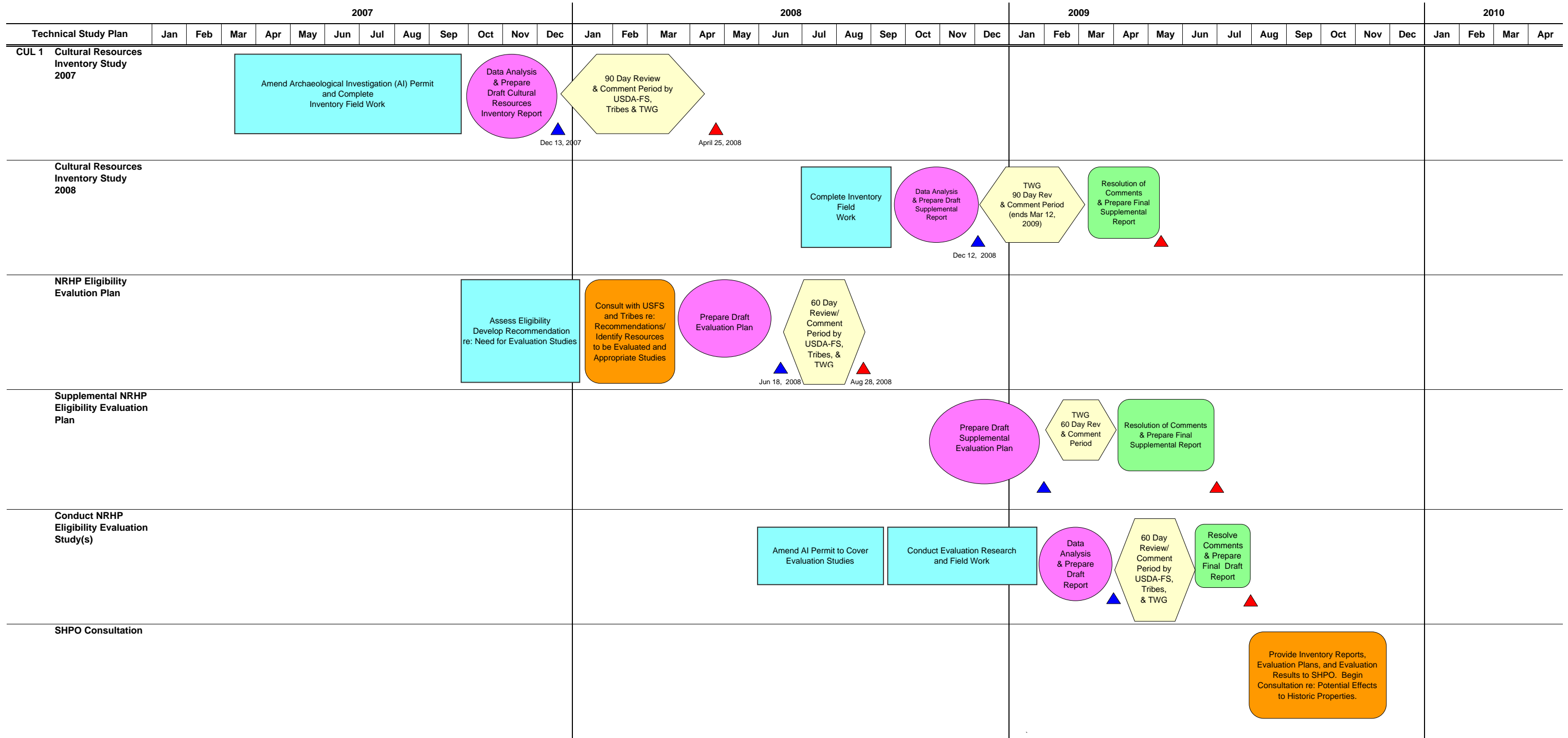


- Stakeholder Consultation
- Data Collection and Field Surveys
- Data Analysis and Prepare Draft Report
- TWG Review and Comment Period
- Resolution of Comments and Prepare Final Report
- Submit Draft Report or Supplemental Draft Report to TWG
- Submit Final Report or Supplemental Final Report to TWG and Plenary

Attachment C. Implementation Schedule for Technical Study Plans as of December 31, 2008 (continued).  
 Aquatic Resources



Attachment C. Implementation Schedule for Technical Study Plans as of December 31, 2008.  
Cultural Resources



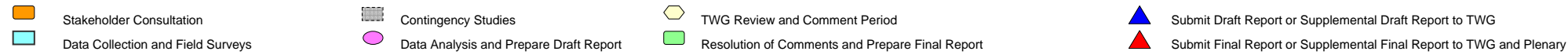
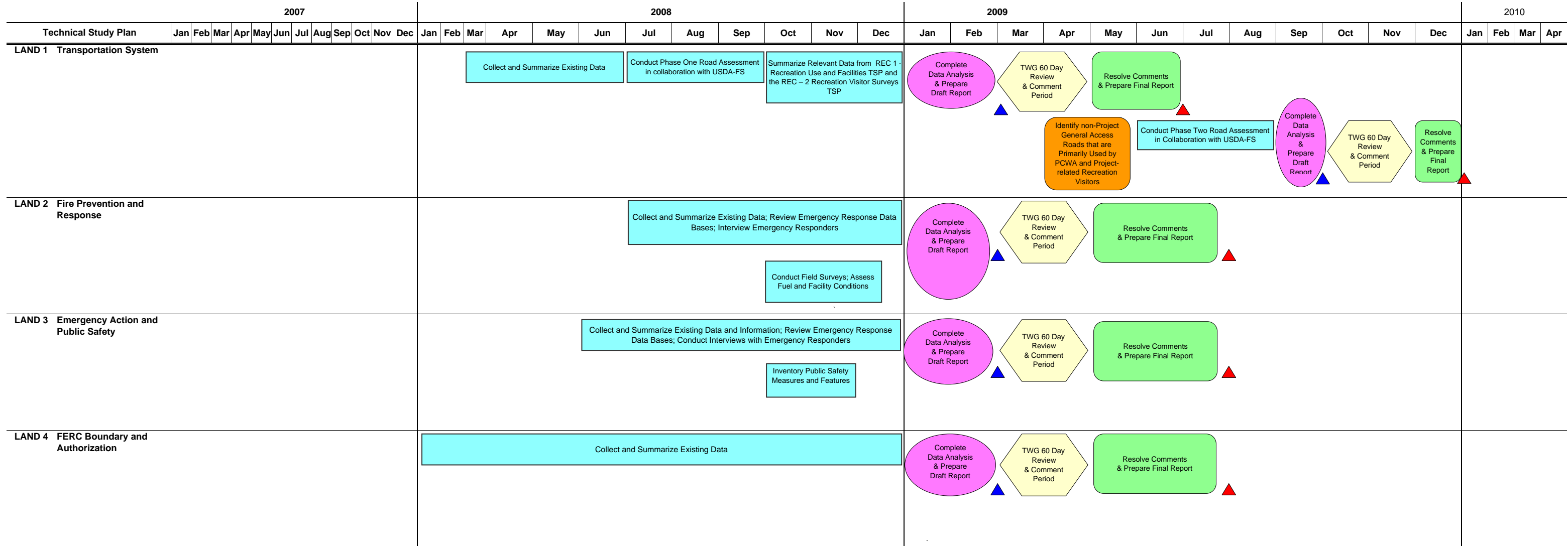
Stakeholder Consultation  
Data Collection and Field Surveys

Contingency Studies  
Data Analysis and Prepare Draft Report

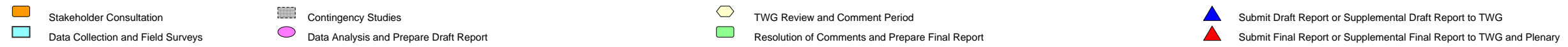
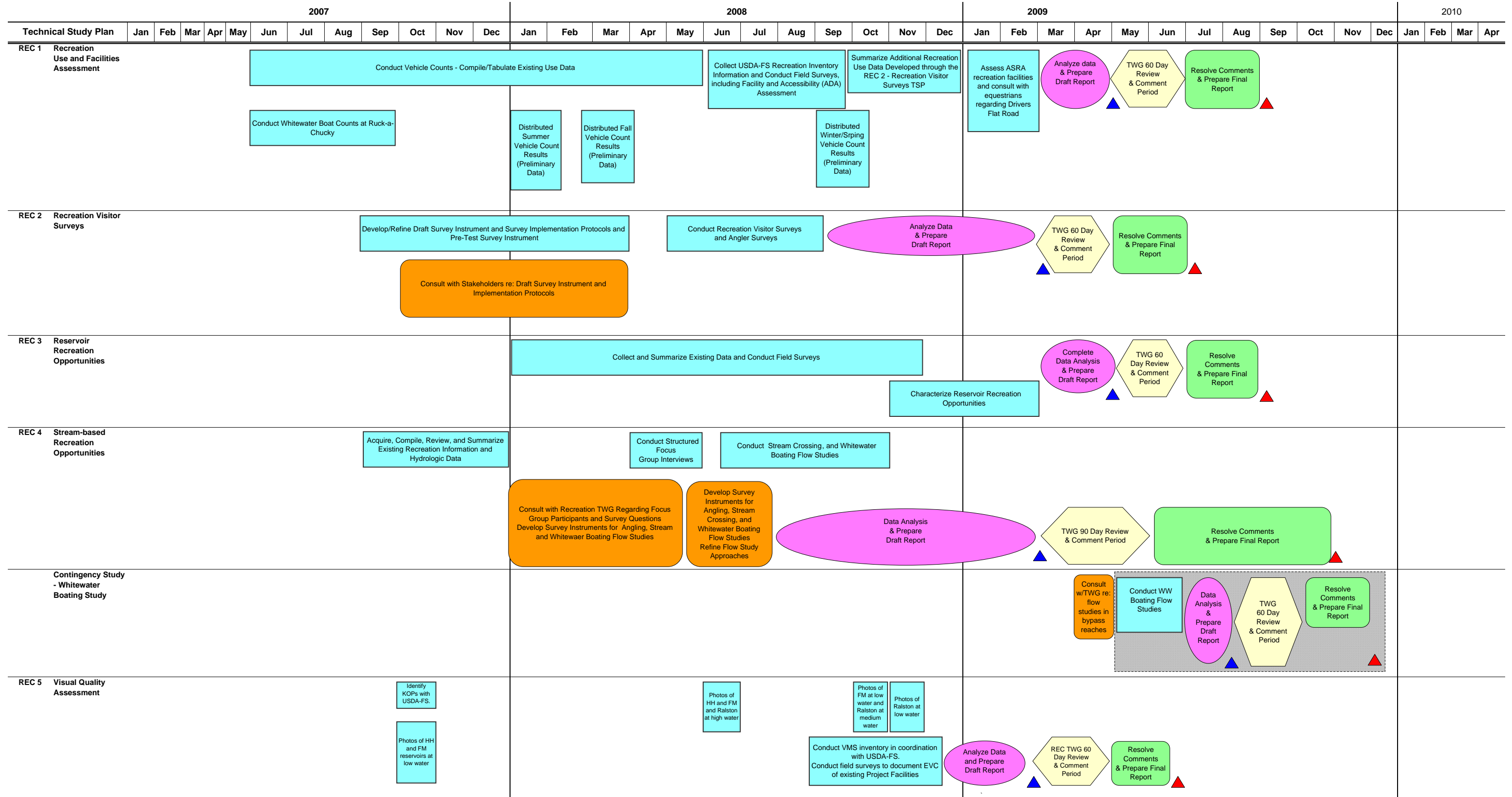
TWG Review and Comment Period  
Resolution of Comments and Prepare Final Report

Submit Draft Report or Supplemental Draft Report to TWG  
Submit Final Report or Supplemental Final Report to TWG and Plenary

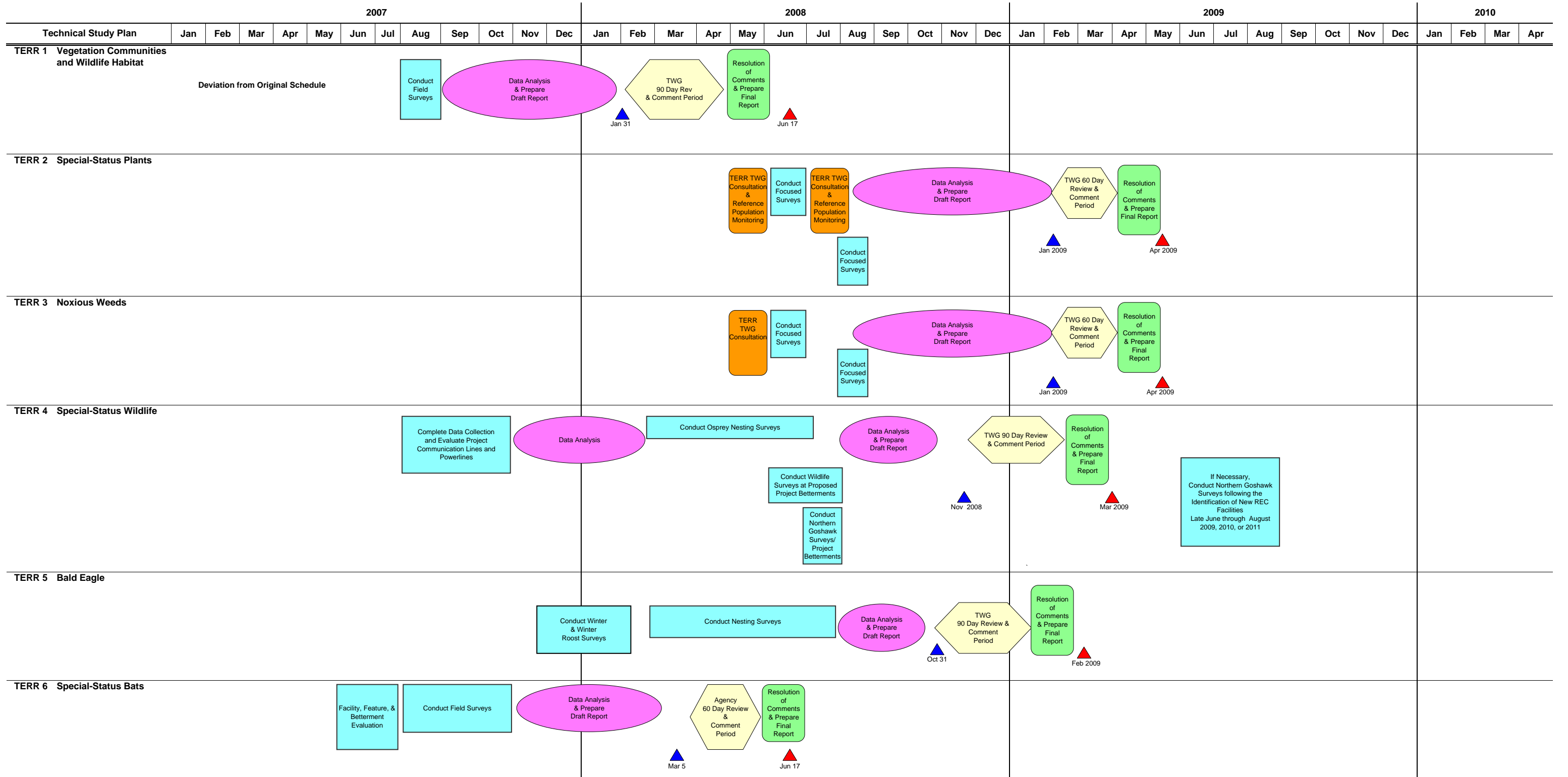
**Attachment C. Implementation Schedule for Technical Study Plans as of December 31, 2008.**  
**Land Management**



**Attachment C. Implementation Schedule for Technical Study Plans as of December 31, 2008.**  
**Recreation Resources**



**Attachment C. Implementation Schedule for Technical Study Plans as of December 31, 2008.**  
**Terrestrial Resources**



- Stakeholder Consultation
- Data Collection and Field Surveys
- Contingency Studies
- Data Analysis and Prepare Draft Report
- TWG Review and Comment Period
- Resolution of Comments and Prepare Final Report
- Submit Draft Report or Supplemental Draft Report to TWG
- Submit Final Report or Supplemental Final Report to TWG and Plenary



**ATTACHMENT D**

**July 1, 2008 Update on the REC 4 - Stream Based Opportunities Technical Study  
Plan Focus Group Sessions and Refined Flow Study Approaches**

**Placer County Water Agency  
Middle Fork of American River Project**

**July 1, 2008 Update on the  
REC 4 – Stream Based Opportunities Technical Study Plan  
Focus Group Sessions and Refined Flow Study Approaches**

This report summarizes the primary flow-related findings that evolved out of three focus group sessions that Placer County Water Agency (PCWA) conducted as part of the REC 4 Stream-based Recreation Opportunities Technical Study Plan (TSP). In addition, it describes how PCWA proposes to refine the flow study approaches that were originally outlined in the REC 4 TSP based on the information developed through the focus group sessions.

