

Rock Creek - Cresta Project
FERC No. 1962

Ecological Resources Committee

Annual Report on 2005 Operation and Monitoring
License Condition 22

And

Annual Water Temperature Monitoring Report
License Condition 4.C

May 22, 2006

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Appendix A: ERC Review of Draft Annual Report

Appendix B: ERC Meeting Notes

Appendix C: ERC Protocols and Groundrules

Appendix D: Water Temperature Monitoring Report

Appendix E: PG&E September 19, 2005 Letter to FERC on Water Temperature Control

Appendix F: Ramping rate Study Initial Findings and Determinations

Rock Creek - Cresta Project, FERC No. 1962
Ecological Resources Committee

Annual Report on 2005 Operation and Monitoring

Draft – April 17 2006

1.0 INTRODUCTION

This Annual Report is prepared in accordance with Condition No. 22 of the License and Appendix B, Section II of the Rock Creek – Cresta Settlement Agreement, dated September 18, 2000. The new License for the Rock Creek Cresta Project was issued on October 24, 2001 and the Ecological Resources Committee (ERC) was formally established shortly thereafter. Organizations that are members of the ERC or have attended ERC meetings or field trips during 2005 are listed below.

ERC Members attending ERC meetings during 2005:

Pacific Gas and Electric Company
California Department of Fish and Game
California State Water Resources Control Board
Plumas County
California Trout
Chico Paddleheads
American Whitewater
Shasta Paddlers
California Sportfishing Protection Alliance
National Park Service
U. S. Fish and Wildlife Service

ERC Members not attending ERC meetings during 2005:

Friends of the River
Natural Heritage Institute
California Outdoors

Liaison Participant: U. S. Forest Service (present at all meetings)

Other ERC Meeting Attendees during 2005

California Hydropower Reform Coalition
Baiocchi Family Representatives
Anglers Committee
Davis Hydro
Plumas CRM
Various Tribal Representatives

ERC members, the Forest Service (FS), and members of the public that have expressed an interest in ERC activities receive meeting announcements and notes. Copies of meeting notes for 2005 and the first portion of 2006 are included in Appendix B. During 2005 the ERC reviewed its decision making procedures and established groundrules to make its processes more effective. A copy of these groundrules, as well as the ERC protocols previously adopted are contained in Appendix C.

This Annual Report has been prepared in coordination with Forest Service and participating members of the ERC. The draft Annual Report was distributed to the ERC and Forest Service for a 30-day review period by email on April 17, 2005 and by hard copy by letter dated April 18, 2005. The draft Annual Report was discussed at the May 17, 2006 ERC meeting. A copy of the April 17 letter to the ERC as well as comments provided by the Forest Service and ERC members are included in Appendix A,

2.0 SUMMARY OF OPERATIONS

2.1 Minimum River Flow Requirements:

In 2005, the California Department of Water Resources May forecast of inflow to Oroville Reservoir was 3,640,000 acre-feet, which classifies 2005 as a normal year under the provisions of License Condition 5.A and Table A.1 normal year flow tables. 2004 was also classified as a normal year, which governs the flow release requirements in January and February 2005. DWR forecasts for March and April, which control the flow requirements in those months, were classified as dry and normal, respectively. As a result, flow requirements were reduced in March and increased again in April. 2005 was year 4 of the first 5-year flow period under License Condition 5. River flow records continue to be recorded at the existing gages NF 56 (Cresta bypass reach) and NF 57 (Rock Creek bypass reach). The minimum flow requirement of 100 cfs from Cresta dam was verified by a combination of records from the flow meter on the release pipe at Cresta Dam and the daily record for the estimated flow through the radial gate at Cresta Dam. The USGS published daily average flow at NF56 and NF57 verified compliance with the base flow requirements for the 2005 water year (October 1, 2004 through September 31, 2005) as set forth in License Table A.1.

Flow records were provided to the FERC by the Licensee's January 20, 2006 letter and FERC's February 9, 2006 letter confirmed compliance with License requirements for the 2005 water year ending October 31, 2005. By letter dated June 28 and September 19, 2005, the Licensee provided information to the FERC concerning deviations in minimum flows below Rock Creek Dam as the result of equipment malfunctions. Preliminary flow records for the remainder of the 2005 calendar year indicate no deviations from the daily levels were experienced except for several days in November to accommodate the annual fish survey effect and a flow reduction on November 11 as a result of a vehicle recovery effort below Rock Creek Dam. The reduction for the vehicle recovery effort was reported to the FERC by letter dated December 7, 2005.

2.2 Recreational Flows:

Recreational flow events were scheduled for 2005 in accordance with Condition 16 (as amended consistent with the Licensee's February 9, 2004 filing and the Forest Service's June 2, 2005 submittal) and occurred on the Cresta reach on July 23, August 27, September 24, and October 15 and on the Rock creek reach on June 26, July 24, August 28, September 25, and October 16. The switch to the fourth weekend of the month was consistent with the scheduling for 2004, which was made to allow as much time as possible for the development of Foothill Yellow-Legged Frog tadpole larva before elevation of flows. Also, no release was provided in the Cresta reach in June due to the presence of egg mass 21 days in advance of the scheduled release date.

Recreation stream flow information required under Condition 18 was provided and posted on the American Whitewater website at www.americanwhitewater.org/nff. Flow information is also being made available at 1-877-708-8829. Recreation and Pulse Flow

Biological Evaluations required under Condition 17 continued in 2005 in accordance with the study plan established by the ERC and FS.

2.3 Ramping and Pulse Flow Requirements:

Operational requirements and objectives for ramping and pulse flow releases as required under Tables A.1 of the License were followed during 2005 with the exception of a Cresta reach pulse flow on February 22, 2005 when the flow was terminated early due to the discovery of a person stranded in the river. No pulse flows were provided in March 2005 since the water year forecast had turned from normal to dry. Winter pulse flows were released on both the Rock Creek and Cresta reaches on January 8 and 29 and February 19 and 22. The shift to a January to March schedule is consistent with the ERC's decision documented by letter to the FERC dated April 15, 2003. The final revised flow tables (license Condition 5) were filed with the FERC by letter dated February 5, 2004. The Forest Service provided its concurrence by letter dated June 5, 2005. FERC's April 5, 2006 order approved the revised flow tables.

Ramping Rate are discussed under Section 4.3.

3.0 STATUS OF PLANS REQUIRED BY LICENSE

Numerous resource protection and other plans are required to be developed in consultation with the Forest Service and ERC, and filed with the Commission. The following is a listing of the plans and filing requirements and their current status.

| Article or Condition | Plan | Status |
|-----------------------------|---|---|
| Art. 405 | T/L R/W Maintenance Plan | Filed by 4/16/04 letter to FERC. FERC 4/22/05 order approved the Plan |
| Art. 406 | Raptor Protection Plan | Filed by 4/16/04 letter to FERC. FERC 4/22/05 order approved the Plan |
| Art. 407 | Cantelow's Lewisia Protection Plan | Filed by 10/23/02 letter to FERC. FERC 4/17/03 order approved plan. |
| Art. 409 | Bald Eagle Protection Plan | Filed by 4/23/02 letter. FERC 8/1/02 order approved plan. |
| Art. 410 | Valley Elderberry Longhorn Beetle Protection Plan | Filed by 4/23/02 letter. FERC 8/1/02 order approved plan. |
| Art. 411 | Shady Rest Maidu Interpretive Display Plan | Filed by 4/23/02 letter. FERC 5/24/02 order approved plan. |
| Cond. 4(C) & Art. 401 | Water Temperature Monitoring Plan | Filed by 10/23/02 letter. FERC 2/28/03 order approved plan with minor changes |
| FERC 2/28/03 Order | Interim Temperature Control Measures | Filed by 5/22/04 letter. Plan combined with Crit. Dry Year Operations and Compliance Plan. FERC 9/11/03 order approved plan. |
| Cond. 4(E) | Coldwater Habitat and Fishery Mitigation and Enhancement Fund | Filed by 10/23/02 letter. FERC approved 7/11/02. Required annual statement filed 1/31/05. |
| Cond. 5 & Art. 401 | Critically Dry Year Operation and Compliance Plan | Revised Plan filed by 5/22/03 letter. FERC 9/11/03 order approved plan. |
| Condition 5.E.6 | Ramping Rate Study | ERC has determined need for study not needed. |
| Cond. 7 | Fishery Monitoring Plan | Filed by 7/30/02 letter FERC 10/10/02 order approved plan. |
| Cond. 8 | Riparian Monitoring Plan | Initial plan filed by 10/23/02 letter. Revised by 6/19/03 letter FERC 7/23/03 order approved plan. . |
| Cond. 9 | Macroinvertebrate Sampling Plan | Filed by 10/23/02 letter. FERC 12/10/02 order approved plan. |
| Cond. 10 & Art. 404 | Fishery Habitat Improvement Plan | Plan filed by 4/23/02 letter. FERC 7/30/02 order approved plan. Discussion ongoing on completion dates of features.. |
| Cond. 11 | Fishery Habitat Monitoring Plan | Plan filed by 4/23/02 letter, supplemented by 12/09/02 letter. FERC 1/10/03 order approved plan. |
| Cond. 12 | River Terrace Planting Plan | Plan filed by 8/6/03 letter. FERC 12/12/03 order approved with modifications. |
| Cond. 13 | Terrace Planting Monitoring Plan | Plan filed by 8/6/03 letter. FERC 12/23/03 order approved plan. |

| Article or Condition | Plan | Status |
|-----------------------------|---|---|
| Cond. 14 | Drum and Radial Gate Operating Plan | Plan filed by 4/22/03 letter. FERC 9/11/03 order approved Plan. |
| Cond. 15 | River Sediment Management Monitoring Plan | Plan filed by 4/22/03 letter. FERC 10/9/03 order approved Plan. |
| Cond. 17 And 5E6 | Recreation and Pulse Flow Biological Evaluation | Revised Plan filed by 4/16/03 letter with note that updates and changes will be documented in annual report. FERC 8/25/04 order approved and modified Plan. |
| Cond. 19 | River Recreation Access Plan | Plan filed by 4/30/03 letter. FERC 9/8/03 order approved Plan. |
| Cond. 21 | Recreation Monitoring Plan | Plan filed by 10/23/02 letter. FERC 2/9/04 order approved Plan. |
| Cond. 23 | River Corridor Interpretation Plan | Plan filed by 4/23/02 letter FERC approved 5/22/02. Display installed Dec 2003. |
| Cond. 24 | Visual Resources Plan | Plan filed by 11/22/02 letter. FERC 6/16/03 order approved Plan. |
| Cond. 25 | Transportation System Management Plan | Plan filed by 11/22/02 letter. FERC 6/16/03 order approved Plan. |
| Cond. 26 | Fire prevention and Response Plan | Plan filed by 11/22/02 letter. FERC 6/16/03 order approved Plan. |
| Cond. 27 | Noxious Weed Management Plan | Plan filed by 11/22/02 letter. FERC 12/12/03 order approved with modifications |
| Cond. 41 | Hazardous Substance Plan | Plan filed by 11/22/02 letter. FERC 6/16/03 order approved Plan. |
| Cond. 42 | Heritage Resources Management Plan | Plan filed by 2/21/03 letter. FERC 10/20/03 order approved Plan. |

4.0 MONITORING CONDUCTED DURING 2005

Monitoring requirements are determined by the various resource plans filed in compliance with license articles and conditions. Detailed reports of monitoring results were provided to the ERC and Forest Service and discussed in ERC meetings. The following provides a summary of the results of the 2003 monitoring effort.

