

8.11 Camino Whitewater Boating Study

8.11.1 Pertinent Issue Questions

The Camino Whitewater Boating Study addresses the following recreational resource questions:

6. What maximum and minimum flow regimes are required for whitewater boating in the stream reaches affected by the Project, including Upper Rubicon River
19. Can there be a flow management hydrology model (unimpaired hydrograph) built with a whitewater filter that estimates flows assuming UARP/Chili Bar presence and absence?
68. What is the need for, and feasibility of, whitewater boating in the reaches below Project dams?

8.11.2 Background

The objectives of the Whitewater Boating Feasibility Study (see *Technical Report on Whitewater Boating Feasibility, February 2004*) included:

- Identify and describe reaches where there are existing or potential whitewater opportunities
- Quantify how the Project affects these opportunities (i.e., flows, boatable days, season of use, access)
- Characterize whitewater opportunities affected by Project operations based on physical characteristics, existing information and interviews (e.g., gradient, length, access, channel characteristics, flows, reservoir storage and diversion capacity)
- Determine current and future demand for whitewater boating on Project reaches
- Develop a range of possible flows to provide other TWGs before conducting additional studies
- Describe and assess the adequacy and availability of existing flow information
- Recommend additional studies needed for whitewater resources (e.g., Single Flow Feasibility Study or Controlled Flow Study)

Reconnaissance conducted as part of the Whitewater Boating Feasibility Study was completed in 2002 and a presentation of the methods and results was made to the Recreation TWG on January 22, 2003. Subsequent documentation of the reconnaissance was presented to the Recreation TWG on February 5, 2003. Helicopter reconnaissance of South Fork Silver Creek below Ice House Reservoir and Silver Creek below Camino Reservoir was conducted on December 18th, 2003. The *Technical Report for the Whitewater Feasibility Study* was distributed to the TWG's in February 2004. Based on the report findings the TWG participants did not determine that further studies were not warranted, and further studies were considered. The need for a controlled flow study on the Camino Reach was discussed at Recreation TWG meetings on April 28th, 2004 and at an Internal Focus Group (IFG) on May 10th, 2004. During these meetings the representatives from the Forest Service, El Dorado County, American Whitewater along with Bill Center, expressed their concern that additional information was needed on the Camino Reach to determine the relative quality of this reach and range of acceptable flows. Based on their recommendations a single flow study was proposed to be conducted in the Fall 2004.

8.11.3 Study Objectives

The objectives of this study include:

- Identify current and potential boating opportunities on the Camino reach. Opportunities may vary by craft, skill level, or preferences for different types of whitewater conditions.
- Identify flow-related attributes for each of those opportunities, including a description and classification of key rapids.
- Develop relationships between flow levels and quality of whitewater experience for the Camino Reach. Resulting "flow evaluation curves" will identify minimum and maximum acceptable flows and optimum flow ranges for each reach for a variety of watercraft.
- Determine the whitewater difficulty using the International Scale of Whitewater Difficulty (American Whitewater 1963) for the reach within the range of test flows.

- Determine what types of watercraft are suited for the reach within the range of test flows.
- Characterize the whitewater resource in the reach in terms of quality of the opportunity and suitability for whitewater boating.
- Determine what operational challenges may exist in providing flows in the boatable range.
- Quantify how the Project has affected the frequency and timing of boatable days available in this reach.

8.11.4 Study Area and Sampling Locations

The study area is defined as the Project reach directly downstream of Camino Dam (between Camino Dam and Slab Creek Reservoir).

8.11.5 Information Needed From and Coordination with Other Studies

Hydrology data to determine the annual number of days and timing of boatable flows that occur under regulated and unimpaired conditions in this reach. Channel morphology and habitat mapping information may be useful to review in the analysis.

Provide timing, duration and magnitude of test flows as soon as practical to other TWGs. The Aquatics TWG will develop a set of concurrent studies that will focus on aquatic resources that could potentially be affected by the study flows.

8.11.6 Study Methods And Schedule

The Camino Whitewater Boating Study requires that a team of boaters paddle a given stream at the specified flow. Although SMUD will assist with the shuttle, participants will travel the entire shuttle route as if they were unassisted to evaluate shuttle as a component of the overall run. The group of participants will then individually complete a single flow survey questionnaire querying them on a number of whitewater and non-whitewater characteristics specific to the run. Participants will also complete a survey questionnaire asking them to make judgments on a range of flows for this reach. A video taped group discussion structured with specific questions will be conducted at the conclusion of the run. This group discussion is designed to allow participants to comment on characteristics and observations that may not have been captured in the survey questionnaire.

The methodology to complete the Camino Whitewater Boating Study will include an organized boating trip on the Project reach at **600 cfs**. Boating teams of between six to 12 kayaks and other crafts suitable for small creek type of boating on the Camino Reach will be organized to run the reach.

The existing information about the whitewater resource on the Camino Reach indicates that current boating opportunities are constrained by the Project diversions around the reach. The target flow for this run was selected anticipating that study participants will be able to provide information about a range of boatable flows.