**Background**

The REC-4 TSP focuses on developing information to characterize stream-based recreational opportunities in the bypass and peaking reaches associated with the Middle Fork American River Project (MFP or Project). Among other things, the REC-4 TSP includes study components that center on developing activity specific information about: 1) trail use at stream crossings; 2) angling; and 3) whitewater boating. The TSP indicates that information regarding these three activities would be developed by: 1) utilizing existing information to characterize opportunities and use; 2) implementing structured group interviews (focus group sessions); and 3) conducting flow studies. The TSP was designed so that information developed through the focus groups could be used to refine the flow study objectives and target flows originally proposed in the TSP.

**Focus Group Sessions**

PCWA conducted three focus group sessions, as follows:

- April 23, 2008 – Whitewater Boating Focus Group
- May 12, 2008 – Trail User/Stream Crossing Focus Group
- May 20, 2008 – Angler Focus Group

Each of the focus groups was well attended by users representing a range of interests and skill levels. The focus group participants were very knowledgeable and provided useful information about trail crossing, angling and whitewater boating in the Project bypass and peaking reaches. The specific reaches that were discussed during the focus group sessions are identified on Tables 1, 2 and 3, along with summary information that was developed through the focus groups.

The information that was developed during the three focus group sessions helped PCWA define the flow related issues that are unique to each user group. This information was then used to refine the study approaches outlined in the REC 4 TSP to

more directly address the flow-related issues associated with each user group. Information developed through each of the focus group sessions is summarized below along with the refined flow study approach.

## **Whitewater Boating**

### ***Focus Group Summary***

The whitewater boating focus group session was attended by 10 people affiliated with the following activities: private boating (3), commercial boating (4) and angling (3). Together, the focus group identified and discussed seven runs:

- 2 runs on the Rubicon River;
- 1 run on the Middle Fork American River between Middle Fork Interbay and Ralston Afterbay;
- 3 runs on the Middle Fork American River between Oxbow Powerhouse and the Confluence; and
- 1 run on the North Fork American River between the Confluence and Oregon Bar.

None of the focus group participants had any experience on the Middle Fork American River between French Meadows Reservoir and Middle Fork Interbay, Duncan Creek, or Long Canyon Creek.

Each of the runs discussed by the focus group is briefly described in the following. Additional information is provided in Table 1.

### *Peaking Reach*

Four runs located in the peaking reach were discussed during the focus group session. All of the focus group participants were familiar with the runs in the peaking reach, associated boating flows, and potential uses. The following is an excerpt of that discussion:

#### Oxbow PH to Ruck-a-Chucky Run

- 15 mile run
- Class IV with one portage (Ruck-a-Chucky rapid)
- Used by intermediate to advance kayakers and rafters
- Primarily used for commercial rafting
- Estimated minimum boating flow is 600 cfs; maximum flow is 3,000 cfs for rafts and kayaks
- A flow study at 368 cfs is not necessary because it is well below the estimated minimum boatable flow.

### Ruck-a-Chucky to Mammoth Bar Run

- 7 mile run
- Class II+
- Used by novice rafters and kayakers. Potentially could be used for instructional boating and family rafting.
- Estimated minimum boating flow is 800 cfs; maximum flow is 1,200 cfs for kayaks, inflatable kayaks (IKs) and canoes
- Any flow is okay for more skilled boaters
- A flow study at 368 cfs is not necessary because it is well below the estimated minimum boatable flow.

### Mammoth Bar to Confluence Run

- 2.3 mile run
- Class II with one portage (Murderer's Bar)
- Used by novice rafters and kayakers. Potentially could be used for instructional boating and family rafting.
- Estimated minimum boating flow is 400 cfs; maximum flow is 15,000 cfs for all watercraft
- A flow study on this reach would involve a long, difficult portage around Murderer's Bar rapid
- The boating characteristics of this run would be very similar to those of the Ruck-a-Chucky to Mammoth Bar Run

### Confluence to Oregon Bar Run

- 3.5 mile run (to Birdsall Take out)
- Class II+, III-
- Used by novice rafters and kayakers. Potentially could be used for instructional boating and family rafting.
- Estimated minimum boating flow is 300 cfs; maximum flow is 15,000 cfs
- 100 cfs minimum for inner tubes and inflatable kayaks
- Flow ranges are not well known because this run was just recently opened when water was reintroduced to the channel at the old Auburn Dam site.

### *Rubicon River*

The Rubicon River was discussed as two runs, one extending from Hell Hole Dam to Ellicott Bridge and the other extending from Ellicott Bridge to Ralston Afterbay. A couple of the focus group participants had boated these runs. The focus group participants identified several other boaters to contact for additional information and to refine the flow ranges discussed during the focus group. PCWA is in the process of contacting these boaters.

### Hell Hole Dam to Ellicott Bridge

- Hike-in put-in located at RM 25
- 4 mile run from RM 25 to Ellicott Bridge
- Class V
- Typically boated when Hell Hole Reservoir spills
- Estimated minimum boating flow is 400 to 500 cfs; maximum flow is 1,200 to 1,500 cfs
- Used by expert kayakers and rafters
- Remote wilderness area
- Access is usually restricted by snow when boating flows are available

### Ellicott Bridge to Ralston Afterbay

- 24 mile run
- Class V
- Typically boated when Hell Hole Reservoir spills
- Estimated minimum boating flow is 400-600 cfs; maximum boating flow is 1,200-2,000 cfs.
- Used by expert kayakers and rafters
- Remote wilderness area
- 2 day run
- Access is usually restricted by snow when boating flows are available

### *Middle Fork American River between French Meadows Reservoir and Ralston Afterbay*

The Middle Fork American River between French Meadows Reservoir and Ralston Afterbay was discussed as two runs, one extending from French Meadows Dam to Middle Fork Interbay and the other extending from Middle Fork Interbay to Ralston Afterbay. None of the focus group participants had experience boating on the Middle Fork American River between French Meadows Dam and Middle Fork Interbay. One focus group participant had boated the Middle Fork American River between Middle Fork Interbay and Ralston Afterbay. The focus group identified other boaters who may have additional information and PCWA is in the process of contacting these boaters.

### Middle Fork American River between Middle Fork Interbay and Ralston Afterbay

- 9 mile run
- Class IV-V for kayaks (5-6 class V drops)
- Class V for small rafts (13-14 foot max)
- 2 day run with rafts, 1 day run with kayaks
- Estimated minimum boating flow is 300-400 cfs; maximum boating flow is 800 cfs for both kayaks and rafts
- Remote
- Many technical portages

### *Duncan Creek and Long Canyon Creek*

None of the focus group participants had experience boating on Duncan Creek. As such, it was not discussed during the focus group. In addition, none of the focus group participants had boated on Long Canyon Creek. One participant had looked at Long Canyon Creek but didn't think it was a desirable boating reach because it is too steep and narrow.

### ***Refined Flow Study Approach***

The REC – 4 TSP indicated that PCWA would conduct whitewater boating studies on four runs in the peaking reach, under a range of flow conditions, up to a maximum of 1,000 cfs, the flow capacity of the Oxbow Powerhouse. In addition, the REC 4 TSP indicates that PCWA would determine the need for flow studies in the bypass reaches based on information developed through the focus group and other sources.

PCWA proposes to conduct the flow studies in the peaking reach as outlined in the REC 4 TSP, with some minor refinements based on the focus group feedback. PCWA is continuing to develop information about the potential whitewater boating opportunities in the bypass reaches for future discussions with the Recreation Technical Working Group (TWG).

### *Peaking Reach*

Based on the information developed through the focus group session, PCWA proposes to conduct boating flow studies on three of the four runs in the peaking reach at the following target flows:

Run	Target Flows (cfs)
Oxbow to Ruck-a-Chucky	1000, 800, and 600
Ruck-a-Chucky to Mammoth Bar	1000, 800, and 600
Confluence to Oregon Bar	368, 600 and 1000 plus either 200 or 800 depending upon the results of the 368 flow study

A flow study is not proposed on the Mammoth Bar to Confluence run because it is a short run and involves a difficult portage around Murderer's Bar Rapid. In addition, the flow characteristics in this reach would be similar to those on the Ruck-a-Chucky to Mammoth Bar Run.

Studies at a target flow of 368 cfs are not proposed on either the Oxbow to Ruck-a-Chucky or Ruck-a-Chucky to Mammoth Bar runs because this flow is well below the known boatable flow range for these runs.

### *Rubicon River*

PCWA is continuing to interview boaters to refine the boatable flow ranges expressed by the focus group participants. The expressed flow ranges can then be used in conjunction with hydrologic data to determine how Project operations do or do not affect boating opportunities on the Rubicon River.

At this time, controlled flow studies on the Rubicon River do not appear feasible for the following reasons:

- Releasing flows in the boating range from the current outlet structure at the base of Hell Hole Dam would flood and damage the adjacent powerhouse and surrounding area.
- It requires 2-3 days to boat to Ralston Afterbay from Mile 25 or Ellicott Bridge, respectively, thereby creating a significant logistical constraint for PCWA to provide such releases.
- The Rubicon River is extremely remote and potentially dangerous, thereby creating a liability concern for PCWA.

Flow studies conducted on spill events do not appear to be feasible for the latter two reasons cited above and for the following reasons:

- Spill events typically occur when the road to the put-ins (RM 25 and Ellicott Bridge) are impassible due to snow.
- During wet water years, tributaries contribute significant volumes of water to the Rubicon River making it difficult to estimate flow in the Rubicon at any one point. The focus group indicated flow in the Rubicon can increase 3 times between Ellicott Bridge and Ralston Afterbay due to accretion from tributaries during wet years.

### *Middle Fork American River between French Meadows Reservoir and Ralston Afterbay*

PCWA is continuing to interview boaters identified by the focus group to obtain additional information about these reaches, including boatable flow ranges, if available. The expressed flow ranges can then be used in conjunction with hydrologic data to determine how Project operations do or do not affect boating opportunities on either of these reaches. Otherwise, PCWA does not propose to conduct boating flow studies on these reaches.

### *Duncan Creek and Long Canyon Creek*

PCWA is continuing to interview boaters identified by the focus group to determine whether either of these streams have been boated and associated boating flows. The expressed flow range, if available, can then be used in conjunction with hydrologic data to determine how Project operations do or do not affect boating opportunities on either of these streams. Otherwise, PCWA does not propose to conduct boating flow studies on these streams.

## ***Flow Study Schedule***

Flow studies are currently being planned based on the results of the focus group sessions, and will be conducted in late July, early August, and September of 2008. A final flow schedule will be provided to the TWG in early July.

## **Trail User /Stream Crossing**

### ***Focus Group Summary***

The focus group was attended by 13 people affiliated with the following activities: horseback riding (7), mountain biking (3) and hiking/running (3). Together, the focus group identified and discussed eight potential stream crossings: one on the Rubicon River, four on the Middle Fork American River between Oxbow Powerhouse and the Confluence, and three on the North Fork American River between the Confluence and Oregon Bar. No stream crossings were discussed on the Middle Fork American River between French Meadows Reservoir and Ralston Afterbay, on Duncan Creek, or on Long Canyon Creek. Each of the crossing discussed by the focus group is briefly described in the following. Additional information is provided in Table 2.

#### *Rubicon River*

##### Nevada Point Trail Crossing

- Located on the Rubicon River, about 5 miles upstream of the confluence of the Rubicon River and Long Canyon Creek
- Formerly a foot bridge that was washed out by high flow
- Bridge was located along the Nevada Point trail, which connects Nevada Point Road on the northeast side of the river to Road 13N66 on the southwest side of the river.
- Project flows reduce flows making it easier to cross the river at this location.

#### *Middle Fork American River – Oxbow Powerhouse to Confluence*

##### Ford's Bar

- Located at RM 14 on the Middle Fork American River, at the mouth of Otter Creek
- Formerly used as an equestrian crossing
- No longer regularly used by equestrians due to changes in stream morphology
- Connects the Roanoke Trail on the south side of the river to a private, gated road on the north side of the river.

##### Ruck-a-Chucky

- Located at RM 9 on the Middle Fork American River
- Site of the old Greenwood Bridge
- Connects Drivers Flat Road (also the Western States Trail in this location) on the north side of the river to Sliger Mine Road on the south side of the river



- Crossing for Western States 100 Endurance Run (WS 100)
- Sometimes used by bikers
- Not currently used by equestrians due to boulders, rocky substrate, and deep center channel.
- PG&E and PCWA consult with the commercial boaters and WS 100 event coordinators every year regarding race logistics and flows.
- Target flow during the WS 100 is 125 cfs (knee high).
- Crossing during the WS 100 is not possible between flow of 350 cfs and 800 cfs because it is too high to wade and too low to boat.
- Boat crossing can be done at flows ranging from 800-3,500 cfs.

### Poverty Bar

- Located at RM 6.5 on the Middle Fork American River
- Connects the American River Trail on the south side of the river and the Western States and Butcher Ranch Road Trails on the north side of the river
- Crossing for the Tevis Cup Endurance Ride
- Not used for the WS 100 Endurance Run
- Not used by bikers because mountain biking on the trails in this area is prohibited
- PG&E/PCWA reduces flows for the Tevis Cup every year. During 2007, flow from Oxbow PH was reduced to a maximum of 250 cfs for a 12 hour period.
- Maximum depth for horse safety is 3 feet.
- Maximum flow for the average rider is 250 cfs (on horses chest).
- Less experienced riders need lower flows to cross.
- Maximum depth for hikers/runners to cross at this location is 18 inches (knee high)

### Mammoth Bar

- Located at RM3 on the Middle Fork American River
- Connects the Mammoth Bar OHV area trails on the north side of the river and the Quarry Road Trail on the south side of the river
- Formerly used by horseback riders as a crossing but no longer regularly used due to the presence of OHV area
- Bikers can use this crossing but it is not heavily used because bikers do not want to use the Quarry Trail
- Potential alternative crossing during the Tevis Cup endurance ride
- Maximum depth for horses to cross at this location is 18-30 inches.
- Difficult to carry a bike across when water depth is over 2 feet.