4.1 Raptor Protection Plan and Bald Eagles Surveys (Articles 406 and 409)

Raptor carcass surveys were conducted in accordance with License Article 406 on November 14, 2005 and the results reported to the FERC by letter dated February 1, 2006. No carcasses were found.

The results of the 2005 monitoring for Bald Eagles were provided to the FERC by letter dated October 25, 2005. Three surveys were conducted three times in the Rock Creek and Cresta reaches. No nesting sites were identified although adults and sub-adults were occasionally observed. The next surveys will occur in 2008.

4.2 Water Temperature Monitoring Plan (Conditions 4C and 5)

As required by the FERC's February 28, 2003 order approving the Water Temperature Monitoring Plan, the annual water temperature monitoring report is attached as Appendix D. A draft of this report (on CD) was provided to the ERC by letter dated March 17, 2006.

Temperature data measured in 2005 are comparable to those of the first three data years (2002-2004). The averaged daily mean temperature data during the 2005 July-August period was 20.9 °C at NF12 (NFFR just above Bucks Creek -- the warmest station in Rock Creek Reach), whereas the averaged value was 21.3 °C, 20.3 °C and 21.2 °C in 2002, 2003 and 2004, respectively. The exceedance levels for daily mean temperatures greater than 20 °C ranged 66%-97% of the time during the July-August period in the overall four monitored years. Similarly, the averaged daily mean temperatures at the lowest station in Cresta Reach (NF16, just above Cresta Powerhouse) ranged 20.5-21.3 °C in 2002-2005, and the 20°C-exceedance levels ranged 50%-95%.

In 2005, the Licensee implemented a special temperature mitigation measure that is similar to what was conducted in July 2003. During the period July 9 through July 15, 2005, the Licensee initiated temperature-based operational changes at the Caribou Powerhouse Complex in order to mitigate temperatures downstream. During this period, the Licensee curtailed or eliminated the use of Caribou No. 2 and passed flow preferentially through Caribou No. 1. On seven days during this period, flow through Caribou No. 2 was reduced to less than 100 cfs. During the test, temperatures in Belden Forebay showed a gradual reduction through the test period. The maximum decrease in temperature was 3.2 °C. Temperatures in the lower portion of Belden Forebay showed a maximum change in temperature of 2.4 °C immediately below Belden Dam (NF 5). Temperatures at stations below Rock Creek Dam and Cresta Dam (NF9 and NF14,

respectively), are more complicated in analysis as they are subject to effects from East Branch of North Fork Feather River (a warm tributary) and ambient condition from the atmosphere. At the beginning of Rock Creek Reach (NF9), temperature data in the test period showed a maximum departure from the ambient trend of 1.7 °C, while as temperatures at the beginning of Cresta Reach (NF14) showed a maximum departure from the trend of 1.2 °C. The observed rate of change in release temperatures at Caribou No. 1 supports preceding assertions that the pool of cool water is of limited volume. At the beginning of the test, Caribou No. 1 release temperatures measured 16.7 °C, and at the end of the seven day test period the release temperatures had raised to 17.8 °C.

In addition to the water temperature data contained in the report, the Licensee provided notification (via Email to ERC members) of instances when the daily average temperature at NF 56 or NF 57 exceeded 20°C for two consecutive days. The first day that the daily average water temperatures exceeded 20°C at NF57 (Rock Creek reach) was July 5. The corresponding day on the Cresta reach was July 7. Daily average water temperatures continued to exceed 20°C on the majority of the days between July and the first week of September.

4.3 Ramping Rate Review (Condition 6)

Data on 2005 pulse flows and ramping rate deviations was provided to the ERC and Forest Service by letter dated February 3, 2006. As was noted in the Annual Report on 2004 Operation, the ERC and Forest Service concluded that a specific ramping rate study was not recommended at that time and that additional literature and peer review work would be conducted in conjunction with Condition 17 study work. During 2005 the ERC and Forest Service continued its belief that specific ramping rate studies are not recommended. As is discussed in Section 6.5, the ERC is in the process of trying to reach a determination under License Condition 17. This effort is currently ongoing.

4.4 Fishery Monitoring Plan (Condition 7)

Three of the four fish population monitoring efforts outlined in the Fishery Monitoring Plan for Condition 7 were conducted in 2005 (i.e., Year 4). Those efforts included: 1) backpack electrofishing in riffle and glide habitats, 2) fish population snorkeling surveys, and 3) angler surveys. The fourth monitoring effort, barge electrofishing in large pools, was not repeated in 2005. The original objective of the pool monitoring was to measure the quantitative response of the fish populations (primarily rainbow trout) in the pools to base flow changes outlined within the new License. After reviewing the results from the barge electrofishing from 2002 (Year 1) and 2004 (Year 3) and after review of similar pool sampling efforts in the 1980s (CDFG), the ERC came to agreement in July 2005 that the pool sampling was not providing useful quantitative data. For this reason, the barge electrofishing was discontinued for 2005 and the snorkeling effort was expanded to provide more quantitative data (index-based) for all habitat types, including large pools. Draft reports on the 2005 backpack electrofishing survey monitoring results were provided to the ERC and Forest Service by letter dated February 3, 2006. The other two reports will be submitted to the ERC and Forest Service in April. These efforts will be

repeated in 2006 (i.e., Year 6) and the 2006 results will be combined with the 2004 and 2005 results to provide three years of baseline data under the initial set of base flows to which future monitoring under adjusted base flows will be compared.

In 2005, the backpack electrofishing surveys were conducted during the first week of October to remain consistent with past efforts and to minimize problems with poor weather conditions. The 2005 snorkeling efforts were conducted in September, and the angling survey was conducted during the legal trout fishing season between the last weekend of April and the middle of November. It should be noted that the April to November season applies only to the portions of the Project Area that are within Plumas County. The lower section of the Cresta river reach that is within Butte County is open to trout fishing all year. The angler survey included both of the river reaches and also the Rock Creek and Cresta reservoirs.

The backpack electrofishing and angler surveys conducted in 2005 were conducted using the same methods and at the same sites as in 2002 and 2004. The basic methodologies were developed by the California Department of Fish and Game (CDFG) during the 1980s and 1990s. The fish snorkeling methodology was tested in 2002, expanded in 2004, and expanded further in 2005 as another monitoring tool to assess expected changes in fish population structure and relative abundance in response to the License-required changes in flow regime over the first 15 years of the new License. Details of the methods and results from the three Condition 7 monitoring efforts that were conducted in 2005 follow:

Backpack Electrofishing in Riffles and Glides - A crew of five to six backpack electrofishers with support netters and live bucket carriers were employed at each of five sampling sites (2 stations in Cresta and 3 stations in Rock Creek). A third station was added in 2005 in the Rock Creek reach upstream of the James Lee School site (i.e., the Granite Creek site). This site was added because the habitat characteristics matched up better with the stations sampled in this area during the 1980s (CDFG). In order to effectively do this type of sampling which requires being able to wade the whole river section, flow reductions were necessary. Flows were reduced in the Cresta reach to 72 cfs from a base flow of 220 cfs, and in the Rock Creek reach to 63 cfs from a base flow of 185 cfs. For future efforts, flows should be reduced near these levels to ensure that the work can be completed safely. Once block nets were placed at both the downstream and upstream ends of the station, a series of multiple passes were made through each station. The collected fish were processed (i.e., identified, measured, and weighed individually) at the end of each pass. Estimates of fish numbers and biomass by species were calculated for each station.

For all stations combined, the same seven fish species were collected in 2005 including riffle and prickly sculpin (30 %), rainbow trout (12 %), hardhead (12 %), Sacramento sucker (34 %), pikeminnow (8 %), and smallmouth bass (5 %). Lower percentages of sculpin and rainbow trout, a similar percentage of hardhead, and higher percentages of suckers, pikeminnow, and smallmouth bass were collected in 2005 than in 2004. Overall,

lower numbers of rainbow trout were collected at most of the sites, and was due, in large to lower numbers of YOY and 1+ juveniles found in 2005.

For both Cresta reach stations, population estimates for rainbow trout (standardized to 100 meters) were much lower in 2005 than in 2004 with 37 and 89 trout/100m being estimated. In 2004, 96 and 167 rainbow trout/100m were estimated for the two Cresta stations. For the Rock Creek reach stations in 2005, the Rodgers Flat station estimate was also lower in 2005 (60 trout/100 m) than in 2004 (123 trout/100 m), while the estimate at the Granite Creek site was actually higher in 2005 (31 trout/100m) than in 2004 (15 trout/100 m). The estimate at the new station in 2005 (i.e., the Granite Creek station) was 87 trout/100 m).

The biomass estimates were also reduced in 2005 ranging from 117 to 328 lbs/mile and from 10.6 to 48.0 lbs/acre. The 2004 values ranged from 167 to 492 lbs/mile and from 24.4 to 51.7 lbs/acre. Even though the numbers of young-of-the-year were reduced in 2005, the majority of the rainbow trout collected in 2005 at the Cresta stations were still young-of-the-year and 1+ trout, while in the Rock Creek reach age 1 and older trout were more dominant at the Indian Jim and Rodgers Flat Rock Creek stations. At the new Granite Creek site, young-of-the-year were more abundant than the other two Rock Creek reach stations, reflecting the production of young trout from Granite Creek. The results continue to suggest that trout population levels over the long term are controlled, in large part, by the recruitment of young trout into the system over multiple years. This is especially true for these two river reaches, where the take of trout by anglers is prohibited.

The abundance and biomass estimates for all of the 2005 sites were still well below the trout fishery objective criteria values of 595 lbs/mile and 62 lbs/acre specified as targets in the SA. However, the condition factors calculated for rainbow trout with the length-weight data indicates that the fish that were collected at each of the sites in 2005 were in 'good' shape. In addition, the 2005 backpack electrofishing effort successfully demonstrated that four distinct age classes of rainbow trout were present, another of the SA objective criteria.

