

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

**SUPPORTING DOCUMENT H
Proposed Technical Study Plans**



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CONTENT

Supporting Document H (SD H) contains 28 detailed stakeholder-approved technical study plans for the Middle Fork American River Project (Project or MFP). The study plans are organized into five resource areas - Aquatic, Cultural, Land, Recreation, and Terrestrial. In addition, SD H describes six study plan components that are required by the Federal Energy Regulatory Commission (FERC or Commission) and applicable to all of the technical study plans.

The stakeholder-approved technical study plans included in SD H were developed in consultation with Federal and state resource agencies, Native American tribes, local governments, non-governmental organizations, and members of the public. The study plans were approved during Plenary meetings conducted between May and November 2007.

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1.0 INTRODUCTION

SD H contains 28 detailed stakeholder-approved Technical Study Plans developed for Placer County Water Agency's (PCWA's) Middle Fork American River Project (MFP) (Table SD H-1 and Appendix A). The study plans are organized into five major resource areas - Aquatic, Cultural, Land, Recreation, and Terrestrial. The plans were developed in collaboration with representatives of Federal and state resource agencies, Native American Tribes, local governments, non-governmental organizations, and members of the public. Thirty-eight Technical Working Group (TWG) meetings were held between August 2006 and August 2007 to review, revise, and reach consensus on the Technical Study Plans. The Plenary approved all of the Technical Study Plans during meetings held in May, June, and September 2007. Minor revisions to these study plans were approved by the TWGs and Plenary in October and November 2007 based on information from early implementation of the studies. The stakeholder-approved Technical Study Plans presented in Appendix A reflect these modifications and address all stakeholder study requests received to date.

The overall objective of the technical studies contained in the Pre-Application Document (PAD) is to develop sufficient information to evaluate potential Project impacts and to develop new license conditions that reasonably balance multiple resource interests. The stakeholder-approved studies will be implemented in 2007-2009, with all data collection methods and results provided to stakeholders in draft reports for review and comment (Figure SD H-1). Comments provided by stakeholders will be addressed and incorporated into final reports. Specific timelines for completion of the draft and final reports are provided in each study plan, with the overall goal of providing stakeholders with timely information as studies are completed. Reports for all the studies will be provided to the stakeholders by mid-2009, with all final reports completed by January 2010.

2.0 CONTENT AND ORGANIZATION OF TECHNICAL STUDY PLANS

The following presents the general content and organization of each individual stakeholder-approved Technical Study Plan contained in Appendix A:

- Potential Resource Issues - This section identifies the environmental or cultural resource issues that are specifically addressed in the study plan.
- Project Nexus - This section describes potential direct and indirect effects of Project operation and maintenance activities on environmental and cultural resources.
- Potential License Condition - This section identifies potential license conditions which may be necessary in the new license (based on the Project Nexus) that are directly influenced by information developed from implementation of the study plan.
- Study Objectives - This section describes the specific study objectives or goals of the study .

- Extent of Study Area - This section clearly identifies the limits of the study area based on the potential Project Nexus for each study plan.
- Study Approach - This section provides a detailed description of the study elements and methodologies proposed to meet each study objective.
- Schedule - This section presents a detailed schedule for implementation of each study including data collection and stakeholder consultation, data analysis and report preparation, draft report distribution, stakeholder review and comment period, comment resolution, and final report distribution.

3.0 OTHER TECHNICAL STUDY PLAN COMPONENTS

The following describes six additional technical study plan components that apply to all stakeholder-approved Technical Study Plans. These components are not addressed individually within each Technical Study Plan provided in Appendix A. Additional information regarding the formal study plan development and implementation process is provided in the Executive Summary and SD A - Relicensing Process Plan.

3.1 RESOURCE MANAGEMENT GOALS/OBJECTIVES

Preliminary Resource Management Objectives were provided by resource agencies to PWCA and stakeholders in September 2007. These objectives were not developed by the resource agencies specifically for the MFP, but were adapted from another relicensing proceeding to reflect the general content and range of management objectives that may be under consideration for the MFP. The intent of their distribution was to verify that the Technical Study Plan and analyses proposed for the MFP would result in collection of sufficient information to address each of the known resource management objectives provided by agencies with jurisdiction over the resources to be studied.

Table SD H-2 summarizes the existing and future information sources which address each of the preliminary Resource Management Objectives. It should be noted that multiple sources provide relevant information related to each Resource Management Objective. Existing information sources include results of early information gathering activities by PCWA presented in the Executive Summary, SD E - Existing Resource Information Report and SD G - 2005/2006 Technical Study Plans and Reports. Future information sources include technical study reports that will summarize information developed during implementation of the stakeholder-approved Technical Study Plans and analyses completed to support proposed new license conditions to be provided in the License Application.

Table SD H-2 was distributed to stakeholders for review and comment and discussed during TWG meetings in October and November 2007 and in the November 2007 Plenary meeting. All comments received from stakeholders were incorporated into the table. The overall consensus of the stakeholders is that the technical studies and analyses proposed in the PAD would collect sufficient information to adequately

address each of the preliminary Resource Management Objectives provided by the resource agencies.

3.2 EXISTING INFORMATION AND ADDITIONAL INFORMATION NEEDS

As discussed above, the overall objective of the technical studies contained in the PAD is to develop sufficient information to evaluate potential Project impacts and to develop new license conditions that reasonably balance multiple resource interests. The first step in meeting this objective involved educating the stakeholders on the MFP facilities and operations and soliciting and summarizing relevant existing resource information.

Beginning in 2005, PCWA's Board of Directors requested staff to begin early consultation with state and federal resource agencies, non-governmental organizations, Native American Tribes, and other stakeholders in preparation for the MFP relicensing. The intent of these early meetings was to identify potential stakeholders and understand their resource interests, describe MFP facilities and operations to interested parties, and solicit existing resource information. Existing resource information relevant to the MFP was acquired, compiled and summarized by PCWA and provided to stakeholders in a series of draft Existing Resource Information Reports. These reports were intended to provide the foundation for understanding resources in the vicinity of the MFP and for determination of additional information needs. Upon receipt of these reports, some stakeholders identified additional information that would be beneficial to include in the Existing Resource Information Reports. This information is included in the updated resource reports provided in SD F - Existing Resource Information Report.

In reviewing the existing information, PCWA identified several resources areas that lacked basic information necessary to developed focused site-specific studies for inclusion in the PAD. PCWA elected to conduct early information gathering in 2005 and 2006 to augment the existing information. PCWA collaborated with resource agencies to develop appropriate scopes of work for the early environmental and cultural data gathering activities. These activities focused on documenting river and stream channel characteristics (geomorphology), riparian vegetation, aquatic habitat, historical Project and pre-Project flows, water temperatures, and meteorological conditions in streams and rivers upstream and downstream of Project diversions and reservoirs. Cultural resource inventories within the FERC Project Boundary were also initiated. Results of these early environmental and cultural studies were distributed to stakeholders in a series of technical reports for consideration during the PAD study plan development. The technical study plans and reports are provided in SD G -2005/2006 Technical Study Plan and Reports. PCWA also discussed the existing resource information with stakeholders during Plenary and TWG meetings in 2006 and early 2007 to facilitate dissemination of known resource information relevant to the MFP.