### *North Fork American River - Confluence to Oregon Bar*

### No Hands Bridge

- Located on the North Fork American River, just downstream of its confluence with the Middle Fork American River
- Existing Historic bridge, as such flow is not an issue

- Bridge is located on the Western States Trail

### Coffer Dam

- Located on the North Fork American River, adjacent to the site of the old Auburn Coffer Dam
- Located along the Auburn to Cool Trail
- Previously used as a crossing when the river was routed through the Coffer Dam tunnel
- This crossing can no longer be used now that the tunnel has been closed and the water has been rerouted back into the river channel
- The river banks were graded and armored with rip rap so the banks are now too steep for horses
- A crossable channel may be present at very low flows.

### Oregon Bar Trail Crossing

- Located at RM 15.5 on the North Fork of the American River
- Connects the Pioneer Trail on the north side of the river an unnamed trail on the south side of the river, which connects to the Olmstead Loop
- Used by horseback riders year-round when flow is low enough
- Hikers and runners don't use this crossing
- Mountain biking is prohibited in this area
- Maximum depth for horses to cross at this location is 18 inches. Can be deeper if velocity is lower.

### ***Refined Flow Study Approach***

The REC 4 TSP indicates that PCWA would assemble a group of stream crossing users to assess stream crossing conditions over a range of flows at specific locations in the peaking reach. The REC 4 TSP did not identify crossing studies on any of the bypass reaches.

Based on the information developed during the focus group session, PCWA proposes to develop stage/discharge relationships at each of the stream crossing locations *in lieu of* assembling a group of stream crossing users to assess crossing conditions. PCWA believes this approach would yield information that more directly addresses the issues associated with stream crossing.

In general, a stage/discharge relationship shows the depth of the water and velocity across a channel cross section over a range of flows. The relationship is developed by first surveying the topography of the stream channel, perpendicular to flow. Depth and velocity measurements are then taken across the channel at specific flows. This information can then be used to “model” what depths and flow velocities would be under a range of flows at that location. The information can be displayed either graphically or in tabular format.

Stage discharge relationships would to be developed at five specific locations in the peaking reach. These locations are:

- Ford's Bar (Otter Creek)
- Ruck-a-Chucky
- Poverty Bar
- Mammoth Bar
- Oregon Bar

A stage/discharge relationship may also be developed at the Coffey Dam crossing location, pending the results of a PCWA team site visit. The focus group participants expressed that crossing may be possible at this location during low flow conditions. During the site visit, the channel morphology will be examined to determine whether it would be possible to safely enter, cross, and exit the river under low flow conditions. If it is possible, then a stage/discharge relationship would be developed at this location. The results of the site visit will be provided to the Recreation TWG for discussion.

PCWA believes this approach would yield information that more directly addresses the issues associated with stream crossing for the following reasons.

- The REC – 4 TSP indicates that the trail crossing flow studies would occur in coordination with whitewater boating and aquatics flow studies. Most of the target flows for these studies are above 350 cfs. The focus group indicated that river crossing is not possible at flows above 350 cfs. Therefore, conducting flow studies at flows above 350 cfs would not yield meaningful information. More importantly, conducting studies at flows above 350 cfs would impose unacceptable risk to the study participants and horses.
- Stream crossing is primarily dependent upon channel morphology, water depth and velocity. The development of stage/discharge relationships would allow PCWA to depict the stream morphology, water depths, and velocities at specific locations over a wide range of flows.

### ***Flow Study Schedule***

The data for the stage/discharge relationships would be collected during the aquatic flow studies, which are scheduled to occur in late July, early August, and September, 2008. A final flow schedule will be sent to the TWG in early July.

The focus group participants expressed interest in documenting crossing conditions themselves during the aquatic and whitewater flow studies. Upon approval by PG&E, the boating and aquatic flow study schedules will be provided to the stream crossing focus group participants so that they may visit the crossing locations during the specified releases to observe and document crossing conditions. PCWA encourages the group to document their observations on the forms that were developed by the

Recreation TWG. Information developed by the trail users and provided to PCWA will be incorporated into the REC 4 Technical Study Report.

## **Angling**

### ***Focus Group Summary***

The angler focus group session was attended by eight anglers. Together, the focus group characterized fishing opportunities in the peaking reach and on the Rubicon River, Long Canyon Creek, Duncan Creek, and the Middle Fork American River from French Meadows Reservoir to Middle Fork Interbay. The focus group did not have any experience fishing on the Middle Fork American River between Middle Fork Interbay and Ralston Afterbay. As such, this reach was not discussed.

### *Peaking Reach*

The peaking reach was divided into two sections for discussion purposes. All of the focus group participants were knowledgeable about the fishing opportunities in the peaking reach.

### Oxbow Powerhouse to Ruck-a-Chucky

- Primary access is available at Indian Bar Rafter Put-in and at Ruck-a-Chucky Day Use Area (Driver's Flat Road)
- Additional access is available via various private and public access roads and trails
- Mixture of public and private land limits access to some areas
- Long distance between public access points also limits access to some areas
- Accessible year round
- Spin, bait, and fly fishing
- Wade, boat and bank fishing
- Predominantly brown and rainbow trout, with brown trout increasing downstream of Cache Rock
- Portage around Ruck-a-Chucky rapid limits use by boat fisherman
- Fishing quality is good at high and low flows
- Fishing success declines as flow changes during ramping, and for about an hour after ramping
- Potential to be stranded on opposite side of river due to increase in flow

### Ruck-a-Chucky to Oregon Bar

- Primary access is available at Ruck-a-Chucky Day Use Area (Driver's Flat Road), Mammoth Bar, Confluence area, and China Bar Day Use Area
- Access to China Bar Day Use Area is limited to weekends
- Additional access is available via various public access roads and trails

- Spin, bait, and fly fishing
- Wade, boat and bank fishing
- Predominantly brown trout
- More variety of fish compared to upstream reach
- Fewer trout compared to upstream reach but good brown trout fishing in the fall
- “Not great fishing” but proximity to town provides nearby angling opportunities
- Fishing quality is good at high and low flows
- Can fish at fairly low flows in this reach
- Fishing success declines as flow changes during ramping, and for about an hour after ramping
- Potential to be stranded on opposite side of river due to increase in flow

### *Rubicon River*

#### Hell Hole Dam to Ellicott Bridge

- Accessible via Hunters Trail, Parsley Bar Trail, Deer Creek Trail, South Fork Trail, and FR 2 at Ellicott Bridge
- Some trail segments are difficult to find or are not well maintained
- Access is limited by snow during winter and early spring
- Combination bank and wade fishing
- Generally more spinning and bait fishing near Ellicott bridge
- More fly fishing farther away from access point
- Predominantly rainbow trout
- Fish size has declined in the last 10-12 years
- Good opportunity for remote camping/fishing experience
- Typical summer time flow is easy to fish
- Flows usually decrease to fishable levels by the time the area is accessible
- Flow looks the same throughout the summer

#### Ellicott Bridge to Ralston Afterbay

- Accessible via FR 2 at Ellicott Bridge, Slide Point Trail, Lawyer Trail, Nevada Point Trail, 13N66 and 14N25G, and FR 23 upstream of Ralston Afterbay
- Middle part of reach is inaccessible
- Access to and near Ellicott Bridge is limited by snow during winter and early spring
- The lower portion of this reach can be accessed earlier in the season due to lower elevations
- Spin and fly fishing
- Combination bank and wade fishing
- Predominantly rainbow and brown trout
- Sometimes catch big Sacramento suckers
- Generally more spinning and bait fishing near Ellicott bridge
- More fly fishing farther away from Ellicott bridge
- Fish size has declined since 1997

- Good opportunity for remote camping/fishing experience
- Typical summer time flow is easy to fish
- Flows usually decrease to fishable levels by the time the area is accessible
- Flow looks the same throughout the summer
- High spring flows can preclude ability to walk the stream bank or cross the river

### *Duncan Creek*

- Accessible via Robinson Flat Road to FR 96, which crosses Duncan Creek downstream of Duncan Creek diversion dam.
- Also accessible from unpaved roads 96.52 and 96.54.
- Access is limited by snow during the winter and early spring
- Used mainly by fly fishers
- Good fishing for brown trout in the fall
- Similar to Rubicon River but smaller fish
- Spring fishery - Fishing success declines as flows recede and water warms
- No problem fishing or wading under typical flow conditions

### *Long Canyon Creek*

- FR 2 and FR 22 provide paved access to confluence of North and South Fork Long Canyon
- FR 23 and 13N65 provide access to Long Canyon at Ramsey Crossing
- Trail access to Long Canyon from 13N65
- 14N25G and 13N66 provide 4WD road access to confluence of Long Canyon and Rubicon River
- Access limited by snow during the winter and early spring
- Spinning and fly fishing
- Predominantly rainbow trout
- Flow is adequate and fairly stable
- Remains fishable as flows decrease through summer

### *Middle Fork American River*

#### French Meadows Dam to Middle Fork Interbay

- Accessible via FR 96 and FR 22 at French Meadows Dam, Middle Fork Interbay Road
- Middle part of reach is inaccessible
- Access is limited by snow during winter and early spring
- Spin and fly fishing
- Have to wet wade to fish area below French Meadows Dam
- Predominantly brown trout
- High spring flows can preclude ability to wet wade the stream
- Must fish after high flows recede

### ***Refined Flow Study Approach***

The REC – 4 TSP indicates that PCWA would assemble a group of anglers to assess fishing conditions over a range of flows at specific locations in the peaking reach and on the Rubicon River, below Ellicott Bridge.

Based on the information developed during the focus group session, PCWA proposes to address flow-related fishing issues in the peaking reach by analyzing ramping conditions in the peaking reach *in lieu of* assembling a group of anglers to assess fishing conditions. PCWA believes this approach would yield more useful information than assembling a group of anglers to assess fishing conditions, for the following reasons:

- Flow ranges for angling in the bypass and peaking reaches are already understood. The focus group participants reported that fishing quality is generally good at all flow levels in the peaking reach. In addition, flows in the Rubicon River below Ellicott Bridge are at good fishing levels when the area is accessible.
- The primary flow-related effect on fishing in the peaking reach is associated with ramping. Specifically, fishing quality and success decline during the ramping period (about 2 hours) and for about one hour after ramping.

PCWA proposes to characterize the frequency, timing and duration of ramping in various locations in the peaking reach under current Project operations. PCWA would then utilize this information to determine how current ramping scenarios affect fishing opportunities in the peaking reach. PCWA believes that this approach would more directly address angler concerns regarding the effects of ramping on fishing opportunities.

This information would be utilized in the future during discussions regarding new license conditions and proposed future operational scenarios. Specifically, the frequency, timing, and duration of ramping at various locations in the peaking reach under proposed future operating scenarios would be assessed with respect to conditions that exist under current operations.

**Placer County Water Agency**

**Middle Fork American River Project**

**Summary of Information Developed through Whitewater Boating Focus Group and Flow Studies Proposed by PCWA**

River	Runs	Difficulty	Potential Use	Estimate of Boatable Flow Range	Recommendation	Rationale
Rubicon River	RM 25 to Ellicott Bridge	Class V	Expert kayakers and rafters	Minimum 400 - 500 cfs Maximum 1,200 - 1,500 cfs	Utilize the estimated boatable flow ranges provided by focus group participants and other boaters to analyze project impacts.	Access is via a hike in put-in. Area is not typically accessible when boating flows are available. Remote wilderness area.
Rubicon River	Ellicott Bridge to Ralston Afterbay	Class V	Expert kayakers and rafters	Minimum 400 - 600 cfs Maximum 1,200 - 2,000 cfs	Utilize the estimated boatable flow ranges provided by focus group participants and other boaters to analyze project impacts.	Remote, 2-day wilderness run. Put-in is not typically accessible when boating flows are available. Controlled flow releases for study purposes do not appear feasible based on infrastructure constraints.
Middle Fork American River	Middle Fork Interbay to Ralston Afterbay	Class V for rafts Class IV-V for kayaks	Expert kayakers and rafters	Minimum 300 - 400 cfs Maximum 800 cfs	Utilize the estimated boatable flow ranges provided by focus group participants and other boaters to analyze project impacts.	Further discussion required regarding need for refinement of flow estimates, logistics, environmental considerations, and liability. Remote wilderness area. Numerous portages. Biological considerations. No ability to release flows in the boating range.
Middle Fork American River	Oxbow PH to Ruck-a-Chucky	Class IV with one mandatory portage	Intermediate to advanced kayakers and rafters. Popular commercial run.	Minimum 600 cfs Maximum 3,000 cfs	Controlled Flow Studies to be conducted in 2008 Target flows: 600 cfs, 800 cfs, 1000 cfs	A flow study at 368 cfs in not necessary because it is below the known minimum boatable flow.
Middle Fork American River	Ruck-a-Chucky to Mammoth Bar	Class II+	Novice rafters and kayakers. Instructional boating. Family rafting.	Minimum 800 cfs Maximum 1,200 cfs	Controlled Flow Studies to be conducted in 2008 Target flows: 600 cfs, 800 cfs, 1000 cfs	A flow study at 368 cfs in not necessary because it is below the known minimum boatable flow.
Middle Fork American River	Mammoth Bar to Confluence	Class II with one mandatory portage	Novice rafters and kayakers. Instructional boating. Family rafting.	Minimum 400 cfs Maximum 15,000cfs	No Flow Study	Short run. Difficult portage is required to complete run. Flow related characteristics would be similar to those on the Ruck-a-Chucky to Mammoth Bar run.
North Fork American River	Confluence to Oregon Bar	Class II+ to III-	Novice rafters and kayakers. Instructional boating. Family rafting.	Minimum 300 cfs Maximum 15,000cfs	Controlled Flow Studies to be conducted in 2008 Target flows: 368, 600 and 1000 plus either 200 or 800 depending upon the results of the 368 flow study	



**Placer County Water Agency  
Middle Fork American River Project  
Summary of Information Developed through Trail User/Stream Crossing Focus Group and Flow Studies Proposed by PCWA**