Angler Survey - Angler surveys were conducted throughout the 2005 trout season from April 30 through November 15, and typically included four weekend days and five weekdays each month.

In 2005, fishing pressure was highest on non-holiday weekends, followed by holidays and their associated weekends, and finally weekdays. The estimated number of anglers per day was highest during the spring (May and June). Fly fishing was the most popular angling method used in terms of angler numbers (48%), followed by numbers of lure anglers and bait anglers. Bait fishing was still observed in 2005 even though it has been prohibited in the riverine reaches under a new set of fishing regulations since 2002. The 2002 regulation changes included the 'artificial lure only' and 'no take' restrictions for rainbow trout.

The 727 anglers interviewed in 2005 reported catching 872 rainbow trout, 6 brown trout, and 304 other fish including 194 Sacramento pikeminnow, 81 smallmouth bass, 21 hardhead, and 8 Sacramento suckers. The number of trout reported in 2005 was very close to the 2004 total, even though more anglers spent more time fishing in 2005. Fewer anglers (17 % of the total) fished in the two project reservoirs than the riverine reaches (83%). Rainbow trout comprised 74 % of the total catch with an average length of 12.3 inches. If smallmouth bass are removed from the non-game grouping, then rainbow trout comprised 79% of the non-game/rainbow trout catch total. Anglers reported catching 60 rainbow trout that were 17 inches or longer in length.

Overall catch per unit effort (CPUE) in 2005 for the Cresta and Rock Creek sections (including river and reservoir reaches combined) averaged 1.01 fish/hour for all species combined and 0.74 trout/hour for rainbow trout. This compares with 1.08 fish/hour for all species combined and 0.86 rainbow trout/hour in 2004. For the riverine reaches only, where the special regulations are in place, angler success in 2005 for rainbow trout was 0.79 trout/hour in the Cresta river reach and 0.91 trout/hour in the Rock Creek river reach. (It should be noted that the CPUE ratios are not based on end-of-the-day surveys so the data can not be used to determine average daily angler fishing effort)

The slightly lower but relatively high success of anglers in 2005 continues to be positive, but it should be noted that the overall pressure in the Rock Creek-Cresta Project reaches is fairly light. CPUE values can be influenced greatly by low numbers of very successful, efficient anglers. The angler surveys are being repeated in 2006, and should shed light on whether the system can handle the increased pressure that will undoubtedly follow the successes in 2004 and 2005. (It is noted that the surveys conducted were not end-of-day and therefore do not provide an indication of total angler hours per day)

Snorkeling Survey - Snorkeling counts were conducted in various habitat units (i.e., deep pools, shallow pools, runs, and riffles) within the Rock Creek and Cresta river reaches. Based on a comparison of upstream counts and cross-sectional transect counts conducted in 2004, only upstream counts were conducted in 2005. In an effort to increase precision of the counts, the total number of snorkeled units was increased to 70 units in 2005 from a total of 41 in 2004. Reach totals of 40 and 30 individual habitat units were snorkeled in the Rock Creek and Cresta reaches, respectively. To further increase precision, the habitat units were selected utilizing an alternative random process.

In general, water visibility characteristics appeared adequate to conduct dive counts in the North Fork Feather River. However the poorer visibility in the upper study sites of both reaches required closer spacing of divers to achieve a full census than did the lower, clearer study sites.

Overall, the 2005 snorkeling effort continues to show that the use of snorkeling to monitor species composition and distribution within the two river reaches is effective and especially useful in pool habitats. Even though estimates of true numbers within a habitat unit are not attainable with this technique, indexes of abundance can be established that will allow comparisons between years at the same sites. The advantage of snorkeling is

that a larger number of sites and a larger percentage of the total river length can be monitored than with other methods.

Target species observed and counted in 2005 were rainbow trout, hardhead, Sacramento pikeminnow, Sacramento sucker, and smallmouth bass. Even though the 2005 effort was more extensive than 2002 and 2004, for most species, including rainbow trout, minor changes in trout abundance were difficult to detect. However, large changes should be discernable in the future with the increased number of stations in each habitat type.

Overall, rainbow trout indices of abundance for combined habitats in 2005 were similar to the 2004 combined indices in both reaches, while the 2005 indices for hardhead were higher in both reaches. For pikeminnow, the 2005 levels were higher in the Rock Creek reach but were at a similar level in the Cresta reach. Suckers and smallmouth bass both showed increases in 2005 in both reaches. The overall decreases in 2005 found in rainbow trout during the electrofishing efforts were not reflected in the combined snorkeling results, but it should be noted that electrofishing was conducted in the shallowest available habitats only (i.e., riffles and shallow glides). The snorkeling results from riffles habitats did show decreases in 2005 for the two smaller size groups (RBT < 5 inches and RBT @ 5-10 inches). Also, increases in these size groups over 2002 levels were observed during both electrofishing and snorkeling efforts in 2004. These observations point out the value of assessing changes in species abundance on a habitat-specific basis, as individual species tend to prefer different habitats (e.g., pools, runs, and riffles, etc.).

A consistent snorkeling methodology (e.g., station number and locations, timing, etc.) has been established in 2005, so a consistent baseline of information will be available from 2005 and 2006 surveys that can be compared with future efforts (2009-2011 and 2014-2016). Being consistent here also applies to establishing a set base flow under which future snorkeling should be done. In order to conduct surveys under the second and third set of base flows (Years 6-10 and Years 11-15), the flows will need to be reduced, at a minimum, to the current first set of base flows during the surveys.

4.5 Macroinvertebrate Sampling Plan (Condition 9)

As required in the Macroinvertebrate Sampling Plan, macroinvertebrate sampling following the California Stream Bioassessment Protocol (CSBP) was conducted in 2005 within the Rock Creek and Cresta regulated reaches along with other partially-regulated and unregulated sites on the North Fork Feather River and Middle Fork Feather River. The draft results of the 2005 CSBP study effort were provided to the ERC and Forest Service by letter dated March 17, 2006. CSBP sampling efforts were also conducted using similar methodologies in 1999, 2000, 2001, 2002, and 2004. The number of stations sampled has expanded over the six-year period to include unregulated sites on the East Branch of the North Fork and on the Middle Fork. In 2005, as in 2002 and 2004, 2 stations were located in the Cresta reach, 3 in the Rock Creek reach, 1 in the North Fork Feather near Belden Town, 1 in the East Branch of the North Fork Feather, and 2 stations in the Middle Fork Feather River near Milsap Bar and the Stag Creek confluence.

At each of these stations, three replicate samples were collected with a standard kick sampler and later processed and analyzed individually. For each of these replicates, the organisms were identified and counted in a systematic manner and species lists were generated. From the species lists, summary metrics were calculated for each replicate and a mean metric value was then calculated for each station. The metrics included standard CSBP metrics such as species richness, diversity/composition, tolerance/intolerance, and functional feeding group measures.

In 2005, an estimate of nearly 35,000 benthic macroinvertebrates were collected from the nine sample sites (27 replicate samples) in regulated, partially-regulated, and unregulated reaches. Of the total number of macroinvertebrates collected, 8,794 individuals were identified, representing 182 taxa from 61 families and 21 taxonomic orders. Common taxa included the net-spinning caddisflies (*Hydropsyche occidentalis*, *Cheumatopsyche campyla*, and *Chimarra utahensis*), the mayflies (*Baetis tricaudatus* and *Acentrella insignificans*), the blackfly (*Simulium hippovorum*), the purse-case caddisfly (*Leucotrichia pictipes*), and the beetle (*Zaitzevia parvula*). Even though the total number collected in 2005 (i.e., nearly 35,000) was much lower than in previous years (e.g., over 84,000 in 2004), richness and diversity were generally higher in 2005.

Overall in 2005, samples from unregulated “reference” reaches and “fully-regulated” reaches characterized a similar benthic community in terms of richness and diversity, while the partially-regulated reaches were less rich and diverse than the other sites. It should be noted that a large variation in replicate metric values was found in 2005 in both regulated and unregulated sites, particularly for richness and diversity metrics, the two most important measures of ecological diversity. Also of note, richness and diversity measures were greater on average for all sites (unregulated and regulated) in 2005 than in 2002 or 2004. The 2005 increases in richness and diversity were more substantial at the regulated sites than at the unregulated sites. (Any comparison in values for 2005, 2004, and 2002 with years prior to 2002 and any between-year comparisons within the 1999-2001 data should be conducted with caution due to differences in the number and location of stations, in the sampling methods, and in sample processing that occurred during the 1999-2002 period.)

CSBP sampling in 2006 and in later years (i.e., 2009-2011 and 2014-2016) that is conducted will utilize the identical methodology (i.e., sample collection methods, laboratory procedures, and station locations/numbers) that was used in 2004 and 2005.

4.6 Fishery Habitat Monitoring Plan (Condition 11)

Two tributary monitoring efforts were conducted in 2005 in the tributaries targeted for habitat improvement efforts (i.e., Opapee, Milk Ranch, and Granite creeks). The efforts included: 1) adult rainbow trout spawner and redd surveys and 2) downstream migrant trapping. A third effort, downstream migrant trapping in three larger tributaries not targeted for improvement efforts (i.e., Chambers, Bucks, and Grizzly creeks), was not conducted in 2005 following ERC review of 2002 and 2004 results. The ERC agreed at

its July 20, 2005 meeting that trapping in the larger tributaries during normal and wet years like 2005 was not practical due to high water early in the season when a lot of downstream migrants move. Therefore, it was agreed that trapping in these larger tributaries would be attempted in the future only during lower water years (i.e., dry and critically-dry years). Details of the methods and results from the 2005 monitoring efforts follow. Draft report on spawner monitoring results of 2005 monitoring was provided to the ERC and Forest Service by letter dated March 17, 2006. The results of the downstream migrant trapping will be submitted to the ERC and Forest Service in April.

The main goal of the spawning channel improvement efforts is to increase recruitment of YOY trout from the tributaries into the main river. The channel improvement work was to be completed over the first few years of the new License, but modifications to the scope and schedule over the last three years proposed by the Licensee and approved by the ERC have postponed some of the efforts until improvements at other locations can be completed and evaluated for at least one year (Addendum to the Fishery Habitat Improvement Plan, FERC License Article 404 & Condition No. 10, submitted to FERC on October 13, 2004).

The initial habitat improvement effort within Granite Creek (i.e., the addition of 75 square feet of spawning gravel) was completed in September 2003, and a second improvement, construction of the Milk Ranch Creek spawning channel, is on schedule to be constructed over the spring and summer of 2006. Monitoring of the placed gravel in Granite Creek has been documented over the last three spawning periods (February-April in 2004, 2005, and 2006). The results of the 2005 use and the movement of placed gravel over the last three years are reported below.

