

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

***DRAFT***

**REC 4 – STREAM-BASED RECREATION  
OPPORTUNITIES  
TECHNICAL STUDY REPORT – 2008**



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

April 2009

**Table of Contents**

	Page
1.0 Introduction.....	1
2.0 Study Objectives.....	1
3.0 Study Implementation.....	1
3.1 Study Elements Completed .....	1
3.2 Deviations from the REC 4 – TSP .....	3
3.3 Outstanding Study Elements .....	4
3.4 Proposed Modifications to the REC 4 – TSP .....	5
4.0 Extent of Study Area.....	5
5.0 Study Approach.....	5
5.1 General Stream-based Recreation Opportunities .....	5
5.1.1 Stream-based Recreation in ASRA Management Plan Update .....	5
5.1.2 Recreation Visitor Surveys.....	6
5.1.3 Maps of Popular Recreation Locations .....	6
5.2 Hydrologic Information .....	6
5.3 Activity Specific Information – Trail Use at Stream Crossings .....	7
5.3.1 Western States and Tevis Cup Routes and Crossings .....	7
5.3.2 Focus Group Session.....	8
5.3.3 Stream Crossing Flow Studies.....	8
5.3.4 Stream Crossing Depths and Velocities.....	10
5.3.5 Flow Travel Time.....	11
5.4 Activity Specific Information - Mining .....	11
5.4.1 Mining Locations in the Bypass and Peaking Reaches.....	11
5.4.2 Existing Mining Claims .....	12
5.5 Activity Specific Information - Angling.....	12
5.5.1 Focus Group Session.....	13
5.5.2 Angling Flow Studies.....	13
5.6 Activity Specific Information - Whitewater Boating.....	14
5.6.1 Whitewater Boating Opportunities on the Peaking and Bypass Reaches.....	14
5.6.2 Focus Group Session.....	15
5.6.3 Whitewater Boating Flow Studies in the Peaking Reach.....	16
5.7 Flow Information Dissemination.....	21
5.7.1 Existing Stream Gaging Stations.....	21
5.7.2 Existing Flow Information Sources .....	21
5.7.3 Flow Enhancement Opportunities .....	21
5.8 Public Safety.....	21

	5.8.1	Signs Warning of Potential Flow Fluctuations .....	22
	5.8.2	Potential Safety Concerns.....	22
6.0		Study Results .....	22
6.1		General Stream –based Recreation Opportunities .....	22
	6.1.1	Stream-based Recreation in ASRA Management Plan Update ....	26
	6.1.2	Recreation Visitor Surveys.....	28
	6.1.3	Maps of Popular Recreation Locations .....	29
6.2		Hydrologic Information.....	30
6.3		Activity Specific Information – Trail Use at Stream Crossings .....	30
	6.3.1	Western States and Tevis Cup Trail Routes and Crossings .....	30
	6.3.2	Focus Group Session.....	33
	6.3.3	Stream Crossing Flow Studies.....	34
	6.3.4	Stream Crossing Depths and Velocities.....	38
	6.3.5	Flow Travel Time.....	40
6.4		Activity Specific Information – Mining .....	40
	6.4.1	Mining Locations in Bypass and Peaking Reaches.....	40
	6.4.2	Existing Mining Claims .....	40
6.5		Activity Specific Information - Angling.....	41
	6.5.1	Focus Group Session.....	41
	6.5.2	Angling Flow Studies.....	42
6.6		Activity Specific Information - Whitewater Boating.....	42
	6.6.1	Whitewater Boating Opportunities on the Peaking and Bypass Reaches.....	42
	6.6.2	Focus Group Session.....	45
	6.6.3	Whitewater Boating Flow Studies in the Peaking Reach.....	46
6.7		Flow Information Dissemination.....	53
	6.7.1	Existing Stream Gaging Stations.....	53
	6.7.2	Existing Flow Information Sources .....	55
	6.7.3	Flow Information Enhancement Opportunities .....	56
6.8		Public Safety.....	57
	6.8.1	Signs Warning of Potential Flow Fluctuations .....	57
	6.8.2	Potential Safety Concerns.....	58
7.0		Literature Cited .....	59