River	Reach	Stream Crossing Location	User Group	Flow/Depth Information Obtained through Focus Group	Recommendation	Rationale
Rubicon River	Ellicott Bridge to Ralston Afterbay	Nevada Point Trail Crossing	Primarily used by hikers.	Formerly a bridge that was washed out by high flow.	No Flow Study	Project operations reduce flows at this location making it easier to cross
Middle Fork American River	Oxbow PH to Confluence	Ford's Bar	Formerly used as an equestrian crossing.	No longer used as a primary stream crossing due to changes in stream morphology.	No Flow Study Develop Stage/Discharge Relationship	This area is no longer a primary crossing location. However, it is still used as a crossing by some users. A stage/discharge relationship would provide additional information about the relationship between depth and flow at this location.
Middle Fork American River	Oxbow PH to Confluence	Ruck-a-Chucky	<u>Hikers/Runners.</u> Important crossing for Western States 100 Endurance Run. <u>Equestrians.</u> Not currently used by equestrians due to boulders, rocky substrate, and deep center channel. <u>Bikers.</u> Sometimes used by bikers. Bikers would use this location more if substrate was better and flows were lower.	<u>Hikers/Runners.</u> PG&E and PCWA consult with the commercial boaters and race event coordinators every year regarding race logistics and flows. Target flow during WS 100 is 125 cfs (knee high). A flow of 125-350 cfs is crossable with just a cable, although it is possible to cross without a cable at flows below 200 cfs. Crossing during the WS 100 is not possible between flows of 350 - 800 cfs because it is too high to wade and too low to boat. Boat crossings can be done at flows ranging from 800-3500 cfs.	Develop Stage/Discharge Relationship	Crossing depths and flows for runners and hikers are already understood based annual coordination activities for the WS 100 Endurance Run. Consultation occurs annually because stream morphology sometimes changes resulting in different flow needs. A stage/discharge relationship would provide additional information about the relationship between depth and flow at this location.
Middle Fork American River	Oxbow PH to Confluence	Poverty Bar	<u>Equestrians.</u> Important crossing for the Tevis Cup Endurance Ride. <u>Hikers/Runners.</u> Not used for the WS 100. <u>Bikers.</u> Not used by bikers because biking on the trails in this area is prohibited.	<u>Equestrians.</u> PG&E reduces flows for the Tevis Cup every year. During 2007, flows from Oxbow PH were reduced to a maximum of 250 cfs for a 12 hours period. Maximum depth for horses is 3 feet. Maximum flow for the average rider is 250 cfs (on horses chest) Ideal crossing depth for horses is 18 inches. Less experienced riders need lower flows. <u>Hikers/runners.</u> Maximum depth for hikers/runners is 18 inches (knee high) 250 cfs is too high a flow for hikers/runners to cross	Develop Stage/Discharge Relationship	Crossing depths are already understood based on consultation activities between PG&E and Tevis Cup organizers. A stage/discharge relationship would provide additional information about the relationship between depth and flow at this location.
Middle Fork American River	Oxbow PH to Confluence	Mammoth Bar	<u>Equestrians.</u> Formerly used as an equestrian crossing. <u>Bikers.</u> Bikers can use this crossing but it is not heavily used because bikers do not want to use the Quarry Trail.	Maximum depth for horses to cross at this location is 18-30 inches. Difficult to carry a bike across the river when flow is over 2 feet.	No Flow Study Develop Stage/Discharge Relationship	This is not a desirable crossing location due to presence of OHV area. However, it is still used as a crossing by some users. A stage/discharge relationship would provide additional information about the relationship between depth and flow at this location.
North Fork American River	Confluence to Oregon Bar	No Hands Bridge	<u>Equestrians.</u> Important crossing for equestrian users. <u>Hikers/Runners.</u> Important crossing for hikers/runners. <u>Bikers.</u> Not used by bikers because biking on the trails in this area is prohibited.	Flow is not an issue at this location due to presence of bridge.	No Flow Study	Not needed due to presence of existing bridge.
North Fork American River	Confluence to Oregon Bar	Coffer Dam	<u>Equestrians.</u> Formerly used as crossing by equestrians when the river was routed through the coffer dam tunnel. This crossing can no longer be used by equestrians now that the tunnel has been closed and the water has been rerouted back into the river channel. The river banks were graded and armored with rip rap so the banks are now too steep for horses. <u>Hikers/Runners.</u> Would use a crossing at this location. <u>Bikers.</u> Would use a crossing at this location.	Cannot be used as a crossing due to the presence of steep, armored banks.	No Flow Study Under Consideration pending results of field visit to assess whether a channel is present at low flows	Not a feasible crossing location at high flows. Crossing may be possible at low flows if deep channel is not present.
North Fork American River	Confluence to Oregon Bar	Oregon Bar	<u>Equestrians.</u> Used by equestrians year round when flow is low enough. <u>Hikers/Runners.</u> Don't tend to use this crossing location. <u>Bikers.</u> Not used by bikers because biking on the trails in this area is prohibited.	Maximum depth for horses to cross at this location is 18 inches. Can be deeper if velocity is lower. Hikers and runners don't use this location. Bikers can't use this location because they are prohibited on the trails in this area.	Develop Stage/Discharge Relationship	Crossing depth for primary user group (equestrians) is already known. A stage/discharge relationship would provide additional information about the relationship between depth and flow at this location.

Placer County Water Agency  
Middle Fork American River Project  
Summary of Information Developed through Angler Focus Group and Proposed Flow Studies

River	Reach	Characterization (type, method, species)	Flow-Related Information	Recommendation	Rationale
Duncan Creek	Duncan Creek Diversion Dam to Middle Fork American River Confluence	Mostly fly fishing Bank fishing - float tube near inlet at French Meadow Reservoir Brown and rainbow trout - varies by year	Fishing and wading not affected by typical flows. Fishing success declines as flow decrease and water warms	No Flow Study	See flow-related information, adequate flow information provided by focus group participants to assess project impacts.
Long Canyon	North and South Fork Long Canyons and Long Canyon to Confluence with Rubicon River	Spinning and fly fishing Bank fishing and wading Predominately rainbow trout	Flows are adequate and fairly stable. Reach is fishable as flows decrease during the summer	No Flow Study	See flow-related information, adequate flow information provided by focus group participants to assess project impacts.
Rubicon River	Hell Hole Reservoir to Ellicott Bridge	Spinning, bait and fly fishing Bank fishing and wading Predominantly rainbow trout	Typical summer flows are easy to fish Flows usually decrease to fishable levels by the time the area is accessible Flow looks the same throughout the summer	No Flow Study	See flow-related information, adequate flow information provided by focus group participants to assess project impacts.
Rubicon River	Ellicott Bridge to Ralston Afterbay	Spinning and fly fishing Bank fishing and wading Predominately rainbow trout	Typical summer flows are easy to fish Flows usually decrease to fishable levels by the time the area is accessible Flow looks the same throughout the summer High stream flows can preclude the ability to walk the stream bank or cross the river	No Flow Study	See flow-related information, adequate flow information provided by focus group participants to assess project impacts.
Middle Fork American River	French Meadows Dam to Middle Fork Interbay	Spinning and fly fishing Wet wading below French Meadows Dam Predominately brown trout	High spring flows can preclude the ability to wet wade. Must fish after high flows recede.	No Flow Study	See flow-related information, adequate flow information provided by focus group participants to assess project impacts.
Middle Fork American River	Middle Fork Interbay to Ralston Afterbay	No reported use by focus group.	Not "great fishing" due to lack of water. Other opportunities nearby.	No Flow Study	See flow-related information, adequate information provided by focus group participants to assess project impacts.
Middle Fork American River	Oxbow PH to Ruck-a-Chucky	Spin, bait and fly fishing Wade, boat and bank fishing Predominantly brown and rainbow trout with brown trout increasing downstream.	Fishing quality is good at high and low flows Fishing success declines as flow changes during ramping, and for about an hour after ramping. Potential for stranding due to increases in flow.	Assess Ramping Conditions	Flow related effects are primarily related to ramping. Effects of ramping will be analyzed.
Middle Fork American River/North Fork American River	Ruck-a-Chucky to Oregon Bar	Spin, bait and fly fishing Wade, boat and bank fishing Predominantly brown trout.	Fishing quality is good at high and low flows Can fish at fairly flow low flows on this reach Fishing success declines as flow changes during ramping, and for about an hour after ramping. Potential for stranding due to increases in flow.	Assess Ramping Conditions	Flow related effects are primarily related to ramping. Effects of ramping will be analyzed.

**ATTACHMENT E**

**AQ 7 - Entrainment Direct Sampling Approach (Contingency Study)**

### INTRODUCTION:

The AQ 7 - Entrainment Technical Study Plan (TSP) specified a process for the Aquatic Technical Working Group (TWG) to collaboratively determine if direct sampling of entrainment was needed to supplement the indirect (potential) entrainment estimates developed at Project facilities. The Aquatic TWG determined during the July 8, 2008 Aquatic TWG meeting that direct entrainment sampling was necessary to complete the AQ 7 -TSP. PCWA, in collaboration with the Aquatic TWG has developed this scope of work and schedule for direct entrainment sampling.

### STUDY OBJECTIVE(S):

- Sample fish distribution and abundance near power tunnel intakes in French Meadows Reservoir and Hell Hole Reservoir.
- Directly sample entrainment at Ralston Afterbay, Middle Fork Interbay, and Duncan Creek Diversion.
- Sample young-of-the-year (YOY) fish abundance and emergence timing upstream of the Duncan Creek diversion.

### EXTENT OF STUDY AREA:

The study area for sampling fish distribution and abundance near power tunnel intakes includes the French Meadows-Hell Hole Tunnel Intake at French Meadows Reservoir and the Hell Hole-Middle Fork Tunnel Intake at Hell Hole Reservoir. The study area for direct entrainment sampling includes the Ralston-Oxbow Tunnel Intake (at Ralston Afterbay), Middle Fork-Ralston Tunnel Intake (at Middle Fork Interbay), and the Duncan Creek Diversion. The study area for sampling YOY abundance and emergence timing is the stream reach above the Duncan Creek Diversion.

### STUDY APPROACH:

#### Sampling for Fish Distribution and Abundance near Intake Structures

##### *Large Reservoirs - French Meadows and Hell Hole Reservoirs*

- Sample fish distribution and abundance throughout the water column near the French Meadows-Hell Hole Tunnel Intake in French Meadows Reservoir and near the Hell Hole-Middle Fork Tunnel Intake in Hell Hole Reservoir.
  - During four representative time periods (spring, early summer, late summer, and fall), use a single beam sonar to sample the number, depth, and relative size of fish throughout the water column near each tunnel intake both during the night and during the day.
    - Conduct a total of eight sonar surveys at each intake (4 seasons X day and night samples = 8 surveys at each intake)
    - Each day or night survey will consist of a minimum of four 200 meter transects for a total sampling effort of at least 1 hour. Transects will be oriented parallel to each other and spaced approximately so that the bottom width of the sonar beams for each track do not overlap (approximately 20-80 m depending on the

water depth). The set of parallel sonar tracks will be centered approximately on the intake GPS coordinate location.

### Sampling for Entrainment

#### *Middle Fork Interbay and Ralston Afterbay*

- Directly sample entrainment using split-beam sonar at the Middle Fork-Ralston Tunnel Intake (at Middle Fork Interbay) and the Ralston-Oxbow Tunnel Intake (at Ralston Afterbay).
  - From approximately February through November 2009 (excluding the fall maintenance outage period), install and maintain a split-beam sonar array (three sonars) that ensonifies approximately 50% of the tunnel intake opening (Appendix A). The sonar arrays must be installed below the normal reservoir operations low water level to operate continuously. If water surface elevations need to be lowered in the reservoirs below the normal low level for high flow events or for other operations such that the sonar equipment will be exposed, then the equipment will be turned off and data will not be collected (the equipment will be damaged if it is not submerged). Data collection will resume once water surface elevations increase above the equipment.
  - Process a maximum of 120 days of data. Initially, process approximately every 6th day of data (60 days total) at each intake to identify the number and relative size of fish potentially entrained (i.e., net movement of fish past the trash rack).
    - Based on review of the results of the systematic sampling (approximately every 6th day), process up to a maximum of 60 additional days of data at each intake. The distribution and amount of additional data processing (60 days or less) will be determined collaboratively with the Aquatic TWG. This may include, but is not limited to, increasing the data processing frequency during time periods or during events (e.g., high flow events) when entrainment is variable.
  - Correct the entrainment estimates for the percent of the intake actually ensonified. Calculate the actual percent ensonified after installation of the sonar arrays. When the sonar fish observations are processed, determine whether fish entrainment is spatially random at the intake or if a spatial pattern is present. If entrainment is spatially random, simply multiply the number of fish entrained (NFE) by the inverse of the average fraction (percent/100) of the intake ensonified (FES) to calculate the total number of fish entrained (TNFE) (i.e.,  $TNFE = NFE / FES$ ). If there is a spatial pattern, then stratify the correction for the percent of the intake ensonified spatially to calculate total entrainment (i.e.,  $TNFE = \sum NFE_i / FES_i$ ).

#### *Small Diversions*

At Duncan Creek Diversion directly sample entrainment through one diversion season (winter through early summer) using passive integrated transponder (PIT) tags.

- During fall 2008, collect fish and implant PIT tags for five days or until 1,000 juvenile/adult trout are tagged (whichever occurs first). Minimum field crew size of five people with two backpack electroshockers. Collect and tag fish upstream of the diversion over approximately a 2-mile length of stream. Implant PIT tags in each fish of appropriate size ( $\geq 60$  mm FL) and record fish location, size, and species. After the PIT

## AQ 7 - Entrainment Direct Sampling Approach (Contingency Study)

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tags have been implanted, PCWA will promptly report the total number of fish tagged to the Aquatic TWG.