Adult Rainbow Trout Spawner Surveys

A series of field visits to each tributary targeted for improvements (i.e., Opapee, Milk Ranch, and Granite) were conducted in the spring 2005 between the middle of February and the beginning of June. Due to the low level of brown trout spawning activity documented during the first two years of fall monitoring, it was agreed in early 2004, after review by the Ecological Resources Committee (ERC), that surveys for brown trout would not be conducted in the immediate future. However, it was also agreed that surveys would be reinstated if the results from other on-going fish population monitoring (i.e., backpack and barge electrofishing, snorkeling surveys, and angler surveys) indicate that brown trout populations in the main stem of the NFFR increase.

The spring surveys were targeted on rainbow trout. Observations for each site visit included: 1) an assessment of available passage at the tributary mouth and within the stream section immediately above the mouth, 2) number of adults moving into the stream or jumping/surfacing at the mouth, 3) spawning activity, 4) the presence and number of redds, and 5) a qualitative assessment of suitable conditions for making observations of fish and redds (e.g., water clarity, the amount of surface cover).

In 2005, bank-side observations of adult trout and spawning activity continued to be an effective technique in shallow riffle and calmer run/pool habitats that are present in the

surveyed sections of the target tributaries. The two smaller tributaries (i.e., Granite and Opapee creeks) surveyed in 2005 contained less surface turbulence and were easy to survey in this manner, while Milk Ranch Creek with higher flows and more turbulence was more difficult to survey.

Overall, the bank-side surveys in 2005 documented much lower numbers of adults than in 2004 passing the mouths and using the sections above the mouths of Granite and Opapee creeks. Unfortunately, the wet period in 2005 extended into April and May, and high flows in all of the tributaries made it more difficult to see adults during this time, especially with bank-side observations. The observed spawning activity that was documented was spread out over a longer time frame than in the past. In fact, some of the spawning activity later in the year may have been on top of sites used earlier, potentially impacting eggs/larvae in the redds. In Milk Ranch Creek, adults were observed only on two occasions: 1) three adults on March 14 at the downstream migrant trap site and 2) a single, large adult attempting to jump into the railroad culvert on May 3rd. Snorkeling in the upper pool was conducted on three occasions between March and the end of April, but no large adults were observed. It is not clear why more adult trout were not observed in Milk Ranch Creek this year, but the low numbers may have been due to potential blockage located about 40 meters from the mouth. In 2006, the passage up to the culvert pool should improve as the main flow has moved to a different channel and now skirts the potential blockage, whose channel is now a secondary channel. In addition, high flow in the winter of 2005/2006 has altered the channel significantly in this lower section of Milk Ranch Creek, and more gravels appear to be available in this section than in the past.

Granite Creek Gravel Addition (Adult Trout Use and Gravel Movement) - On September 23, 2003 gravel was placed in the short stream section between the campground road crossing and the Highway 70 crossing. Two weirs of medium and small boulders were first placed across the stream channel, above which gravel was spread out upstream of the weirs. At the time of placement, the dimensions of the two rectangular gravel areas were measured at 7' wide x 9' long and 9' wide x 12' long. The depth of the gravel averaged from 4 to 5 inches.

The movement of the placed gravel has been tracked over the fall and winter of 2003-2004, through the spring of 2004, and over the summer, fall, winter, and spring periods of 2004, 2005, and 2006. Starting with the first increase in flow during the fall/early winter of 2003, small portions of the gravel moved down into the stream section immediately below the downstream boulder weir. However, the majority of the material remained in place at that time. With periodic flow increases over the winter and into the spring and summer periods of both 2004 and 2005, more and more of the gravel was observed in the stream section below and a significant amount was found deposited in the main stem near the mouth. At this point in time (March 2006), all of the gravel has been moved downstream into the main stem, primarily due to extremely high tributary flows in late December 2005.

During the spring 2005 adult surveys, trout were observed on multiple occasions using a variety of sites including the gravel placement sites. A high of six spawning adults were

concentrated in this area during the March 31 site visit. Even though a large amount of the gravel moved downstream and into the main stem over the first two years, some of the gravel remained in place through 2005, and was utilized by spawning rainbows for the second consecutive year. Overall, the addition of gravel has been a success, as adults were observed spawning at the sites in both 2004 and 2005. In addition, adults were also observed in 2005 using gravel collected in the downstream migrant trapping sites located in the lower section below the campground road crossing.

Downstream Migrant Trapping

Tributaries Targeted for Improvements (Opapee, Milk Ranch, Granite Creeks)

Downstream migrant trapping was conducted in 2005 between May 31 and September 27 on the following three targeted tributaries: Opapee Creek, Milk Ranch Creek, and Granite creeks. The primary objective of the 2005 monitoring was to quantify the number and timing of young-of-the-year trout (YOY) migrating from the three tributaries targeted for improvements. The 2005 results provided measures of YOY production from Granite Creek in a second year following the addition of gravel in 2003 and measures of existing baseline production in Opapee and Milk Ranch creeks prior to channel improvement efforts. Rush Creek was also monitored during this time period in 2005 to document the recruitment of YOY (presumably a portion of which were produced by main river adult trout) to help assess the effectiveness of the Rush Creek fish ladder at passing adult rainbows.

During each week of the May-September monitoring period, the traps were installed and left in place to sample for a 48 hour period. The traps were revisited after 24 hours, so the fish from the first day could be collected and processed, the traps and the trap leads could be cleared of debris, and water temperature and stream stage could be recorded. At the end of the 48-hour sampling period, the traps were removed, and the remaining collected fish were identified and measured. Due to higher summer flows in 2005, overflow problems occurred more often in 2005 than in 2004. The overflow problems that did occur in 2005 were evident both during the early portion of the sampling period (e.g., in May and June) and in the late summer due to a heavy riparian growth and an early leaf fall. As in prior years, overflows were also more severe in the larger tributaries (i.e., Milk Ranch Creek and Rush Creek). The 2005 trapping efforts were initiated later in the year than in 2004 (May 31 in Opapee and Granite creeks, June 7th in Rush Creek, and July 19th in Milk Ranch Creek).

The 2005 results showed Opapee Creek as the highest producer of YOY rainbows of the three tributaries monitored, followed by Granite Creek, and then Milk Ranch Creek. Overall, however, the YOY recruitment for all of the tributaries were much lower than in 2004. High tributary flows in April and May likely forced some larvae produced from early season spawners (February/March) out of their redds prematurely, and probably disturbed or even destroyed eggs/larvae from late season spawners (April and May). The adult monitoring in 2005 noted fewer total spawners observed, but spawning occurred over a more extended spawning period.

In terms of the overall timing of downstream movement, the results showed that the highest levels of downstream movement during the first week of July for both Granite and Opapee creeks, with steady but lower numbers moving downstream through August and September. For Milk Ranch Creek, the early collections were affected by the higher flow levels and the site could not be efficiently sampled until mid-July. The highest numbers collected at Milk Ranch were during the first two weeks of effort, indicating that the sampling may have missed most of the early production.

The downstream migrant trapping that was completed in Rush Creek showed a very low number of YOY (6 total) moving down into the East Branch of the North Fork Feather in 2005. Because the 2005 trapping was started in early June (about the same time as in 2004), the extremely low numbers suggest that early summer high flows may have destroyed many of the Rush Creek redds in 2005.

4.7 Terrace Planting Monitoring Plan (Condition 13)

By letter dated February 23, 2006 the Licensee submitted the second annual Rock Creek – Cresta River Terrace Planting Report to the FERC. Terrace planting activities are ultimately planned at six locations on the Rock creek reach. Three of these locations were planted in early 2005 and were the object of late summer / fall monitoring in 2005. The remaining three sites will be planted at the time site improvements are made for spawning channels or river recreation access sites. At the three sites planted in 2005, a total of 294 willow, cottonwood and maple trees were planted.

Monitoring in 2005 showed survival rates of planted stock to be well below the targeted goal of 85% at all but one site. Primary factors were flood damage, both from seasonal high flows and recreation flows, and insufficient soil moisture (drought) at the more upland planting locations. Harsh planting conditions are typical throughout the targeted revegetation areas. It is unlikely that additional plantings at these sites would significantly improve total survival of individuals or contribute to recruitment of new mature age-class riparian trees in these areas.

4.8 River Sediment Monitoring Plan (Condition 15)

Results for the 2005 monitoring period are compared to the 2003 and 2004 monitoring results. Since there was no sediment promotion test in 2005, the results are representative of the natural variability in geomorphic conditions, with the exception of any local influences that were detectable and attributable to the gravel augmentation test performed in March 2005. It is noted that a sediment promotion test was conducted on January 1, 2006 when flows exceeded 20,000 cfs. The test is not discussed in this year's report, but will be described in the next year's annual data monitoring report.

Since no sediment promotion tests were conducted in 2004, and flows exceeded 10,000 cfs, one hundred cubic yards of river-run gravels were placed in Rock Creek and Cresta reaches in 2005. The gravel augmentation was implemented on March 9, 2005 in Cresta

Reach near Bear Ranch Creek confluence, and on March 25 in Rock Creek Reach near Rogers Flat. Shortly after gravel placement, a storm event peaked at 10,000 cfs occurred on May 19, 2005. This storm was sufficient to mobilize gravels and provided information to assess the efficacy of the gravel augmentation program. A field inspection was conducted on October 20, 2005 by ERC members. Most of the gravels placed in Rogers Flat site remained on the left bank channel margins, below the bankfull channel elevation, but well above the low-flow elevation where fish spawning would be expected to take place. It was decided and consequently recommended to and concurred by ERC that, in order to increase the likelihood of gravels dispersing into low-flow channel, the future gravel augmentation site be moved downstream a few hundred feet near the left pier of the abandoned Rogers Flat Bridge. Most of the 100 cubic yards of gravels placed in Cresta Reach below Bear Ranch Creek confluence were effectively transported downstream. Field observations detected only small pockets of gravel trapped between the lee and stoss of large boulder-cobble bed material near the left bank. This did not result in a net increase in spawnable habitat. The fact that nearly all placed gravels were transported downstream confirmed the earlier geomorphologic conclusion that NFFR has tremendous transport potential far exceeding sediment supply. For the future gravel augmentation program, it was recommended to ERC that remnant gravels perched along the left bank channel margins be collected by hand and directly place into pockets within the low-flow channel where there is suitable depth and velocity flow spawning. These placed gravels will be monitored during the following year's flow events to determine if they remain stable and therefore provide some increase in spawnable habitat.