Beginning in August 2006, PCWA initiated collaboration with stakeholders to identify additional information needed in the PAD Technical Study Plans to fully evaluate potential Project impacts and to develop new license conditions. Thirty-eight TWG meeting were held between August 2006 and August 2007 to review, revise, and reach consensus on the scope of additional information gathering necessary to include in the

Technical Study Plans. The Plenary approved all the Technical Study Plans during the May, June, and September 2007 meetings.

3.3 CONSISTENCY WITH GENERALLY ACCEPTED PRACTICE IN THE SCIENTIFIC COMMUNITY

The proposed study methodologies (including data collection and analysis techniques, field schedules, and study durations) in the stakeholder-approved Technical Study Plans are consistent with generally accepted practice in the scientific community. The study plans were collaboratively developed with technical experts representing the licensee, state and federal resource agencies, Native American tribes, non-government organizations and the public. Many of these technical experts have experience in multiple relicensing proceedings in California. The scope of each of the technical studies provided in the PAD are consistent with common approaches used for other relicensing proceedings in California and the nation and, where appropriate, reference specific protocols and survey methodologies.

3.4 CONSIDERATIONS OF LEVEL OF EFFORT AND COST

As discussed above, the overall objective of the technical studies contained in the PAD is to develop sufficient information to evaluate potential Project impacts and to develop new license conditions that reasonably balance multiple resource interests. Proposed technical study approaches were evaluated first to verify that the desired information was focused on potential Project impacts associated with the MFP (i.e., Project Nexus), second to confirm that the information collected would substantially influence decisions on new license conditions (i.e. clear linkage between information obtained and decision process), and third to substantiate that the study approaches and resulting level of efforts were consistent with generally acceptable practices in the scientific community. The stakeholder-approved Technical Study Plans included in the PAD meet these evaluation criteria and reflect consensus of PCWA and the stakeholders on the scope of the technical studies. Table SD H-3 presents the estimated level of effort and cost for completion of each of the Technical Study Plans.

3.5 PERIODIC PROGRESS REPORTS

PCWA has a well-defined process for the manner and extent information obtained during implementation of the Technical Study Plans will be provided to the stakeholders. Each Technical Study Plan contains a detailed schedule for data collection and analysis, development and distribution of draft Technical Study Reports, and stakeholder review and comment. Figure SD H-1 provides an overview of these activities for each study plan. In general, a 60 day comment period is provided for stakeholder review of each draft Technical Study Report. The comment period is extended to 90 days if the distribution of the draft Technical Study Report is scheduled between Thanksgiving and New Year's. An additional 60-90 day period has also been allocated in the schedule to resolve stakeholder comments on the draft Technical Study Reports and to develop and distribute the final Technical Study Reports.

In addition to the formal distribution of draft and final Technical Study Reports, PCWA will also present an overview of the content and key findings of each Technical Study Report to stakeholders during regularly scheduled TWG meetings. The timing of these meetings will be emailed to stakeholders in advance and posted on PCWA's relicensing website <http://relicensing.pcwa.net/>.

3.6 ANNUAL STUDY PLAN REPORT AND MEETING

Annually, during study implementation, PCWA will file a study report to the Federal Energy Regulatory Commission (Commission or FERC) and stakeholders describing overall progress in implementation of the study plans including data collected to date, any deviations in technical approaches or schedules, and a proposed schedule for completion of the remaining study plan components. The study report will also include a description of any proposed modifications to the approved studies or new studies proposed by PCWA.

Within 15 days following filing of the study report, PCWA will hold a meeting with stakeholders and FERC to discuss the study results and PCWA's or other participant's proposals, if any, to modify the study plans in light of the progress of the study plan and data collected. Within 15 days following the meeting, PCWA will file a meeting summary, including any modification to ongoing studies or new studies proposed by PCWA.

PCWA began implementing elements of the stakeholder-approved Technical Study Plans in May 2007, which is consistent with the schedule provided in the study plans. PCWA will distribute a Study Plan Report to FERC and MFP stakeholders on January 22, 2008 describing overall progress in implementation of the study plans in 2007 including data collected to date, any deviations in technical approaches or schedules, and a proposed schedule for completion of the remaining study plan components. PCWA has also scheduled a Study Plan Report Meeting for February 4, 2008 to discuss the study results and PCWA's or other participant's proposals, if any, to modify the study plans in light of the progress of the study plan and data collected. PCWA will file a meeting summary with FERC, including any modification to ongoing studies or new studies proposed by PCWA on February 19, 2008 for review and comment by stakeholders.

In subsequent years, during study plan implementation, PCWA will follow a similar schedule for distributing annual Study Plan Reports (January 2009 and 2010), conducting a Study Plan Report Meeting (February 2009 and 2010), and filing a meetings summary (February 2009 and 2010). The timing of these activities in 2009 and 2010 will be emailed to stakeholders in advance and posted on PCWA's relicensing website <http://relicensing.pcwa.net/>.

TABLES

Table SD H-1. List of Stakeholder-Approved Technical Study Plans.

Aquatic Resources

- AQ 1 - Instream Flow Technical Study Plan
- AQ 2 - Fish Population Technical Study Plan
- AQ 3 - Macroinvertebrates and Aquatic Mollusk Technical Study Plan
- AQ 4 - Water Temperature Modeling Technical Study Plan
- AQ 5 - Bioenergetics Technical Study Plan
- AQ 6 - Fish Passage Technical Study Plan
- AQ 7 - Entrainment Technical Study Plan
- AQ 8 - Reservoir Fish Habitat Technical Study Plan
- AQ 9 - Geomorphology Technical Study Plan
- AQ 10 - Riparian Resources Technical Study Plan
- AQ 11 - Water Quality Technical Study Plan
- AQ 12 - Special-Status Amphibian & Aquatic Reptiles Technical Study Plan

Cultural Resources

- CUL 1 - Cultural Resources Technical Study Plan

Land Management

- LAND 1 - Transportation System Technical Study Plan
- LAND 2 - Fire Prevention and Response Technical Study Plan
- LAND 3 - Emergency Action and Public Safety Technical Study Plan
- LAND 4 - FERC Boundary and Authorization Technical Study Plan

Recreational Resources

- REC 1 - Recreation Use & Facilities Assessment Technical Study Plan
- REC 2 - Recreation Visitor Surveys Technical Study Plan
- REC 3 - Reservoir Recreation Opportunities Technical Study Plan
- REC 4 - Stream-based Recreation Opportunities Technical Study Plan
- REC 5 - Visual Quality Assessment Technical Study Plan

Terrestrial Resources

- TERR 1 - Vegetation Communities & Wildlife Habitat Technical Study Plan
- TERR 2 - Special-Status Plants Technical Study Plan
- TERR 3 - Noxious Weeds Technical Study Plan
- TERR 4 - Special-Status Wildlife Technical Study Plan
- TERR 5 - Bald Eagle Technical Study Plan
- TERR 6 - Special-Status Bats Technical Study Plan

Table SD H-2. Information Sources that Address Resource Management Objectives.