- Install an automatic PIT tag reader at the diversion intake and record the number of PIT tagged fish passing through the diversion intake during the diversion season (approximately December 2008 - June 2009). Correlate the number of PIT tagged fish entrained to the percent of the total fish population upstream of the diversion that would potentially be entrained.
  - Estimate the percent of the fish population and number of fish upstream of the diversion that were entrained during the diversion season as follows:
    - Assume survival of the PIT tagged fish in the stream through the diversion season is equal to that of untagged fish in the stream and assume approximately >99% PIT tag retention and tagging survivorship of implanted fish (Steve McCutcheon, Pers. Comm. 2008; Dare 2003).
    - Calculate the percent of the population in the sampling reach PIT tagged by using the Fall 2008 fish population estimate (number/mile) and the number of fish PIT tagged (PIT tagged fish / estimated number of fish in the sampling reach).
    - Calculate the percent of the Fall 2008 PIT tagged fish entrained at the end of the diversion season (PIT tagged fish entrained / PIT tagged fish Fall 2008).
    - Calculate the number of the fish in the sampling reach upstream of the diversion present during Fall 2008 that were entrained during the diversion season (percent of Fall 2008 PIT tagged fish entrained \* estimated number of fish in the sampling reach Fall 2008).
    - If a relationship exists between distance upstream of the diversion that fish were PIT tagged and the percent of tagged fish entrained, then use the relationship to estimate the percent of the total juvenile/adult fish population upstream of the diversion entrained, including fish beyond the two mile sampling reach (e.g., percent entrained by half mile distance increments \* estimated fish population per half mile stream segment upstream of the diversion); otherwise, use the estimate for the approximately 2 mile sampling reach upstream of the diversion for the entrainment analysis.
    - If there appears to be a need for a more sophisticated analysis that incorporates natural mortality of PIT tagged fish from the date they are tagged through the diversion season into the analysis, then use the fall 2007 and 2008 age class structure of the fish populations to estimate an instantaneous survivorship curve.
  - Calibrate the diversion tag reader by passing PIT tags (a minimum of 10 tags each time) through the readers at the beginning, middle, and end of the diversion season. This will be used to determine the percent of the PIT tags that pass the antenna that are recorded. It is assumed that 100 percent of PIT tags will be recorded. If the calibration is less than 100 percent, then the Aquatic TWG will be consulted to determine collaboratively how best to correct measurements of entrainment based on PIT tag recordings.
  - Successful completion of the PIT tag study depends on the following assumptions. If the assumptions cannot be met, then PCWA will not be held responsible for completing the study. The assumptions are as follows:

## AQ 7 - Entrainment Direct Sampling Approach (Contingency Study)

- A special use permit, if needed, can be obtained from the US Forest Service to install a propane tank (500 gallons), 50 watt propane generator, and housing structure for power generation.
- PCWA can obtain the appropriate scientific collecting permit from CDFG.
- A PIT tag antenna that functions properly (e.g., no interference from nearby metal) can be built large enough to accommodate the flow through the Duncan Creek Diversion Intake and be successfully installed. Biomark, Inc. has made a site visit and tested a preliminary mock-up antenna and has relatively high confidence that a working antenna can be successfully constructed and installed; however, the Duncan Creek antenna would be one of the largest Biomark, Inc. has constructed.
- The antenna can be protected from damage (e.g., flow and debris) and will operate properly throughout the winter/spring diversion season. PCWA will make a good faith effort to protect the antenna and repair or fix the antenna if it is damaged or malfunctions, but during the winter/spring period limited access due to snow and high flow conditions could make repairing or fixing the antenna unsafe or impractical.
- Direct sampling of juvenile/adult fish entrainment using PIT tags and sampling of the timing and abundance of YOY upstream of the diversion in May and June (see below), in addition to fish population estimates above and below the diversion developed in the AQ - 4 Fish Population TSP, will provide sufficient information to collaboratively develop entrainment PM&E measures with the Aquatic TWG.
  - Use the entrainment results at Duncan Creek diversion to help estimate the general level of potential entrainment at the North Fork and South Fork Long Canyon Diversions (e.g., low, medium, high).

### Sampling for YOY Abundance and Timing

At Duncan Creek Diversion, monitor young-of-the-year (YOY) trout timing and abundance upstream of the diversion.

- On four occasions in the May and June time period, sample the presence and abundance of YOY trout upstream of the diversion to determine the timing of YOY emergence and the timing of the greatest abundance of YOY fish. This information will be used to relate YOY timing to diversion operations timing.

### DIRECT SAMPLING SCHEDULE:

Figure 1 (see Appendix A) and the following table provide a schedule of AQ 7 entrainment study activities.

## AQ 7 - Entrainment Direct Sampling Approach (Contingency Study)

---

<b>Date</b>	<b>Activity</b>
September 2008 through November 2009	Conduct entrainment sampling and data analysis
August 2009	Distribute Draft Report to Aquatic TWG <ul style="list-style-type: none"><li>• Duncan Creek Entrainment study</li><li>• YOY abundance and timing</li><li>• Sonar data in reservoirs</li><li>• Winter, spring and early summer direct entrainment data at power intakes</li></ul>
September and October 2009	Aquatic TWG review and comment period
January 2010	Distribute Draft Final Report to the Aquatic TWG incorporating comments on Draft Report and late summer and fall entrainment data at power intakes
February 2010	Aquatic TWG review of Draft Final Report and comment period
March 2010	Resolve comments and prepare Final Report
April 2010	Distribute Final Report to the Aquatic TWG and Plenary

### REFERENCES:

Steve McCutcheon. Personal communication with Biomark Inc. regarding PIT tag retention and tagged fish survivorship. Boise, Idaho, August 29, 2008.

Dare, M. 2003. Mortality and long-term retention of passive integrated transponder tags by spring Chinook salmon. *North American Journal of Fisheries Management* 23:1015-1019.

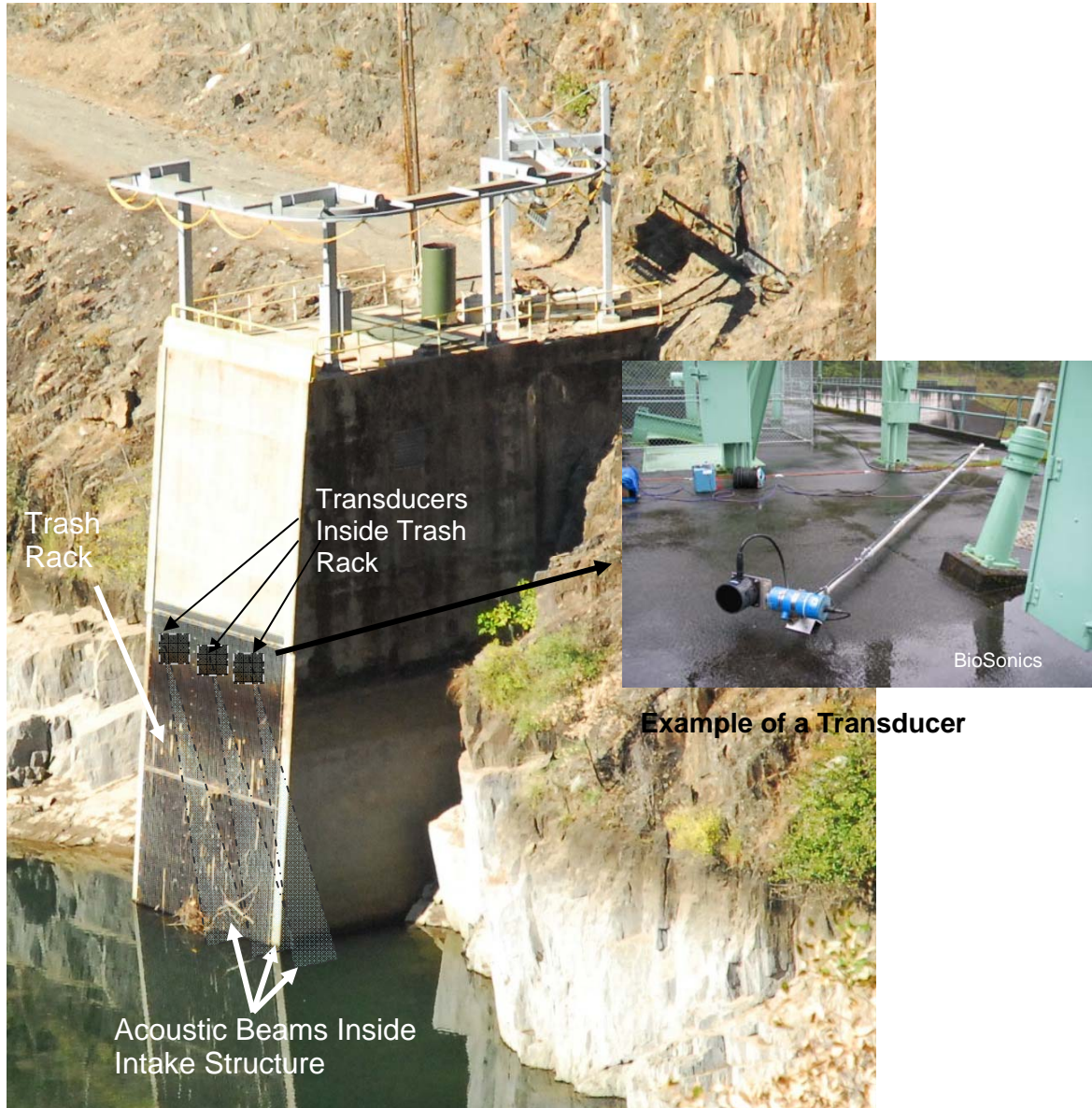


**APPENDIX A**  
**Pictorial of the Hydroacoustics Sampling Design**

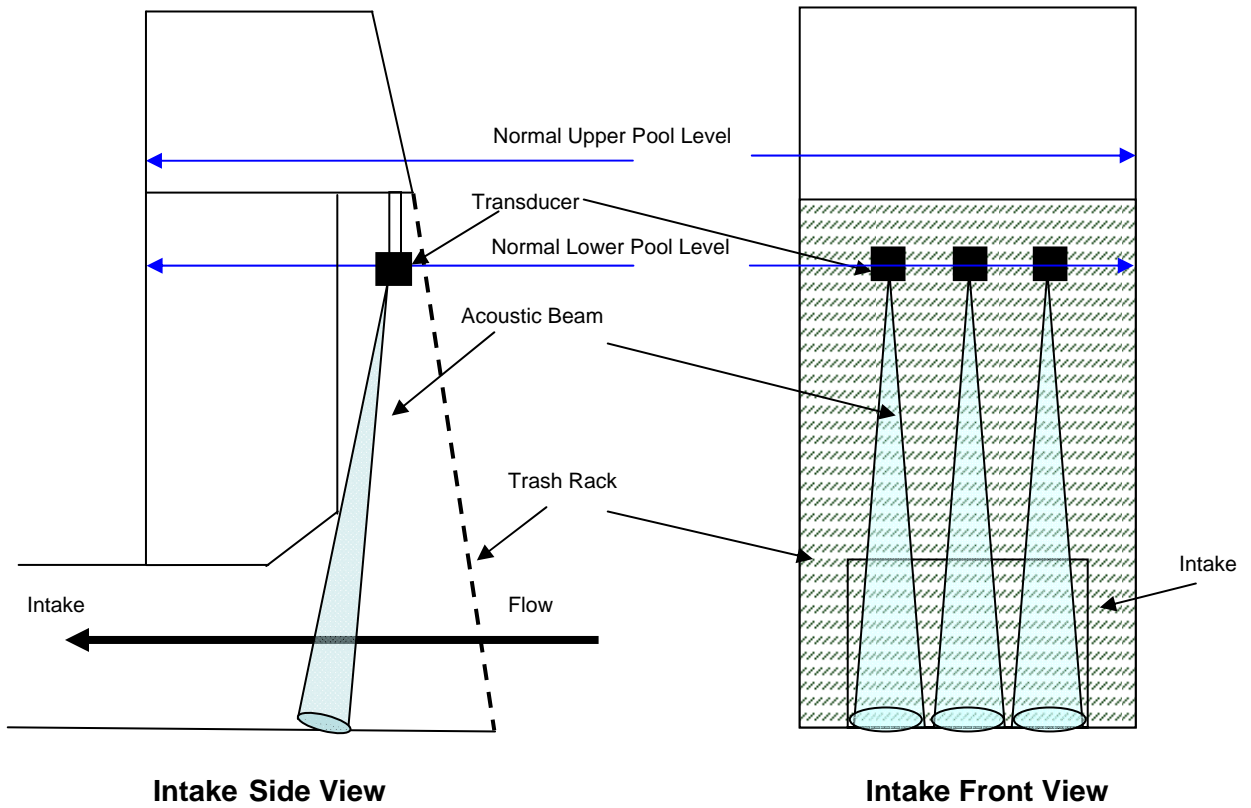
The following is a brief pictorial of the hydroacoustics sampling design that will be used to detect the number of fish entering the intakes at Ralston Afterbay and Middle Fork Interbay. Three split-beam transducers will be 'fixed' or attached to the inside of the trash racks of the tunnel intakes at both Ralston Afterbay and Middle Fork Interbay dams. Schematics illustrating the hydroacoustic sampling design are shown in Figures 1 through 4.

To determine the risk of entrainment, the direction that a fish is traveling and its depth location relative to the intakes is assessed. The direction of fish travel within the acoustic beam is translated into a compass angle. Fish that are traveling at angles towards the intake (see example histogram in Figure 5) and are at the depth of the intake are assumed to be entrained (Figure 6).

