

## **COVER SHEET**

**FINAL ENVIRONMENTAL IMPACT STATEMENT  
FOR THE UPPER AMERICAN RIVER AND CHILI BAR  
HYDROELECTRIC PROJECTS  
Docket Nos. P-2101-084 and P-2155-024**

Section 5  
Staff's Conclusions  
Pages 5-1 through 5-50

**FEIS**

## 5.0 STAFF'S CONCLUSIONS

### 5.1 COMPREHENSIVE DEVELOPMENT AND RECOMMENDED ALTERNATIVE<sup>44</sup>

Sections 4(e) and 10(a) of the FPA require the Commission to give equal consideration to all uses of the waterway on which a project is located. When we review a hydropower project, we consider the water quality, fish and wildlife, recreational, and other non-developmental values of the involved waterway equally with its electric energy and other developmental values. Accordingly, any license issued shall be best adapted to a comprehensive plan for improving or developing a waterway or waterways for all beneficial public uses.

This section contains the basis for and a summary of our recommendations to the Commission for relicensing the UARP and Chili Bar Project. To decide which alternative to recommend, we compare the costs and environmental benefits of the alternatives.

Based on our independent review and evaluation of the proposed Projects and the No-action Alternative, we select the Proposed Action (including most of the terms of the Settlement Agreement that are within the Commission's ability to enforce), with some modifications by staff, as the preferred alternative.

We recommend this alternative because (1) issuance of new licenses would allow SMUD and PG&E to continue to operate the Projects as a dependable source of electric energy for their customers; (2) the electricity generated by the UARP and Chili Bar Project (total installed capacity of 1,088 MW and 7 MW, respectively) would avoid the need for an equivalent amount of fossil-fuel fired electric generation and capacity, continuing to help conserve these nonrenewable energy resources while reducing atmospheric pollution; and (3) the recommended environmental measures would protect and enhance aquatic and terrestrial resources, improve public use of recreational facilities and resources, and maintain and protect historic and archaeological resources within the area affected by Project operations.

The Proposed Action includes the construction and operation of the Iowa Hill development. Construction of the Iowa Hill development would disturb the majority of the 283-acre parcel, including 185 acres of lands in the Eldorado National Forest, and introduce new visual elements to the landscape. SMUD proposes in-kind replacement of habitat and construction of an underground powerhouse to minimize the effects on wildlife and neighboring land owners. Though pumped-storage projects use more

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<sup>44</sup>In this section "we" means the Commission staff. This is a standard section for the Commission's NEPA documents that presents the Commission staff's preferred alternative and rationale in support of the preferred alternative; it does not necessarily reflect the Forest Service's conclusions.

energy than they generate, we recommend inclusion of the Iowa Hill development in the preferred alternative because the pumped-storage operations would provide flexibility within SMUD's generating system by using off-peak energy to help meet on-peak energy needs,

We recommend approving most of the Settlement Agreement terms with some minor modifications and making these terms conditions of the licenses to be issued for the UARP and Chili Bar Project.<sup>45</sup> However, we recommend that many of the plans and specific measures for implementation as proposed in the Settlement Agreement be filed with the Commission for approval. This would allow Commission staff to monitor compliance with the conditions of the licenses and review the results of many of the proposed studies and measures.

By letters dated January 30, 2007, and January 31, 2007, respectively, the Forest Service and Interior filed revised preliminary terms and conditions, under section 4(e) of the FPA. The revised preliminary terms and conditions are consistent with the provisions of the Settlement Agreement, and we discuss them in the context of our discussions of the Settlement Agreement measures throughout this final EIS. However, some of the revised preliminary section 4(e) conditions that have been included in the Settlement Agreement are inconsistent with the Commission's policies.

The Forest Service specifies in revised preliminary condition no. 47 that SMUD provide \$1,000,000 annually to the Forest Service for the operation, maintenance, and administration of the developed recreational sites, facilities, or uses that are adjacent to or in the vicinity of the Project reservoirs and facilities listed in preliminary condition nos. 44 and 45 consistent with Proposed Articles 18 and 19 in the Settlement Agreement. Although we agree that the developed recreational sites and facilities listed in preliminary condition nos. 44 and 45 are needed Project recreational facilities, the \$1,000,000 limit is contrary to the Commission's policy on the imposition of funds and cost caps. SMUD would be responsible under any license issued for ensuring the safe and useful condition of Project recreational sites regardless of the cost. Therefore, we include a measure for SMUD to implement the proposed maintenance activities in our recommended alternative, noting that the collection agreement between SMUD and the Forest Service would serve to define the O&M activities related to Project recreational facilities. We recognize some of the recreation occurs at undeveloped sites surrounding the reservoirs and that the Settlement Agreement includes SMUD's share of the Forest Service's cost of servicing these areas. However, because these costs are incurred for

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<sup>45</sup>The precise wording of these staff recommendations may differ from similar recommendations made by SMUD and PG&E, or as presented in the Settlement Agreement. These wording changes are primarily the result of summarization and are not intended to change any of the Settlement Agreement terms that we recommend.

tasks done outside the project's boundary, we would not recommend the Commission require SMUD to reimburse the Forest Service for these costs

Forest Service specifies in revised preliminary condition no. 56 that SMUD develop and implement a transportation system management plan for roads on or affecting National Forest System lands addressing SMUD's primary responsibility for non-system roads and for maintenance level 1 and 2 roads and the shared levels of responsibility for maintenance level 3, 4, and 5 roads consistent with Proposed Article 1-30 in the Settlement Agreement. We understand that the Forest Service seeks to ensure that the roads accessing Project recreational facilities are maintained. However, as written, the measure could involve roads not directly related to Project operations or facilities. We modified this measure by clarifying that the transportation system management plan focus on Project access roads that are primarily used for Project purposes within the UARP boundary and would be included in the Project boundary.

BLM specifies in revised preliminary condition Article 2-14 that PG&E pay BLM \$15,000 annually to provide a Project recreation brochure/map and an interpretive, education, and public information plan. We conclude that PG&E should identify the available whitewater recreational facilities and make the public aware of when and how they can access these facilities; however PG&E can choose to have BLM prepare and distribute the brochure and associated public information. We do not recommend adopting a cost limit. Such cost caps, as noted above, are contrary to Commission policy.

The following discussion summarizes our recommendations and some of our rationale for these recommendations. We first list the recommended measures by Project, and then we discuss our rationale.

### **5.1.1 Upper American River Project**

We evaluate numerous recommendations in the resource sections of this final EIS and, given the environmental benefits, we recommend including the following measures that SMUD proposes in any license issued by the Commission for the UARP. Our recommended modifications to SMUD's proposed measures are *italicized*.

1. Maintain minimum streamflows in Rubicon River below Rubicon dam, Little Rubicon River below the Buck Island dam, Gerle Creek below Loon Lake dam, Gerle Creek below Gerle dam, SFSC below Ice House dam, Silver Creek below Junction dam, Silver Creek below Camino dam, Brush Creek below Brush Creek dam, SFAR below Slab Creek dam, SFAR (as shown in tables 3-4 through 3-10) within 3 days of determining base water year types and operations consistent with DWR Bulletin 120 forecast each February through May until 2 days after issuance of a subsequent monthly forecast. (Proposed Article 1-1)
2. Release an additional block of water into Silver Creek below Junction dam and below Camino dam annually in the months of July, August, and

September in Wet water years and not to exceed 1,044 acre-feet in July, 491 acre-feet in August, and 475 acre-feet in September as directed by the Agencies. (Proposed Article 1-1)

3. Provide annual pulse flow events within 3 months after license issuance but not before implementation of the proposed minimum flows in the Rubicon river below the Rubicon dam during BN, AN, and Wet water years, using the existing flashboards at the Rubicon tunnel headworks. The goal is to provide 600 cfs for 3 days that coincides with winter storm events or spring snowmelt runoff in the Rubicon River Watershed if a natural spill of 3,600 acre-feet or more within 3 consecutive days does not occur. Parties will meet annually to coordinate tunnel gate operation, and may develop a tunnel gate operation plan for future pulse flows. *File a report with the Commission by July 31 of each year stating the dates when the pulse flows were provided or an explanation of why they were not provided that year.* (Proposed Article 1-2)
4. Provide annual pulse flow events (as shown below) in Gerle Creek below Loon Lake dam. Schedule pulse flows to coincide with spring snowmelt runoff as specified based on month and water year type, below. *File a report with the Commission by July 31 of each year, stating the dates when the pulse flows were provided or an explanation of why they were not provided that year* (Proposed Article 1-2)

<b>Day</b>	<b>BN</b>	<b>AN</b>	<b>Wet</b>
Day 1	125	200	600
Day 2	125	200	600
Day 3	180	250	740*
Day 4	125	200	600
Day 5	125	200	600

\* or maximum capacity of outlet works, whichever is less.

5. Prior to implementing pulse flows in Gerle Creek below the Loon Lake reservoir dam, complete a sensitive site investigation that includes additional permanent cross-sections that characterize the upper and middle Rosgen Level 3 analysis reaches, and mapping unstable banks and downed logs that are obstructing streamflow and test pulse flows at levels up to 740 cfs, or the maximum capacity of the outlet works, to determine the appropriate pulse flows to meet desired channel conditions. (Proposed Article 1-2)

6. Provide annual pulse flow events within 3 months after license issuance, but not prior to the implementation of the new minimum streamflows, as shown below in SFSC below Ice House dam. *File a report with the Commission by July 31 of each year, stating the dates when the pulse flows were provided or an explanation of why they were not provided that year.* (Proposed Article 1-2)

<b>Day</b>	<b>BN</b>	<b>AN</b>	<b>Wet</b>
Day 1	450	550	600
Day 2	450	550	600
Day 3	550	650	780*
Day 4	450	550	600
Day 5	450	550	600

\* or maximum capacity of outlet works, whichever is less.

7. Implement a ramping rate of 1 foot per hour for pulse flow releases in Gerle Creek below Loon Lake dam and SFSC below Ice House reservoir dam; minimum streamflow releases in Silver Creek below Junction dam, Silver Creek below Camino dam, and SFAR below Slab Creek dam; and recreational streamflow releases in SFSC below Ice House dam and SFAR below Slab Creek dam. (Proposed Article 1-3)
8. Develop and file a plan to coordinate operations with the licensee of the Chili Bar Project to comply with the minimum streamflows, pulse flows, ramping rates, and recreational streamflows for both Projects. Consult and coordinate with the licensee of the Chili Bar Project in the implementation of Proposed Articles 2-1 (minimum streamflows), 2-2 (ramping rates), 2-4 (monitoring program), 2-5 (adaptive management program), 2-6 (sediment management plan), 2-14 (public information services), and 2-15 (recreational streamflows). (Proposed Article 1-4)
9. Implement a monitoring program including filing a final monitoring plan for each element listed in items 10 through 22 below and filing an annual report describing the monitoring efforts by June 30 of each year. (Proposed Article 1-5)
10. Develop a plan to (a) monitor rainbow trout fish populations by electrofishing and/or snorkeling during late summer/fall in 10 river reaches; (b) monitor hardhead by snorkel surveys in SFAR below Slab Creek reservoir dam, only, from immediately downstream of Mosquito Road Bridge to, and including site SCD-F2; and (c) monitor brown trout in the Gerle Creek below Loon Lake reservoir dam. (Proposed Article 1-5)

11. Develop a plan to conduct aquatic benthic macroinvertebrate monitoring at: Rubicon river below Rubicon dam, Gerle Creek below Loon Lake dam, Gerle Creek below Gerle dam, SFRR below Robbs Peak dam, SFSC below Ice House dam, Silver Creek below Junction dam, Silver Creek below Camino dam, and SFAR below Slab Creek dam. (Proposed Article 1-5)
12. Develop a plan to (a) monitor foothill yellow-legged frogs in Silver Creek below Junction dam, Silver Creek below Camino dam, SFAR below Slab Creek dam, and Rock Creek (tributary upstream of White Rock powerhouse) and (b) monitor mountain yellow-legged frogs in Rubicon reservoir, Rockland lake, and Buck Island reservoir. (Proposed Article 1-5)
13. Develop a plan to visually monitor for foothill yellow-legged frogs in Silver Creek below Camino dam in June through September when streamflows are 100 cfs or less and flows fluctuate more than 40 cfs or more over 1 week's time. (Proposed Article 1-5)
14. Develop a plan to conduct aerial photo flights and Greenline method at the 15 intensive field study sites and collect data to document species composition, percent cover, and length and width of riparian community. (Proposed Article 1-5)
15. Develop a plan to collect, identify, and archive samples of the species of algae in Silver Creek below Junction reservoir dam and additional baseline samples in SFRR below Robbs Peak dam, Silver Creek below Camino dam, and SFAR below Slab Creek dam and add additional sites or reaches if it is determined that the algal species have negative effects on the aquatic ecosystem. (Proposed Article 1-5)
16. Monitor Gerle Creek fluvial, geomorphic properties below Loon Lake dam at LL-DG1 and LL-G2 in years 1 and 2 and develop a Gerle Creek geomorphology mitigation plan that includes channel stabilization recommendations. (Proposed Article 1-5)
17. Develop a geomorphology monitoring plan providing for establishing permanent transects and monitoring channel cross-sections, longitudinal profiles, substrate composition, and other geomorphic properties (Rosgen Level 3) in representative areas, including the in Rubicon River below Rubicon dam, Gerle Creek below Loon Lake dam, SFRR below Robbs Peak dam, SFSC below Ice House dam, Silver Creek below Camino dam, and SFAR below Slab Creek dam. (Proposed Article 1-5)
18. Develop a water temperature monitoring plan to install and maintain continuous recording devices as soon as weather and flow conditions allow at 17 locations immediately above and below Project dams and at the confluence with tributaries and monitor stream temperatures from March 15 to September 30 in all years or until it can demonstrated that operation of

the Project reasonably protects the “cold freshwater” beneficial use as determined by the Agencies. (Proposed Article 1-5)