The boating team members will have the skills necessary to boat the reach. Boating participants will be selected by interested TWG participants. Each boater will sign a waiver of liability prior to participating in the study. The primary data for this study will consist of the boaters' responses to questionnaires that they will complete at the conclusion of each run. The questionnaire will include a section to gather data for a comparative flow evaluation for the reach. A draft of the questionnaire has been prepared and is attached to this study plan. Comments and changes to the questionnaire will be incorporated prior to initiating the study. The type of data to be collected include: 1) boatability, 2) quality of the reach, 3) suitability of the run for different crafts and boater skill levels, 3) quality of the put-in/take-out locations, 4) boater's opinion of the class of difficulty of the run, 5) quality and length of the shuttle, 6) any safety concerns or hazards, 7) scenic quality, 8) number and difficulty of portages, 9) availability of play areas, 10) length and difficulty of the shuttle, and 11) boater's opinion of the flows that would represent the general paddling public preference.

If practical, the locations of any significant boating hazards or log jams in the reach will be made using GPS equipment during the study flow.

The study methods will include videotaped recordings and/or photographs taken at key locations on the run. The post-run discussion among the boaters (after the team has completed the questionnaires) will also be recorded on videotape. The post run group discussion, will include identifying suitable locations in the reach for lunch or break stops, possible overnight use locations, access and potential for commercial boating use in the reach as well as discussing other general aspects of the reach. The questions for the group discussion will be developed with interested TWG participants during the process of reviewing and finalizing the questionnaires that will be used in the study.

The schedule for conducting the Camino Whitewater Boating Study is listed below:

Camino Reach: September 15, 2004

Although the Licensee has every intention of completing this study in September 2004, this study plan needs to include a contingency for unforeseen power generation needs or because of biological concerns raised by the Aquatics TWG.

8.11.7 Analysis

The information developed in this study will be used to describe the whitewater boating opportunities on this reach, quality of the run, ease of the shuttle (in terms of time, distance, quality of route), access at both put-ins and take-outs, scenic quality, class of difficulty and boatability. The data collected will be summarized and analyzed for frequencies of responses and general trends that may exist in the data. The questionnaire responses will be used to estimate by watercraft type, the minimum and maximum acceptable boating flows and optimum boating flow for the reach that is within the normal peaks of the natural hydrograph. These definitions (Whittaker et al. 1993) are:

- Minimum Acceptable Flow: the lowest flow at which 50% of the survey respondents will return to paddle.
- Maximum Acceptable Flow: the highest flow at which 50% of the survey respondents will return to paddle.
- Optimum Flow: The flow level that provides the best combination of flow conditions for a whitewater opportunity. The optimum flow is the peak of the flow preference curve.
- Flow Preference Curve: the graphic relationship between flow (vertical axis) and survey responses (horizontal axis).

Hydrology data for the period of record (1975 to 2001) will be analyzed to display how often boatable flows, as identified by the boaters, including optimum flows, have occurred under unimpaired and regulated conditions. The analysis will also identify when these flows have occurred over the period of record (number of days with boatable days per month and water year type) under unimpaired and regulated conditions. Hourly data will be used, where available or where it can be synthesized. Information about the hydrologic conditions as they relate to the contribution of the flows to the reach from the SFAR will also be presented.

Other hydrologic factors that may affect boating opportunities will also be analyzed. These will include how quickly typical spill flows move through the boatable range and whether there are other flow fluctuations that make it difficult to boat this reach under current operations.

8.11.8 Study Output

A written report will be prepared to include documentation of survey findings with presentation in graphical and discussion format in a manner which appropriately answers issue questions. The study output will include a USGS quad map showing basic information about the runs including the location of the put-ins and take-outs, potential break or lunch stop locations, portages, locations of barriers/log jams, areas with safety concerns, shuttle route, and locations of photographs or videotape recordings taken during the study. The study output will also include the

summarized responses to the questionnaires, flow preference curves, photographs showing portions of the runs, put-ins and take-outs, and edited videotape of the run and post-run group discussion. The edited video will capture watercraft at selected rapids. The output will also include graphical and tabular data to compare the number and timing of boatable days that occur under unimpaired and regulated conditions in this reach. Operational aspects of the Project such as the low level outlet valve and the minimum instream flow requirements will be presented in the report.

8.11.9 Recreation and Aesthetic TWG Endorsement

This study plan was approved on June 23, 2004 by the following entities of the TWG: Eldorado National Forest, American River Recreation Association/Camp Lotus, National Park Service, El Dorado County Parks and Recreation, El Dorado County Water Agency, PG&E and SMUD. The Plenary Group approved this plan on September 1, 2004. None of the participants at the meeting said they could not “live with” this study plan.

8.11.10 Literature Cited

American Whitewater, 1963. International Scale of Whitewater Difficulty.

Whittaker et al. 1993. Instream Flows for Recreation: A Handbook on Concepts and Research Methods. U.S. Department of the Interior.