**Figure 1. Picture Illustrating the Hydroacoustic Sampling Design at Ralston - Oxbow Tunnel Inlet Structure.**

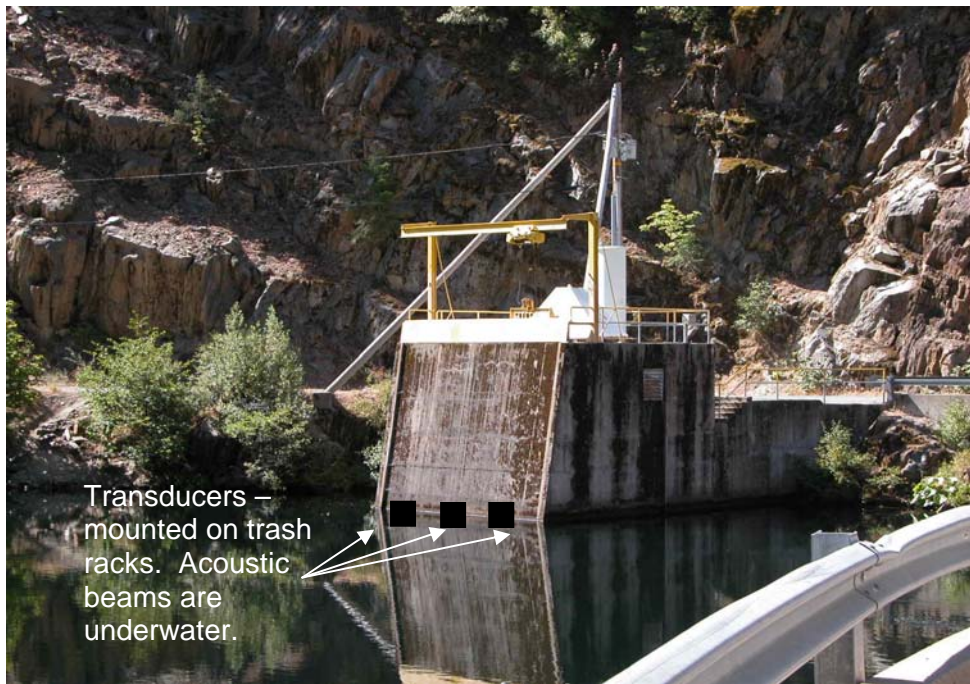


**Figure 2. General Schematic Illustrating the Orientation of Acoustic Beam and Sample Volume at each intake.**



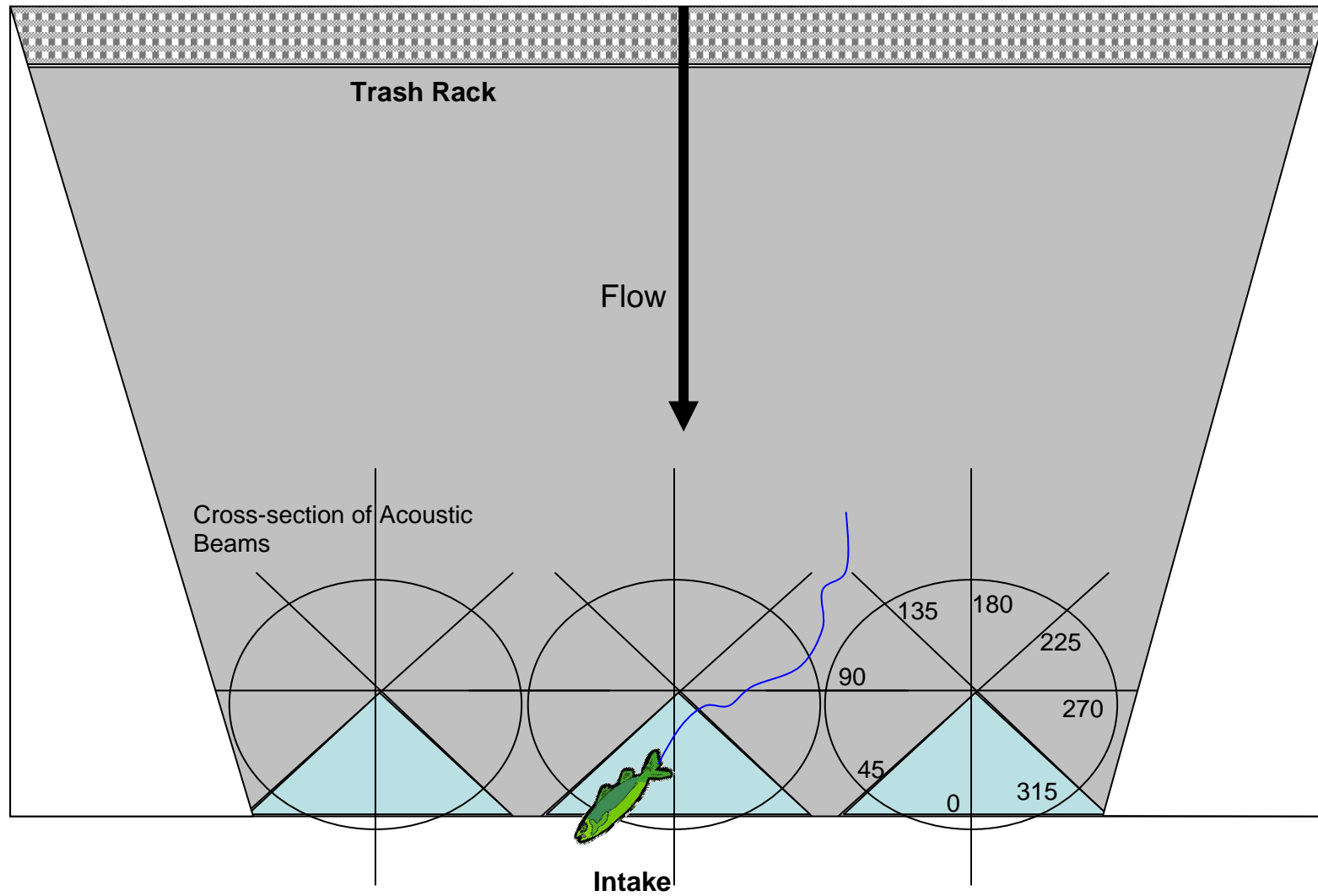
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**Figure 3. Picture showing the Middle Fork - Ralston Tunnel Inlet Structure.**

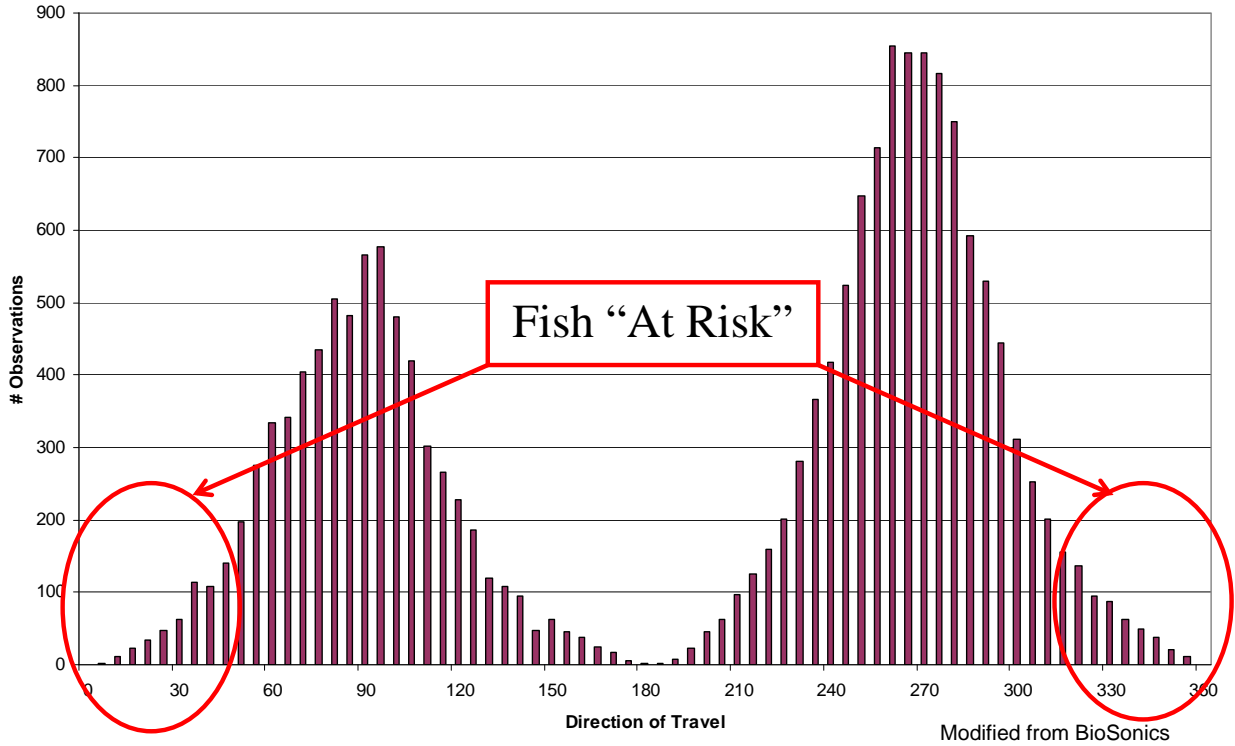


Note: Trash racks are below the water's surface. Refer to Figure AQ 7-1 for a similar design at Ralston Afterbay.

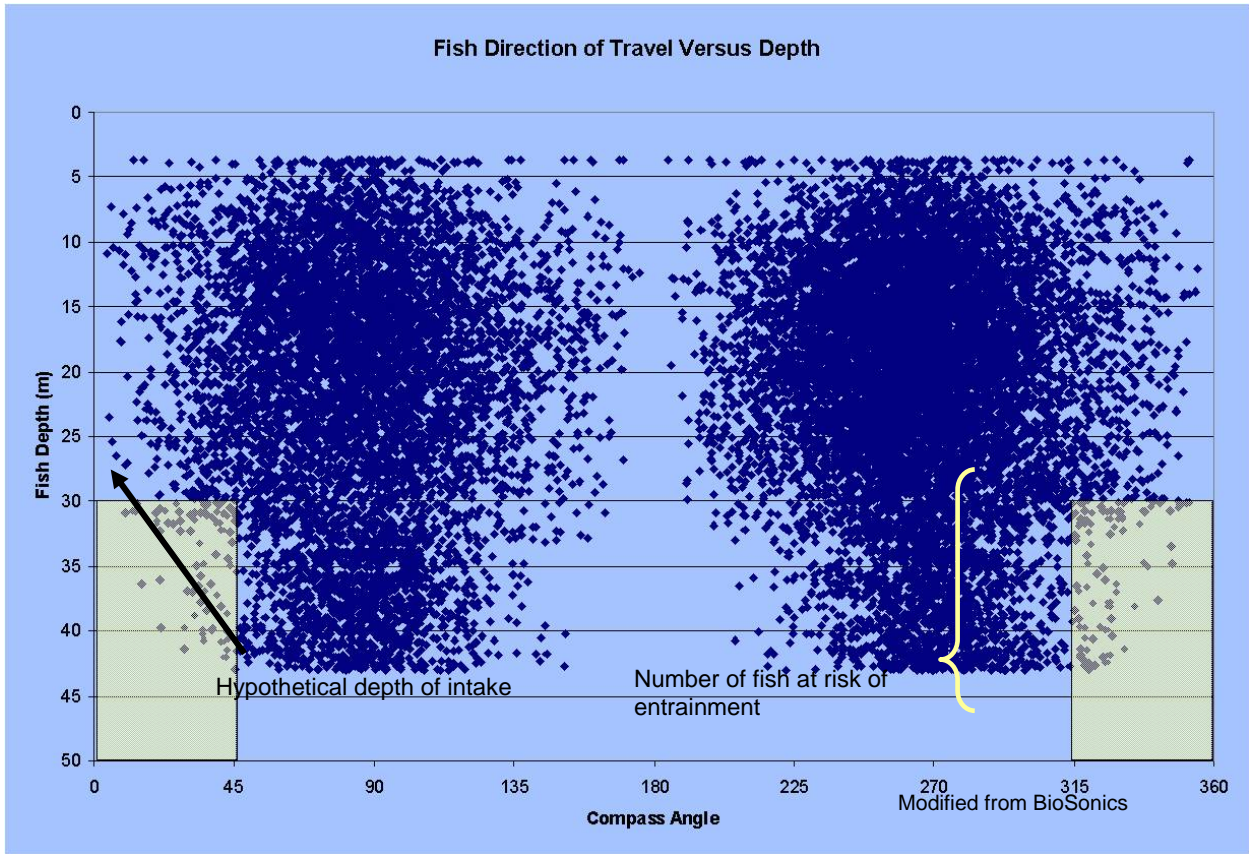
**Figure 4. Cross-sectional Top View of the Acoustic Beams Showing the Sectors (Blue Color) where Fish Have a Risk of Entrainment.**



**Figure 5. Example Summary Data of the Number of Fish at Risk of Entrainment Based on the Direction of Fish Travel.**



**Figure 6. Assessment of Risk of Entrainment Based on Fish Direction of Travel and Depth.**



## References

BioSonics. 2008. What is hydroacoustics. Available at [http://www.biosonicsinc.com/resources/what\\_is\\_hydroacoustics.html](http://www.biosonicsinc.com/resources/what_is_hydroacoustics.html)). Accessed August 2008.



**ATTACHMENT F**

**AQ 11 - Water Quality Contingency Sampling Protocol (Contingency Study)**

## AQ 11 - Water Quality Contingency Sampling Protocol (Contingency Study)

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### INTRODUCTION:

The AQ 11 - Water Quality Technical Study (PCWA 2007) was implemented for the Middle Fork American River Project during the spring and fall 2007 to characterize water quality conditions upstream and downstream of Project facilities. The study included a screening level assessment of methylmercury concentrations in sport fish muscle tissue at four Project reservoirs and in the Middle Fork American River downstream of Oxbow Powerhouse. Numerous fish tissue samples exceeded the Office of Environmental Health Hazard Assessment (OEHHA) screening guidelines for methylmercury of 0.08 ppm (PCWA 2008).

The AQ -11 Water Quality Technical Study Plan (TSP) specified a contingency study process that would be implemented if methylmercury concentrations exceeded the screening guidelines. The process is as follows:

- *If methylmercury in fish tissue exceeds the OEHHA guidelines of 0.08 ppm (Cal EPA 2005; Klasing and Brodberg 2006) during the initial sampling, the Aquatic TWG will be consulted concerning the need for additional sampling. If additional sampling is deemed appropriate, a sampling protocol will be developed.*

The results of this study were provided in the AQ 11 - Water Quality Technical Study Report (PCWA 2008) and were discussed during the March 10, 2008, May 5, 2008, and June 2, 2008 Aquatic Technical Working Group (TWG) meetings. After reviewing the study results, the Aquatic TWG determined that additional fish tissue methylmercury sampling is warranted. This study plan describes the scope of work for additional sampling of sport fish muscle tissue for methylmercury analysis. The scope of work incorporates recommendations provided by Russ Kanz, State Water Resources Control Board, based on discussions with OEHHA.

### STUDY OBJECTIVE(S):

Collect and sample additional sport fish muscle tissue methylmercury concentrations following OEHHA guidelines (Cal EPA 2005) that could be used to develop safe eating guidelines for the locations in the study area.

### EXTENT OF STUDY AREA:

The study area will include French Meadows Reservoir, Hell Hole Reservoir, Middle Fork Interbay, Ralston Afterbay, and the Middle Fork American River at Otter Creek (Table AQ 11-1 and Map AQ 11-1).

### STUDY APPROACH:

- Collect and sample methylmercury from a total of 9-12 edible sized sport fish of each target species present in the following locations: French Meadows Reservoir, Hell Hole Reservoir, Middle Fork Interbay, Ralston Afterbay, and the Middle Fork American River at Otter Creek. The total number of fish includes fish already sampled during the 2007 field season.
  - The number of fish of each target species that will be collected in 2008 at each location is identified in Table AQ 11-1. The number of fish collected previously in 2007 is also included in the table. The minimum fish size for each species that will be collected is provided in Table AQ 11-2.

## AQ 11 - Water Quality Contingency Sampling Protocol (Contingency Study)

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- If PCWA is unable to collect the target number of individuals, then PCWA will consult with the Aquatic TWG to determine how to proceed.
- Submit fish to Brooks Rand Laboratory (Seattle, Washington) for individual fish muscle tissue analysis (fillets). Field sampling and fish handling procedures will be consistent with those used for the 2007 fish tissue sampling and consistent with those outlined by the California Environmental Protection Agency (Cal EPA) (2005) and those used at the California Department of Fish And Game Marine Pollution Studies Laboratory at Moss Landing (Method # MPSTL - 102a) (MPSTL 2005).
- Catch fish using a combination of methods, including gill nets, electrofishing, and hook-and-line. Handle fish with polyethelene gloves. Record the species, fork length, and weight of each fish. Place each fish into a labeled zipper-closure bags (double bagged and double labeled) and place immediately on ice for delivery to the analytical laboratory (Mark Stephenson and Amy Byington, Pers. Comm. 2008). Ship each cooler with a chain of custody form showing the sample identification number and collection date and time of each sample.
- Prepare summary report and provide data to OEHHA.

### CONTINGENCY STUDY SCHEDULE:

Date	Activity
September through November 2008	Collect fish samples
November 2008 through March 2009	Analyses and develop report
April 2009	Submit draft report to the Aquatic TWG
May through June 2009	Aquatic TWG 60 day review and comment period
July 2009	Resolve comments and prepare final report
August 2009	Submit final report to the Aquatic TWG and Plenary

### REFERENCES:

California Environmental Protection Agency (Cal EPA). 2005. General Protocol for Sport Fish Sampling and Analysis. Pesticide and Environmental Toxicology Branch, Office of Environmental Health Hazard Assessment, California Environmental Protection Agency. December 2005.

Klasing, S. and R. Brodberg. 2006. Draft Development of Guidance Tissue Levels and Screening Values for Common Contaminants in California Sport Fish: Chloradane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene. Pesticide and Environmental Toxicology Branch Office of Environmental Health Hazard Assessment, California Environmental Protection Agency.  
<http://www.oehha.ca.gov/fish/gtlsv/pdf/draftGTLsvchddt.pdf>

Marine Pollution Studies Laboratories (MPSTL). 2005. Sampling marine and freshwater bivalves, fish and crabs for trace metal and synthetic organic analysis. Method # MPSTL-102a.

Placer County Water Agency (PCWA). 2007. PCWA Middle Fork American River Project (FERC Project No. 2079), Pre-Application Document (PAD), Submitted to FERC on December 13, 2007.