19. Develop a water quality monitoring plan addressing water chemistry, bacterial content, and metal bioaccumulation, field sampling locations, sampling frequency, handling methods, quality assurance/quality control methods, and define the laboratory analyses and associated method detection limits for all constituents and parameters to be monitored in the monitoring program. (Proposed Article 1-5)
20. Develop a Robbs Peak powerhouse entrainment monitoring plan to determine when and at what flows flow migration is occurring. (Proposed Article 1-5)
21. Develop a bear management plan. (Proposed Article 1-5)
22. Develop a bald eagle monitoring plan. (Proposed Article 1-5)
23. Implement an Ecological Resources Adaptive Management Program as early as reasonably practicable within 3 months after license issuance generally consisting of implementation of a monitoring program (Proposed Article 1-5, above) and specific adaptive management measures. (Proposed Article 1-6)
24. Develop and implement a stabilization plan for the Gerle Creek channel below Loon Lake dam. (Proposed Article 1-7)
25. *Develop and implement a Gerle Creek fish passage plan with measures to maintain the reservoir level at Gerle Creek at an elevation sufficient to provide fish passage into Gerle Creek from August through October 31, and implement channel modifications within the delta, if needed, to maintain passage for brown trout.* (Proposed Article 1-8)
26. Continue to move mobile, instream large woody debris greater than both 20 centimeters wide and 12 meters in length downstream beyond Robbs, Junction, Camino, and Slab Creek reservoir dams. (Proposed Article 1-9)
27. Develop and file a Streamflow and Reservoir Elevation Gaging Plan that meets USGS standards and includes include a minimum of 10 streamflow gage locations, 9 reservoir elevation compliance gaging locations, and provides for simple staff gages at the Slab Creek and Ice House recreational boating put-ins and the installation of telemetry equipment if such equipment is economically and technologically feasible, and can be installed in a manner consistent with the laws, regulations, and policies applicable to the congressionally-designated Desolation Wilderness. (Proposed Article 1-10)
28. Develop and implement a plan to evaluate canal and penstock emergency and maintenance release points to determine if improvements can be made

to minimize potential adverse water quality impacts when the release points are used. (Proposed Article 1-11)

29. Maintain and operate in working condition all devices and measures for wildlife protection along Project canals, provide an annual report of deer or other wildlife found in Project canals, and, should wildlife mortality exceed 3 individuals, develop and implement a wildlife exclusion plan. (Proposed Article 1-12)
30. Before commencing any new construction or maintenance (including but not limited to proposed recreational developments), ensure that a *draft* biological assessment is prepared for the relevant federal agency (FWS or NMFS) *and filed with the Commission*. (Proposed Article 1-12)
31. Immediately notify agencies if occurrences of sensitive plants or wildlife species are detected prior to or during ongoing construction, operation, or maintenance of the Project and develop and implement appropriate protection measures if directed by the responsible agencies. (Proposed Article 1-12)
32. Annually review the current list of special status plant and wildlife species (federal ESA or Eldorado National Forest Watch List) and develop and implement a study plan to assess the effects of the Project on the species as necessary. (Proposed Article 1-12)
33. Consult with BLM, FWS, and CDFG prior to undertaking maintenance under transmission lines within the Pine Hill Rare Plant Preserve. (Proposed Article 1-12)
34. Develop and implement an avian protection plan that addresses retrofitting transmission lines as described in the Bird-Powerline Associations Technical Report to meet APLIC design and siting standards. (Proposed Article 1-12)
35. Develop and file an invasive weed management plan that provides for inventory and mapping of new populations and actions and/or strategies to prevent and control known populations or introductions of new populations *for all land within the Project boundary affected by Project activities*. (Proposed Article 1-13)
36. Develop and implement a vegetation management plan that addresses hazard tree removal and trimming, transmission line clearing, habitat improvement, revegetation of disturbed sites, soil protection and erosion control, revegetation with culturally important plant populations, and use of clean, weed free, and preferably locally collected seed *for all land within the Project boundary affected by Project activities*. (Proposed Article 1-13)

37. Annually schedule and facilitate a meeting with the Agencies to review and discuss the results of implementing license conditions and other issues related to preserving and protecting the ecological values affected by the Project and provide, 2 weeks prior to the meeting, an operations and maintenance plan for the year. (Proposed Article 1-14)
38. Develop and implement a recreation implementation plan including a construction schedule for the recreational facilities specified in Proposed Article 1-19, and other issues including but not limited to signing and sign placement, dissemination of public information, and a schedule for the design of facilities to be reconstructed. (Proposed Article 1-15)
39. Conduct a recreational survey and prepare a report on recreational resources every 6 years from the date of license issuance, including, but not limited to, changes in use and use patterns, levels of use, user preferences, kinds and sizes of recreational vehicles, carrying capacity information sufficient to indicate change in capacity and recreational user trends in the Project area. (Proposed Article 1-16)
40. *Identify* an individual for liaison with the Forest Service whenever planning or construction of recreational facilities or other Project improvements and maintenance activities are taking place with the National Forest. (Proposed Article 1-17)
41. Schedule a meeting with the Forest Service every 6 years to review all Project recreational facilities described in Proposed Articles 1-18 and 1-19 and to agree upon the need and timing for maintenance, rehabilitation, construction, and reconstruction work. (Proposed Article 1-18)
42. Keep or include Project recreational facilities within the Project boundary as shown in Attachment 1 and include the listed 34 recreational facilities constructed or reconstructed by SMUD in the future within the Project boundary. (Proposed Article 1-18)
43. Complete the construction, reconstruction, and restoration to meet current Forest Service design standards and the requirements of the ADA including all the pre-construction survey, design, permitting, analysis, and specifications for the initial recreational Projects identified at the time of license issuance, including Buck Island development; High Country area trails; formal recreational facilities in Crystal Basin at Loon Lake, Gerle Creek, Union Valley, and Ice House reservoirs; recreational facilities in the Canyonlands at Junction, Brush Creek and Slab Creek reservoirs (as shown in table 3-65, in section 3.3.6.2, *Recreational Resources*). (Proposed Article 1-19).

44. Develop and implement a plan to install bear-proof food storage lockers and bear-proof trash receptacles at all recreational facilities identified as lacking such facilities. (Proposed Article 1-19)
45. Maintain, rehabilitate, and reconstruct, including the costs of design and administration, and otherwise provide the heavy maintenance necessary to keep existing Project recreational facilities in serviceable condition as determined through the Review of Recreation Developments. (Project Article 20)
46. Provide for the operation, maintenance, and administration of those developed recreational sites, facilities, or uses that are adjacent to or in the vicinity of the Project reservoirs and facilities listed in Proposed Articles 1-18 and 1-19. (Proposed Article 1-21)
47. Provide *recreation use data on* carrying capacity on lands affected by the Project, including, but not limited to: visitor perceptions of crowding, user perceptions of “desired conditions,” user preferences for amenities, capacity conditions at developed facilities within or affected by the Project, and resource impacts and social experience. (Proposed Article 1-22)
48. Meet or exceed the end-of-month reservoir elevations for Loon Lake, Union Valley, and Ice House reservoirs (as shown in table 3-25, section 3.3.2.1. *Water Resources, Reservoir Levels*). (Proposed Article 1-23) and follow procedures and protocols for super dry water years, interim modification, conferences on abnormal water years, and reservoir level monitoring and adjustments. (Proposed Article 1-23)
49. Based on the determination of water year type, provide recreational streamflows in the SFAR below Slab Creek in BN, AN, and wet water years and in Silver Creek below Ice House dam (as shown in table 3-65 in section 3.3.6.2, *Recreational Resources, Whitewater Boating*) and in Slab Creek below Slab Creek reservoir dam, and if construction of Iowa Hill development has not commenced within 5 years of license issuance, prepare and implement a whitewater boating recreation management plan to address the whitewater recreation needs in reach from the Slab Creek dam to White Rock powerhouse. Provide enhanced recreation boating flows downstream of Slab Creek dam after year 15 *with or without the construction of the Iowa Hill development only* if environmental and use triggers are met. (Proposed Article 1-24)
50. Provide real-time streamflow information for 10 reaches via a toll-free telephone number and web site and real-time reservoir level information 10 reservoirs including two simple staff gages for use by the public at each reservoir. (Proposed Article 1-25)

51. Provide a Project recreation brochure/map that describes the recreational opportunities, facilities, rule, and responsibilities for the Project area. (Proposed Article 1-25)
52. Develop and implement an interpretive, education, and public information plan. (Proposed Article 1-25)
53. Provide up to a total of 50,000 pounds of fish per year but not less than 25,000 pound of fish per year to be distributed among Loon Lake, Union Valley, and Ice House reservoirs as determined by CDFG. (Proposed Article 1-26)
54. Meet every 5 years with the Forest Service to review opportunities to improve how well Project facilities blend in with the surrounding landscape and prior to any new construction or maintenance of facilities, prepare and implement a plan for the protection and rehabilitation of National Forest System visual resources affected by the Project as directed by the Forest Service. (Proposed Article 1- 27)
55. Implement 10 specific enhancement measures (e.g., painting) to existing facilities to improve visual quality. (Proposed Article 1-27)
56. Implement the final HPMP including unanticipated discovery protocols. (Proposed Articles 1-28 and 1-29)
57. Develop and implement a transportation system management plan for *Project roads used primarily for Project purposes* on or affecting National Forest System lands addressing SMUD's primary responsibility for non-*National Forest System* roads and for maintenance level 1 and 2 roads and the shared levels of responsibility for maintenance level 3, 4, and 5 roads. (Proposed Article 1-30)
58. Develop and implement a trails system management plan for trails that are needed for *Project purposes* and are located on or affect National Forest System lands, including a map; the seasons and amount of SMUD's use of the trails, trail conditions of the trails, and a provision for identifying maintenance and reconstruction needs for trails required for Project operations every 5 years. (Proposed Article 1-31)
59. Develop and implement a facility management plan including a map showing all Project facilities, the type and season of use of each structure; the condition of each structure, and (4) provision for a plan every 5 years identifying the maintenance, reconstruction, and removal needs of Project facilities. (Proposed Article 1- 32)
60. Prepare vegetative management plan prior to any ground disturbing activities. (Proposed Article 1-33)

61. Develop and implement a fire prevention and response plan developed in consultation with appropriate state and local fire agencies that sets forth SMUD's responsibility for the preventing, reporting, control, and extinguishing of fires in the vicinity of the Project resulting from Project operations. (Proposed Article 1-34)
62. Reserve the Commission's authority to require fishways as may be prescribed by NMFS and FWS under Section 18 for the construction, operation, and maintenance of fishways including measures to determine, ensure, or improve the effectiveness of the fishways. (Proposed Article 1-35)
63. Develop a schedule for implementing the articles included in any license issued for the Project. (Proposed Article 1-37)
64. Protect hardhead in the Slab Creek reservoir from the Iowa Hill development operations by monitoring populations and entrainment, monitoring edgewater temperatures between May and September, maintaining a temperature of at least 12°C during the months of June and August in the SFAR Slab Creek dam reach below Mosquito Bridge, preventing pumped storage related flow fluctuations in the SFAR below Slab Creek. (Proposed Article 1-40)
65. Prior to initiating construction of the Iowa Hill development, purchase an equivalent acreage of land (or a conservation easement for an equivalent acreage of land) to be managed as wildlife habitat over the term of the license (Proposed Article 1-41)
66. File a storm water pollution prevention plan at least 90 days prior to ground-disturbing activities for construction of the Iowa Hill development. (Proposed Article 1-42)
67. Develop and implement a plan for managing groundwater inflows during construction and for groundwater monitoring and management once construction is completed. (Proposed Article 1-43)
68. Develop a design for the Iowa Hill development that meets the VQOs or the Eldorado National Forest Land and Resource Management Plan. (Proposed Article 1-44)
69. Develop and implement a plan to address construction noise to vehicle idling and advance notification of any material transport and construction activities within 0.5 mile of the parcels, including a noise hot line telephone system for reporting construction noise disturbances and monitoring compliance with the provision of the plan. (Proposed Article 1-48)
70. Develop and implement a plan for recreational access to the Slab Creek reservoir during the construction of Iowa Hill reservoir and the tunnel

connecting to Slab Creek reservoir and when Iowa Hill is operational.  
(Proposed Article 1-49)

71. Development and implement a final transportation management plan for the Iowa Hill development *in consultation with the Advisory Committee that identifies preferred access routes for construction traffic and heavy equipment to access the upper and lower reservoir construction sites using the criteria or similar criteria employed in the Transportation Route Technical Report.* (Proposed measure not included in the Settlement Agreement)

In addition to the applicant-proposed Project-related environmental measures listed above, we recommend including the following staff-recommended environmental measures in any license issued for the UARP.

- Provide an annual employee environmental awareness program to educate employees and key personnel about the known locations of special status species and habitats in the vegetation management plan.
- Develop and implement a wildlife lands mitigation plan for the construction of the Iowa Hill development that identifies the locations of wildlife mitigation lands, management goals and objectives, management activities that would be implemented and measures to ensure that the management goals would be met and include these lands in the Project boundary.

### **5.1.2 Chili Bar**

We evaluate numerous recommendations in the resource sections of this final EIS and, given the environmental benefits, we recommend including the following measures that PG&E proposes in any license issued by the Commission for the Chili Bar Project. Our recommended modifications to PG&E's proposed measures are *italicized*.

