PROTOCOLS FOR CONDUCTING EL DORADO IRRIGATION DISTRICT PROJECT 184 AMPHIBIAN SURVEYS

(EL DORADO COUNTY, CALIFORNIA)

May 1, 2002

PREPARED FOR:
El Dorado Irrigation District
2890 MOSQUITO RD.
PLACERVILLE, CA 95667

May 1, 2002

Scott Shewbridge
El Dorado Irrigation District
2890 Mosquito Rd.
Placerville, Ca 95667

Re: FERC Project 184, Amphibian Survey Protocol

As part of the relicensing of the El Dorado Hydroelectric Project, FERC 184-065 (Project 184), the El Dorado Irrigation District (EID) has contracted with ECORP Consulting, Inc. (ECORP) to conduct a study of sensitive amphibian species occurring within the Project 184 area. This study addresses Section 4.0 of the Scope of Work dated September 24, 2001, and amended on October 19, 2001. Based on further comments and recommendations from USFS, USFWS, CDFG, and SWRCB, as provided in a letter from USFS dated April 12, 2002, we have amended our Scope of Work. The following primary edits have been made to the protocol:

- Slow-moving and low gradient portions of streams, and pools within low gradient streams, have been added as potential habitat for CRLF. We have incorporated data from the USFS (Jan Williams) identifying all low-gradient stream reaches (<4%) within the project area. If, after conducting initial site visits to these locations, we determine that they provide suitable habitat for red-legged frogs, formal CRLF surveys will be conducted per USFW guidelines.

- Elevation ranges for species-specific surveys sites have been adjusted. Surveys for CRLF and foothill yellow-legged frog surveys will be conducted at elevations below 5,000 ft, mountain yellow-legged frog surveys will be conducted at elevations above 5,000 ft, and Yosemite toad surveys will be conducted at sites above 6,000 ft in elevation in the Caples Lake and Silver Lake region.

- We have added additional survey sites for Yosemite toad that include small lakes within 1.0 mile of project-affected aquatic at elevations above 6,000 ft. However, CDFG has planned concurrent amphibian surveys, and so we have excluded a number of our previously selected survey sites because they are targeted for surveys by CDFG. The majority of the sites that we have deleted from our study, which will be surveyed by CDFG, are lakes and ponds in the vicinity of Lake Aloha, Pyramid Creek, and Caples Creek. Sites that we have added are lakes within 1.0 mile of Caples Lake and Silver Lake.

- We have added additional mountain yellow-legged frog survey sites along the following tributaries of the Silver Fork American River : Girard Creek, Martin Creek, and Mule Canyon.

Please find enclosed the revised Protocols for Conducting El Dorado Irrigation District Project 184 Amphibian Surveys. Tom Keegan and Stacia Hoover assisted me in revising the protocol, per agency recommendations. If you have any questions, please call me at (916) 782-9100.

Sincerely,

Peter Balfour, M.S.
Vice President / Principal Biologist

CC: Richard Floch / Richard Floch and Associates

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PROTOCOLS FOR CONDUCTING
PROJECT 184 AMPHIBIAN SURVEYS

184 - FERC

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1.0 INTRODUCTION

As part of the relicensing of the El Dorado Hydroelectric Project, FERC 184-065 (Project 184), the El Dorado Irrigation District (EID) has contracted with ECORP Consulting, Inc. (ECORP) to conduct environmental studies in support of EID's application to the Federal Energy Regulatory Commission (FERC). One of the elements of the application involves the evaluation of recreation and pulse flows of water on aquatic resources. Aquatic amphibians were identified as one of the resource groups that could potentially be affected by these flows. In particular, three special-status frog species, California red-legged frog (*Rana aurora draytonii*) (CRLF), foothill yellow-legged frog (FYLF) (*Rana boylii*) and mountain yellow-legged frog (*Rana muscosa*) (MYLF), and one special-status toad species, Yosemite toad (*Bufo canorus*), have the potential to occur within the 184 Project Area, and may be affected by the operation of the hydroelectric facilities. The three target frog species have been documented in, or in close proximity to the project area through surveys conducted by the U.S. Forest Service (USFS), California Department of Fish and Game (CDFG) and other sources. However, it is generally accepted that the Yosemite toad does not occur in the project area. The closest confirmed occurrences of the species are those of hybrids between Yosemite toad and western toad (*B. boreas*), which have been documented approximately 6 miles (3.7 km) southwest of the study area in the Mokelumne drainage, at Lower Blue Lake, Meadow Lake, and Twin Lake. Yosemite toads have also been sighted at Ebbetts pass, roughly 17 miles (10.5 km) southwest of the study area. Given that the project area may be near the zone of hybridization between the Yosemite toad and the western toad, 2002 field surveys will include documentation of toad sightings above 6,000 feet in the event toads in this region are later determined to be Yosemite toad hybrids. The regulatory status and habitat requirements of the four target amphibian species of the survey are summarized in Table 1.