## AQ 11 - Water Quality Contingency Sampling Protocol (Contingency Study)

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PCWA. 2008. AQ 11 - Water Quality Technical Study Report - 2007. Final. June 2008.

Mark Stephenson. Personal communication with Director of the Marine Pollution Studies Laboratories - Department of Fish and Game. Moss Landing California. August 11, 2008.

Amy Byington. Personal communication with Research Technician at Marine Pollution Studies Laboratories - Department of Fish and Game. Moss Landing California. August 11, 2008.

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## TABLES

**Table AQ 11-1. Methylmercury Fish Sampling Locations and Target Number of Fish.<sup>1</sup>**

Sampling Location	Species	No. Analyzed in 2007 <sup>1</sup>	Minimum No. Needed in 2008 <sup>1</sup>
French Meadows Reservoir	Brown Trout	2	7
	Rainbow Trout	3	6
	Crayfish	0	9
Hell Hole Reservoir	Brown Trout	6	3
	Lake Trout	1	8
	Kokanee	0	9
	Rainbow Trout	1	8 <sup>2</sup>
	Crayfish	0	9
Middle Fork Interbay	Brown Trout	6	3
	Rainbow Trout	4	5
Ralston Afterbay	Brown Trout	4	5
	Rainbow Trout	1	8 <sup>2</sup>
Middle Fork American River at Otter Creek	Brown Trout	1	8 <sup>2</sup>
	Rainbow Trout	9	0

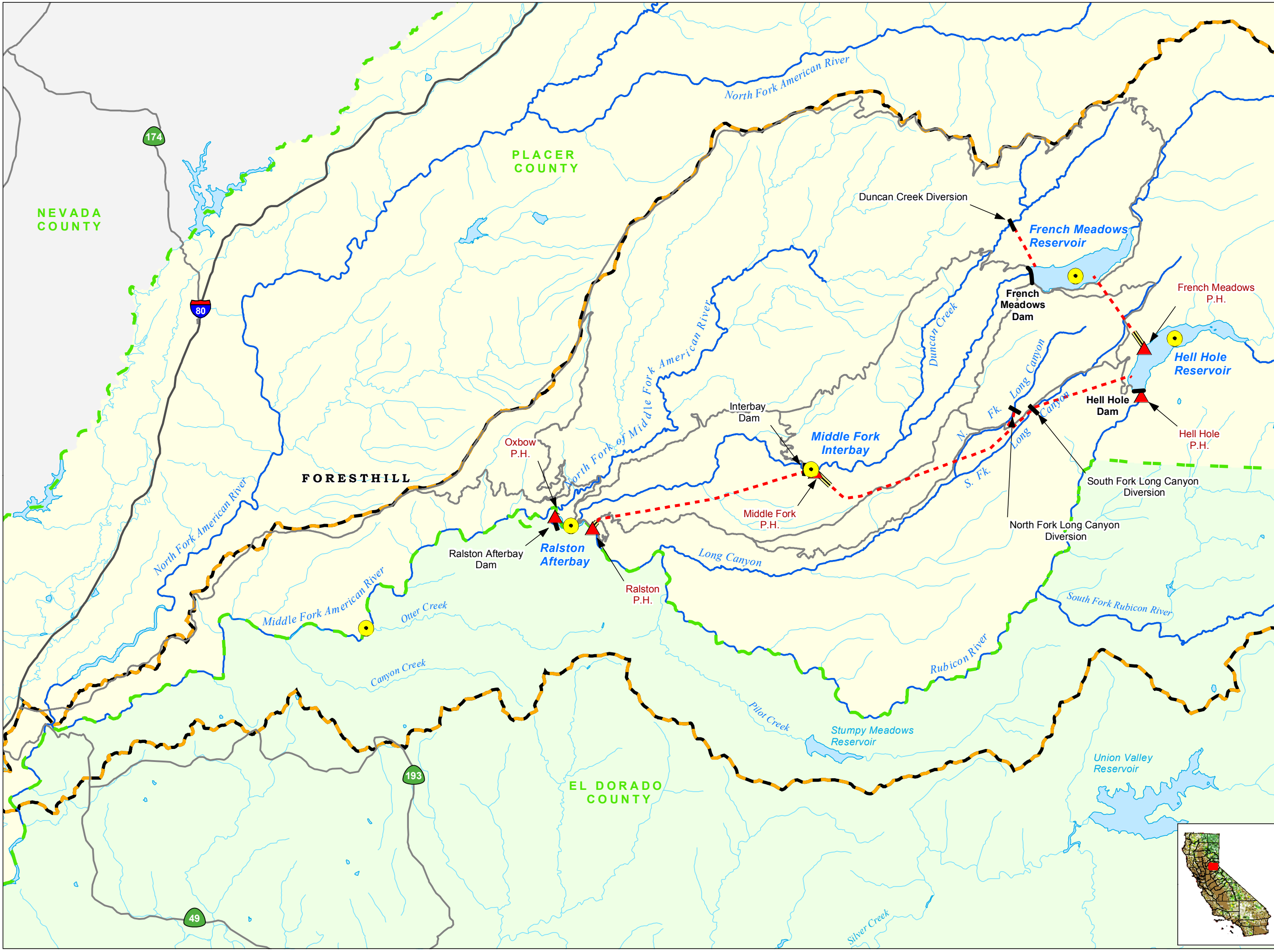
<sup>1</sup>See Table AQ 11-2 for legal and/or edible size limits.

<sup>2</sup>Low abundance of this species at the sampling location may make it difficult to collect the target number of individuals; a good-faith effort will be made to collect the target number of individuals.

**Table AQ 11-2. Legal and/or Edible Size Limits for Target Species.**


Legal/edible Size Limits	Minimum Size (mm)
Brown Trout	200
Rainbow Trout	200
Lake Trout	350
Kokanee	200
Crayfish	30

**MAP**



- Project Facilities**
- ▲ Powerhouse
  - Dam
  - Tunnel
  - Penstock
- Transportation**
- Major Road
  - Minor Road
- Designated Boundary**
- County Boundary
- Hydrography**
- Watercourse
  - Water Body
  - Middle Fork American River Watershed\*
- Water Quality Contingency Study Plan**
- Sampling Locations


\*Modified from Calwater Ver. 2.2 to represent drainage above high-water mark of Folsom Lake




Placer County Water Agency  
Middle Fork American River Project

**Map AQ 11-1**

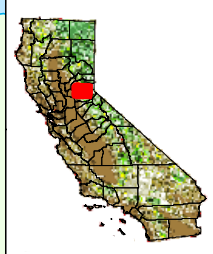
**2008 Methylmercury Fish Sampling Locations**





Projection: CA State Plane, Zone 2  
Datum: NAD 83

Date: 8/12/08





**ATTACHMENT G**

**Final Cultural Resources Evaluation Plan (August 28, 2008),  
Excluding Privileged Information**

**Placer County Water Agency  
Middle Fork American River Project  
(FERC No. 2079)**

***FINAL***

**CULTURAL RESOURCES EVALUATION PLAN**



Placer County Water Agency  
P.O. Box 6570  
Auburn, CA 95604

August 2008

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3.0 Summary of Cultural Resources Inventory Work Completed to Date .....	1
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5.0 Evaluation Study Area .....	3
6.0 Determining Historical Significance .....	4
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7.1. Evaluation Methods .....	5
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7.1.2. Archaeological Sites.....	6
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Table 2.	Category 2: Resources that will be Evaluated because they could Potentially be Affected by Project Operation and Maintenance Activities.
Table 3.	Category 3: Evaluation Approach to be Determined Pending Further Information.
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## **1.0 INTRODUCTION**

This Cultural Resources Evaluation Plan (CREP) describes how the Placer County Water Agency (PCWA) will evaluate cultural resources in the vicinity of the Middle Fork American River Project (MFP or Project) to determine their eligibility for listing on the National Register of Historic Places (NRHP). The evaluation of cultural resources for NRHP eligibility is a component of the CUL 1 - Cultural Resources Technical Study Plan (TSP), which was developed in consultation with the stakeholders and is included in Supporting Document (SD) H of PCWA's Pre-Application Document (PAD). The CREP was developed based on cultural resources research and field surveys conducted in 2005, 2006 and 2007, as summarized in Section 3.0.

PCWA is currently completing cultural resources field surveys at select locations. Any additional sites found in 2008 that need to be evaluated for NRHP eligibility will be addressed in a Supplemental CREP. The Supplemental CREP will be distributed to the stakeholders for review and comment prior to proceeding with any additional eligibility evaluations.

## **2.0 OVERVIEW OF THE CUL 1 - CULTURAL RESOURCES TSP OBJECTIVES**

The CUL 1 - Cultural Resources TSP includes two primary objectives, as follows:

- Develop information about the occurrence of cultural resources that could potentially be affected by Project operation and maintenance activities; and
- Determine the eligibility of cultural resources for listing in the National Register of Historic Places (NRHP).

Figure CUL 1-1 shows the CUL 1 - TSP study objectives and the study elements and activities that relate to each objective. It also shows how information developed through the cultural resources studies has been or will be documented. As indicated on Figure CUL 1-1, the study objectives will be met by completing the Cultural Resources Inventory Study and by conducting an Eligibility Assessment.

Ultimately, the information developed as part of the CUL-1 TSP will be used to develop a Historic Properties Management Plan (HPMP) designed to protect cultural resources that could potentially be affected by MFP operation and maintenance activities. The plan will focus on cultural resources that are eligible for or are listed on the NRHP.

## **3.0 SUMMARY OF CULTURAL RESOURCES INVENTORY WORK COMPLETED TO DATE**

The Cultural Resources Inventory Study was initiated in 2005 as part of PCWA's early relicensing studies and includes two phases. Phase 1 was completed in 2005 and focused on retrieving, compiling and reviewing existing cultural resource information in the vicinity of the MFP. Phase 2, which began in 2006 and will continue through 2008, focuses on verifying the location and condition of known cultural resources, and identifying and recording previously unrecorded cultural resources in areas associated

with the MFP. The results of the cultural resources inventory work conducted to date are documented in the following reports:

- 2005 Cultural Resources Inventory Study Report (PCWA 2006)
- 2006 Cultural Resources Inventory Study Report (PCWA 2007)
- CUL 1 - Cultural Resources Technical Study Report - 2007 (PCWA 2008)

The majority of the study area was surveyed in 2006 and 2007. However, a few locations in the study area have not yet been surveyed. These locations are currently being surveyed. The cultural resources surveys are expected to be complete by the end of 2008.

The Eligibility Study described in this CREP will be conducted in 2008 and early 2009 after the appropriate permits are obtained. Additional sites that are recommended for evaluation based on information from the 2008 field survey will be evaluated after circulating a Supplemental CREP. The results of the Eligibility Study will be documented in a draft report that will be distributed for review and comment to the U.S. Department of Agriculture-Forest Service (USDA-FS), Native American Tribes, and the Cultural Resources Technical Working Group (TWG) in March 2009.

#### **4.0 RESOURCE SUMMARY**

To-date, 29 cultural resources have been identified within the study area, which was defined in the CUL 1 - Cultural Resources TSP to include all public and PCWA-owned lands within the existing FERC Project boundary and within a 200-foot area surrounding any: 1) Project facility or feature; 2) Project recreation facility; 3) stakeholder-identified dispersed concentrated use area, and 4) potential Project betterment, including new facilities, roads and trails, staging, and disposal sites. Of the 29 cultural resources identified in the study area, one previously recorded resource (FS-05-17-54-06) could not be relocated. The remaining 28 were either: 1) previously known resources that have been relocated and examined; 2) newly recorded resources found during field surveys, or 3) newly recorded isolated finds that will not be considered further per USDA-FS policy. The cultural resources located in the study area that have been identified to-date include:

- 10 Native American archaeological sites;
- 10 historic structures, buildings, and objects, such as mines, mine ditches and stream diversions;
- 4 historic era archaeological deposits associated with mines and ranching activities;
- 2 archaeological sites with both Native American and Euroamerican components; and
- 3 isolated artifacts.

Information about these resources, including location maps and Department of Parks and Recreation (DPR) 523 forms are available in the 2006 Cultural Resources Inventory Report (PCWA 2007) and the CUL 1 - Cultural Resources Technical Study Report - 2007 (PCWA 2008).

## 5.0 EVALUATION STUDY AREA

The eligibility study involves evaluating specific cultural resources that were identified during surveys conducted in 2006, 2007 and 2008 and that meet one or both of the following two criteria:

- 1) the resource lies within an area that could potentially be affected by Project operation and maintenance activities; and/or
- 2) the resource lies within an area that could potentially be affected by the construction, operation and maintenance of Project betterments.

The following table identifies the areas around specific types of Project features that could be affected by Project operation and maintenance activities, or by the construction, operation and maintenance of Project betterments, based on a detailed review of the PCWA's operation and maintenance activities. The evaluation studies will be limited to the resources located within the areas identified below.

### Evaluation Study Area

<b>Distance</b>	<b>Existing Project Facilities and Features, Recreation Facilities, and Dispersed Concentrated Use Areas Identified by Stakeholders</b>
10 feet	on either side of trails
20 feet	around the perimeter of the large reservoirs, medium reservoirs, and diversion pools outside the perimeter fence of powerhouses, switchyards, and substations around ancillary support facilities and Project fences
30 feet	on either side of penstocks, valve houses, and removable sections around gaging stations and weirs on either side of communication lines, powerlines, photovoltaic poles and lines, and roads and access points on either side of water supply lines (above ground or buried)
60 feet	around intakes, gatehouses, surge tanks, adits, portals, microwave reflectors, radio towers, and sediment disposal and drop inlets
100 feet	around recreation facilities and dispersed concentrated use areas
<b>Distance</b>	<b>Proposed Project Betterments</b>
100 feet	around new facilities, roads, and trails; staging and disposal sites; and new inundation areas

## 6.0 DETERMINING HISTORICAL SIGNIFICANCE

The process of determining the eligibility of resource for listing in the NRHP is known as “evaluating the historical significance” of a resource. The criteria used to evaluate historical significance are found in regulations contained in Title 36 of the Code of Federal Regulations, Section 60.4 (36 CFR 60.4). Cultural resources that meet the NRHP eligibility criteria and which retain integrity are historically significant. The NRHP eligibility criteria are included in Appendix A for reference. Pertinent excerpts are shown below:

*National Register criteria for evaluation.* The quality of significance in American history, architecture, archeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association and:

- (a) that are associated with events that have made a significant contribution to the broad patterns of our history; or
- (b) that are associated with the lives of persons significant in our past; or
- (c) that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
- (d) that have yielded, or may be likely to yield, information important in prehistory or history.

Archaeological resources are typically evaluated under criterion (d) while architectural resources are evaluated under criterion (c). Mining remains from the 19th Century may be evaluated under criterion (a) because they are associated with the historically significant California Gold Rush which was an important event in American history. A resource need only meet the integrity standard and one (not all) of the eligibility criteria to be determined historically significant.

Evaluations of historical significance are reviewed by the State Historic Preservation Officer (SHPO) who concurs or does not concur with the evaluation of each property. In the event there is a dispute regarding the eligibility of a property, the parties submit the dispute to the Keeper of the NRHP, who will have the final say regarding eligibility. Cultural resources determined to be eligible for listing in the NRHP are considered historic properties and must be managed to preserve their historically significant characteristics. Specific management approaches are defined in the HPMP.