1. Maintain minimum streamflows in the SFAR below Chili Bar dam provided that of inflow to the Chili Bar Project reservoir and the Chili Bar reservoir elevations are sufficient, within 3 days of determining base water year types and operations consistent with DWR Bulletin 120 forecast each February through May until 2 days after issuance of a subsequent monthly forecast. The minimum streamflow schedule, the specific factors to be applied, and the compliance point for measuring minimum streamflows are provided in section 3.3.3.2, *Aquatic Resources*. (Proposed Article 2-1)
2. When the inflow to the Chili Bar Project and the Chili Bar reservoir elevations are sufficient, implement up ramping rates for licensee-controlled streamflow releases of 500 cfs per hour for flows between 150 cfs and 1,000 cfs and 1 foot per hour for flows between 1,000 cfs and 1,950 cfs and

- down ramping rates of 1 foot per hour for flows between 1,950 and 1,000 cfs, 500 cfs per hour for flows between 1,000 cfs and 600 cfs and 250 cfs for flows between 600 cfs and 150 cfs. (Proposed Article 2-2)
3. Develop and file a plan to coordinate operations with the licensee of the UARP to enable PG&E to comply with the minimum streamflows, pulse flows, ramping rates, and recreational streamflows for both Projects. (Proposed Article 2-3)
  4. Implement a monitoring program including a final monitoring plan for each element as described in items 5 through 10 below and file annual report describing the monitoring efforts by June 30 of each year. (Proposed Article 2-4)
  5. Develop a plan to (a) monitor rainbow and brown trout populations by electrofishing and/or snorkeling at SFAR below Chili Bar dam and note any hardhead detected. (Proposed Article 2-4)
  6. Develop a plan to conduct aquatic benthic macroinvertebrate monitoring at SFAR below Chili Bar dam. (Proposed Article 2-4)
  7. Develop a plan to monitor foothill yellow-legged frogs, western pond turtles, and California red-legged frogs in the SFAR below Chili Bar dam (entire reach from CB-AI5 to Ponderosa Campground on right and left banks). (Proposed Article 2-4)
  8. Develop a plan to conduct aerial photo flights and Greenline method at the five intensive field study sites and collect data to document species composition, percent cover, and length and width of riparian community. (Proposed Article 2-4)
  9. Develop a water temperature monitoring plan to install and maintain continuous recording devices at four locations in the SFAR immediately below Chili Bar dam, upstream of Dutch Creek confluence, upstream of Camp Lotus, and upstream of Greenwood Creek and monitor stream temperatures from March 15 to October 15 in all years or until it can demonstrated that operation of the Project reasonably protects the “cold freshwater” beneficial use as determined by the Agencies. (Proposed Article 2-4)
  10. Develop a water quality monitoring plan addressing water chemistry, bacterial content, metal bioaccumulation and algae, field sampling locations, sampling frequency, handling methods, quality assurance/quality control methods, and define the laboratory analyses and associated method detection limits for all constituents and parameters to be monitored in the monitoring program. (Proposed Article 2-4)

11. Implement in coordination with SMUD an adaptive management program as early as reasonably practicable within 3 months after license issuance generally consisting of implementation of a monitoring program (Article 2-4, above) and specific Commission-approved adaptive management measures. (Proposed Article 2-5)
12. Develop a geomorphology monitoring plan in coordination with SMUD including profile measurements at three cross-sectional transects, longitudinal profiles, substrate composition, and other geomorphic properties three sampling sites (CB-G1, CB-G2, and CB-G3) to be performed every 5 years. (Proposed Article 2-6)
13. Ensure that mobile instream large woody debris in Chili Bar reservoir of sizes greater than both 20 centimeters wide and 12 meters in length continues downstream beyond Chili Bar dam using reasonable means that include short-term spill flows at the dam (Proposed Article 2-7)
14. Develop and implement a streamflow and reservoir elevation gaging plan that meets USGS standards and approved by the Water Board at a minimum addressing compliance gaging at SFAR below Chili Bar dam (existing USGS gage no. 11444500 or its successor) and in the Chili Bar reservoir. (Proposed Article 2-8)
15. Annually review the current list of special status plant and wildlife species (federal ESA or BLM sensitive) and develop and implement a study plan to assess the effects of the Project on the species as necessary. (Proposed Article 2-9)
16. Develop and file an invasive weed management plan that provides for inventory and mapping of new populations and actions and/or strategies to prevent and control known populations or introductions of new populations *for all land within the Project boundary affected by Project activities.* (Proposed Article 2-10)
17. Develop and implement a vegetation management plan that addresses hazard tree removal and trimming, transmission line clearing, habitat improvement, revegetation of disturbed sites, soil protection and erosion control, revegetation with culturally important plant populations, and use of clean, weed free, and preferably locally collected seed *on all land within the Project boundary affected by Project activities.* (Proposed Article 2-10)
18. Annually schedule and facilitate a meeting with the Agencies and BLM to review and discuss the results of implementing license conditions and other issues related to preserving and protecting the ecological values affected by the Project and provide, 2 weeks prior to the meeting, an operations and maintenance plan for the year. (Proposed Article 2-11)

19. *Identify* an individual for liaison with the BLM whenever planning or construction of recreational facilities or other Project improvements and maintenance activities are taking place on BLM lands with the Chili Bar Project boundary. (Proposed Article 2-12)
20. Construct or install *and maintain* (1) a gravel parking area for three to four vehicles off Rock Creek Road, (2) a 36-inch-wide trail that meets a grade of 5 percent or less from the parking area to Chili Bar reservoir, (3) a kiosk sign along the trail near the beginning, explaining the rules of the area, and (4) one picnic table of coated wire mesh material in a level upland area that is outside of the floodplain. (Proposed Article 2-13)
21. In conjunction with SMUD, provide real-time lake stage height and storage information for Chili Bar reservoir, install up to two simple staff gages for use by public, real-time streamflow and reservoir level information via a toll-free telephone number and web site, and collect streamflow information consistent with the standard USGS gaging practices for the existing stream gage facilities downstream of Chili Bar reservoir dam. (Proposed Article 2-14)
22. Provide a Project recreation brochure/map and an interpretive, education, and public information plan. (Proposed Article 2-14)
23. Based on the determination of water year type, provide recreational streamflows in the SFAR below Chili Bar dam (as shown in table 3-67 in section 3.3.6.2, *Recreational Resources, Whitewater Boating*), provided that inflows to the Project are sufficient. (Proposed Article 2-15)
24. Meet every 5 years with BLM to review opportunities to improve how well Project facilities blend in with the surrounding landscape and prior to any new construction or maintenance of facilities, prepare and implement a plan for the protection and rehabilitation of BLM visual resources affected by the Project as directed by BLM. (Proposed Article 2-16)
25. *Finalize* and implement a HPMP including unanticipated discovery protocols *within 1 year of license issuance*. (Proposed Articles 2-17 and 2-18)
26. Reserve the Commission's authority to require fishways as may be prescribed by NMFS and FWS under section 18 for the construction, operation, and maintenance of fishways, including measures to determine, ensure, or improve the effectiveness of the fishways. (Proposed Article 2-19)
27. Develop a schedule for implementing the articles in any license issued for the Project. (Proposed Article 2-21)

In addition to the applicant-proposed Project-related environmental measures listed above, we recommend including the following staff-recommended environmental measures in any license issued for the Chili Bar Project.

- Provide an annual employee environmental awareness program to educate employees and key personnel about the known locations of special status species and habitats in the vegetation management plan.
- Develop and implement a recreation plan.

### **5.1.3 Rationale for Staff Recommendations**

This section describes the rationale for some of our recommendations on measures that we conclude should be included as conditions of any licenses issued, as well as any measures that we do not recommend as license conditions. This section is arranged by major resource topic, and within each topic we discuss each of the Projects or provide our rationale for recommending or not recommending specific measures.

#### **Aquatic Resources**

Project operations could affect aquatic habitats and sediment transport in the stream reaches. The Settlement Agreement includes a set of measures (Proposed Articles 1-1 through 1-6 for the UARP and 2-1 through 2-5 for the Chili Bar Project) focused on the ecological health and suitability of reaches downstream of the Project dams to support native fish, amphibian, and reptile populations. A major goal of the proposed streamflows and pulse flows is to simulate the natural hydrograph as much as possible during important times of the years to benefit species that are cued to spring/early summer snowmelt runoff patterns, lower base flows in the late summer/early fall, and winter flows that would provide habitat in most years.

#### *Minimum Flows*

The minimum streamflow schedules in Proposed Articles 1-1 for UARP and 2-1 for the Chili Bar Project are major parts of the Settlement Agreement and would enhance native fisheries in the stream reaches. In most reaches where accretion flows are low and spawning gravels are present, the proposed increase in minimum stream flows and associated reduction in water temperature (mean temperatures below 20°C in the summer months) are expected to benefit the native fish populations by creating either more available spawning habitat or juvenile habitat during critical life stages in the spring or fall. Increasing flows and lowering temperatures during these seasons should also result in habitat conditions that are less favorable for California roach and speckled dace consistent with Agency objectives.

The most significant increases in WUA for various life stages of rainbow and brown trout would occur in the five reaches already having plentiful or modest amounts of spawning gravels. The proposed minimum flows in the Rubicon River downstream of Rubicon dam, where spawning gravels are plentiful, would result in 84 percent of

available WUA for rainbow trout spawning in BN water years and 48 percent in CD water year. The slightly reduced temperature in May and June would benefit the preferred trout species while creating less favorable habitat for California roach and speckled dace, consistent with resource agency objectives. In the Gerle Creek reaches downstream of Loon Lake dam and Robbs Peak dam, where the trout fishery is robust, the proposed minimum flows would increase the WUA for all life stages, with the greatest increase in spawning habitat for trout. In the SFSC downstream of Ice House dam, the increased minimum flows would increase WUA for trout adult and spawning life stages and the cooler temperatures would benefit rainbow trout population in this reach. Finally, in Brush Creek downstream of Brush Creek dam, the proposed minimum flows will increase the WUA for all life stages of rainbow and brown trout.

The Settlement Parties indicate that the proposed minimum streamflows would benefit a variety of amphibians, including the foothill yellow-legged frog. However, we question some of these potential benefits. In the upper reaches, including Rubicon, Gerle Creek, and Robbs Peak, the cooler temperatures that would result from the increased streamflow would increase potential habitat for mountain yellow-legged frog populations. The proposed minimum streamflows may also provide potential habitat for foothill yellow-legged frogs in the lower end of these reaches. However, these reaches are not within the optimal elevation ranges for these species (too low for mountain yellow-legged frogs and too high for foothill yellow-legged frogs) and the proposed minimum flows would also provide more habitat for predatory trout.

Further, the colder temperatures that would result from increased minimum streamflows in the lower elevation reaches, including Camino, Slab Creek, and Chili Bar, may not be beneficial to foothill yellow-legged frog tadpole development and would also provide more habitat for predatory trout. However, the increased minimum streamflows in the spring could benefit foothill yellow-legged frogs and western pond turtles by dislodging second-year bullfrog tadpoles from pools. Bullfrogs are natural predators of foothill yellow-legged frogs and young western pond turtles. Therefore, if higher spring flows reduce the survival of over-wintering bullfrog tadpoles, foothill yellow-legged frog and western pond turtle habitat conditions would improve.

Increased minimum streamflows during the spring months would also result in inundation of stream margin habitats and primary floodplain terraces that would occur under an unimpaired flow regime. These variations in streamflows and inundation would improve the health of riparian vegetation and increase the functioning of the riparian ecosystem by promoting stream bank stability and improved water quality, reducing the potential for erosion, increasing storage of nutrients and water, and providing forage and habitat for wildlife.

Reserving a block of water, monitoring water temperatures at the lower end of the Junction dam reach and Camino dam reach, and developing a plan for notification protocols and ecological monitoring needs associated with the block of water would

facilitate informed decision-making of how best to manage the block of water to provide the most cost-effective improvement of ecological resources, if necessary.

### *Pulse Flows and Ramping Rates*

Based on geomorphology studies, SMUD and the Agencies identified reaches that would benefit from periodic pulse flows (Proposed Article 1-2) to mobilize and flush sediments downstream. Coordinating the provision of pulse flows with natural high flow events is reasonable. Our analysis shows that in the reaches where pulse flows are proposed (the Rubicon River below Rubicon dam, Gerle Creek below Loon Lake dam, and SFSC below Ice House dam) naturally occurring spring storm events would be mimicked, scouring floodplain soils, redistributing sediment, and reducing encroachment. We conclude that implementation of the pulse flows would help improve instream habitat for fish and facilitate increased production toward the desired biomass goals.

Effects associated with ramping are variable, depending on species, life-stage, and, in some case, time of day of the ramping event. The proposed minimum flows, in conjunction with the controlled up- and down-ramping rates, would attempt to provide stable flow regimes in the Chili Bar dam reach to protect foothill yellow-legged frogs during the reproductive season. Stable flows during the breeding season are optimal to avoid egg mass desiccation from decreasing flows, egg mass scouring from increasing flows, and tadpole stranding from flows receding and draining from isolated pools. When controlled ramping rates are successfully implemented, they would minimize the potential for foothill yellow-legged frog egg mass scouring and tadpole and juvenile stranding and displacement. Implementation of the proposed ramping rates in Proposed Articles 1-3 for the UARP and 2-2 for the Chili Bar Project would also reduce the effects of flow fluctuations on other sensitive aquatic species that are vulnerable to sudden changes in flow and would reduce the potential for stranding of fish.

For the UARP, the major costs for these aquatic resource measures include the physical modifications and installation of a larger valve at Rubicon dam and Slab Creek dam to facilitate the provision of minimum streamflows, pulse flows, and ramping rates. The total annual costs for implementing the minimum flow releases, including the capital cost for the modification to the two Project dams and periodic adjustments to the minimum release valves at all 10 Project dams, would be about \$185,100 and implementation of the pulse flows would cost about \$26,000 annually. The proposed minimum streamflow schedule for the UARP would result in a total foregone power production cost of \$7,821,000. The proposed pulse flows for the UARP would result in an additional foregone power cost of \$478,000. The improvements to the 60 miles of riverine aquatic and riparian habitat and native fish and amphibian populations in the eleven downstream reaches would be worth the cost. For the Chili Bar Project, we estimate that the annual capital cost and energy losses for the implementation of the proposed minimum flow regime and ramping rates would be \$19,400 and a foregone

power production cost of \$56,300; the improvement to the aquatic habitat in the Chili Bar reach would be worth the cost.

### **Large Woody Debris**

The lack of woody debris could affect aquatic habitat in the stream reaches. Currently, SMUD collects and stockpiles woody debris to reduce interference with recreational boating and prevent debris jams at the dams. Proposed Articles 1-9 for the UARP and 2-7 for the Chili Bar Project provide for transporting woody debris that collects in the Project reservoirs to the natural stream downriver. Ensuring that large woody debris is allowed to move downstream through the Projects would enhance the aquatic habitat for native fish populations in each of the Project reaches included in the plans. The measures to pass large woody debris downstream of the dams also would benefit foothill yellow-legged frogs and other amphibians and reptiles by providing substrate for macroinvertebrates, trapping organic material and sediment, creating pools, and slowing the water velocity during peak flows. We estimate that the annual cost for implementing the woody debris plan for the UARP would be about \$14,000 and \$10,000 for the Chili Bar Project. Implementation of woody debris plans at both Projects would be reasonable measures and worth the cost to ensure boater safety and improve the habitat for fisheries and sensitive amphibian species in the downstream reaches.