Bathymetric survey was conducted in each reservoir within 500 feet upstream of the dam to determine if there is any significant change in sediment deposition from the previous years. Result of the 2005 survey indicated the bathymetry remained generally the same as previous years. The siltation level, as of September 2005, is about 4-8 feet below the invert of the 30-inch instream flow release inlet in Rock Creek and about 20 feet below in Cresta. A relatively symmetrical local flushing cone has been consistently observed within 75 feet of the Cresta Dam. The flushing cone is skewed toward the radial gate (near highway side) in front of Rock Creek Dam.

4.9 Recreation Streamflow and Pulse Flow Biological Evaluation (Condition 17)

4.9.1 Stranding and Displacement Study Results for 2005

Stranding Study Results

- No stranding studies were conducted in 2005.

Displacement Study Results

- No Displacement studies were conducted in 2005.

Issues/Findings/Recommendations:

- The ERC and FS are in the process of reviewing the three years of reports as well as peer reviews of these reports. It is likely that this process will continue although the ERC and Forest Service may reach interim determinations in regards to Condition 17 and the need for further studies. The status of the determinations on study results and actions that the ERC and Forest Service are pursuing are summarized in Section 8.

4.9.2 Foothill Yellow-Legged Frog Study Results for 2005

Overview:

Two rounds of surveys at the nine known breeding sites on the Cresta Reach (1a, 1d, 6a, 6b, 6c, 9a, 9b, 9d, 9e) were conducted in June and a third survey at five sites (1a, 1d, 6a, 9a, 9e) in early July. No surveys were conducted in the Rock Creek Reach due to lack of documenting any FYLF in all surveys conducted between 2002 through 2004.

June 2, 3 and 4, 2005 Survey

- During the June 2-3 surveys, a total of three egg masses were observed at three separate subsites (1a, 9a, and 9e). The egg mass at site 9e was laid while the survey was in progress on June 2. No other egg masses were observed; however, gravid females were observed at subsites 1a, 6a, 9a, 9b, and 9e.
- On June 4, a presence/verification survey was conducted at subsite 9a. During that survey, egg masses were still verified to be present in the reach and five new egg masses were also observed, along with one gravid and four spent female frogs.

June 14-15, 2005 Survey

- Ten new egg masses were observed during this survey effort at subsite 1a, two new egg masses at subsite 6a, and two new egg masses at subsite 9a. For both June surveys, a total of 22 egg masses were located within the Cresta Reach. Additionally, one gravid female was observed on subsite 6a and three males remained on subsite 1a.
- No tadpoles were observed during these surveys.

July 6-7, 2005 Survey

- A third round of surveys was conducted at those breeding sites documented to have egg masses during the June surveys (1a, 6a, 9a, 9e) on July 6 and 7, 2005 (within the 21-day window prior to the July 23 flow event). One additional subsite (1d) was also surveyed to fulfill the criteria of surveying a minimum of five sites, as described in the scope of work. No egg masses were observed at any of these subsites during the July surveys.

- A total of 14 tadpole groups at two of the five subsites (1a and 9a) were observed during this survey effort. Most tadpoles were located near egg mass oviposition sites, but many were dispersed. Habitat characteristics of tadpole locations were similar to previous years results, however, the maximum depth that tadpoles were observed exceeded observations made in previous years. Individual tadpoles were found as deep as 170 cm. During previous years, tadpoles had not been observed at depths greater than 50 cm, probably because snorkeling was not used during those earlier tadpole surveys.

Summary

- The number of egg masses observed in 2005 (22) was fewer than the number found during 2003 (28) and 2004 (31) surveys.
- The 2005 breeding season was initiated later in the season and extended for a shorter duration compared to observations made during previous years (2002-2004).
- In 2005, the first egg mass was laid on or about May 31 and the last egg mass was laid on or about June 9. By contrast, the date that egg masses were first laid during the previous three years ranged from May 8 to May 27 and the latest date that egg masses were laid ranged from June 2 to June 11.
- The late onset of breeding in 2005 may have been due to high flow levels during most of May, which apparently caused frogs to delay breeding.

Issues/Recommendations

- The ERC and FS are in the process of reviewing the three years of reports, 2005 limited surveys, as well as peer reviews of these reports. It is likely that this process will continue although the ERC and Forest Service may reach interim determinations in regards to Condition 17 and the need for further studies. The status of the determinations on study results and actions that the ERC and Forest Service are pursuing are summarized in Section 8.

4.9.3 Macroinvertebrate Study Results for 2005

Overview:

- No benthic sampling was conducted in 2005.
- Licensee contracted with a consulting firm to develop a white paper on the effects of pulse/recreation flows on benthic macroinvertebrates not addressed by the present study. The ERC and FS was provided a copy of this document for review and comment, and will help in the peer review process described below.

Issues/Findings/Recommendations:

- With the addition of macroinvertebrate data from the Belden reference reach through the CEC sponsored studies conducted in 2004, comparisons of all of the metrics will be possible. The CEC report is scheduled to be fully completed in early 2006, and it is expected that a full comparison with the 2004 data will be conducted by mid to late-2006. This analysis should help shed light on the impacts of recreation flows on the macroinvertebrate populations in the Rock Creek and Cresta reaches not only in 2004, but also with the data collected in 2003.
- The ERC and FS are in the process of reviewing the three years of reports as well as peer reviews of these reports. It is likely that this process will continue although the ERC and Forest Service may reach interim determinations in regards to Condition 17 and the need for further studies. The status of the determination on study results and actions that the ERC and Forest Service are pursuing are summarized in Section 8.

4.9.4 Turbidity Monitoring Results for 2005

Turbidity monitoring was conducted on June 26, 2005 and October 16, 2005 in the Rock Creek Reach. Turbidity, total suspended solids (TSS) (June event only), settleable solids, total and dissolved mercury (June event at Station RC3 only), and water transparency (black disc measurements) were monitored at two stations in the Rock Creek Reach, at NFFR immediately below Rock Creek Dam and at RC3 above Highway 70 bridge near Tobin.

Issues/Findings/Recommendations:

- The shape of the turbidity was similar to the previous measurement in 2003 and 2004. Peak turbidity levels measured in 2005 were at 13.9 NTU and 8.8 NTU during June and October events, respectively. These peak levels were lower than the previous years.
- Total and dissolved mercury concentrations were not detected above the applicable water quality criteria.
- The TSS, black disc and turbidity data were evaluated relative to the stress index models compiled by ENTRIX in the turbidity whitepaper entitled, “Agency Review Draft White Paper Turbidity and Suspended Sediment Effects on Salmonids and Aquatic Biota in Flowing System.” Based on the highest measurement levels, Newcombe’s water clarity model suggested a low-level (i.e., behavioral) impact. Newcombe and Jensen’s suspended sediment model suggested a low-level sublethal impact for adults and juveniles and mid-level sublethal impact for eggs and larval fish.

4.10 Recreation Monitoring Plan (Condition 21)

A report on the results of the recreational boater use monitoring for 2005 was provided to the ERC and Forest Service by letter dated February 3, 2005. Also included in the February 3, 2005 letter was a summary report on the 2002 to 2004 recreation visitor surveys and observation data. In addition, a creel census was done under the Fishery Monitoring effort (Condition 7) discussed above that provided information on fishing recreation.

During recreational flow days counts were made to determine the number of boaters using the flow releases. One boater day is considered one person using the reach during any portion of the day no matter how many trips that person may take. This presents logistical challenges to avoid double counting boaters that may be making multiple trips. American Whitewater collected the number of boaters using a roster and issuing wrist bands. These estimates were also verified by observers stationed at certain locations to collect boating use data. The final use estimates are summarized in the following table. All use numbers except for June and July on the Rock Creek reach exceeded the use triggers under License Condition 16.

2005 Recreational Flow Use Estimates

| Month | Cresta | Rock Creek reach |
|--------------|---------------|-------------------------|
| June | NR | 47 |
| July | 83 | 102 |
| August | 214 | 262 |
| September | 253 | 251 |
| October | 155 | 186 |

4.11 Noxious Weed Management Plan (Condition 27)

FERC's December 12, 2003 order approved the Noxious Weed Management Plan and required that initial weed surveys be conducted during the summer of 2004. These surveys were actually completed in 2003 and a report was prepared and submitted to the Forest Services for review by letter dated March 9, 2004. The Forest Service Provided comments on December 15, 2004 and a report was filed with the FERC by letter dated December 29, 2004. The report includes proposed treatment measures and proposed that a noxious weed workshop be held with the Forest Service in 2005 to discuss treatment options appropriate for USA lands and to develop a specific treatment plan to be implemented in 2006 (see discussion in Section 5.11).

A meeting was held between Licensee and the Plumas National Forest in January of 2005 to discuss a process for implementation of the noxious weed control work. A workshop, possibly involving representatives from other National Forests in addition to the Plumas Forest was discussed. To date, no further action on this has been taken. Licensee has nearly completed work on development of a project description to send to the Plumas Forest describing the extent, schedule and methods proposed for weed control within the

Project area. This description will be issued to the Forest for review and comment in early April or May 2006.

5.0 MONITORING PLANNED FOR 2006

Monitoring during 2006 will be conducted in accordance with the requirements specified in the various resource plans, subject to adjustments that may be made by the ERC AND Forest Service. Any adjustments or changes to be implemented in 2006 are included in the summaries below.

5.1 Water Temperature Monitoring Plan (Condition 4C)

For 2006, continuous temperature recorders will be placed at 52 stations on the North Fork Feather River and one reference station of the Middle Fork Feather River. Temperature profiles will also be taken in Lake Almanor and Butt Valley Reservoir. Recording devices will be in place from June 1 (or as soon thereafter as possible if the dams are spilling) until September 30, except for NF56 and NF 57 where data collection continues until October 31. 2006 monitoring data will be included in the data report to the ERC in early 2007.

In addition to the above data collection, Licensee will continue to monitor telemetered temperature data from NF 56 and NF 57 so that the notification requirements of Condition 4 can be met.

License Condition 4.C provides that water temperature monitoring results will be submitted to the FS and ERC on a weekly basis in dry and critically dry years and on a bi-weekly basis in normal and wet years in 9 of the first 15 years of the license. This effort was not undertaken in 2002, 2003, 2004, or 2005. ERC decided at its January 18, 2006 meeting that this increased monitoring would also not be pursued in 2006.

5.2 Fishery Monitoring Plan (Condition 7)

Three separate fish monitoring elements are scheduled to be conducted in 2006 including: 1) backpack electrofishing in riffle and glide habitats, 2) snorkeling surveys, and 3) angler surveys. As discussed earlier, the barge electrofishing in large pools completed in earlier efforts, will not be conducted for the second consecutive year in 2006. The three 2005 efforts will be repeated with no changes instituted for 2006. In 2006, angler surveys will purposely not be done during white water weekend events. Separate angler surveys were completed during the 2005 recreation flow weekends, but the data and its analysis were isolated from the regular annual angler surveys.