The following summarizes information sources which address resource agency management objectives. Note: The majority of the management objectives refer to protection, mitigation and enhancement (PM&E) measures or potential future license conditions which will be fully evaluated in the License Application using information developed in the Technical Study Plans.

Preliminary Resource Agency Management Objectives	Early Information Gathering		Aquatic Resources Technical Study Plans											Recreation Resources Technical Study Plans					Land Management Technical Study Plans				Cultural Resources Technical Study Plan	Terrestrial Resources Technical Study Plans						License Application			
	Existing Resource Information Reports in PAD	PCWA Early Relicensing Studies & Reports (Aquatic Habitat, Riparian, Geomorph, Water Temperature Monitoring, Hydrology, Cultural)	AQ1 - Instream Flow	AQ2 - Fish Population	AQ3 - Macroinvertebrate & Aquatic Mollusk	AQ4 - Water Temperature Modeling	AQ5 - Bioenergetics	AQ6 - Fish Passage	AQ7 - Entrainment	AQ8 - Reservoir Fish Habitat	AQ9 - Geomorphology	AQ10 - Riparian Resources	AQ11 - Water Quality	AQ12 - Special-Status Amphibian & Aquatic Reptiles	REC 1 - Recreation Use & Facilities Assessment	REC 2 - Recreation Visitor Surveys	REC 3 - Reservoir Recreation Opportunities	REC 4 - Stream-based Recreation Opportunities	REC 5 - Visual Quality Assessment	LAND 1 - Transportation System	LAND 2 - Fire Prevention & Response	LAND 3 - Emergency Action & Public Safety	LAND 4 - FERC Boundary & Authorization	CUL 1 - Cultural Resources	TERR 1 - Veg Communities & Wildlife Habitat	TERR 2 - Special-Status Plants	TERR 3 - Noxious Weeds	TERR 4 - Special-Status Wildlife	TERR 5 - Bald Eagle	TERR 6 - Special-Status Bats			
Aquatic Biota Objectives Populations of native aquatic biota, including fish, benthic macroinvertebrates, and riparian species are viable with adequate habitat consistent with species' needs. Maintain, enhance, or restore all life stages of native aquatic species. <ul style="list-style-type: none"> ■ Maintain, recover, and restore riparian resources, channel condition, and aquatic habitat. ■ Maintain, recover, and restore streamflow regime sufficient to sustain desired conditions of native riparian, aquatic, wetland, and meadow habitats. ■ Protect aquatic systems to which species are uniquely adapted. 	X	X	X	X	X	X	X	X	X	X	X	X	X																				X
Fisheries Objectives Biomass Indices Maintain, restore, or recover favorable ecological conditions for all life stages of rainbow trout and other native fishes and desired non-native fishes in their appropriate range and habitat.	X	X	X	X	X	X	X	X	X	X	X	X	X																				X
Fish Passage Ensure fish passage during their spawning season.		X	X	X				X																									X
Native Species Maintain, enhance, or restore all life stages of native species.	X	X	X	X	X	X	X	X	X	X	X	X	X												X	X	X	X	X	X	X	X	X
Entrainment Minimize the effects of stream diversions or other flow modifications from hydroelectric projects on threatened, endangered, and sensitive species. Minimize entrainment at the outlets of the reservoirs.		X	X	X	X		X	X					X													X		X					X
Fish Stocking Ensure fish stocking in Project reservoirs is adequate to compensate for entrainment in the facilities at these reservoirs.	X			X					X						X	X																	X
Macroinvertebrate Objective Macroinvertebrate indices (metrics) in Project-affected stream reaches shall be comparable to reference reaches. Numerical objectives based on the collection and review of additional benthic macroinvertebrate data will be developed.	X				X							X																					
Natural Hydrograph Objective Ensure water use achieves seasonal discharge fluctuations that simulate the shape of the natural hydrograph in duration, magnitude, rate of change, and frequency to the extent necessary to obtain the aquatic resource objectives	X	X	X	X	X	X	X	X		X	X		X																				X
Flow Fluctuations Objective Minimize Project-caused flow fluctuations uncharacteristic of the natural hydrograph to protect biota and maintain public safety.	X	X	X	X	X	X	X						X				X				X												X

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Preliminary Resource Agency Management Objectives	Early Information Gathering		Aquatic Resources Technical Study Plans										Recreation Resources Technical Study Plans					Land Management Technical Study Plans				Cultural Resources Technical Study Plan	Terrestrial Resources Technical Study Plans						License Application			
	Existing Resource Information Reports in PAD	PCWA Early Relicensing Studies & Reports (Aquatic Habitat, Riparian, Geomorph, Water Temperature Monitoring, Hydrology, Cultural)	AQ 1 - Instream Flow	AQ 2 - Fish Population	AQ 3 - Macroinvertebrate & Aquatic Mollusk	AQ 4 - Water Temperature Modeling	AQ 5 - Bioenergetics	AQ 6 - Fish Passage	AQ 7 - Entrainment	AQ 8 - Reservoir Fish Habitat	AQ 9 - Geomorphology	AQ 10 - Riparian Resources	AQ 11 - Water Quality	AQ 12 - Special-Status Amphibian & Aquatic Reptiles	REC 1 - Recreation Use & Facilities Assessment	REC 2 - Recreation Visitor Surveys	REC 3 - Reservoir Recreation Opportunities	REC 4 - Stream-based Recreation Opportunities	REC 5 - Visual Quality Assessment	LAND 1 - Transportation System	LAND 2 - Fire Prevention & Response	LAND 3 - Emergency Action & Public Safety	LAND 4 - FERC Boundary & Authorization	CUL 1 - Cultural Resources	TERR 1 - Veg Communities & Wildlife Habitat	TERR 2 - Special-Status Plants	TERR 3 - Noxious Weeds	TERR 4 - Special-Status Wildlife	TERR 5 - Bald Eagle	TERR 6 - Special-Status Bats		
Channel Morphology Objective Maintain or restore channel integrity. Maintain, improve, or restore fluvial processes to provide for balanced sediment transport, channel bed material mobilization and distribution, and channel structural stability that contribute to diverse aquatic habitat and healthy riparian habitat.	X	X	X							X	X																					X
Sediment Transport Objective Ensure delivery and transport of sediment are balanced so that stream channels are not excessively aggrading or degrading over time, and particle size distribution allows for diverse bed form within the stream channel.	X	X	X							X																						X
Stream Channel and Floodplain Objective Ensure stream channels have appropriate cross-section size (width to depth) and stable stream banks, and floodplains and flood-prone areas have connectivity to the stream channel.	X	X	X							X	X																					X
Large Woody Debris Objective Ensure that the level of large woody debris is within the range of natural variability in terms of frequency and distribution and is sufficient to sustain stream channel physical complexity and stability. If characteristics are outside the range of natural variability, implement mitigation measures and short-term restoration actions as needed to prevent further declines or cause an upward trend in condition.		X		X					X	X																						X
Riparian Habitat Objectives <ul style="list-style-type: none"> Maintain riparian vegetation in proper functioning condition. Maintain or restore riparian resources. Maintain or restore streamflow regime sufficient to sustain desired conditions of native riparian, aquatic, wetland, and meadow habitats. 	X	X	X							X	X														X							X
Water Quality Objective Ensure compliance with the water quality objectives, such as temperature, to fully protect the designated beneficial uses, including public health and safety, as designated in the Central Valley Regional Water Quality Control Board	X	X		X		X	X					X		X	X	X	X				X											X
Water Temperature Objective Ensure that flows are protective of the designated beneficial uses of cold freshwater habitat and warm freshwater habitat as appropriate, and do not adversely affect water temperatures for local aquatic- and riparian-dependent species assemblages.	X	X	X	X	X	X	X		X		X	X	X				X								X		X					X
Streamflow and Reservoir Storage Gaging Plan Objective Develop a streamflow and reservoir storage gaging plan to evaluate compliance and resource responses to changes in streamflows and reservoir levels. The plan may include installation of additional gaging stations.	X	X														X	X				X											X