### **Coordination between the UARP and Chili Bar Project Operations**

Better coordination of Project operations between SMUD and PG&E could result in fewer spills downstream of the Chili Bar Project and positive effects on special status amphibians. Proposed Articles 1-4 and 2-3 provide for coordination between the UARP and Chili Bar Project. The whitewater runs between Chili Bar dam and Folsom reservoir are of regional, if not national importance. These river sections are the most heavily boated in California, in part because the flows are relatively dependable and extend well into the summer and fall months and because of their proximity to large population centers. Historically, SMUD and PG&E have had limited coordination, where PG&E calls SMUD plant operators shortly before upstream releases for PG&E to decide how low to draw down Chili Bar reservoir. Often, this coordination has not worked well, causing Chili Bar reservoir to spill and providing unpredictable flows in the whitewater runs downstream of the Chili Bar dam. As proposed, coordination would occur more frequently and would allow PG&E to improve access to its recreational facilities by allowing boaters and other recreational users to more closely predict the timing and magnitude of flows and would help PG&E avoid losing opportunity to generate. Coordination between UARP and Chili Bar Project would also help ensure effective implementation of the Proposed Articles and protection of special status amphibians in the Chili Bar dam reach. Development and implementation of the plan with detailed protocols to coordinate operations and implement license conditions affecting both Projects would have annual cost of \$13,100 for SMUD and \$10,000 for

PG&E. Implementation of the plan would be worth the cost because it would not only enhance whitewater boating opportunities in the Chili Bar reach and avoid unnecessary harm to special status amphibians but also would increase the power generation at Chili Bar.

### **Reservoir Levels**

UARP water level fluctuations affect both boaters and fisheries resources in Project reservoirs. Proposed Articles 1-1, *Minimum Streamflows*, 1-8, *Fish Passage at Gerle Creek*, and Proposed Article 1-23, *Reservoir Levels*, for the UARP provide for specific water level elevations for protecting fish populations, ensuring the availability of boat launch facilities, or enhancing the visual experience at these Project reservoirs. Loon Lake, Ice House, and Union Valley reservoirs are large lakes with heavy recreational use in the summer months. Meeting end-of-month water surface elevation targets at these reservoirs in July, August, and September, as called for in Proposed Article 1-23, would ensure that at least one public boat launch would be available at each reservoir during the peak recreation season and would enhance the overall recreational experience of users of these popular reservoirs. Our analysis shows that water surface elevation targets proposed in the Settlement Agreement are within the historical range of water surface elevations at these large reservoirs for all except SD water years, and we conclude that SMUD would be able to meet the end-of-month elevations. Therefore, we recommend inclusion of the proposed elevations along with the proposed procedures for agency consultation in SD water years, when SMUD would have difficulty meeting the end-of-month water surface elevations. Operating the Project to attain the end-of-month target elevations at Loon Lake, Ice House, and Union Valley reservoirs as specified in the Settlement Agreement would not involve any additional cost to SMUD because they are within the existing range of reservoir fluctuations.

Although our analysis indicates that SMUD could meet the proposed end-of-month elevations at the larger reservoirs, our analysis of water surface elevations at smaller storage reservoirs (Rubicon and Buck Island) indicates that SMUD might have difficulty controlling water surface elevations during May and June. The high elevation Rubicon and Buck Island reservoirs have limited storage capacity and are greatly affected by changes in the inflow to the reservoirs, normally driven by snowmelt. Further, the manual control gates are not typically installed until June or early July because these high elevation reservoirs are remote and difficult to access. The conditions make it difficult for SMUD to control water levels for part of the summer. However, once the gates are installed, they can maintain a relatively stable water surface elevation during low inflow conditions, which normally start during July and extend through the recreation season. We also conclude that SMUD would be able to maintain an overwintering minimum pool at elevation 6,527 feet in the Rubicon reservoir.

Fluctuations of the water levels of Gerle Creek reservoir would still occur, partly because this reservoir operates as a afterbay for Loon Lake powerhouse and as a forebay for the canal leading to Robbs Peak reservoir and powerhouse. Again, many of the variations in the early part of the May 1 to September 10 period are the result of limited storage capacity and rapid variations in inflow similar to the Rubicon and Buck Island reservoirs. However, we expect that SMUD would use the Gerle Creek canal headworks gates to maintain the elevation of Gerle Creek reservoir at or above elevation 5,225 feet during the summer recreation season. In the draft EIS we recommended that SMUD operate Gerle Creek reservoir to maintain water levels at 5,228 feet in the fall to allow upstream passage of brown trout. In comments on the draft EIS, SMUD, the Forest Service, Interior, and American Rivers all stated that upstream fish passage into Gerle Creek may not be a function of reservoir levels and could be affected by sediment barriers at the upper end of Gerle Creek reservoir. SMUD also commented that maintaining Gerle Creek reservoir at elevation 5,228 feet in the fall would constrain operations and would not guarantee fish passage. Instead, SMUD proposed that continued studies and consultation with the agencies would result in a more practical solution. Therefore, we now recommend that SMUD develop and implement a Gerle Creek fish passage plan because the new information that SMUD provided indicates that fish passage would not be guaranteed even if Gerle Creek reservoir were maintained at elevation 5,228 feet in the fall. The plan could involve measures, such as channel modifications, if needed, to ensure continued fish passage into Gerle Creek during the August through October period so that brown trout can access spawning areas in Gerle Creek. Our recommended Gerle Creek fish passage plan would allow SMUD to determine in consultation with the Agencies how they will ensure fish passage given the potential barriers that they identified at the upper end of Gerle Creek reservoir. The estimated annual cost of preparing and implementing the plan to allow fish passage into Gerle Creek would be \$6,800 and the benefit to fisheries would be worth the cost.

We also note that the terminology in the Settlement Agreement to make a “good faith effort” or “to make every reasonable effort” or implement a measure “as early as reasonably practicable” relative to water surface elevations at the smaller reservoirs (Rubicon, Buck Island, and Slab Creek) is difficult for the Commission to enforce. Attempting to maintain water surface elevations within an historical range (1975 to 2000) as proposed for the Junction and Brush Creek reservoirs would also be difficult for the Commission to enforce. Further, other than noted above, we do not find any biological or recreational use basis for meeting the proposed elevations at these small reservoirs. For these reasons, we do not recommend including these measures in any license issued for the UARP.

### **Streamflow and Reservoir Elevation Gaging**

Proposed Articles 1-10 for the UARP and 2-8 for the Chili Bar Project, *Streamflow and Reservoir Elevation Gaging*, provide for a plan to monitor streamflows

and reservoir elevations. SMUD and PG&E already monitor or, in some cases, provide assistance to USGS for monitoring and recording many hydrological indicators, such as reservoir water level and stream gaging sites, in the Project area. Daily and, in many cases, hourly or shorter interval data recordings allow SMUD and PG&E to manage their facilities for hydroelectric generation and document environmental compliance within the terms of its existing license.

As discussed in section 3.3.2.2, SMUD would install new gages or otherwise find a means to measure the increased minimum streamflows downstream of Rubicon, Buck Island, Gerle Creek, Robbs Peak, and Junction dams. Developing a coordinated gage installation plan, in consultation with resource and land management agencies, as well as USGS, would ensure that any new gages necessary to measure the flows and water levels that may be specified in a new license would provide accurate data consistent with applicable USGS standards. SMUD's and PG&E's proposals, including gaging and publication of flow information, would provide current flow and lake level data for the benefit of recreational visitors in planning flat water, whitewater boating, and fishing trips. Flow data would also be used to monitor the potential effects of Project operations on foothill yellow-legged frogs that are vulnerable to sudden changes in flow. We estimate that the annual cost for upgrading the gaging stations would be \$98,200 for SMUD and \$6,500 for PG&E. Implementation of streamflow and reservoir elevation gaging plans would be worth the cost to ensure compliance with recommended minimum flow and water surface elevation provisions.

Currently, real-time reporting is not available on any Project tunnel or powerhouse or on any non-project diversion structures located within the upper Rubicon River watershed. Proposed Article 1-10, *Streamflow and Reservoir Elevation Gaging*, does not include gaging at these diversion structures as recommended by the Placer County Water Agency. Gaging of these diversion structures is not necessary to ensure compliance with proposed minimum streamflow schedules or reservoir levels; therefore, we do not recommend it.

### **Wildlife and Plant Protection Measures**

Project operations could potentially affect special status plant and wildlife species such as black bear, mule deer, osprey, and northern goshawk within the UARP Project boundaries. Proposed Article 1-12 provides for the protection of these wildlife and plant species through the implementation of wildlife safety measures at UARP canals and transmission lines and rare plant protection measures within the Pine Hill Preserve. Additionally, Proposed Articles 1-12 for the UARP and 2-9 for the Chili Bar Project provide for review, notification, and/or evaluation of potential effects of the UARP and Chili Bar Project on special status species, in consultation with the Forest Service or BLM, depending upon which agency lands would be affected. Although it appears that Project facilities do not directly cause deer mortality or impede migration, monitoring wildlife mortality would identify any future need for preventive measures at Project canals and ensure that any fencing or crossing structures are functional and

would minimize potential harm to mule deer and other small game in the Project area. Implementation of the wildlife and plant measures specified in Proposed Article 1-12 for the UARP would cost \$29,900 annually and the benefit to wildlife would be worth the cost. An Avian Protection Plan that would address retrofitting UARP transmission lines so that they meet the current APLIC standards would minimize avian electrocution or collision once all transmission lines meet these standards. The development of the plan and retrofitting of existing transmission lines would cost \$20,300 annually, and the benefit to raptors would be worth the cost.

UARP transmission lines, which require occasional maintenance clearing, cross through sections of the Pine Hill Preserve. Because transmission line right-of-way maintenance includes occasional disturbance to vegetation and soils, the proposed measure to consult with BLM, FWS, and CDFG prior to conducting maintenance activities within the Pine Hill Preserve would ensure that the locations and methods of maintenance are designed to minimize effects to rare plant species. Additionally, consultation with the Forest Service, FWS, and CDFG prior to any new construction or maintenance and identifying any potential effects, would protect any special status species that occur either within the Pine Hill Preserve or elsewhere within the Project boundary. To protect sensitive species, we would add to both SMUD's and PG&E's proposed measures annual employee awareness programs to educate employees and key personnel about the known locations of special status species and habitat. Although not specifically included, including an awareness program as part of the vegetation management plan in Proposed Articles 1-13, *Vegetation and Invasive Weed Management Plans*, for the UARP would effectively protect species, such as valley elderberry longhorn beetles and elderberry shrubs, within the Project boundary from any transmission line maintenance activities by clearly delineating them as areas to be excluded from maintenance. We estimate that the annual cost for development and implementation of the invasive weed and vegetation management plans to be \$57,600 for the UARP and \$6,500 for the Chili Bar Project. The benefits of protecting sensitive plant and wildlife species, reducing noxious weeds, and educating personnel about protocols for identifying and protecting Project-related sensitive species would be worth the cost of these plans.

No known special-status species would be affected by the Chili Bar Project. Consulting with the BLM, however, annually to update the special-status species list and prior to any ground-disturbing activity, as discussed in Proposed Article 2-9, would ensure that special status plant or wildlife species that either currently occur or could occur in the Project boundary are protected. The benefit of protecting special status species would be worth the estimated annual cost of \$5,000.

## **Monitoring Programs**

### *Aquatic Resources*

Proposed Articles 1-5 for the UARP and 2-4 for the Chili Bar Project, *Monitoring Program*, set forth a comprehensive program of monitoring to document the effects of the increased minimum streamflows, pulse flows, and ramping rates on native fish populations, aquatic macroinvertebrates, amphibians and reptiles, riparian habitat, algae species, geomorphology, water temperature, and numerous water quality parameters in the reservoirs and stream reaches. The Settlement Parties have agreed to use trout biomass as an indicator of the ecological health of stream reaches and would use the baseline biomass values for monitoring the effectiveness of the proposed flows in achieving the trout biomass objectives for each stream reach. They also have established permanent monitoring transects for the channel geomorphology monitoring to determine the long-term effects of the increased flow in sediment transport and channel width.

### *Fish, Amphibians, and Aquatic Reptile Populations*

Project operations could affect fish and amphibian populations in the stream reaches. Monitoring the response of native fish populations to the increased minimum streamflows over the term of the license would provide information that can be used to inform resource managers whether or not the stated resource goals are being met. Monitoring the response of all life stages of foothill yellow-legged frogs, mountain yellow-legged frogs, and western pond turtles over time would be necessary to evaluate potential effects of the proposed flow changes, along with effective adaptive management changes, as needed. Mountain yellow-legged frogs have not been found in the Project-affected reaches or reservoirs despite suitable habitat, perhaps due to populations of predatory fishes and bullfrogs. However, mountain yellow-legged frogs may use Project-affected reaches as migratory corridors. Monitoring would determine the presence/absence and distribution of foothill yellow-legged frogs, mountain yellow-legged frogs, and western pond turtles in Project-affected reaches, and help identify potential migration/dispersal barriers. The proposed monitoring would also document the potential effects of the proposed changes in minimum flows, operational spills, channel maintenance pulse flows, ramping rates, and the recreational streamflow releases on all foothill yellow-legged frog life stages.

### *Riparian Habitats and Algae*

Riparian habitat could be affected by flow alterations and large water level fluctuations resulting from the proposed Projects' operations. Monitoring riparian vegetation every 5 years for the first 15 years of a new license, followed by subsequent monitoring every 10 years, as proposed, would allow the riparian vegetation to respond to the proposed flow regimes without being confounded by short-term changes caused by rare events such as a large flood. The algal species identification and monitoring

plan for the Junction dam, Camino dam, Slab Creek dam, and Robbs Peak dam reaches would assess the distribution and possible adverse affects of alga(e) in the Project-affected reaches. Because of the extent of algae growth in the Junction dam reach and the potential for *D. geminata* to adversely affect water quality and the aquatic community, including preventing successful reproduction of foothill yellow-legged frogs, it is important to establish baseline information for the new flow regime as to species and potential adverse effects that could result from abnormally high densities of algae. This information could be used to determine whether the new streamflow releases effectively reduce the extent of algae in the Junction dam reach and help determine whether there are algae-related problems in other UARP-affected stream reaches. Because of the extent of algae growth in the Chili Bar dam reach and the potential for *D. geminata* to adversely affect water quality and the aquatic community, it also is important to periodically evaluate whether *D. geminata* has become established in this reach.