For all three fishery monitoring efforts, the methodologies are now established and accepted in final form, so the results will be more useful for comparison with future replicated efforts over the term of the monitoring period (2005-2016).

5.3 Macroinvertebrate Sampling Plan (Condition 9)

Under the Macroinvertebrate Study Plan, the CSBP macroinvertebrate sampling is currently planned for 2006, 2009, 2010, 2011, 2014, 2015 and 2016. This sampling will

be based on the basic procedures described in the California Stream Bioassessment Protocol (CSBP), but will also follow the specific detail established during the 2004 and 2005 sampling efforts, including sample collection, sample processing, and data analysis. The annual information will continue to provide added information on large and rare specimens; while, at the same time, data sets that can be compared directly with other CSBP data sets from other river systems.

5.4 Fishery Habitat Monitoring Plan (Condition 11)

The monitoring of adult rainbow trout and redds in the target tributaries will be continued in 2006 following the same bank-side and snorkeling methodologies that were used in 2005. Monitoring of these tributaries in the fall for brown trout spawning will not be conducted in 2006, as was the case in 2004 and 2005.

Downstream migrant trapping will be repeated at the three channel modification tributaries (i.e., Opapee, Milk Ranch, and Granite creeks) in 2006. The downstream migrant trapping at the Opapee and Milk Ranch sites will provide a fourth year of pre-project YOY production to assess channel improvement efforts, and the trapping at Granite Creek will provide a third year of post-project monitoring. Gravel was placed in Granite Creek in September of 2003 in compliance with Condition 10 of the License. Based on the use of the placed gravels and the movement of gravel out of the placement sites over the last two years, the ERC needs to make a recommendation in 2006 whether to add more gravel or not to Granite Creek.

Downstream migrant trapping on Chambers, Bucks, and Grizzly creeks is also scheduled for 2006, but will likely not be done due to anticipated high tributary flows in the spring and early summer of 2006. This trapping effort on the larger tributaries is scheduled for the years 2006, 2009-11 and 2014-16 in coordination with the main river fish population monitoring. The Licensee has recommended that the value and extent of these efforts be reviewed each year by the ERC and Forest Service prior to each year's effort due to the inability to sample these sites early in the season.

5.5 River Terrace Planting Monitoring Plan (Condition 13)

Plantings were completed in early 2005 and were maintained and monitored monthly during 2005. The second annual progress report was received from Licensee's consultant in November 2005 and was forwarded to the FERC in February 2006. Monitoring will continue quarterly and annual reports will continue to be submitted to the FERC for four more years.

5.6 River Sediment Monitoring Plan (Condition 15)

Spill flows of exceeding 20,000 cfs were experienced below Rock Creek and Cresta dams in January 2006. A sediment promotion test was conducted according to the Drum and Radial Gate Operating Plan (Condition 14) from early morning on January 1, 2006 until the evening of January 2 when flows dropped below 20,000 cfs. Peak flows during the

storm are estimated at approximately 45,000 cfs. In compliance with River Sediment Management Plan (Condition 15), field monitoring and full scale reservoir bathymetric surveys are planned for the summer of 2006. No gravel placement test is planned for 2006. The results of this monitoring will be described in the next annual report.

5.7 Recreation Streamflow and Pulse Flow Biological Evaluation (Condition 17)

5.7.1 ERC Evaluation Schedule Plan for 2006

During 2005 the Licensee, with the ERC and the FS, produced several documents evaluating the recreation streamflow and pulse flow studies. These documents consist of the 2002-2004 recreation streamflow study results and the 2005 biological study whitepapers summarizing the results and providing recommendations for future studies and releases. The licensee also coordinated, with consultation from the ERC and FS, a peer review of the studies of the recreational streamflow releases conducted over the past three years. Section 9 provides a discussion on the current status of the decisions based on the study results. FERC's August 25, 2004 order approving the Condition 17 study plan requires that a final report be submitted to the Commission by May 31, 2007.

5.7.2 2006 Monitoring Effort

Overview

Proposed 2006 recreation and pulse flow biological investigations are largely predicated upon findings, rationale, and data gaps that may be identified by the ERC. The Licensee had provided its assessment in a summary document titled *Condition 17 Recreation and Pulse Flow Biological Evaluation Findings and Initial Determination*, dated January 18, 2006. ERC comment and guidance provided during the October 19, 2005 ERC meeting has also been incorporated into the planned 2006 Condition 17 investigations. The following is the currently envisioned monitoring.

Proposed 2006 FYLF Monitoring Investigations

- The Licensee is in the process of developing a revised FYLF study plan with the FS for evaluating the number of egg masses at previously monitored sites in both the Cresta reach and Poe reach (as a reference) for the entire breeding season, late April through mid-June.
- VES and Snorkeling Surveys for egg masses for both reaches will be conducted per study methods used in 2003-2005.
- Egg mass observations will include determination of incomplete fertilization and/or the presence of the fungus *Saprolegnia*.
- During egg mass VES and Snorkeling surveys the presence and numbers of tadpoles and adults will be noted.

Proposed 2006 Turbidity Monitoring Investigations

- Based on the previous monitoring results, site specific conditions during natural and uncontrolled spill events, and the whitepaper developed in 2005 no additional studies are recommended.

Proposed 2006 Benthic Macroinvertebrate Investigations

- No additional reach specific study is recommended.
- Macroinvertebrate sampling using CSBP methodology will be conducted in 2006 under condition 9, and as scheduled under Condition 7 through 2016. The results from this effort may be used as a screening tool to alert us to a short-term problem with the macroinvertebrates in the Project reaches, but cause and effect will be difficult to establish based on one sampling event per year. This survey was not specifically designed to assess impacts of pulse and recreation flows; rather, the macroinvertebrate surveys were set up to help assess longer term impacts of base flow adjustments during the first 15 years of the License.

Fish Displacement

- No further study of fish stranding and displacement is proposed with the existing flow schedule and ramping rates for 2006.
- If the ERC and FS elect to add recreation flow day(s) to the existing schedule, a screening assessment for stranding at one high risk site per reach, during June and July 2006 (or whichever year the day(s) are added) will be conducted to address remaining concerns related to fish stranding.
- Fish population surveys will be conducted in 2006 and as scheduled under Condition 7 through 2016. The results from this effort and the attainment of the fish population criteria listed in the Settlement Agreement may be used as a screening tool to alert us to a short-term problem with the fish populations in the Project reaches, but cause and effect will be difficult to establish based on one sampling event per year. These surveys were not specifically designed to assess impacts of pulse and recreational flows; rather, the fish population surveys were set up to help assess longer term impacts of base flow adjustments during the first 15 years of the License.

5.8 Recreation Monitoring Plan (Condition 21)

As was previously noted, 2005 recreational use reached the triggers for potentially adding flow days in the months except June and July on the Rock Creek reach. In order for these days to be added the ERC and Forest Service must first reach a determination of positive, neutral, or no significant adverse effects under License Condition 17. As part of the discussions focused on reaching a determination the ERC is considering fixing the level of flow days for the next several years. If this proposal is adopted, counting of recreational use in 2006 will not be required. If discussions break down, the Licensee

proposed that counting of recreational use not be conducted in 2006 since the previous use data has shown fairly consistent use levels about the trigger amounts and the Licensee would not dispute the addition of flow days in 2007 if the ERC and Forest Service reach a determination under License Condition 17. However, use in the Rock Creek reach early in the season may be appropriate since the 2005 use in June and July did not meet the triggers.

Recreational user surveys were conducted in the period 2002 through 2004, and a summary report submitted to the ERC in early 2006. It is proposed that user surveys not be continued in 2007. However, creel census surveys will continue as provided under Condition 7.

5.9 Noxious Weed Treatment (Condition 27)

The Rock Creek – Cresta Noxious Weed Control Monitoring Program baseline survey results were filed with the FERC by Licensee's December 29, 2004 letter. On March 13, 2005, the Licensee met with the Forest Service to begin discussion of possible treatment options. It was agreed that control efforts on some species are not required. These species would likely include bull thistle, cheat grass, Klamathweed, common mullien, and blackberry. The Forest Service agreed to work with the Licensee to develop a list of appropriate target species for treatment. The Licensee and Forest Service would then develop a project description for the treatment-phase of work over the next six months. The Project description would be used, along with other specific information on local area natural resources, to document the proposed weed control work including methods, scope and schedule of weed control activities on National Forest System Lands. On another Forest in California it was determined that a NEPA analysis was not required in view of the recently issued FERC license but that a specific biological assessment was necessary and this approach is thought to be appropriate here. The project description is nearing completion now and is expected to be ready for review by the Forest Service in April 2006. The Licensee noted that it would proceed with treatment of species that may exist on its property within the weed control program area beginning in 2006. The Forest Service also noted that it would suggest that a quick survey be conducted every two years on disturbed areas to see what changes have occurred for targeted species. Licensee conducted noxious weed awareness training in August and September of 2005 for its hydroelectric operations staff, system-wide as part of a required program of environmental training for employees..

6.0 STATUS OF PROJECT RELATED IMPROVEMENTS, ENHANCEMENTS, AND DECISIONS

6.1 Water Temperature Control Measures (Condition 4D)

By letter dated July 28, 2005, the Licensee filed a report with the FERC titled “Rock Creek – Cresta Project, FERC Project No. 1962, License Condition 4D Report on Additional Reasonable Control Measures”. This document was commissioned by Parties in the Project 2105 licensing process, and had not been reviewed or approved by the ERC as a Rock Creek – Cresta work product prior to Licensee filing. As the result of a dispute resolution process within the ERC, it was determined that characterizing this report under License Condition 4D was premature and the contents do not fully satisfy the requirements for compliance with Condition 4D. A further letter of clarification (Attached as Appendix E) was filed on September 19, 2005. The report was amended and represents only a study and informational report in water temperature monitoring and control measures on the North Fork Feather River. As was noted in the last Annual Report, in November 2004 the Licensee issued a statement that it does not anticipate recommending the Prattville modifications. Consideration of alternatives to the Prattville modifications is continuing with the Project 2105 relicensing forum and will also be evaluated as part of the California Environmental Quality Act environmental review for the 401 certification effort for that Project. At its October 19, 2005 meeting the ERC decided that it will not, as a group, submit recommendations.

6.2 Ramping Rate Study (Condition 5.E.6)

At its meeting on May 18, 2005 the ERC accepted a paper on initial findings and determinations concerning ramping rates based on the study effort conducted primarily under License Condition 17. A copy of this paper is included as Appendix F. This paper noted that should additional, specific ramping rate studies be recommended by the ERC and FS, a study plan will be submitted to the FERC by May 31, 2006. Although the ERC has not concluded its evaluations and decisions under License Condition 17, the need for such further specific ramping rate studies has not been identified.