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Preliminary Resource Agency Management Objectives	Early Information Gathering		Aquatic Resources Technical Study Plans										Recreation Resources Technical Study Plans					Land Management Technical Study Plans				Cultural Resources Technical Study Plan	Terrestrial Resources Technical Study Plans						License Application			
	Existing Resource Information Reports in PAD	PCWA Early Reicensing Studies & Reports (Aquatic Habitat, Riparian, Geomorph, Water Temperature Monitoring, Hydrology, Cultural)	AQ 1 - Instream Flow	AQ 2 - Fish Population	AQ 3 - Macroinvertebrate & Aquatic Mollusk	AQ 4 - Water Temperature Modeling	AQ 5 - Bioenergetics	AQ 6 - Fish Passage	AQ 7 - Entrainment	AQ 8 - Reservoir Fish Habitat	AQ 9 - Geomorphology	AQ 10 - Riparian Resources	AQ 11 - Water Quality	AQ 12 - Special-Status Amphibian & Aquatic Reptiles	REC 1 - Recreation Use & Facilities Assessment	REC 2 - Recreation Visitor Surveys	REC 3 - Reservoir Recreation Opportunities	REC 4 - Stream-based Recreation Opportunities	REC 5 - Visual Quality Assessment	LAND 1 - Transportation System	LAND 2 - Fire Prevention & Response	LAND 3 - Emergency Action & Public Safety	LAND 4 - FERC Boundary & Authorization	CUL 1 - Cultural Resources	TERR 1 - Veg Communities & Wildlife Habitat	TERR 2 - Special-Status Plants	TERR 3 - Noxious Weeds	TERR 4 - Special-Status Wildlife	TERR 5 - Bald Eagle	TERR 6 - Special-Status Bats		
Threatened, Endangered, and Sensitive Species and Management Indicator Species Objective Ensure that PM&E measures are consistent with any applicable FS biological evaluation for sensitive species or any applicable biological opinion issued under the federal or state Endangered Species Act. Ensure that PM&E measures comply with the Forest Plan. Minimize the effects of stream diversion or other flow modifications from hydroelectric projects on threatened, endangered, or sensitive species.	X	X	X	X	X	X	X	X	X				X											X	X		X	X	X	X	X	X
Invasive Weed Control Objective Reduce and, where possible, reverse the spread of invasive weeds.	X	X									X															X					X	
Reservoir Levels Objective Maintain reservoir levels in Project reservoirs to protect beneficial uses. Maintain reservoir levels sufficient to ensure that aesthetic, recreational, ecological, public safety, and power production needs are addressed.	X	X	X	X		X			X			X		X	X	X		X			X										X	
Visual Resources Objective Ensure that visual quality meets appropriate management area direction.	X																	X													X	
Recreation Management Objective Provide for quality day use and overnight recreation opportunities associated with the Project and ensure that other resources are not adversely impacted by this recreational use.	X													X	X	X	X						X	X	X	X	X			X	X	
Recreation Design Objective Ensure Project-related facilities meet current FS design standards and standards for accessibility.	X													X																	X	
Wilderness and Wild and Scenic River Objective Ensure wilderness values and outstandingly remarkable wild and scenic river values are maintained or enhanced.	X																														X	
Recreational Streamflow Objective Provide streamflow regime to optimize recreational opportunities, including stream angling, swimming, waterplay, boating, and other recreational beneficial uses that are consistent with ecosystem capabilities, that minimize user and ecological conflicts, that consider hydropower operations, and that maintain a high degree of user satisfaction as determined by user surveys, with due consideration for lake levels and levels of quality lake-based recreation.	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X														X	
Lake Fishing Objective Protect and enhance lake-fishing opportunities in Project reservoirs consistent with overall lake-based recreation and lake level goals.	X	X		X		X			X						X	X															X	