Table 1 Target special-status aquatic amphibians within the FERC 184 Project Area

Species	Status	Approximate Elevation of Occurrence	General Aquatic Habitat Preferences (or requirements)
California red-legged frog	- Federal Threatened Species - CA Protected Species	< 5,000 ft (1,524 m)	Permanent ponds, slow-moving streams and pools with emergent or overhanging vegetation
Foothill yellow-legged frog	- Federal Species of Concern - USFS Sensitive Species - CA Species of Concern - CA Protected Species	< 5,000 ft (1,524 m)	Rivers and streams with cobble/boulder substrate and shallow riffle habitat
Mountain yellow-legged frog	- Federal Species of Concern (proposed to list as endangered) - USFS Sensitive Species and - CA Species of Concern - CA Protected Species	> 5,000 ft (1,524 m)	Slow moving runoff streams, ponds, lakes and associated wet meadows.
Yosemite toad (Possible Hybrids)	- Federal Species of Concern (petition to list as endangered) -USFS Sensitive Species - CA Species of Concern - CA Protected Species	> 6,000 ft (1,830 m)	Streams, lakes and wet meadows with vegetated and gently sloped shorelines

During the summer, fall, and winter of 2001, ECORP initiated the amphibian study by documenting baseline population and habitat data for the four target amphibian species within the Project 184 study area. Information on the distribution and habitat use of special-status amphibians in the Project Area is necessary to evaluate potential impacts resulting from anticipated stream flow modifications (particularly short-term modifications). Results obtained during 2002 field surveys, scheduled to begin on April 1, 2002, will ultimately be used to evaluate the potential effects of project operations on special-status amphibians, and will facilitate management decisions that may affect amphibian populations (e.g., stream flow modifications).

The following study plan outlines the methods that will be used during 2002 field surveys. The plan provides the results of baseline amphibian investigations to date, and presents detailed maps depicting the locations of proposed survey areas. The plan augments ECORP's original Scope of Work dated September 24, 2001, and includes modifications pursuant to comments from the FERC collaborative.

2.0 STUDY AREA

For the purposes of this study, the Project 184 project area was subdivided into distinct reaches, which are described below and are depicted in Figure 1.

Figure 1. Project 184 – Survey Reach Locations

Reach 1 - Lower South Fork American River (SFAR): the SFAR, beginning from the upper end of Slab Creek Reservoir and extending upstream to the confluence with Esmeralda Creek.

Reach 2 - Downstream of Diversion Dam SFAR: the SFAR, beginning from the confluence with Esmeralda Creek and extending upstream to the SFAR Diversion.

Reach 3 - Upstream of Diversion Dam SFAR: the SFAR, beginning from the SFAR Diversion and extending upstream to the confluence with Pyramid Creek.

Reach 4 - Echo Lake and Upper SFAR: the SFAR, beginning from the confluence with Pyramid Creek and extending to the SFAR headwater. Reach 4 also includes the Echo Conduit, a 2 km wide band along the perimeter of both Upper and Lower Echo Lake, and Echo Creek (upstream a distance of 2 km from the confluence with Lower Echo Lake).

Reach 5 - Pyramid Creek and Lake Aloha: Pyramid Creek, beginning from the confluence with the SFAR and extending upstream to Lake Aloha. Reach 5 includes the area within 2 km of Lake Aloha.

Reach 6 -Silver Fork American River: the Silver Fork American River, beginning from the confluence with the SFAR and extending upstream to the confluence with Caples Creek.

Reach 7 - Upper Silver Fork AR and Silver Lake: Silver Fork American River, beginning at the confluence with Caples Creek and extending upstream to Silver Lake. Reach 7 includes the area within 2 km of Silver Lake.

Reach 8 - Caples Creek and Caples Lake: Caples Creek from the confluence with the Silver Fork American River to Caples lake. Reach 8 includes the area within a 2 km of Caples lake.