### *Geomorphology*

Project operations could affect sediment deposition in some of the Project stream reaches. Monitoring changes in sediment deposition as specified in Proposed Article 1-5 for the UARP and 2-6, *Sediment Management Plan*, for the Chili Bar Project would allow SMUD and PG&E, in consultation with the Agencies and BLM, to determine if and when to dredge the reservoirs and where to deposit the dredged materials. Based on our review of the studies, we conclude in section 3.3.1.2 that pulse flows in the reaches where sediments are trapped or deposited would help to transport these sediments downstream. The downstream reaches are where sediment most likely would have traveled if the impoundment did not exist; however, because any added material could threaten the resources of the reach, the development of a sediment management plan for the Chili Bar Project would minimize these potential effects and would be worth the estimated annual cost of \$800 for PGE and \$6,500 annual cost for SMUD. This is one of several monitoring programs where SMUD would share the cost of implementation.

### *Water Quality*

Development and implementation of the water temperature monitoring plan in Proposed Articles 1-5(9) and 2-4(5) would document spring through summer water temperatures in the UARP bypassed reach and temperatures of water passing through or over Chili Bar dam and facilitate a determination of whether the fish and amphibian communities are supported. Monitoring water temperature immediately downstream of the dams, as proposed, would document thermal conditions at the upper end of the bypassed reaches and provide insight into conditions throughout reaches that experience little change in temperature (e.g., Buck Island dam). Monitoring at the other sites listed in table 3-27 along with up to five additional UARP sites and two additional Chili Bar Project sites would document thermal conditions downstream of confluences, and in critical locations within the Ice House dam, Camino dam, Slab Creek dam, and Chili

Bar dam reaches where it is not clear whether the proposed minimum streamflow schedule would achieve the temperature objectives.

Monitoring temperature in the Ice House dam reach just upstream of Junction reservoir and in the SFAR immediately downstream of Slab Creek dam would provide the temperature data necessary to determine whether scheduled high flow releases to these reaches may need to be adaptively managed.

The results of SMUD's 2002 to 2004 monitoring of reservoir temperatures provides evidence that there is virtually no cold water available in the Rubicon, Buck Island, Gerle Creek, Robbs Peak, and Camino reservoirs. Because substantial temperature data were collected within the past 10 years, sufficient data likely already exist to answer most questions about coldwater availability in the other UARP reservoirs. Therefore, the existing temperature data could be used, as appropriate, to evaluate the availability of cold water prior to collecting any additional reservoir temperature data. We conclude that development and implementation of the water temperature monitoring plan referred to in Proposed Article 1-5(9), *Monitoring Program*, would document spring through summer water temperatures in UARP bypassed reaches under any new Project operations and help confirm that desired fish and amphibian communities are supported, although we question the benefit of monitoring temperatures in UARP reservoirs.

Monitoring water temperature immediately downstream of the Chili Bar dam, as proposed in Proposed Article 2-4(5), *Monitoring Program*, would document thermal conditions at the upper end of the Chili Bar reach under any new Project operations. Monitoring at the other three designated sites downstream of the Chili Bar dam with up to two additional sites would document thermal conditions in critical locations within the Chili Bar dam reach. Because this reach is not managed for coldwater fishes and results of PG&E's 2002 to 2004 temperature monitoring study show that little cold water is available in Chili Bar reservoir, we question the need for additional monitoring of Chili Bar temperatures. However, development and implementation of the water temperature monitoring plan referred to in Proposed Article 2-4(5), *Monitoring Program*, would confirm that desired fish communities and amphibians are supported under any new Project operations.

Proposed Articles 1-5(10) and 1-6(8) for the UARP and 2-4(6) for the Chili Bar Project would provide data to document consistency with water quality standards. We conclude in section 3.3.2.2 that geologic and hydrologic characteristics primarily control the concentrations of minerals, and many of the waters affected by the UARP and Chili Bar Project have little potential for contamination from petroleum products. Therefore, we question the need for these parameters at each monitoring location. SMUD and PG&E's proposed approach to select and monitor bioaccumulation of the specified metals in aquatic organisms at 5-year intervals would ensure that results of this sampling effort are consistent with the Water Board's approach and would facilitate evaluation of changes in fish body burdens of these metals. However, we conclude that

the proposed UARP and Chili Bar Project operations would not likely have any significant effect on mercury methylation or bioaccumulation in the Projects reservoirs.

Sampling near swimming beaches at the popular recreational sites, such as those at Union Valley reservoir and in the whitewater reach downstream of the Chili Bar dam, shows exceedances of bacteria. SMUD and PG&E's proposed approach to select and monitor 15 shoreline recreational locations within the Project boundary would document near worst-case bacteria concentrations at locations of greatest concern.

Once data have consistently documented that specific water quality parameter(s) support the corresponding desired aquatic resources, there may no longer be a need for monitoring those parameters/sites. Proposed Articles 1-5(10) and 2-4(6), *Monitoring Program*, include clauses that address this issue and would potentially allow SMUD and PG&E to reduce monitoring of minerals, nutrients, metals, petroleum products, hardness, and bacteria. We conclude that Proposed Articles 1-5(10) and 2-4(6) would provide data to document any unanticipated effects on water quality under any new Project operations and identify any trends in risks to the health of humans and wildlife. We note that monitoring through the entire new license term may not be necessary and recommend reducing or ceasing monitoring of water quality parameters and sites where data consistently demonstrate little or no effect on water quality standards.

#### *Entrainment at Robbs Peak*

Proposed Article 1-5(12) provides for monitoring entrainment at the Robbs Peak development. We conclude in section 3.3.4.2 that there is little evidence of fish entrainment at the Robbs Peak powerhouse. Studies performed by the licensee showed that the population of rainbow trout in the SFRR upstream of the powerhouse is naturally limited by intermittent summer flow, sub-optimal water temperatures, and unfavorable winter conditions. Fish that transit the Gerle Canal from Gerle reservoir may also become entrained in the powerhouse. However, the canal provides very little suitable habitat for trout. Although studies performed during relicensing showed that the potential for fish to become entrained at Robbs Peak Powerhouse is extremely low, the adaptive management program nevertheless calls for development of mitigation measures if monitoring indicates fish are being entrained there. The development of mitigation to minimize any entrainment at the Robbs Peak afterbay through the adaptive management program would likely protect the few native trout currently in the SFRR, where populations appear to be declining.

#### *Terrestrial Resources—Bear Interactions and Bald Eagles*

Human-bear interactions are infrequent but are increasing in the UARP area. The proposed upgrades at many of the recreational facilities include bear-resistant containers. Implementation of the bear management plan monitoring plan proposed in Articles 1-5(13) for the UARP would determine if the proposed bear-proof lockers and trash bins are successfully keeping bears away from campgrounds or if additional measures would be needed.

Bald eagles nest at UARP's Union Valley and Loon Lake reservoirs and wintering eagles occur throughout the UARP area. Neither nesting nor wintering bald eagles have been observed at the Chili Bar Project. UARP operations, maintenance, and recreation all have the potential to disturb or injure the federally threatened bald eagle. Proposed Article 1-5(13) for the UARP, which calls for SMUD to continue to monitor bald eagle nest sites in coordination with the Forest Service and FWS, would allow nest productivity numbers to be assessed to determine if Project recreation is adversely affecting bald eagle fledging success. If monitoring shows Project activities are adversely affecting the bald eagle, the adaptive management program proposed in Proposed Article 1-6 would allow Project activities to be changed.

### *Summary*

The overall Monitoring Program for the UARP is expensive, totaling about \$448,100 annually, with the development and implementation of most of the individual monitoring plans ranging from \$6,200 for the monitoring plan for bioaccumulation in fish to \$110,000 for water quality monitoring. However, noting some exceptions, the monitoring program is well-designed, provides specific metrics on which to base the effectiveness of proposed fish and wildlife protection measures, and ties directly to adaptive management measures by showing whether proposed measures are having the intended results.

We estimate the cost of the monitoring programs specified for the Chili Bar Project would be \$12,700 annually for PG&E and \$102,000 for SMUD's share of the costs of monitoring programs resulting from the overlapping studies. We would expect some of these costs to be reduced if the monitoring results demonstrate that Project operations consistently meet water quality standards or other monitoring objectives and monitoring is no longer required.

### **Adaptive Management Programs**

Proposed Articles 1-6 and 2-5, *Adaptive Management Programs*, provide specific steps that would be taken if the monitoring program and other scientific information indicate that it is likely the intended results of the fish and wildlife measures would not be met without adaptive management changes. The specific adaptive management changes identified in the Settlement Agreement mostly represent a balancing of interests between the protection of native fish, amphibian, and reptile populations and recreational boating use within the framework of maintaining good water quality in several reaches. Overall, the Proposed Articles provide a reasonable set of steps that could be implemented if the proposed measures fail to achieve intended results in these reaches. In some cases, implementation of the adaptive management measures would reduce energy losses, and in other cases, costs would depend on the specific measures developed in response to the monitoring results (e.g., measures to address entrainment).

## **Vegetation and Invasive Weed Management**

Invasive weeds occur throughout both Project boundaries. For both Projects, operations, maintenance, and recreation can act as a method of seed dispersal and create disturbed areas favorable to the spread of invasive weeds. Proposed Articles 1-13 for the UARP and 2-10 for the Chili Bar Project, *Vegetation and Invasive Weed Management Plans*, provide for the control of noxious weeds and address vegetation management, including soil and erosion control, revegetation, and transmission line vegetation maintenance. Implementing these plans would control current populations and future infestations of noxious weeds within the Project boundary on Forest Service and BLM lands at the UARP and Chili Bar Project, respectively.

We understand the proposed invasive weed management plan for UARP to be intended for lands within the Project boundary that are adjacent to Project features directly affecting National Forest System lands, including about 150 miles of transmission lines upstream of the proposed Iowa Hill development. Because not all Project-related noxious weed infestations occur on Project lands that affect National Forest System lands, expanding the invasive weed and vegetation management plan to all lands that are affected by Project operations or maintenance within the Project boundary would result in more complete control of noxious weeds that are affected by the proposed Projects. This expansion would benefit local plants and wildlife, including rare plants such as the federally listed Pine Hill endemic species that occur outside of National Forest System lands. In its comments on the draft EIS, SMUD indicated that the lower 30 miles of transmission lines traverse private lands making it difficult to determine which infestations result from project activities. SMUD says that these uncertainties could potentially increase SMUD's responsibilities and would increase the cost of its proposed invasive weed management plan. We now recognize that about 30 miles of Project transmission line from the proposed Iowa Hill development downstream to the Folsom Junction are outside of National Forest System lands, which would result in an additional cost to SMUD. To minimize this additional cost, we recommend conducting annual monitoring in conjunction with annual inspections and Project maintenance in the transmission line rights-of-way. We now estimate the annual cost of SMUD's vegetation management plan and invasive weed plan with our expansion to include the 30 miles of transmission lines on non-National Forest System lands to be \$87,900, or about \$30,000 more than SMUD's more limited plan. Overall, increasing the invasive management and vegetation management plans to include infestations on Project lands would be worth the added cost.

Significant populations of the noxious weeds Scotch broom and Himalayan blackberry occur on the Chili Bar reservoir shoreline and along roadsides. Project operations and maintenance activities create conditions that are favorable to the existence of noxious weeds. Implementing the proposed invasive weed and vegetation management plans as proposed by PG&E at the Chili Bar Project would control current populations and future infestations of noxious weeds within the Project boundary on BLM lands. Because not all Project-related noxious weed infestations occur on BLM

lands, expanding the invasive weed and vegetation management plan to all lands within the Project boundary would result in more complete control of noxious weeds that are affected by Project operations and maintenance. The proposed vegetation management plan would establish practices that would minimize conditions favorable to the establishment of noxious weeds. The costs associated with these plans for PG&E would be \$6,500. The benefit of controlling noxious weeds at the UARP and Chili Bar Project would justify the costs of these plans.

## **Recreation Enhancements**

### *Recreation Implementation Plan*

The Settlement Agreement includes a suite of proposed articles (Proposed Articles 1-15 through 1-26 for UARP and 2-13 through 2-15 for the Chili Bar Project) that focus on upgrading, expanding, operating and maintaining recreational facilities and services in response to user demands; monitoring future use; providing additional whitewater boating opportunities; providing public information; and fish stocking (at the UARP) within the framework of a recreation plan. Proposed Article 1-15, *Recreation Implementation Plan*, would increase and formalize SMUD's responsibilities to provide and update formal and dispersed recreational facilities that provide access to the Project lands and waters. The proposed plan reflects the unique character and management responsibilities of public recreational sites around the Projects and recognizes that although SMUD has no legal authority to redevelop public access sites owned or managed by others, it has the responsibility to ensure reasonable public access to Project lands and waters for those portions of the recreational sites currently within the Project boundary or proposed to be within the Project boundary. The assistance and funding included in the plan would improve delivery of recreational services by streamlining implementation of the improvement measures and providing a mechanism for earmarking licensees' funds to specific Project-related improvements.

Monitoring recreational use over time in a manner consistent with the Commission's recreational use and needs assessment (Form 80) would provide environmental and recreational use data that would allow SMUD to modify the type and quantity of recreational facilities to be commensurate with demonstrated users preferences and demand. As proposed, the recreational measures would provide substantial benefits to recreational visitors and the proposed recreational streamflows are generally planned to mimic natural conditions and enhance terrestrial and aquatic resources within and downstream of the Project developments. Based on what is known about the Projects, the proposal appears to simultaneously protect and enhance environmental resources while continuing to provide and enhance recreational opportunities. However, as with any complex system, changes in recreational use patterns or Project operations could have unanticipated adverse effects on aquatic or terrestrial resources. The proposed adaptive management measures would provide a means to address these effects over the term of any new license issued. As proposed,

SMUD would file reports with the Commission summarizing monitoring results. If any recreation-related adaptive measures are required during the term of any new license, SMUD would file an amendment to the proposed recreation implementation plan with the Commission for approval.