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Preliminary Resource Agency Management Objectives	Early Information Gathering		Aquatic Resources Technical Study Plans											Recreation Resources Technical Study Plans					Land Management Technical Study Plans				Cultural Resources Technical Study Plan	Terrestrial Resources Technical Study Plans						License Application			
	Existing Resource Information Reports in PAD	PCWA Early Relicensing Studies & Reports (Aquatic Habitat, Riparian, Geomorph, Water Temperature Monitoring, Hydrology, Cultural)	AQ 1 - Instream Flow	AQ 2 - Fish Population	AQ 3 - Macroinvertebrate & Aquatic Mollusk	AQ 4 - Water Temperature Modeling	AQ 5 - Bioenergetics	AQ 6 - Fish Passage	AQ 7 - Entrapment	AQ 8 - Reservoir Fish Habitat	AQ 9 - Geomorphology	AQ 10 - Riparian Resources	AQ 11 - Water Quality	AQ 12 - Special-Status Amphibian & Aquatic Reptiles	REC 1 - Recreation Use & Facilities Assessment	REC 2 - Recreation Visitor Surveys	REC 3 - Reservoir Recreation Opportunities	REC 4 - Stream-based Recreation Opportunities	REC 5 - Visual Quality Assessment	LAND 1 - Transportation System	LAND 2 - Fire Prevention & Response	LAND 3 - Emergency Action & Public Safety	LAND 4 - FERC Boundary & Authorization	CUL 1 - Cultural Resources	TERR 1 - Veg Communities & Wildlife Habitat	TERR 2 - Special-Status Plants	TERR 3 - Noxious Weeds	TERR 4 - Special-Status Wildlife	TERR 5 - Bald Eagle	TERR 6 - Special-Status Bats			
Recreational Access Objective Provide river recreation facilities that are consistent with Recreation Opportunity Spectrum (ROS) class (or equivalent), physical, social, and ecological carrying capacity of the resource and demand levels, with the possibility of adjustment based on user satisfaction.	X													X	X		X																X
Streamflow and Reservoir Level Information Objective Provide streamflow and lake level information for Project-affected reaches and lakes that is available to the general public and is adequate for river and lake recreation use.	X	X														X	X	X				X										X	
Public Safety and Recreation Information Provide information regarding public safety and recreation opportunities associated with Project reservoirs and streams.	X													X	X	X	X					X										X	
Transportation and Facilities Management Objective Ensure appropriate level of maintenance on Project-related roads and trails. Ensure roads and trails are maintained to FS standards. Ensure Project-related facilities are appropriately identified and maintained.	X													X						X												X	
Special-Use Authorization Objective Ensure that Project-related special-use authorizations are up to date and address current permitted use.																						X											
Vegetation Management and Fire Prevention Objective Ensure appropriate vegetation management for Project-related activities. Minimize loss of resources from Project-related fires.	X																			X				X								X	
Hydropower Operations Objective The Project continues to be a competitive source of low cost, reliable, and flexible hydroelectric generation.		X																														X	
Consistency with Plans Ensure that hydropower operations are consistent with the Forest Plan, the Auburn State Recreation Area Management Plan, with the reasonable protection of other beneficial uses of water as identified in the Basin Plan.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Cultural Resources Objectives <ul style="list-style-type: none"> Evaluate heritage resources that may be affected by the Project, and protect/conservate significant resources, or mitigate effects to those resources. 	X	X																					X									X	
<ul style="list-style-type: none"> Conduct, as part of Section 106 compliance, on-going consultation with the appropriate Native American tribe(s) as defined by the FS. 	X	X																					X									X	
<ul style="list-style-type: none"> Ensure full compliance of Section 106 through a Programmatic Agreement. 																							X									X	

Table SD H-3 - Level of Effort and Cost for Completing Technical Study Plans¹.

Technical Study Plan	Total Estimated Cost	Total Level of Effort in Labor Hours	Breakdown of Total Labor Hours by Activity			
			Project Management	Scoping	Data Collection	Data Analysis/Report Development
Aquatic Resources Studies						
AQ1-Instream Flow	\$1,760,000	14690	400	680	11380	2230
AQ2-Fish Population	\$850,000	6300	180	40	4930	1150
AQ3-Macroinvertebrate	\$333,000	2363	160	120	1600	483
AQ4-Water Temperature Modeling	\$580,500	4400	100	120	2260	1920
AQ5-Bioenergetics	\$68,500	480	40	80	40	320
AQ6-Fish Passage	\$121,000	1000	60	40	260	640
AQ7-Entrainment	\$485,000	3577	160	160	2360	897
AQ8-Reservoir Fish Habitat	\$111,000	920	40	40	120	720
AQ9-Geomorphology	\$732,000	5333	180	60	2695	2398
AQ10-Riparian Resources	\$296,000	2298	160	48	976	1114
AQ11-Water Quality	\$298,500	1806	140	40	1151	475
AQ12-Special-Status Amphibian & Aquatic Reptile	\$715,500	5015	200	140	3690	985
Totals	\$6,351,000	48182	1,820	1,568	31,462	13,332
Cultural Resources Studies						
CUL1-Cultural Resources	\$224,000	1999	144	218	1186	451
Totals	\$224,000	1999	144	218	1,186	451
Land Management Studies						
LAND1-Transportation System	\$125,000	724	64	64	260	336
LAND2-Fire Prevention and Response	\$120,000	678	58	50	360	210
LAND3-Emergency Action	\$100,000	650	32	48	206	364
LAND4-FERC Boundary	\$85,000	446	26	50	62	308
Totals	\$430,000	2498	180	212	888	1218
Recreation Resources Studies						
REC1-Recreation Use & Facilities Assessment	\$380,000	3112	160	132	2196	624
REC2-Recreation Opportunities	\$442,000	4466	200	60	3472	734
REC3-Reservoir Recreation Opportunities & Management	\$112,000	688	54	46	268	320
REC4-Stream Flow & Opportunities	\$370,000	2456	132	120	1324	880
REC5-Visual Quality Objectives	\$77,500	410	36	54	148	172
Totals	\$1,381,500	11132	582	412	7408	2730
Terrestrial Resources Studies						
TERR1-Vegetation Communities and Wildlife Habitat	\$76,400	470	40	24	220	186
TERR2-Special-Status Plants	\$256,900	1962	80	24	1640	218
TERR3-Invasive Plants & Noxious Weeds	\$45,900	300	22	22	160	96
TERR4-Special-Status Wildlife	\$143,165	1002	80	24	600	298
TERR5-Bald Eagle	\$76,900	558	22	20	344	172
TERR6-Special-Status Bats	\$92,400	808	36	22	520	230
Totals	\$691,665	5100	280	136	3484	1200
Project Total	\$9,078,165					