**List of Tables**

- Table REC 4-1. Bypass and Peaking Reaches Associated with the Middle Fork Project.
- Table REC 4-2. Measured and Estimated Flows during Trail Crossing Studies.
- Table REC 4-3. Whitewater Boating Flow Study Dates and Target Flows by Reach.
- Table REC 4-4. Whitewater Boating Flow Study Team Members.
- Table REC 4-5. Whitewater Boating Flow Study Photo-Documentation Locations.
- Table REC 4-6. Summary of Information Developed through Trail User/Stream Crossing Focus Group.
- Table REC 4-7. Distances Between Points and Associated Water Travel Times.
- Table REC 4-8. Travel Time Matrix
- Table REC 4-9. Sections Containing Patented Mining Claims along Bypass and Peaking Reaches associated with the Middle Fork Project.
- Table REC 4-10. Sections Containing Unpatented Mining Claims along Bypass and Peaking Reaches associated with the Middle Fork Project.
- Table REC 4-11. Summary of Information Developed through Angler Focus Group.
- Table REC 4-12. Distances and Gradients associated with the MFP Bypass Reaches and Runs.
- Table REC 4-13. Distances and Gradients associated with the MFP Peaking Reach and Runs.
- Table REC 4-14. Summary of Information Developed at Whitewater Boating Focus Group Meeting (April 3, 2008) and Provided by Foothill Water Network (February 9, 2009).
- Table REC 4-15. Stream Based Opportunities Technical Study Information regarding Bypass Reaches in the Vicinity of the Middle Fork Project Developed through Follow-up Conversations with Whitewater Boaters after the April 23, 2008 Whitewater Focus Group Meeting (Raw Notes).
- Table REC 4-16. Boating Opportunity Days Analysis Criteria – Bypass Reaches.
- Table REC 4-17. Boating Opportunity Days Analysis Criteria – Peaking Reach.
- Table REC 4-18. Common Sources of River and Stream Flow Information Available to the Public.
- Table REC 4-19. Inventory of Flow Fluctuation Warning Signs along Project Bypass and Peaking Reaches and Access Points.

**List of Maps**

- Map REC 4-1. Boating Runs in the Peaking Reach.
- Map REC 4-2. Whitewater Flow Study Photo Documentation Locations – Tunnel Chute Run.
- Map REC 4-3. Whitewater Flow Study Photo Documentation Locations – Mammoth Bar Run.

- Map REC 4-4. Whitewater Flow Study Photo Documentation Locations – Confluence Run.
- Map REC 4-5. Popular Fishing Areas and Access Points Identified by the Angler Focus Group Participants.
- Map REC 4-6. Popular Waterplay Areas in the Watershed.
- Map REC 4-7. Gaging Station Locations in the Vicinity of the Middle Fork American River Project.
- Map REC 4-8. Popular Trails in the Middle Fork American River Watershed (2 sheets).
- Map REC 4-9. Areas Where Mining has been Observed and Areas Closed to Mining along the Bypass and Peaking Reaches (2 sheets).
- Map REC 4-10. Whitewater Boating Resources on the Bypass Reaches.
- Map REC 4-11. Mining Claims along Bypass and Peaking Reaches.

### **List of Figures**

- Figure REC 4-1. REC 4 – Stream-based Opportunities Technical Study Plan Objectives and Study Elements.
- Figure REC 4-2. Pulse Travel Velocity.
- Figure REC 4-3. Pulse Travel Time.
- Figure REC 4-4. North Fork Gradient.
- Figure REC 4-5. Middle Fork American River Gradient.
- Figure REC 4-6. Rubicon River Gradient.
- Figure REC 4-7. Long Canyon Gradient.
- Figure REC 4-8. Duncan Creek Gradient.

### **List of Appendices**

- Appendix A. Trail Use/Stream Crossing Focus Group Materials.
- Appendix B. Angler Focus Group Materials.
- Appendix C. Whitewater Boating Focus Group Materials.
- Appendix D. Whitewater Boating Flow Study – Invitation to Participate in Boating Studies, Related Correspondence, and Blank Forms.
- Appendix E. Description of Whitewater Boating Reaches and Runs.
- Appendix F. ASRA Visitor Survey Summary of Key Findings.
- Appendix G. REC 2 – General Visitor Survey Results Relevant to Stream-based Recreation.
- Appendix H. Hydrographs by Water Year Type – Bypass Reaches.
- Appendix I. Hydrographs by Water Year Type – Peaking Reach.
- Appendix J. Photographs of Trail Crossing Locations at Different Flows.
- Appendix K. Stage/Discharge Relationships for Stream Crossings – Measured.

Appendix L.	Stage/Discharge Relationships for Stream Crossings – Modeled.
Appendix M.	Ramping Analysis in Peaking Reach.
Appendix N.	2007 Private Whitewater Boating Use – PCWA Counts.
Appendix O.	Whitewater Boating Flow Study – Completed Boater Profiles and Evaluation Forms.
Appendix P.	Hydrographs with Boating Ranges by Water Year Type – Bypass Reaches.
Appendix Q.	Hydrographs with Boating Ranges by Water Year Type – Peaking Reach.
Appendix R.	Boating Opportunity Days by Year and Water Year Type – Bypass Reaches.
Appendix S.	Boating Opportunity Days by Year and Water Year Type – Peaking Reach.