The Settlement Agreement does not provide for a recreation plan for the Chili Bar Project nor does PG&E propose to prepare a plan. However, PG&E proposes a few specific recreational measures to improve recreational access to the Project. In its license application, PG&E contends that recreational use is low, safe public access is best achieved at the upstream end of the reservoir, and Project operations limit recreational opportunities near Chili Bar dam. In subsequent sections, we generally agree with this assessment. However, we expect that recreational use and needs would change over the term of any new license issued for the Chili Bar Project. Development of a recreation plan for the Project, based on periodic monitoring, would help the licensee manage these changes in recreational demand and provide a structure to evaluate the adequacy of Project recreational facilities to meet future recreational demand. Such a plan would be designed to achieve the following objectives: (1) promote public safety and increase public awareness of recreational opportunities at the Chili Bar Project; (2) maintain reasonable health and safety standards through a litter and sanitation management; (3) provide safe and reasonable access to the Project reservoir; (4) address congestion and conflicts among visitors and resources related to recreational activities, if any; (5) provide reasonable recreational facilities for a range of recreational opportunities; (6) reduce recreational effects on cultural, terrestrial, and aquatic resources; and (7) provide a forum for public and agency input into recreational facility needs at the Project. We estimate that the annualized cost for the development of a recreation plan for the Chili Bar Project would be \$2,700, and the benefit of coordinating recreational enhancements through such a plan would be worth the cost.

#### *Project Boundary and Recreational Facilities*

Proposed Article 1-18, *Review of Recreational Developments*, lists 34 recreational facilities and specifies including these facilities within the Project boundary. Most of the recreational facilities proposed to be included in the Project boundary are immediately adjacent to the existing Project boundary and directly associated with recreational sites that provide access to the lands and waters used for hydroelectric operations. However, two of the sites—Airport Campground and Big Hill Communication Site—are well outside the current boundary.

SMUD built Airport Flat Campground in 1996 as part of the exhibit R amendment to the license, and it is one of the few licensee-developed facilities away from a main reservoir. SMUD developed the site in lieu of expanding Gerle Creek Campground as a result of concerns that an expanded Gerle Creek Campground would lead to crowding conditions and degradation of the recreational experience. As such, the Airport Flat Campground was developed to handle existing and future recreational demand associated with the Project. Big Hill Communication Site was also built by

SMUD under the existing license; it is primarily used as a communication, fire observation and fire staging area for the Forest Service and includes the Big Hill Vista. Visitors to the area often drive to the top of Big Hill to overlook Crystal Basin, a vista that includes UARP facilities, and the high Sierra Mountains to the east. Although the principal purpose of the site is for Forest Service operations, including those specific public accessible facilities on top of Big Hill within the Project boundary would ensure that the site is maintained for public use for the term of any new license issued. We find it reasonable to include these facilities within the Project boundary.

SMUD's proposal to enhance, expand and formalize the sites listed in table 3-65 (Proposed Article 1-19) would substantially improve public access in the Project area. The proposed improvements to recreational facilities within the Project boundary are site-specific, derived from a recreational needs assessment, prepared in consultation with the Forest Service and stakeholders, and targeted at either improvements to existing facilities or development of informal facilities. In addition, the proposal considers recreational needs from a geographical perspective and recommends site improvement measures based on the overall need in the Project area. The total annualized costs of SMUD's proposed upgrades at the 34 developed and proposed recreational sites would be \$1,720,800. Although upgrading the Project recreational facilities would be costly, the improvements are scheduled to be implemented during the next 20 years, are supported by user data projecting increased use over the term of any new license, and would benefit the hundreds of thousands of annual visitors to the Project area.

PG&E's proposal to provide a parking area off Rock Creek Road, a trail that leads from the Rock Creek Road to Chili Bar reservoir, an informational kiosk along the trail, and a picnic table at the reservoir (Proposed Article 2-13) would address the demand for day-use recreation opportunities identified in the recreation needs study. The annual cost for providing this improved access to the Chili Bar reservoir and reach would \$15,200 and would be worth the cost by formalizing the existing informal use of this popular area. PG&E also proposes to exclude about 152 acres of land from the existing Project boundary. Our preliminary analysis suggests that this proposed boundary change would have minimal environmental effects; however PG&E has not demonstrated that the lands it proposes to exclude are no longer needed for Project purposes and therefore, absent this, we recommend these lands remain in the Project boundary.

#### *Recreation Operation, Maintenance, and Administration*

Operation and maintenance are essential components of any recreational development to ensure that the facilities are maintained at a level that provides reasonable public access for the term of any new license issued. In addition to the proposed maintenance activities included in Proposed Article 1-20, Proposed Article 1-21 specifies that SMUD address sanitation along with other recreation use-related issues by annually paying the Forest Service \$1,000,000 to provide operation, maintenance,

and administration of developed recreational sites, facilities, or activities that are within, adjacent to, or in the vicinity of UARP reservoirs and facilities. These activities include picking up litter, providing public information, enforcing rules and regulations, maintaining signage, and other activities associated with the effects of recreational use at Project recreation facilities within and on adjacent Forest Service lands. After examining the Settlement Agreement rationale document, we concluded in the draft EIS that the cost of work done by Forest Service for maintenance, operations, and administration of project recreation sites equals or exceeds the \$1,000,000 annual cost in the Settlement Agreement. However, following the Commission's policy on setting caps, we did not recommend SMUD's share of these costs be set at a maximum of \$1,000,000 as specified in the Settlement Agreement.

In comments on the draft EIS, SMUD expressed concern that without the cap specified in the Settlement Agreement that the cost to SMUD to off-set Forest Service's administering developed recreation sites, facilities, or uses that are adjacent to or in the vicinity of UARP reservoirs and facilities could be far higher. The Forest Service suggests that the annual collection agreement with SMUD would be the appropriate document to provide clear direction and definition to ensure SMUD's payments to the Forest Service directly contribute to Project and Project-related operations, maintenance, and administration. We note that SMUD has been and continues to be responsible for the operation and maintenance costs associated with its recreation facilities within the project boundary. We agree with the Forest Service that the collection agreement between SMUD and the Forest Service described in preliminary section 4(e) Condition No. 47 (and associated annual amendments) would be an appropriate way to clearly define and direct what O&M tasks would be done, estimate the cost, and clarify which funds directly contribute to project related O&M.

At the same time we recognize some of the recreation occurs at undeveloped sites surrounding the reservoirs and that the Settlement Agreement includes SMUD's share of the Forest Service's cost of servicing these areas. The Forest Service comments that the costs associated with administering dispersed recreation adjacent to and in the vicinity of UARP reservoirs and facilities are very minor relative to the total costs to operation, maintain, and administer developed and project recreation on behalf of SMUD. Nevertheless, because these costs are incurred for tasks done outside the project's boundary, following the Commission's recent settlement policies on project boundaries, we would not recommend the Commission require SMUD to reimburse the Forest Service for these costs.

### **Recreational Streamflows**

The whitewater run below Slab Creek reservoir of Class IV rapids is currently used between Ice House and Chili Bar. The Settlement Agreement proposes that SMUD use existing facilities and spill at Slab Creek dam to make whitewater flow releases in the spring. The Settlement Agreement also calls for more extensive

releases<sup>46</sup> if: (1) the Iowa Hill development is built, or (2) Iowa Hill is not built and the trigger for use of the whitewater flows is met by year 10 after license issuance. If SMUD does not commence construction of Iowa Hill, it would monitor whitewater use during the first 10 years after the license issuance to determine if the use triggers set in year 5 are exceeded. The Settlement Agreement notes that the proposed October flow releases would not occur if after 5 years of monitoring the data shows that releasing the whitewater flows would have significant effect on environmental resources. If October flows cannot be provided because of operational, aquatics, or other reasons, then the equivalent flow volume would be added to the spring flow releases.

Given that the reach already draws visitation at the expert level (Class IV), we would expect, with interest by outfitters, more use in the reach. However, currently there are no recreational use data available to gage how much use would occur. The cost of providing the more extensive recreational boating flows below Slab Creek would be considerable. While SMUD says that the use of the Iowa Hill development would help them make these releases without the expensive reconfiguration of White Rock tunnel adit, the recreational streamflow releases would result in \$322,000 in foregone energy production annually at the UARP. The estimated cost for providing recreational streamflow releases downstream of Ice House dam would be an additional \$108,000, for a total cost of \$430,000 in forgone energy.

If the construction of the Iowa Hill development has not commenced by year 5 after license issuance, the Settlement Agreement calls for SMUD to consult on a Whitewater Boating Recreation Plan describing whitewater recreational use and impacts and setting triggers that would determine if SMUD should modify Project facilities to allow SMUD to deliver the more extensive recreational flows set in the agreement. We agree with the Settlement Agreement's use of triggers to help the parties decide if the more extensive whitewater releases should be provided. The estimated annual cost for preparing and implementing the Whitewater Boating Recreation Plan including the necessary access and support facilities would be \$48,600.

Because of the foregone energy that would result from releasing the more extensive recreational flows set in the Settlement Agreement and the unknown level of whitewater use this stretch of the river will get, we recommended in the draft EIS that in year 10 after license issuance, and based upon the Whitewater Boating Recreation Plan, SMUD, after consulting with the interested parties, file for Commission approval the whitewater releases they recommend for the remainder of the license, with or without the Iowa Hill development. In comments on the draft EIS SMUD, the Forest Services, and many others requested that we adhere to the streamflow releases provided for in the

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<sup>46</sup>The more extensive table of releases would require boating releases during both dry and critically dry water years and include up to 12 springtime releases and 6 October releases.

Settlement Agreement as representing a hard fought balancing of interests between the development and nondevelopment uses of the river. We recognize the effort that went into determining the proposed streamflow releases and agree that little would be gained from revisiting or renegotiating the proposed streamflow releases. However, we continue to recommend that the more extensive recreational streamflow be provided only if the recreational demand triggers are met. If after 10 years of monitoring in year 15, the recreational use is sufficient to justify the additional cost, then we would agree that the flow volume should be consistent with Settlement Agreement.

### *Public Information Services*

The proposed brochures and map and the interpretive, education, and public information plan (Proposed Articles 1-25 for the UARP and 2-14 for the Chili Bar) would improve upon existing public education and interpretation information with updated materials that complement the Forest Service and BLM publications. The proposal would help expand recreational opportunities by providing visitors with easily accessible information about Project resources. Real-time information for all streamflow and reservoir elevation locations normally can be easily and inexpensively be collected in either 1-hour or 15-minute intervals and be made available to the public. Based on this information, the public, operators of downstream projects, such as the Middle Fork American River Project, and others would be able to coordinate their activities and operations. Providing the public with this information to enable them to coordinate whitewater activities and having real-time flow data would benefit public recreation use and would justify our estimated annual cost of \$34,600 for the interpretive, education, and public information plan and brochures and \$13,100 for the upgrading gages and providing real-time flow data.

Flow compliance monitoring for releases from Chili Bar reservoir would necessitate the continuing operation of gage no. 11444500, located downstream of Chili Bar dam. Currently, this is not a real-time USGS gage, but flows and gage heights are available at 1-hour intervals on the CDFG web site for this streamflow gage. Reservoir level compliance would likely entail upgrading the current system that PG&E uses to monitor the water level within Chili Bar reservoir. The annual cost associated with public information services as specified in Proposed Article 2-14 would be \$1,700 for PG&E, plus SMUD's share of \$14,200, and would be worth this modest cost.

### *Fish Stocking*

Reservoir-related angling is one of the most important recreational activities associated with the Project, particularly in the large storage reservoirs, including Loon Lake, Union Valley, and Ice House reservoirs. Assisting CDFG in fishing stocking (Proposed Article 1-26 for the UARP) would help ensure that the recreational fishery is maintained for the term of any license issued. We note that recreational fish stocking could adversely affect mountain yellow-legged frogs if populations were to become established in Loon Lake (elevation 6,410 feet) and may also adversely affect foothill

yellow-legged frogs in the reaches downstream of these reservoirs, particularly Ice House dam reach, due to escapement. However, the level of proposed stocking, which is similar to the existing CDFG stocking program, would not be expected to result in any additional effect on frogs over existing conditions. The \$106,100 annual cost of fish stocking is justified based on the large angler demand at these popular reservoirs.

### *Trails System Plan*

As proposed by SMUD and PG&E, the trail-specific measures in Proposed Article 1-31 would allow SMUD to continue to access the Project developments at the higher elevations in Crystal Basin where there are no access roads. Although the proposed measure would substantially benefit recreational visitors by extending and formalizing trail access to Project facilities, we would limit SMUD's responsibility to those trails that are used primarily for Project operations and that are within the Project boundary. SMUD's proposed trail plan as modified by staff would help to ensure that the condition of the portion of the trail system used by SMUD is maintained at an adequate level over time. In addition, the plan would help ensure that trail users are educated about allowed and prohibited activities and that use is zoned in a manner to avoid adverse effects on aquatic and terrestrial resources in the area.

PG&E's proposal to develop a trail on BLM lands to access the Chili Bar reservoir in Proposed Article 2-13 would formalize recreational use that already occurs on these lands. Currently, anglers, picnickers, and other visitors follow an old logging road part way into the canyon and follow a user-made trail to the water's edge. Formalizing this trail would help ensure that it is designed to follow natural contours and would reduce erosion and other effects that can be associated with informal trails. The estimated annual cost of \$15,200 would be justified based on existing use of the informal trail.

### **Transportation Management System**

Proposed Article 1-30 for the UARP, *Transportation Management System*, provides for a plan to establish SMUD's level of responsibility for improving and maintaining Project access roads and perform several specific improvements, including reconstructing and surfacing several Forest Service roads that provide access to Project recreational facilities. Upgrading drainages to meet 100-year storm events and implementing erosion control measures during maintenance activities, including snow removal, would minimize the potential for road erosion into streams. Upgrading existing roads used for access to Project facilities and Project recreational facilities would enhance public safety and access at several highly used recreation facilities. Developing and implementing the plan, including annual snow plowing, would cost about \$279,800 annually. Reconstructing Forest Service access roads would be relatively expensive with an annual cost of \$290,900 annually but would address several public safety concerns affecting thousands of visitors to the recreational facilities at Union Valley and Ice House reservoirs. We note that it is the Commission's practice to

include only those roads used primarily for Project purposes that are located within the Project boundary. Therefore, the transportation management system plan should clearly identify the roads either already within or proposed to be included in the Project boundary that are necessary to access the Project recreational facilities and limit SMUD's responsibilities to those access roads or portions of roads that are primarily used for Project purposes. If the identification of the roads or portions of roads that SMUD would be responsible for involves fewer roads than envisioned in the proposed measure, we would expect a corresponding reduction in the annual cost for repair and maintenance.