6.3 Fishery Habitat Improvement Plan (Condition 10)

Consistent with the requirements of Condition 10, a Fishery Habitat Improvement Plan was filed by letter dated April 21, 2002. The Licensee’s November 23, 2004 letter to FERC requested modification and extension of time in regards to the Plan. By letter dated June 2, 2005 the USFS provided the FERC with a revised 4(e) Condition text acceptable to the USFS. FERC issued an order modifying Condition 10 on July 20, 2005. The following summarizes the status of the four elements of License Condition 10.

1. Granite Creek Spawning Gravel Enhancement – Spawning gravel was placed in Granite Creek in September 2003. The downstream movement of the gravel was observed in 2005. In addition, adult rainbow trout have been observed in both 2004 and 2005 utilizing the gravel that remains in place at those sites for spawning.

Continued observations will be made through the spring of 2006 during the monitoring program outlined in the Fishery Habitat Monitoring Plan. No further action on the spawning gravel is anticipated at this time. However, the reintroduction of more gravel may be considered at a future date.

2. Rock Creek Weir Removal – Based on the difficulty of removing the weir, the cost of constructing and maintaining a fish passage facility and the limited spawning habitat available upstream of the weir, the Licensee proposed deletion of this requirement from the Project License in its November 23, 2004 letter to FERC. The FERC granted this request by order dated July 20, 2005. The removal of the weir and potentially other issues related to the Settlement Agreement has given rise to a dispute resolution process that is currently ongoing.
3. Spawning Channel at Milk Ranch Creeks – The Licensee has retained a consultant to design and construct the spawning channel and has secured all necessary permits with the exception of the Water Quality Certification. In late 2005 the State Water Resources Control Board did agree that work on the middle portion of the channel could commence prior to the issuance of the permit since it would be constructed in the “dry”. Winter weather has precluded any significant construction. The revised 4(e) language adopted by the FERC’s July 20, 2005 order states “Unless otherwise agreed to by the ERC and the Forest Service, the spawning channel shall be constructed by November 30, 2005. Due to the delay in the issuing of the permit, this channel was not completed by the anticipated 2005 date. However, the ERC has not yet agreed on a revised completion date. The Licensee is prepared to start construction as soon as the water quality certification is received. This permit is anticipated within the next month, in which case the construction will be completed by the fall of 2006.
4. Spawning Channel at Opapee Creek – The ERC had previously agreed to focus on the Milk Ranch Creek channel first and not pursue the Opapee Creek channel until at least one year’s experience is obtained on the successful operation of the Milk Ranch Creek channel. The FERC’s March 7, 2006 letter responding to issues raised by the California Sportfishing Protection Alliance also requested that the Licensee address the feasibility of completion of the Opapee Creek channel by November 30, 2007. Due to the delay in the completion of the Milk Ranch Creek channel, the Licensee is proposing that the initial design work on the Opapee Creek channel begin this year and that the permit process begin in the fall of 2006. This will leave the option open to construct the channel in the summer and fall of 2007 if the initial experience gained on the Milk Ranch Creek channel is positive and the ERC decides it is prudent to commence the construction of the Opapee Creek channel. If the ERC decides that additional time is needed to assess the effectiveness of the Milk Ranch Creek channel prior to starting construction, the Licensee will provide a further update in the annual report submitted in May of 2007.

6.4 Gravel Movement and Placement (Condition 14)

During a storm event in late December 2005 and early 2006 flows in the North Fork Feather River in the vicinity of the Project reached approximately 45,000 cfs. This provided an opportunity to initiate the sediment transport promotion test specified under the Drum and Radial Gate Operation Plan (Condition 14). The drum gates at both Rock Creek and Cresta Dams were fully lowered from the early morning of January 1, 2006 until the evening of January 2, 2006 when flows receded to 20,000 cfs. As a result of the initiation of this test, the placement of gravel that was deferred from 2005 was cancelled.

6.5 Effects of Recreational and Pulse Flow Releases and Status of Final Report (Condition 17)

In the fall of 2005 the ERC began discussion of whether the recreation and pulse flows had a positive, neutral or no significant adverse effect as required under License Condition 17. The Licensee prepared a major summary report of all study work to date plus whitepapers prepared on turbidity effects and the effects on Macroinvertebrates and Fish. The initial draft of this document was provided to the ERC members by letter dated May 12, 2005. A final complete document on CD was provided by letter dated January 23, 2006. Reports from several peer review experts were obtained in the fall of 2005. In January and February of 2006 ERC members shared the results of their individual data assessments. During meetings in March 2006 the ERC proposed a number of possible recreational flow proposals for 2006 that might allow a favorable determination under Condition 17. The California Hydropower Reform Coalition (representing the interests of the non-governmental groups that are part of the ERC) provided a proposal that included recreational flow for all projects on the NFFR, including Project 1962, 2105 and 2107. Although discussions within the ERC are continuing, the ERC has not reached mutual agreement on a proposal that includes a determination under Condition 17. As a result, a decision on additional recreational flow days has not been reached.

FERC's August 25, 2004 order approving the Condition 17 study plans requires the submission of a final report by May 31, 2007. If the ERC is able to reach a mutual agreement on a proposal that resolves the decision under Condition 17, PG&E will begin the preparation of the final report to the FERC. If the final proposal includes items that require a license amendment, PG&E will initiate actions to seek such amendment. If the ERC is unable to reach mutual agreement it is anticipated that the ERC may seek assistance under the ADR process under the Rock Creek – Cresta Settlement Agreement or seek assistance in other appropriate forums. In any event, PG&E currently believes that this matter can be addressed and the final report completed by May 31, 2007.

6.6 River Access Management (Condition 19)

As required under License Condition 19, a River Access Management Plan was filed with the FERC by letter dated April 30, 2003. Under this plan the highest priority improvement is the development of river access at a location known as the Rock Creek Bench just downstream of the Rock Creek Dam. This site would provide parking and

sanitation facilities. The engineering cost was estimated at \$500,000 for this development. Since the funding available under License Condition 19 is only \$300,000, additional outside funds will be required to accomplish the development of this site. Plumas County suggested to the ERC that a grant under California Proposition 40 might be a possible option. The Licensee worked with the County to complete an application and it was submitted to the State on December 10, 2004. Unfortunately, this application was not successful and no further progress has been made on this matter.

6.7 Rock Creek Turbine Upgrades (Article 302)

FERC's November 17, 2003 order granted an extension of time for commencement of the efficiency upgrades at the Rock Creek Powerhouse until October 23, 2005. By order dated December 20, 2005, the FERC granted an extension of time until December 31, 2007. The order also requires that the Licensee provide the FERC with final contract plans by October 31, 2007.

7.0 OTHER ITEMS OF INTEREST

7.1 Humbug Valley (Settlement Agreement Appendix B.III.1)

During 2002, Licensee completed high-resolution orthorectified aerial photography of the Humbug Valley. In 2003, the aerial imagery was incorporated into a mobile GIS platform utilizing ArcPad 6.0.3 software (ESRI ©). Other background layers including USGS topographic Quads, roads and a Licensee parcel boundary were also included in the GIS. The platform was then further enhanced with inclusion of custom designed electronic data forms that allow capture of geo-referenced information covering a broad range of resource management categories including sensitive wildlife, sensitive plants, noxious weeds, aquatic sampling, photo-monitoring and more. In addition, Licensee incorporated into the GIS database, existing information on known sensitive plant locations in the Valley, based on work performed under contract in 1998. A total of 21 populations representing 5 different species were mapped. Habitat capable of supporting willow flycatcher, a Forest Sensitive and State listed threatened species known to breed in the Valley, was also mapped using the aerial coverage and incorporated into the database as additional geo-referenced polygon features. These habitat areas correspond to the distribution of large stands of willow shrub vegetation and occur north and south of Humbug Road. Three additional areas were mapped, two in the northern half of the Valley and one in the southern half, that were previously identified as areas where stream channel restoration work might occur.

In 2004, the ERC discussed pursuing a contract with Plumas Corporation/CRM to propose and pursue enhancement/restoration measures in Humbug Valley. After some delays and uncertainties in 2004 and early 2005 related to next steps for the Valley, it was decided to meet with the Plumas Corp. on-site in August 2005. Following the August site visit with representatives from Plumas Corp. and others from the ERC and FS, the potential effort for initial work in the Valley was refined to focus primarily on the upper headcut areas. The Licensee is currently in the process of finalizing a contract with the Plumas Corporation to evaluate three specific levels of stream channel intervention in this headcut area. The assessment will be completed during the summer of 2006, with estimated costs for the three alternatives being developed by the end of the year. The extent of the eventual measures will be determined based on the amount of money identified under the Settlement Agreement for mitigation of livestock-related impacts (no longer necessary due to the Licensee's decision to eliminate cattle grazing).

Also in 2005, a draft Resource Management Plan (a required element within the SA) was assembled by the Licensee and distributed to the ERC for comment. This document is essentially in outline form and contains within its appendices the related assessments and study efforts completed to date in the Valley (e.g., the 2002 and 2003 mapping efforts referenced above, the draft Humbug Valley Monitoring Program, and CalTrout's Yellow Creek Stream Assessment). Comments were received on the first draft during the December 2005 ERC meeting. A revised plan that is more focused on Licensee lands in the Valley is being finalized and will be reissued for further comment to the ERC, the FS, others (i.e., tribes) in 2006. Future long term management of Licensee lands in Humbug

Valley will most likely be determined, to some degree, by the Land Stewardship Council, but the Resource Management Plan will hopefully provide a useful framework in the interim and in the future.

7.2 Rush Creek Fish Ladder (Settlement Agreement Appendix B.III.5)

Under Appendix B, Section III.5 of the Rock Creek – Cresta Settlement Agreement, PG&E agreed to maintain the existing fish ladder located at the Highway 70 crossing of Rush Creek. This fish ladder incurred significant damage during the 2005/2006 New Year's Eve storm event, and is no longer operating. The lower 15-ft portion of the wooden ladder has broken away from its connection and has moved about 30 meters downstream and is resting in the middle of the channel. Over the last few years the maintenance activity has consisted of opening and closing the top end of the ladder prior to and after the trout spawning migration periods, and also performing some minor construction and repairs to the ladder itself during this time period.

In early February the Licensee and Mr. Mike Kossow of Meadowbrook Consulting (the ladder's original designer and current operator) visited the site and determined that making a temporary repair in time for this year's adult rainbow trout migration period (starting in March and/or April of 2006) was not practical considering the level of damage, the existing water levels, the impending snow melt runoff flow period, and the permitting that would be required for any instream work, especially for potential concrete work in the channel. A follow-up site visit was conducted later in February with Caltrans and the USFS to further review the current condition of the ladder and to start discussing options for repair/replacement options. Potential fixes that were discussed at the meeting were: 1) repairing the existing ladder with a new wood section at the lower end, 2) replacing the whole ladder or perhaps just the lower portion with a new concrete ladder/section, and 3) filling in the area below the road crossing with boulder/rock fill to bring up the grade. A final solution has not yet been proposed.