Notes: ¹

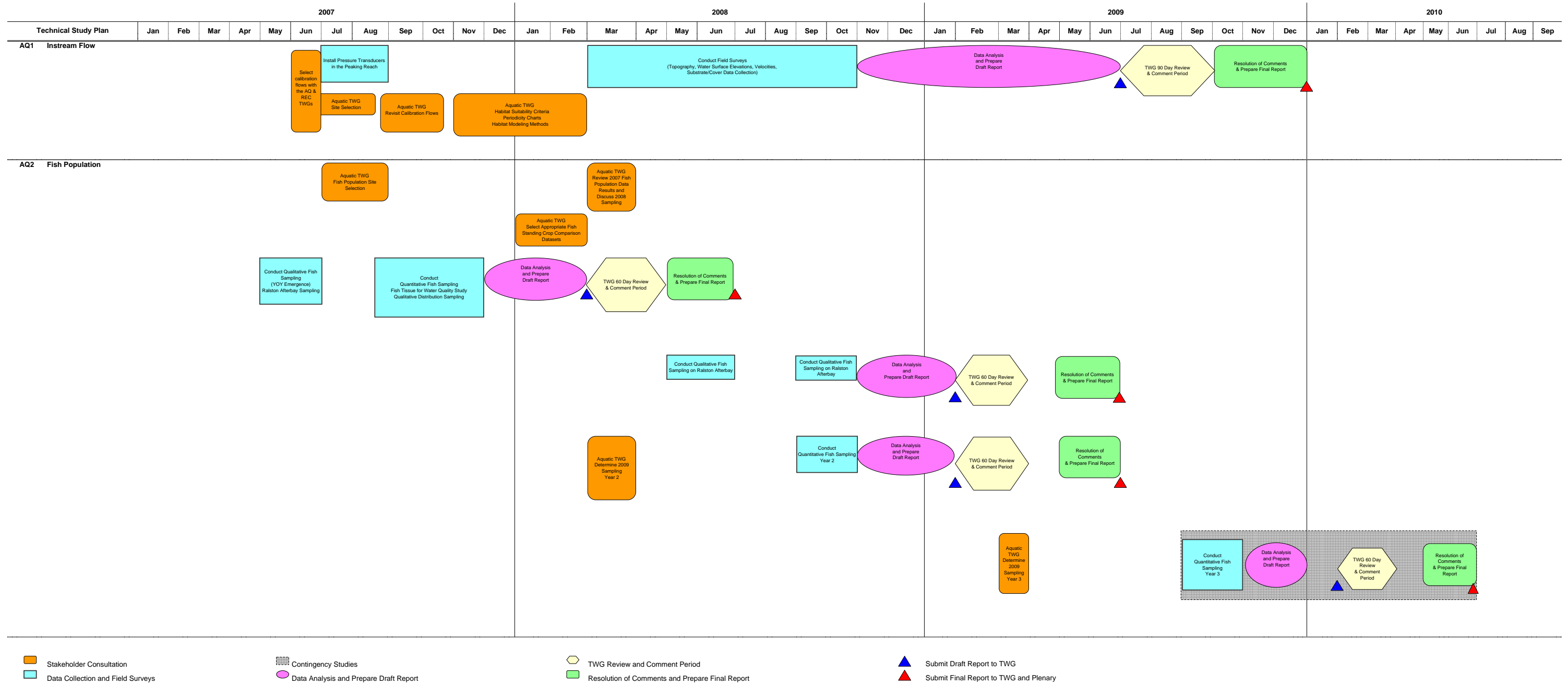
Total estimated cost includes all labor and other direct costs.

Total estimated cost includes all costs associated with the technical studies contained in Appendix A, including contingency studies.

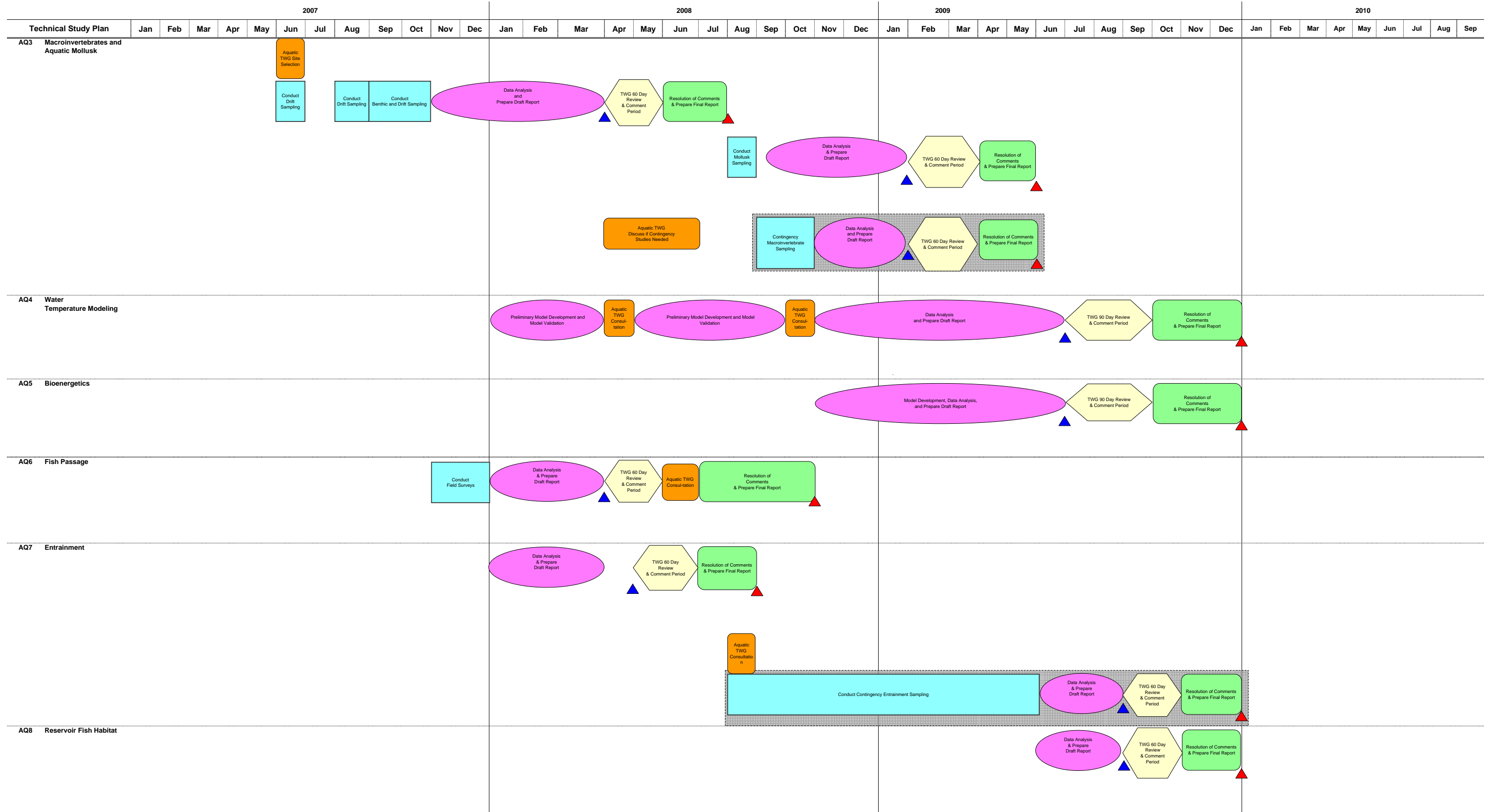
Total costs do not include the cost of developing the technical study plans contained in Appendix A.