## 7.0 EVALUATION APPROACH

For the purposes of this CREP, the various types of resources present in the Project vicinity have been divided into four categories depending upon evaluation approach, as follows:

**Category 1.** These are resources that will not be evaluated for NRHP eligibility because they are situated outside the area affected by Project operation and maintenance activities, or by the construction, maintenance, or operation of Project betterments. Category 1 resources are identified on Table 1.

**Category 2.** These are resources that will be evaluated for NRHP eligibility because they are situated within areas that could potentially be affected by Project operation and maintenance activities or by the construction, operation and maintenance of Project betterments. Category 2 resources are identified on Table 2.

**Category 3.** These are resources that may be evaluated pending additional information to be developed in 2008. These resources are situated in the vicinity of the Project but additional information regarding the resource boundaries and/or relationship to the Project is necessary to determine whether the resource could potentially be affected by Project operation and maintenance activities, or by the construction of Project betterments. Once this information is developed, each of these resources will be placed into either Category 1 or Category 2, as appropriate. Category 3 resources are identified on Table 3.

**Category 4.** These are resources that have previously been evaluated for NRHP eligibility and that lie within the area potentially affected by Project operation and maintenance activities, or by the construction, maintenance, or operation of Project betterments. Category 4 resources are identified on Table 4. No additional studies are necessary.

The methods that will be used to evaluate the Category 2 resources are described in the following subsection.

## **7.1. EVALUATION METHODS**

All resources identified as Category 2 resources will be evaluated for NRHP eligibility. Category 2 resources consist of two different types of resources - historic structures and archaeological sites. The historic structures will be evaluated using historic research to determine their age and historical significance. Archaeological sites will be evaluated through consultation with Native American Tribes and by using archaeological methods and relevant ethnographic information. The evaluation methods proposed for each resource are summarized on Table 2 and further described in the following.

### **7.1.1. Historical Structures**

Historic structures will be evaluated to determine whether the resource meets one or more of the criterion for inclusion on the NRHP. Historic structures evaluations will be based upon historic information, including local histories, mining histories, historic maps and photographs, engineering documents, and materials found in archives and libraries of local and state historical societies and academic libraries. Structures or buildings that are considered Category 2 resources (and not necessarily historically related to MFP



facilities) will be evaluated for NRHP eligibility by preparing all necessary DPR 523 forms.

The MFP facilities were constructed in the 1960s and will be at least 50 years old at the time the new license is issued. Therefore, the Project facilities are considered Category 2 resources. Planned and constructed as an integrated system within a well-defined time period, the MFP facilities will be evaluated for NRHP eligibility as a historic district. This approach will utilize DPR 523 forms (Primary Record, BSO Record, Linear Record, District Record, Location Record, and Continuation Sheets) to identify and evaluate all components/elements of the system. These DPR 523 forms will also determine whether MFP system components/elements contribute or don't contribute to the significance of the historic district.

In order to evaluate the significance of the district, a historic context will be developed. The historic context will review historic information concerning water conveyance and hydroelectric generating systems planned and constructed in the 1960s. The context will provide a baseline for understanding the relative importance of the MFP facilities in terms of local, state, and national significance and whether the facilities retain associations with significant historical trends or events (NRHP Criterion A), significant people or groups of people (NRHP Criterion B) and/or are important for their engineering and/or architecture (NRHP Criterion C).

### **7.1.2. Archaeological Sites**

Archaeological sites associated with Native American and other cultural groups will be evaluated to determine whether the resource meets one or more of the criterion for inclusion on the NRHP. Archeological resources will be evaluated by consulting with Native American Tribes and by generating data through shovel probes and test excavation units (TEUs).

Prior to conducting test excavations or any other ground disturbing activities, PCWA will obtain an Archaeological Resources Protection Act (ARPA) permit from the USDA-FS. The ARPA permit application will include "Research Designs" that identify where shovel probes and TEUs are expected. In addition, the Research Designs will include information about the number and location of TEUs anticipated at each site, data collection methods, and documentation methods. As required by ARPA, the Tribes will be notified by the Eldorado National Forest (ENF) or the Tahoe National Forest (TNF) of PCWA's permit application and the Tribes will be provided a 30-day period to comment on the application. All field work, including test excavations, will be performed in accordance with the terms and conditions outlined in the ARPA permit.

### **Tribal Consultation**

PCWA will consult with the Native American Tribes regarding each of the prehistoric archaeological resources to be evaluated as part of this plan. Consultation with interested tribes will be undertaken in an effort to determine those historic attributes that may be associated with each site recognized by the Tribe, recognizing that such

consultation may involve a broader geographical area than the defined boundaries of a given archaeological site. As part of this effort, PCWA will conduct site visits and will meet with tribal representatives in whatever forum is most comfortable for tribal representatives. Information developed through Tribal consultation will be documented and will remain confidential as designated by tribal representatives. The objective of the consultation is to develop understanding of the historical associations of the cultural resources as they relate to potential Project effects.

### Tribal Monitors

In some cases, shovel probes and potentially TEUs may be necessary to accurately delineate the boundaries of a prehistoric archaeological site or to develop additional information about the resource. Shovel probes, and potentially TEUs, are anticipated at three archaeological sites (FS-05-17-54-116; FS-05-17-54-400; FS-05-03-55-201), as shown on Table 2. In addition, shovel probes and potentially TEUs may be necessary at three other Category 3 archaeological sites depending upon the outcome of 2008 field surveys and research activities. These three sites are identified on Table 3 as FS-05-03-53-04, FS-05-03-53-375, and FS-05-17-54-468. In cases where shovel probes and/or TEUs are necessary, PCWA will provide the Tribes with a field schedule so that the Tribe(s) can provide on-site tribal monitors to observe the shovel probes or test excavations, if desired.

### **Shovel Probes and Test Excavation Units**

Shovel probes (50 centimeter (cm) x 50 cm) will be used to assess the boundaries and contents of archaeological sites. In some cases, it may be necessary to excavate a small number of TEUs, measuring 1 meter (m) x 1 m or 1 m x 2 m. In all excavations, soils will be removed using hand tools with soils screened through 1/8-inch mesh, to recover artifacts and other items of interest. Materials found will be sorted, counted, tallied, and described in the field. Diagnostic artifacts will be photographed in the field.

Detailed excavation methods to be used at each site will be described in Research Designs, which will be submitted to the appropriate USDA-FS offices as part of the ARPA application. The Research Designs will include details such as the amount of material to be excavated and collection and handling procedures.

### Collection of Materials

Obsidian flakes will be collected for obsidian hydration analysis and source determination and basalt artifacts will be collected to determine their original source. Obsidian and basalt samples will be reburied at the appropriate site after analysis.

No other materials are expected to be collected. In the event a rare, exceptional artifact is found it will be retained and curated at the appropriate USDA-FS office. PCWA will provide the curator with a catalogue and evaluation of all materials deposited with the curatorial facility, including the facility's accession or catalogue numbers, and confirmation, signed by an authorized curatorial facility official, that artifacts, samples,

and collections were deposited with the approved curatorial facility. The confirmation will include the date the materials were deposited and the type, number, and condition of the deposited materials.

#### Human Remains, Funerary Objects, Sacred Objects or Objects of Cultural Patrimony

In the event that human remains, funerary objects, sacred objects or objects of cultural patrimony are discovered, PCWA will immediately cease work, will protect and secure the site to the extent practicable, and will notify the USDA-FS archaeologist of the discovery. In addition, PCWA will notify all of the Tribes interested in the relicensing of the MFP within 24 hours of the discovery. Upon notification, PCWA will consult with the USDA-FS and the Tribes regarding the protection and/or recovery of important objects and human remains. PCWA will not resume excavation activities at the site until agreed to by the Tribes and allowed to do so by the USDA-FS archaeologist.

### **8.0 REPORTING**

The information developed as part of this CREP and the Supplemental CREP will be documented in a detailed report, which will be provided to the USDA-FS, Tribes, and the Cultural Resources TWG for review and comment. The report will describe the methods that were used to evaluate each site and the results of the evaluation. In addition, it will identify those sites that were determined to be eligible for inclusion in the NRHP based on specific eligibility criteria. Upon completion, the report and all relevant information will be provided to the SHPO, who will make a determination regarding each resource's eligibility for inclusion in the NRHP. Any eligible resources that are located within the evaluation study area will be addressed in a HPMP), a draft of which will be included in PCWA's Application for New License. The HPMP will identify specific measures that PCWA will undertake to protect NRHP resources located within the evaluation study area.

## **Placeholder for**

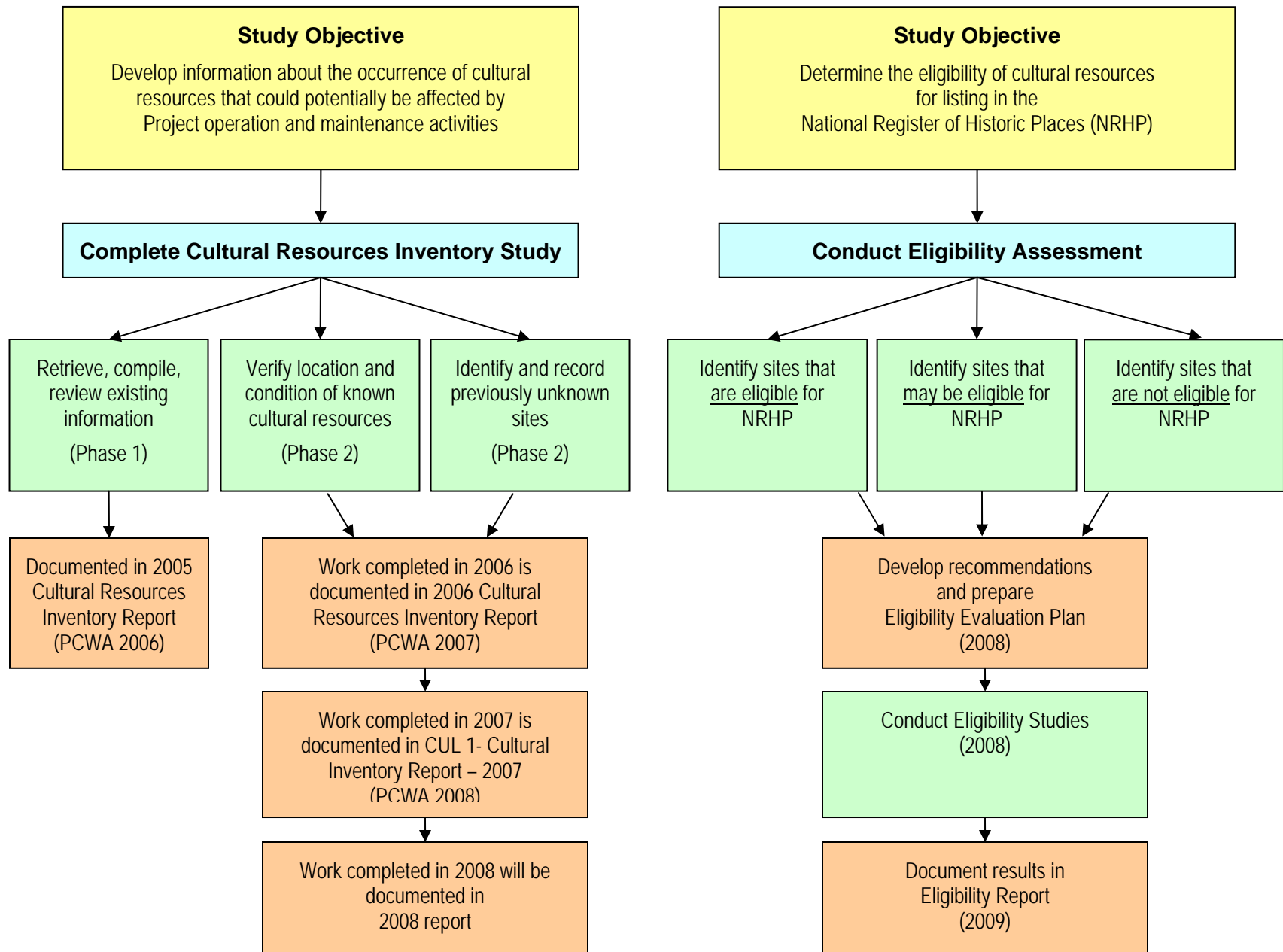
### **TABLES**

#### **Privileged Information**

The Tables have been removed from this document because they contain confidential cultural resources information, and are considered “privileged” information. This type of information may not be made available to the public pursuant to the Federal Energy Regulatory Commission’s (FERC’s) regulations contained in 18 CFR Section 5.2(c) and 18 CFR Section 388.112.

**FIGURE**

**Figure 1. CUL 1 – Cultural Resources Study Objectives and Related Study Elements and Reports.**



**APPENDIX A**  
**36 CFR 60.4**  
**Historic Property Evaluation Criteria**

## Criteria for Evaluation

The criteria applied to evaluate properties (other than areas of the National Park System and National Historic Landmarks) for the National Register are listed below. These criteria are worded in a manner to provide for a wide diversity of resources. The following criteria shall be used in evaluating properties for nomination to the National Register, by NPS in reviewing nominations, and for evaluating National Register eligibility of properties. Guidance in applying the criteria is further discussed in the "How To" publications, Standards & Guidelines sheets and Keeper's opinions of the National Register. Such materials are available upon request.

*National Register criteria for evaluation.* The quality of significance in American history, architecture, archeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association and:

- (a) that are associated with events that have made a significant contribution to the broad patterns of our history; or
- (b) that are associated with the lives of persons significant in our past; or
- (c) that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
- (d) that have yielded, or may be likely to yield, information important in prehistory or history.

*Criteria considerations.* Ordinarily cemeteries, birthplaces, or graves of historical figures, properties owned by religious institutions or used for religious purposes, structures that have been moved from their original locations, reconstructed historic buildings, properties primarily commemorative in nature, and properties that have achieved significance within the past 50 years shall not be considered eligible for the National Register. However, such properties will qualify if they are integral parts of districts that do meet the criteria of if they fall within the following categories:

- (a) A religious property deriving primary significance from architectural or artistic distinction or historical importance; or
- (b) A building or structure removed from its original location but which is significant primarily for architectural value, or which is the surviving structure most importantly associated with a historic person or event; or
- (c) A birthplace or grave of a historical figure of outstanding importance if there is no appropriate site or building directly associated with his productive life.



- (d) A cemetery which derives its primary significance from graves of persons of transcendent importance, from age, from distinctive design features, or from association with historic events; or
- (e) A reconstructed building when accurately executed in a suitable environment and presented in a dignified manner as part of a restoration master plan, and when no other building or structure with the same association has survived; or
- (f) A property primarily commemorative in intent if design, age, tradition, or symbolic value has invested it with its own exceptional significance; or
- (g) A property achieving significance within the past 50 years if it is of exceptional importance.

This exception is described further in NPS "How To" #2, entitled "How to Evaluate and Nominate Potential National Register Properties That Have Achieved Significance Within the Last 50 Years" which is available from the National Register of Historic Places Division, National Park Service, United States Department of the Interior, Washington, D.C. 20240.