### **Visual Resource Protection**

Proposed Articles 1-27 for the UARP and 2-16 for the Chili Bar Project provide for the development and implementation of visual management plans consistent with the Forest Service VQCs for the UARP as well as the BLM visual resource standards for the Chili Bar Project. The Proposed Articles also provide for meetings with the land managing agencies every 5 years to review opportunities to improve how the facilities blend with the surrounding landscapes. These plans would provide for short-term maintenance activities including painting facilities and for review of future maintenance activities to ensure that the facilities do not significantly detract from the natural landscape of the area. The annualized capital cost associated with the measures to improve the visual quality of existing facilities at the UARP would be \$77,200 and the annualized for preparation and implementation of the visual resources plan would be \$5,500 for the UARP. The benefit to the aesthetic resources of the Project of implementing both the capital measures and the plan would be worth the costs.

### **Cultural Resources**

Proposed Articles 1-23 for the UARP and 2-17 for the Chili Bar Project provide for the continued protection of cultural resources through finalization of HPMPs for the UARP and Chili Bar Project. Proposed Articles 1-24 for the UARP and 2-18 for the Chili Bar Project provide protocols for unanticipated discoveries over the term of any licenses issued for the Projects. SMUD drafted an HPMP in 2005 that was reviewed by the Forest Service in June 2006. On February 11, 2008, the Commission issued the draft PA and draft HPMP for review within a 30-day comment period and directed SMUD to file a revised HPMP within 90 of the close of the comment period. Finalization and implementation of SMUD's or PG&E's HPMP in consultation with the SHPO, Tribes, and the Forest Service in the case of UARP or BLM in the case of Chili Bar would ensure that adverse effects on historic properties arising from UARP or Chili Bar Project operations or Project-related activities over the term of the licenses would be avoided or satisfactorily resolved. We estimate that implementation of the final HPMPs would cost SMUD about \$6,600 annually and PG&E about \$3,500 annually and the benefit of protecting cultural resources would outweigh the costs of these plans.

## **Iowa Hill Development**

The Settlement Agreement includes a series of Proposed Articles (1-37 through 1-50) that set forth SMUD's commitments for resource protection during the construction and operation of the proposed Iowa Hill development. These measures would address potential effects of the proposed development on native fish in Slab Creek reservoir and other environmental resources of the Eldorado National Forest and surrounding landscape. In written and oral comments on the draft EIS, many local residents expressed concerns about traffic congestion and the damage that heavy equipment would cause on local roads, many of which are unimproved one-lane country roads. They also were concerned about the potential for fire and the damage that a fire cause on Iowa Hill and in the adjacent canyon. Many of the individuals who commented on the draft EIS also attended meetings of the Advisory Committee and questioned why various mitigation measures being considered by SMUD were not included in the draft EIS. In response to these concerns, SMUD indicated that it was working on a Transportation Route Technical Report and an Addendum to the 2005 Visual Resources Technical Report. We asked SMUD to file these reports which they did on January 31, 2008. We have incorporated the results of these revised studies into the final EIS. We also note that the draft EIS did not provide a description of the draft transportation management plan that SMUD included in its license application. We have added information from this draft plan and include the measure in SMUD's proposed action in the final EIS.

### *Storm Water Pollution Prevention Plan and Erosion Control*

Construction of the Iowa Hill development could affect water quality. Proposed Article 1-42, *Water Quality and Water Pollution*, provides for a plan identifying the best management practices for erosion and sediment control and the method of installation and removal of a temporary coffer dam in Slab Creek reservoir to prevent any construction disturbance to the water quality in the reservoir. We reviewed the technical reports and the physical conditions of the reservoir shoreline and conclude that the shoreline attributes and location of the intake combined with the use of an impermeable liner in the upper reservoir would minimize sediment mobilization and shoreline erosion in the Slab Creek reservoir. The proposed storm water pollution prevention plan would provide reasonable assurance that water quality and aquatic habitat are not directly or indirectly adversely affected by SMUD's construction activities. SMUD also would have an environmental monitor onsite to observe conditions. The annual costs associated with the storm pollution prevention plan would be \$3,600 and would be necessary to protect aquatic resources.

### *Groundwater Monitoring*

Proposed Article 1-43, *Groundwater*, provides for the development and implementation of a plan for monitoring groundwater during and after construction of the Iowa Hill development. Operation of the Iowa Hill development could result in

seepage along the tunnel resulting in soil instability and affecting water quality in the water table. SMUD indicates that eliminating all groundwater from entering and exiting the water conveyance tunnels would be infeasible. Therefore, implementation of this plan would provide information on the effects of the development on groundwater and allow SMUD to recommend mitigation to remedy identified effects on groundwater. The annualized cost of the groundwater monitoring plan would be \$3,600 and would be worth the cost to control the effects of the Project on groundwater.

#### *Water Temperature and Fisheries in Slab Creek Reservoir*

Proposed Article 1-40, *Aquatic Resources*, includes several provisions to protect native fish (hardhead) populations in Slab Creek reservoir. These provisions include monitoring hardhead populations before and after construction of the pumped-storage facilities, monitoring water temperatures in the shallow water areas of Slab Creek reservoir, ensuring that water surface fluctuations do not occur as a result of Project operations, and monitoring the entrainment of hardhead. Simulations of the operation of the proposed development suggest that the pumping operations could lead to slightly cooler conditions in Slab Creek reservoir. We would not expect increases of less than 1°C to affect hardhead populations. Monitoring water temperatures along the edge of the reservoir would provide data that could be used along with information about the distribution of hardhead to document if pumped-storage operations are not affecting the distribution of hardhead.

Project operations would typically result in at least 35 feet of water above the Iowa Hill intake. As discussed in section 3.3.3.2, *Aquatic Resources*, because most of the hardhead are at shallower depths and/or near the reservoir margins, entrainment into the intake would likely be minimal. Furthermore, the highest frequency of occurrence of hardhead was at shallow depths near the reservoir margin and juvenile hardhead are not expected to occur at the depth of the intake. Monitoring hardhead distribution and whether entrainment of these fish (or others) occurs as a result of Project operations for 2 years as proposed by SMUD would be justified to document whether this expectation is borne out. The annualized cost of monitoring hardhead populations and monitoring temperature in the shallow water areas of Slab Creek reservoir would be \$25,400 and \$2,600, respectively.

#### *Terrestrial*

Construction of the Iowa Hill development would require the clearing of the majority of the 283-acre site, about 141.5 acres of land. Proposed Article 1-41, *Terrestrial Resources*, provides for in-kind replacement of permanently disturbed vegetation. The upper reservoir, berm, and switchyard would result in the loss of upland mixed-conifer forest, and the transmission line would result in the conversion of mixed conifer forest to non-forested montane shrubland habitat. No riparian vegetation or wetlands would be affected by construction of the proposed development.

Although we concur with the proposed measure, we note that the specific parcels of land that would be purchased, the habitat types they contain, or the wildlife management goals that would be applied to the properties have not yet been determined. Therefore, we recommend that SMUD develop a wildlife lands mitigation plan that identifies the locations of wildlife mitigation lands, management goals and objectives, management activities that would be implemented, and measures to ensure that the management goals would be met. In comments on the draft EIS, SMUD asked that our recommended plan allow for alternative approaches to land conservation such as transfer of lands to conservation organizations. We would have no problem with the inclusion of alternatives that would achieve the same objective to conserve these lands for the benefit of wildlife. Because the wildlife lands would be maintained for the life of the Project, whether managed by SMUD or a third-party, these lands should be included in the Project boundary. Our estimated annual cost of \$1,300 for such plan would be justified to ensure that the objectives of the wildlife mitigation are met. In addition, the wildlife and plant protection measures for sensitive plant and wildlife species, bald eagles, vegetation, and invasive weed management would also apply to the Iowa Hill development. Implementing the proposed measure, with Staff's additional recommendation for a final plan, would ensure that the habitat lost due to construction of the Iowa Hill development would be mitigated. The annual cost associated with the acquisition of lands or easements to replace the permanently disturbed wildlife habitat at Iowa Hill would be \$36,300.

#### *Slab Creek Recreation Access Plan*

Proposed Article 1-49 provides that SMUD address access to Slab Creek for recreation during and after construction. Public access to the Slab Creek whitewater run is difficult. The steep terrain and landowner constraints limit suitable sites for parking at the put-in and potential take-out locations. Developing an access plan to help provide a reasonable level of public access to these facilities would help ensure that boaters could use recreational releases. We estimate that the annualized cost of the Slab Creek recreation plan would be \$1,800, and the benefit of safe access to the proposed whitewater releases would be worth the cost.

#### *Visual Quality Standards*

Proposed Article 1-44 calls for SMUD to provide the Forest Service with the design specifications for the proposed Iowa Hill development that would meet the VQOs of the Eldorado National Forest. Provision of plan specifications and simulated views of the proposed facilities would help ensure that Project facilities, including the earthen berm of the upper reservoir, the intake/outtake structure, and the transmission lines, blend with the surrounding landscape of the Eldorado National Forest. In comments on the draft EIS local residents indicated that SMUD was performing additional visual resource simulations including more viewpoints and requested that the results be included in the final EIS. The study results reinforce our general conclusions

that project facilities would introduce new linear elements to the landscape but would not dominate the landscape and do not cause use to change our recommendation for the development of a visual resources protection plan. The annualized cost associated with the visual resource protection plan for Iowa Hill would be \$1,800, and the benefit of protecting the Project's aesthetic resources would be worth the cost.

### *Cultural Resources*

Proposed Article 1-45 provides that SMUD comply with the NHPA, section 106, procedures prior to commencing construction on National Forest System lands and to follow unanticipated discovery procedures during the construction and operation of the Project. Unanticipated discovery protocols would protect sites that might be discovered during the construction and operation of the development from unnecessary damage or destruction. The annual cost for compliance with cultural resource regulations at the Iowa Hill development would be included in the cost for the UARP HPMP, and a separate plan for Iowa Hill would not be necessary.

### *Construction Noise*

Proposed Article 1-48 provides measures to address construction noise. Although a large portion of the construction activities for the water conduits and the powerhouse cavern would take place underground, construction of the upper reservoir atop Iowa Hill would generate noise as earth-moving equipment clear the site and build the upper reservoir. SMUD states that most construction work at the Iowa Hill development would begin at 6:30 a.m. to avoid traffic congestion. Starting construction work at this time would reduce local construction-related traffic congestion and safety hazards and is allowed under El Dorado County General Plan. Development and implementation of a plan to control construction noise, as proposed by SMUD, to meet El Dorado County General Plan noise level limits and Forest Service standards would minimize, but not eliminate, the potential effects of noise during construction. Neighboring residents and visitors to the Iowa Hill area would hear the construction activities during the daytime but to a lesser extent than would occur without implementation of noise abatement techniques. The stationary noise source (the turbine/generating units) at the proposed Iowa Hills development would be placed in an underground powerhouse and would not affect noise levels on the surface. Therefore, noise effects associated with operation of the proposed Project would not be significant. Traffic noise, which would be limited to two employees and periodic deliveries and maintenance activities, would be minor. We estimate the annualize cost for the development of a noise abatement plan would be \$3,600 and would be necessary to minimize adverse effects of Iowa Hill construction on noise levels.

## 5.2 CUMULATIVE EFFECTS SUMMARY

The relicensing of the UARP and Chili Bar Project and the licensing of the Iowa Hill development would cumulatively affect water resources, fish and wildlife, recreational opportunities, and cultural resources in the American River Basin and the SFAR Basin. In addition to the diversions in the UARP and Chili Bar Project, the EID operates the El Dorado Project No, 176, which diverts up to 165 cfs of water around a 22-mile section of the SFAR to its consumptive water system and the El Dorado powerhouse, located a short distance downstream of the SFAR's confluence with Silver Creek. This has resulted in an incremental increase in spring through summer temperatures in the river between the confluence and the El Dorado powerhouse. The UARP and Chili Bar Project-proposed increased minimum streamflows, along with the increased minimum streamflows at the El Dorado Project, would tend to reduce spring through summer temperatures in most of the UARP- and Chili Bar Project-affected stream reaches. The operation of the proposed Iowa Hill development would reduce water temperatures emanating from Slab Creek reservoir by less than 0.5°C. This change would have no observable effect on water temperatures in Chili Bar reservoir or the Chili Bar dam reach. Under the Proposed Action, these cumulative effects are expected to provide a thermal regime that would support the designated beneficial uses, including a coldwater habitat for resident fish and amphibians.

Water quality in the UARP and Chili Bar Project-affected reaches is generally good, although it currently does not always satisfy the Basin Plan water quality objectives for bacteria and some chemical parameters. Numerous factors, including land management, development, and water-oriented recreation, all have incrementally adversely affected water quality, particularly fecal coliform concentrations in heavily-used areas of reservoirs and in the Chili Bar dam reach. In contrast, expansion of the Hangtown Creek Wastewater Treatment Plant in Placerville is expected to somewhat reduce bacteria and nutrient loadings from Weber Creek to the SFAR. The cumulative effects of these actions would be an overall improvement in water quality.

Private land development, public land use, and hydropower development have cumulatively affected the California red-legged frog, foothill yellow-legged frog, and mountain yellow-legged frog in the American River Basin due to road construction, multiple land use practices, facilities and operations, and other development that fragment breeding populations and create habitat for species, such as bullfrogs, that prey on California red-legged frogs, foothill yellow-legged frogs, and mountain yellow-legged frogs. Flow releases to benefit coldwater fisheries during the summer and early fall and Project reservoirs may isolate foothill yellow-legged frog breeding populations. For example, it is likely that the foothill yellow-legged frog in lower Slab Creek dam reach and lower Camino dam reach are reproductively isolated by coldwater water releases in upper Slab Creek dam reach and the Slab Creek reservoir (Kupferberg, 2006). However, the proposed minimum flow releases would not increase or decrease the current population fragmentation.

The recreational measures proposed by SMUD and PG&E would improve recreational opportunities throughout much of the SFAR Basin. Each proposed measure is incrementally small. However, together, the recreational measures would improve opportunities in the region, allowing the Projects to adapt to change recreational use over time, better using existing recreational resources, and developing new resources that address current and foreseeable recreational activities, such as hiking and biking.