FIGURES

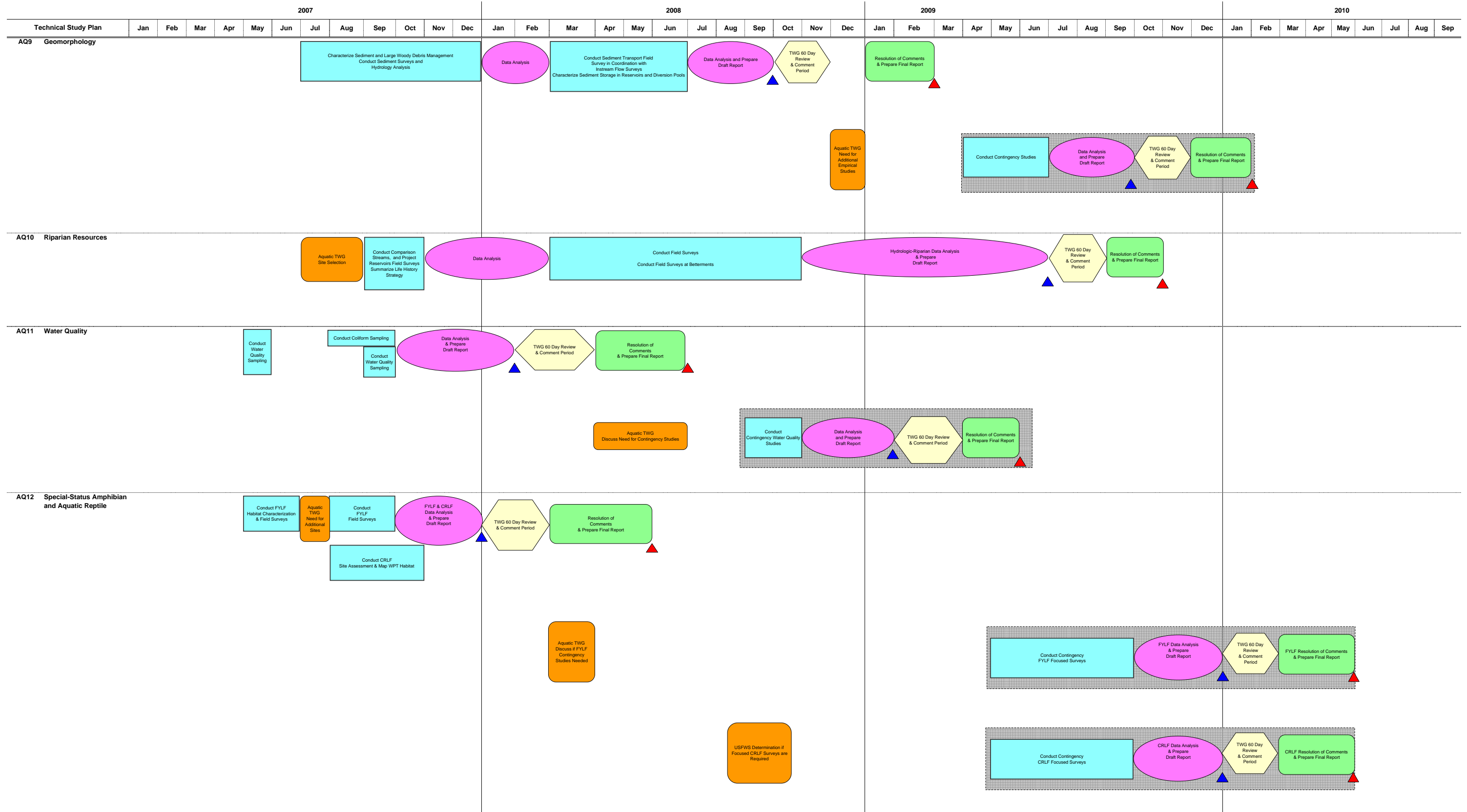
**SD H-1. Implementation Schedule for Technical Study Plans.
Aquatic Resources**



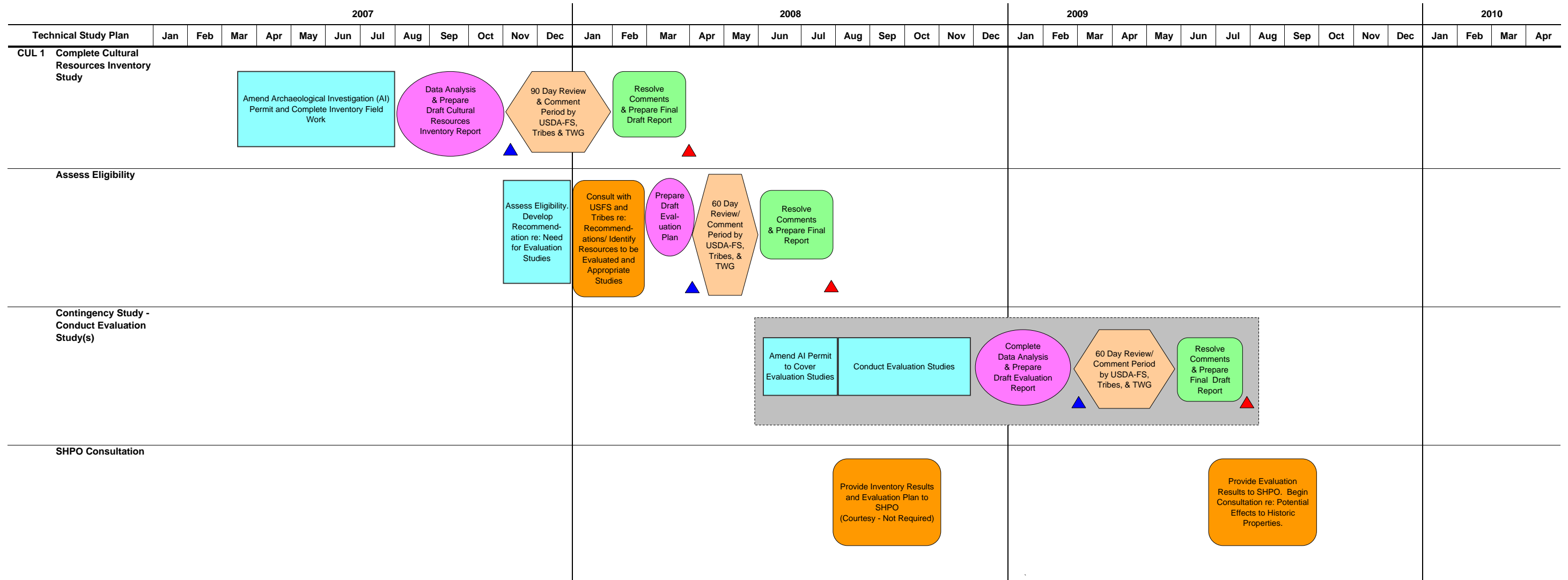
**SD H-1. Implementation Schedule for Technical Study Plans (continued).
Aquatic Resources**