8.0 PROPOSED CHANGES IN PROJECT OPERATION NOT REQUIRING FERC APPROVAL

A few changes and adjustments in the monitoring effort are proposed for 2006. The applicable monitoring plans have the flexibility to accommodate these changes subject to consultation with the ERC and FS. These changes have been discussed in the above section on monitoring for 2006.

8.1 Recreation Streamflow and Pulse Flow Decision and Final Report

As noted in Section 6.4, during 2005 the ERC and FS engaged in frequent discussions on the results of the Condition 17 studies and whether a determination could be made of positive, neutral or no significant adverse effects. As of April 14, 2006 the ERC had not reached consensus. It is unknown at this time whether a final proposal with mutual agreement by all ERC members will contain any provisions that might require changes to Project operation, amendment of the Project 1962 license or otherwise need FERC approval.

9.0 PROPOSED CHANGES IN PROJECT OPERATION REQUIRING FERC APPROVAL

As noted under Section 8.1, at the present time the Licensee does not anticipate any changes to project operation that will require FERC approval. However, minor license amendments may be required to allow for changes in schedules and other minor adjustments.

Appendix A

ERC Review of Draft Annual Report

A draft of the Annual Report on Rock Creek – Cresta 2005 Operations was provided to the ERC members by letter dated April 18, 2005. A copy of the transmittal letter is included in this Appendix A. The ERC discussed the Draft Annual Report at its meeting on May 17, 2006. A revised Section 6.5 Effects of Recreational and Pulse Flow Releases and Status of Final Report was proposed to reflect the current status of discussions. The results of the 2005 water temperature monitoring (contained here in Appendix B) were provided to the ERC members by letter dated March 17, 2006.

Comments provided by the Forest Service and ERC members included the following:

- 1) The SWRCB provided revisions to Section 6.1 Water Temperature Control Measures. These were incorporated into the final report.
- 2) CSPA questioned the accuracy of the hours and angler success reported in paragraphs 1 and 2 on page 11 of the draft “Annual Report on 2005 Operations”. CSPA expressed concern that the data provided indicated that the fisherman apparently only fished for less than two hours and in his experience, that this was not reasonable. The data in the original report, “2005 Angler Creel Survey: Rock Creek – Cresta Project (FERC No. 1962) North Fork Feather River”, was reviewed and the data presented in the draft “Annual Report on 2005 Operations” is correct. The reason for the relatively low number of hours fished by the anglers (approximately 1.6 hours) is because the surveys are conducted as fisherman are encountered, and not at the end of their fishing day. Consequently, these data only represent the number of hours fished and fish caught at the time of the survey, and not all of the hours fished or fish caught. The survey methodology is consistent with all past year’s survey efforts, and therefore allows for consistent comparisons between different years results.
- 4) The USFS commented that the electrofishing conducted under Condition 7 (Section 4.4) requires a significant reduction in instream flow for several days. When the flow schedule is increased next year this will create larger difference between the normal instream flow and the reduced flow for monitoring. The USFS suggested the ERC consider other monitoring methods (such as snorkel surveys) in the future that might replace the electrofishing.

Appendix B

Rock Creek - Cresta Ecological Resources Committee Meeting and Study Session Notes

January 20, 2005
February 17, 2005
March 16, 2005
April 20, 2005
May 18, 2005
June 15, 2005
July 20, 2005
August 30, 2005
September 21, 2005
October 19, 2005
November 16, 2005
January 18, 2006
February 15, 2006
March 1, 2006
March 15, 2006
April 19, 2006

Appendix C

Rock Creek - Cresta Ecological Resources Committee Protocols

6/8/05 ERC Groundrules

6/6/04 Public Participation Protocols

7/30/02 Meeting Protocols

Appendix D

Rock Creek Cresta Project

Results of 2005 Water Temperature Monitoring Report

Appendix E

September 19, 2005 Letter to the FERC
Clarification of Report on Water Temperature Measures

Appendix F

Rock Creek - Cresta Ecological Resources Committee

Condition 5.E.6 Ramping Rate Study
Initial Findings and Determination
April 13, 2005 – Revised 4/22/05

Condition 5.E.1 and 6 Ramping Rate Study
Initial Findings and Determination
April 13, 2005 – Revised 4/22/05

OVERVIEW

Basic Ramping Rates specified by the Rock Creek-Cresta Project FERC 1962 License Condition 5.E.1 have been evaluated during three years of study. Initial findings and determinations summarized herein are based upon said study effort, an assessment of release and gaging facility design limitations, and peer reviewed literature that assesses potential effects of ramped flows upon aquatic biota.

ERC AND FOREST SERVICE INITIAL DETERMINATION

A specific ramping rate study to evaluate the potential to mitigate adverse effects of existing ramping rates upon stream biota is not recommended at this time. Although a specific ramping rate study is not recommended at this time, a literature review of the effects of ramping rates upon aquatic biota is currently being conducted by the Licensee. In addition to the literature review, a peer review panel will be formed to, in part, address any issues concerning the effects of ramping rates on the Project reaches.

A final decision regarding the possible need for a specific ramping rate study will be made after the ERC and FS complete their review and evaluation of the initial three years of study data and the literature review, and receive guidance from a peer review panel. The decision will be submitted to FERC no later than March 2006. Should any additional, specific ramping rate studies be recommended by the ERC and FS, a study plan will be submitted to FERC by May 31, 2006.

BACKGROUND

Condition 5.E.1 and 6 requirements

1. Basic Ramping Rates. During periods when ramping can be controlled, the following will be the initial Ramping Rates during the first three years after acceptance of the new license. These rates will be followed as close as reasonably practicable given radial gate operating limitations. Revision to these rates may occur as the result of the monitoring plan as provided under item E.6 below. Water to accommodate future adjustments to Ramping Rates as applied to controlled Pulse Flow releases shall be made up from the total volume of water for such Pulse Flows, or Minimum River Flows.

March, April and May - 250 cfs/hr. up-ramp and 150 cfs/hr. down-ramp
June 1 - June 15 - 300 cfs/hr. up-ramp and 150 cfs/hr. down-ramp
Remainder of the year - 400 cfs/hr. up-ramp and 150 cfs/hr. down-ramp

6. Ramping Study. The potential affects associated with Ramping Rates will be evaluated in connection with recreation and Pulse Flow releases, as described in Condition 17. This study shall include a minimum testing period of three years. If during this period the ERC and Forest Service determine that changes are needed to the initial level of the basic Ramping Rates, Licensee will submit to the Commission revised Ramping Rates as soon as practicable.

CONSIDERATIONS FOR INITIAL DETERMINATION

The following information was taken into consideration for the initial determination regarding the need for a ramping rate study:

1. Condition 17 Recreation and Pulse Flow Biological Evaluations

Absent a finding by the ERC and FS of significant adverse ecological impact, as stipulated by License Condition 16 E and Condition 17, any consideration for adjustments to the Basic Ramping Rates stipulated in License Condition 5.E.1 would be premature, and could not be justified.

2. Facility Design Limitations

Even if a finding of “unacceptable adverse ecological impacts” (Cond 16E) was determined upon completion of the review of the initial three-year data set, release and gaging facility design limitations do not provide for stepped releases of finer gradation than those specified in the Basic Ramping Rates, listed above.

Pacific Gas and Electric Company operations and water management staff have conducted extensive evaluations of release and gaging facilities and have implemented extensive automation upgrades to existing release facility controls in an effort to meet the Basic Ramping Rate targets as closely as possible.

Though no finer gradation of stepped releases can be made or measured with existing release and gaging facilities, specified Basic Ramping Rates could potentially be applied over a longer period (e.g., incremental adjustments made every two hours vs. every hour). However, this will not achieve the basic ramping rate study objective of providing smaller incremental changes per time (at least as a function of any given step) and will result in significantly truncated recreation flow releases at the specified flow levels for any given month. Further, as explained in Additional Considerations, below, a slower ramping period generally will not effectively mitigate for potential ecological impacts that are triggered by shear stress, this being largely a function of flow magnitude, timing, and duration, not rate of change.

3. Ability to Conduct a Study of Ramping Rates

As previously presented to the ERC and FS, Pacific Gas and Electric Company technical specialists are uncertain if a suitably controlled field study could be designed and implemented to assess differential ramping rate effects upon stream ecological resources. Several factors contribute to this uncertainty. Gaging and release facility design limitations introduce a wide ranging variance into incremental (stepped) releases and the considerable potential “overlap” in steps would confound interpretation of results. Further, isolation and interpretation of inter-annual variability in response variables (e.g., turbidity measures) would be impossible to assess, absent suitable controls. Though suitably controlled laboratory studies could be designed and conducted, applicability of results could be questioned.

Absent a suitably controlled study, interpretation of results would be subject to criticism or dispute and the cost to conduct such a study would not be justifiable.

Additional Considerations

Rationale for Ramping Rates - Generally speaking, stepped up-ramping has been specified to address public safety concerns, whereas stepped down-ramping has been primarily specified to mitigate the potential for fish stranding.

Physical Processes Governing Impacts to Aquatic Biota - Available literature, data collected during the initial three years of study, and study of unplanned events (e.g., emergency flow reductions) indicate that the potential for ecological impacts resulting from recreation flow releases or other “pulsed” flow releases is driven primarily by the specific magnitude, frequency, timing, and duration of a given release or set of releases and the physical characteristics of the channel (i.e., profile, slope, substrate, embeddedness, entrenchment) (R2 Resource Consultants, Inc. 2005). The channel form of the Project reaches generally does not present a high risk of stranding under the applied ramping rates (or even absent applied ramping rates during emergency flow reductions). Three years of study affirms the low incidence of stranding predicted by an evaluation of the channel form.

Except for the potential for stranding impacts that may result during down-ramping, the largest potential for ecological impacts associated with “pulsed” flow or recreation flow events results from scour processes that are governed by shear stresses upon bed material and biota. Shear stresses are a function of water velocity, and turbulence created by substrate size/evenness, which is largely a function of flow magnitude for any given channel type. As such, shear stresses generally are not mitigable through application of slower ramping rates, per se, since exceedence of a threshold for substrate mobilization or biotic response largely dictates the potential for impact (in connection with magnitude, duration, and frequency of the flow release).

References

R2 Resource Consultants, Inc. 2005. Effects of pulse type flows on benthic macroinvertebrates and fish: a review and synthesis of information. R2 Resource Consultants, Inc., Redmond, Washington.