If SMUD uses Cable Road for access for construction traffic, improvements to this road could stimulate additional residential development in the vicinity of Iowa Hill and could cumulatively affect land use in combination with the land and resource management plan for Eldorado Forest. However, an alternative route suggested by SMUD in its Transportation Route Technical Study (SMUD, 2008x) on the southwest side of Iowa Hill for construction traffic to access the construction site could minimize use of other local roads and reduce the amount of road improvements that would be necessary for construction, thereby also reducing effects on the developmental potential.

The UARP and Chili Bar Project are among a large number of hydroelectric projects in central California that affect prehistoric and historic archaeological resources located along the American River and its tributaries. These projects attract recreational use around the reservoirs. The increased recreational use resulting from the availability of the reservoirs has contributed to both inadvertent and intentional destruction of prehistoric and historic archaeological resources and of TCPs. Although continued erosion and recreational use of the American River area would be expected to continue to affect archaeological resources and TCPs, the measures included in HPMPs for the UARP and Chili Bar Project, as well as measures being or already developed and implemented at other hydroelectric projects in the area, would cumulatively reduce the rate of destruction of these cultural resources.

### **5.3 FISH AND WILDLIFE AGENCY RECOMMENDATIONS**

Under the provisions of section 10(j) of the FPA, each hydroelectric license issued by the Commission shall include conditions based on recommendations provided by federal and state fish and wildlife agencies for the protection, mitigation, and enhancement of fish and wildlife resources affected by the Project.

Section 10(j) of the FPA states that, whenever the Commission believes that any fish and wildlife agency recommendation is inconsistent with the purposes and the requirements of the FPA or other applicable law, the Commission and the agency shall attempt to resolve any such inconsistency, giving due weight to the recommendations, expertise, and statutory responsibilities of the agency.

In response to the Commission's notice soliciting final terms and conditions for the UARP and the REA notice for the Chili Bar Project issued on July 28, 2006, as extended for both Projects by notice issued on November 16, 2006, NMFS, Interior, and

CDFG filed letters of comment that included section 10(j) recommendations.<sup>47</sup> These agencies are also parties to the Settlement Agreement.<sup>48</sup> In their letters containing their 10(j) recommendations, Interior, and CDFG recommend that the Commission approve the Settlement Agreement and all the provisions thereof. NMFS did not file revised section 10(j) recommendations. Commission staff also recommends that the Settlement Agreement provisions that are within the scope of section 10(j) be included as terms of any new licenses.

#### **5.4 CONSISTENCY WITH COMPREHENSIVE PLANS**

Section 10(a)(2)(A) of the FPA requires the Commission to consider the extent to which a project is consistent with federal and state comprehensive plans for improving, developing, or conserving waterways affected by a project. We reviewed 56 plans for the state of California that have been filed with the Commission and determined that the following 23 are relevant to the UARP and Chili Bar Project. The proposed Iowa Hill development of the UARP does not meet the VQOs of the Eldorado National Forest land and resource management plan. Under Proposed Article 1-44, SMUD would develop a visual resources protection plan that would include final designs for the Iowa Hill development that would meet the Forest Service VQOs for the Eldorado National Forest. There are no other conflicts with the proposed Projects:

- California Advisory Committee on Salmon and Steelhead Trout. 1988. Restoring the balance: 1988 annual report. Sausalito, California. 84 pp.
- California Department of Fish and Game. 1979. Rubicon River wild trout management plan. Sacramento, California. July 1979. 46 pp
- California Department of Fish and Game. 1979. South Fork Merced River wild trout management plan. Sacramento, California. July 1979. 26 pp.
- California Department of Fish and Game. 1979. Nelson Creek wild trout management plan. Sacramento, California. July 1979. 27 pp.
- California Department of Fish and Game. 1981. Yellow Creek wild trout management plan. Sacramento, California. August 1981. 18 pp. and appendix.
- California Department of Fish and Game, U.S. Fish and Wildlife Service, National Marine Fisheries Service, and Bureau of Reclamation. 1988.

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<sup>47</sup>All three agencies filed letters in response to the initial notice dated October 18, 2006; October 17, 2006; and October 18, 2006. In its filing, NMFS indicated that Interior and CDFG filed revised terms and conditions on January 31, 2007.

<sup>48</sup>The Settlement Agreement was filed with the Commission on February 1, 2007.

- Cooperative agreement to implement actions to benefit winter-run Chinook salmon in the Sacramento River Basin. Sacramento, California. May 20, 1988. 10 pp. and exhibit.
- California Department of Fish and Game. 1990. Central Valley salmon and steelhead restoration and enhancement plan. Sacramento, California. April 1990. 115 pp.
  - California Department of Fish and Game. 1993. Restoring Central Valley streams: A plan for action. Sacramento, California. November 1993. 129 pp.
  - California Department of Fish and Game. 1996. Steelhead restoration and management plan for California. February 1996. 234 pp.
  - California Department of Parks and Recreation. 1998. Public opinions and attitudes on outdoor recreation in California. Sacramento, California. March 1998.
  - California Department of Parks and Recreation. 1980. Recreation outlook in Planning District 2. Sacramento, California. April 1980. 88 pp.
  - California Department of Parks and Recreation. 1980. Recreation outlook in Planning District 3. Sacramento, California. June 1980. 82 pp.
  - California Department of Parks and Recreation. 1994. California outdoor recreation plan, 1993. Sacramento, California. April 1994. 154 pp. and appendices.
  - California Department of Water Resources. 1983. The California water plan: Projected use and available water supplies to 2010. Bulletin 160–83. Sacramento, California. December 1983. 268 pp. and attachments.
  - California Department of Water Resources. 1994. California water plan update. Bulletin 160–93. Sacramento, California. October 1994. Two volumes and executive summary.
  - California Department of Water Resources. 2000. Final programmatic environmental impact statement/environmental impact report for the CALFED Bay-Delta Program. Sacramento, California. July 2000. CD Rom, including associated plans.
  - California State Water Resources Control Board. 1975. Water quality control plan report. Sacramento, California. Nine volumes.
  - California—The Resources Agency. Department of Parks and Recreation. 1983. Recreation needs in California. Sacramento, California. March 1983. 39 pp. and appendices.

- California—The Resources Agency. 1989. Upper Sacramento River fisheries and riparian habitat management plan. Sacramento, California. January 1989.
- Forest Service. 1988. Eldorado National Forest land and resource management plan. U.S. Department of Agriculture, Forest Service, Placerville, California. December 1988. 752 pp.
- State Water Resources Control Board. 1999. Water quality control plans and policies adopted as part of the state comprehensive plan. April 1999.
- U.S. Fish and Wildlife Service, California Department of Fish and Game, California Waterfowl Association, and Ducks Unlimited. 1990. Central Valley habitat joint venture implementation plan: A component of the North American waterfowl management plan. Department of the Interior, Portland, Oregon. February 1990.
- U.S. Fish and Wildlife Service. 2001. Final restoration plan for the anadromous fish restoration program. Department of the Interior, Sacramento, California. January 9, 2001.

## **5.5 RELATIONSHIP OF LICENSE PROCESS TO LAWS AND POLICIES**

### **5.5.1 Water Quality Certification**

Pursuant to 401(a)(1) of the Federal Water Pollution Control Act (Clean Water Act) and Commission regulations, SMUD and PG&E are required to file as part of their license application a copy of the water quality certificate provided by the state of California or proof that such a certificate has been applied for or the requirements waived. SMUD and PG&E applied for section 401 Water Quality Certification for their Projects on September 22 and 18, 2006, respectively, following the Commission's notice for final terms and conditions (UARP) and REA notice (Chili Bar), which were issued on July 28, 2006. Both applicants subsequently withdrew their applications for Water Quality Certification. PG&E submitted a new application for Water Quality Certification in a letter dated May 1, 2007, that was acknowledged as received by the Water Board on May 22, 2007. SMUD resubmitted its application on October 23, 2007. State action on the Water Quality Certification applications will be required before October 22, 2008, for the UARP and before May 1, 2008, for the Chili Bar Project. If the state does not act on the two applications by these dates, respectively, certification of the two Projects will be deemed waived.

### **5.5.2 Endangered Species Act**

Section 7 of the ESA requires federal agencies to ensure that their actions are not likely to jeopardize the continued existence of endangered or threatened species or cause the destruction or adverse modification of the critical habitat of such species.

The FWS lists three plant and three wildlife species potentially occurring in vicinity of the UARP and Chili Bar Project that are federally designated as threatened or endangered and therefore protected under the ESA. These include the endangered Pine Hill ceanothus (*Ceanothus roderickii*) and Pine Hill flannelbush (*Fremontodendron decumbens*), as well as the threatened Layne's butterweed (*Seneco layneae*), valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*), and California red-legged frog (*Rana aurora draytonii*).

Our analyses of Project effects on these species are presented in section 3.3.5, *Threatened and Endangered Species*, and our final recommendations are presented in section 5.1, *Comprehensive Development and Recommended Alternative*.

We conclude that relicensing the UARP with the fish and wildlife habitat protection and enhancement measures proposed in the Settlement Agreement would be likely to adversely affect the Pine Hill ceanothus, Pine Hill flannelbush, the Layne's butterweed, and the valley elderberry longhorn beetle, but would not likely adversely affect the California red-legged frog. By letter dated September 25, 2007, we initiated formal consultation with FWS on the three plant species and valley elderberry longhorn beetles, and requested concurrence on the California red-legged frog. By letter dated October 23, 2007, FWS determined that the information in the draft EIS was insufficient for the FWS to consult on the UARP and requested additional information on the potential effect of the Proposed Actions on the Pine Hill plants, the valley elderberry longhorn beetle, and the California red-legged frog. By letter dated December 12, 2007, we provided the information requested by FWS. Subsequently, on December 13, 2007, FWS indicated that it had only recently learned of the El Dorado-SMUD Cooperative Agreement of 2005 and asked for a full assessment of the prospective development that could be stimulated by the water supply agreement. FWS reiterated this request by letter dated February 7, 2008, without mention of the documentation we provided in response to the original request. FWS maintains the position that it cannot initiate consultation on the relicensing of the UARP without a full assessment of the effects on ESA species of the water supply agreement.

We conclude that relicensing the Chili Bar Project with the fish and wildlife habitat protection and enhancement measures proposed in the Settlement Agreement would have no effect on the Pine Hill endemic plants and the valley elderberry longhorn beetle and would not likely adversely affect the California red-legged frog. By letter dated September 25, 2007, we requested concurrence from FWS on the California red-legged frog. By letter dated October 19, 2007, FWS determined that the information in the draft EIS was insufficient for the FWS to make a determination about the California red-legged frog and requested additional information. On November 2, 2007, we provided the information requested by FWS. On December 6, 2007, FWS concurred with our determination that the relicensing of the Chili Bar Project is not likely to adversely affect the California red-legged frog.

### **5.5.3 National Historic Preservation Act**

The NHPA (16 U.S.C. 470 et seq.) (as amended) requires federal agencies to manage cultural resources under their jurisdiction and authorizes the Secretary of the Interior to maintain a National Register. The law also provides for the creation of SHPOs to facilitate the implementation of federal cultural resource policy at the state level, and for the responsible federal agency (i.e., agency official) to consult with Native American tribes who attach religious or cultural importance to cultural resources under their jurisdiction. Section 106 of the Act requires federal agencies to take into account the effect of any proposed undertaking on properties listed in, or eligible for listing in the National Register. If the agency official determines that the undertaking may have adverse effects on properties listed in or eligible for listing in the National Register, the agency official must afford an opportunity for the Advisory Council to comment on the undertaking. The relicensing of the UARP and Chili Bar Project is considered an undertaking, and the Commission acts as the agency official.

SMUD and PG&E, under the authority of the Commission, have conducted section 106 consultations with the California SHPO, and other interested parties since 2001. This consultation included scheduled collaborative cultural resource workgroup meetings, as well as individual meetings conducted by the applicants. Commission staff will be continuing Section 106 consultations. On February 11, 2008, Commission staff circulated a draft PA and the draft HPMP for the UARP for comment and directed SMUD to file a revised HPMP within 90 days of the close of the comment period. Under the Proposed Action, UARP would implement the final HPMP that would be attached to the executed PA. On January 15, 2008, the Commission circulated a draft PA for comments. Under the Proposed Action PG&E would finalize its HPMP within one year of license issuance. Each HPMP would provide specific guidance to applicant personnel about the treatment of historic, archaeological, and traditional cultural resources during the terms of the new licenses.

### **5.5.4 Americans with Disabilities Act**

Public recreation facilities must comply with the Americans with Disabilities Act of 1990 (ADA, Public Law 101-336) to the extent possible. The Commission, however, has no statutory role in implementing or enforcing the ADA as it applies to its licenses. A licensee's obligation to comply with the ADA exists independent of its Project license. As recreation facilities are updated, expanded, or newly developed, SMUD and PG&E propose to ensure that access needs of the disabled are addressed and comply with ADA standards. The proposed recreational measures included are consistent with this Act.

### 5.5.5 Clean Air Act

The 1990 amendments to the Clean Air Act (CAA) and the Conformity Rules require federal agencies to conform to State Implementation Plans (SIPs). EPA and federal agencies have established requirements and procedures to ensure that federally sponsored or approved actions will comply with the National Ambient Air Quality Standards (NAAQS), and conform to the appropriate SIPs. The conformity rules apply to designated non-attainment or maintenance areas for criteria pollutants regulated under NAAQS. The SIPs are the approved state air quality regulations that provide policies, requirements, and goals for the implementation, maintenance, and enforcement of the NAAQS. SIPs include emission limitations and control measures to attain and maintain the NAAQS. The EPA has developed two conformity regulations for transportation and non-transportation projects. Non-transportation projects are governed by the “general conformity” regulations (40 CFR Parts 6, 51 and 93) described in the final rule for Determining Conformity of General Federal Actions to State or Federal Implementation Plans. Since the proposed Project is a non-transportation project, the general conformity rule applies. We prepared a general conformity determination and applicability analysis using the EPA NONROAD model and provided the results in the draft EIS. In response to the California Air Resources Board (CARB), we prepared another general conformity determination and analysis using the CARB EMFAC and OFFROAD2007 models and provided the report to the CARB for review. Under the EPA NONROAD model, SMUD proposed to adjust its construction schedule to eliminate exceedances of oxides of nitrogen. However, under the CARB OFFROAD model, emissions would be below the *de minimis* for all pollutants such that an adjustment to the construction schedule would not be needed.