**SD H-1. Implementation Schedule for Technical Study Plans (continued).
Aquatic Resources**



**SD H-1. Implementation Schedule for Technical Study Plans (continued).
Cultural Resources**



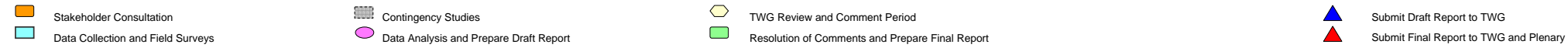
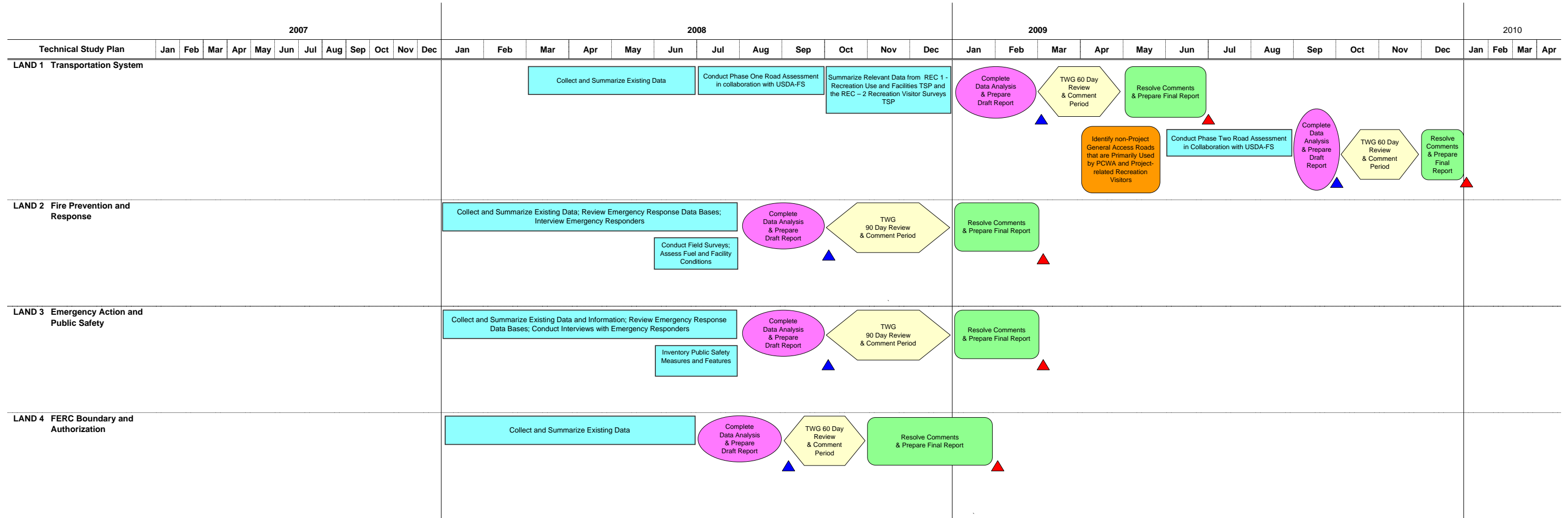
■ Stakeholder Consultation
■ Data Collection and Field Surveys

Contingency Studies
● Data Analysis and Prepare Draft Report

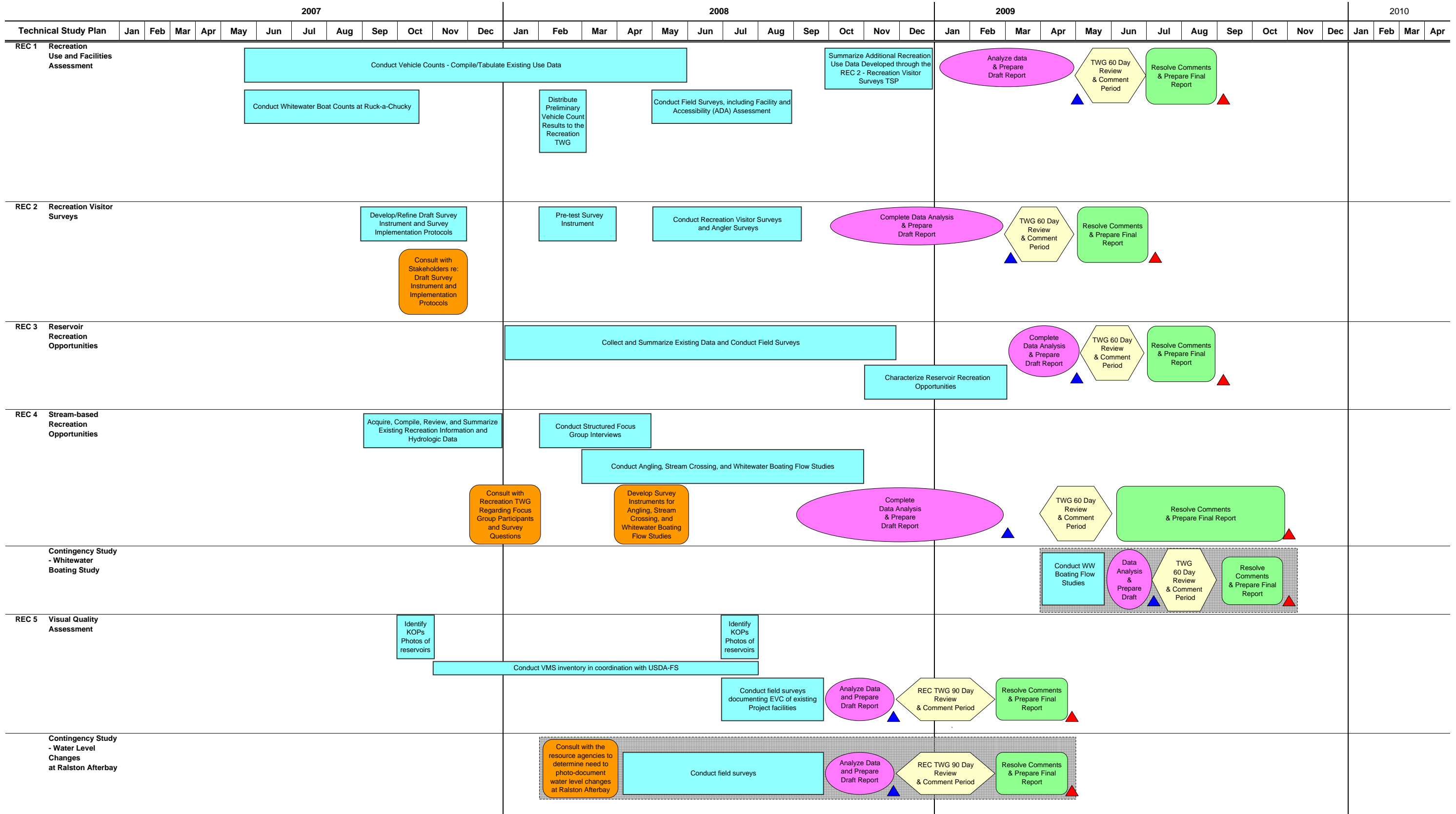
TWG Review and Comment Period
■ Resolution of Comments and Prepare Final Report

▲ Submit Draft Report to TWG
▲ Submit Final Report to TWG and Plenary

**SD H-1. Implementation Schedule for Technical Study Plans (continued).
Land Management**



**SD H-1. Implementation Schedule for Technical Study Plans (continued).
Recreation 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 to TWG
Submit Final Report to TWG and Plenary

APPENDIX A
Stakeholder-Approved Technical Study Plans