3.0 METHODS

3.1 Site Selection

3.1.1 California Red-legged Frog Site Assessment

Surveys of the Project 184 project area will involve surveys specifically designed to detect the CRLF within areas considered to be suitable breeding habitat. Many of these areas are located on private property and, as such, may not be accessible. The USFWS has indicated that CRLF surveys will be a required component of the amphibian study plan, and requested that a CRLF site assessment be conducted in advance of survey efforts. The assessment was conducted to document and characterize the extent of regionally-occurring habitats representing known or potential habitat for the CRLF per *Guidance on Site Assessment and Field Surveys for California Red-legged Frogs*,

dated February 18, 1997) (USFWS 1997). Methods used in our investigation are summarized in the subsections below.

Per USFWS assessment guidelines, the first level of evaluation involved analyses of all documented locality data for the project region, specifically within 5 miles (3.1 km) of the project area. The second level of analyses involved an evaluation of known frog occurrences and potential habitat within one mile (1.6 km) of the project site. Aerial photographs and topographic maps of the entire Project 184 project site were reviewed to determine the approximate extent of areas within the project vicinity that could potentially provide habitat for the CRLF. When possible, habitat areas were differentiated by type (e.g., stock pond, spring) via photograph signature analyses and/or by using information provided on USGS quadrangles. The locations of these areas were then delineated on USGS 7.5 minute topographic quadrangle base maps. The results of the assessment are summarized below:

The lower reaches of the Project 184 project area are located near, but outside of, formally designated Critical Habitat (Unit 3) for the CRLF. The species is currently known to occur within the Weber Creek watershed, south and west of Project 184. Frogs are known to occur in Spivey Pond near Pollock Pines, and in North Fork Weber Creek upstream of the Snows Road crossing. Spivey Pond is located within 5 miles of the Project 184 Project area (Figure 2); the North Fork Weber Creek is located outside of the 5-mile project area radius. Historical records of the CRLF also have been documented in both the North Fork Weber Creek and South Fork Weber Creek at the Snows Road crossings, and in Weber Creek in the vicinity of Placerville.

California red-legged frogs are not known to occur within the Project 184 project area, however, potentially suitable habitat occurs within 1 mile. Selected survey sites for CRLF discussed earlier, consist of ponds (natural or man-made), springs, and seeps, below 5,000 feet (1,524 m) elevation, and occurring within 1.0 mile (1.6 km) of Project affected river reaches. In addition, areas of slow-moving, low-gradient streams (<4%) will be evaluated to determine if they provide potential CRLF habitat that will require formal surveys. Low-gradient stream and river areas are depicted on the site map included as Attachment B. Figures 3a-e identify potential habitat areas, primarily ponds, seeps, and springs that could serve as potential CRLF breeding areas. The actual habitat quality of these areas, however, is not known. Most of these areas occur on private property and, as such, may not be accessible. Areas for which access is secured will be surveyed using current USFWS protocols (USFWS 1997).

Figure 2

Figure 3a

Figure 3b

Figure 3c

Figure 3d

Figure 3e

3.1.2 Foothill Yellow-legged Frog, Mountain Yellow legged Frog, and Yosemite Toad

The process of site selection began with a thorough literature and information search to determine species-specific habitat requirements and known species occurrences within the Study Area. A number of resources were used, including published literature, the California Fish and Game Natural Diversity Data Base (CNDDB), local resource agency biologists, and species experts.

Based on information gathered on species-specific habitat criteria, including elevation ranges, we identified areas of potential habitat for the three special-status amphibian species in the Project area. High-resolution aerial photographs and USGS topographic maps were used to identify and characterize aquatic habitats, and to determine their potential to provide suitable habitat for the target species. Distinct sites were selected through photographic and topographic interpretation, and delineated onto a map. A number of ground-level site assessments were conducted at many locations during the fall of 2002 to confirm the suitability of the sites for the target species, and to obtain information regarding access and ownership.

In addition, information on species occurrences in the Project area was obtained from the USFS, CDFG, and the California Natural Diversity Database (CNDDB), and all occurrences were delineated on the survey locations map. The presence of MYLF is well documented at many locations within the Project area (e.g., Lake Aloha). The California Department of Fish and Game (Stafford Lehr, personal communication) has indicated that survey effort may be reduced within areas of historic sightings based upon EID's acceptance of the data. We are presently awaiting USFWS's concurrence on this matter.

Selected survey sites for CRLF discussed earlier, consist of ponds (natural or man-made), springs, seeps, and areas of slow moving streams below 5,000 feet (1,524 m) elevation, and occurring within 1.0 mile (1.6 km) of Project affected river reaches. Potential survey sites for FYLF consist of suitable river and stream habitat below 5,000 feet (1,524 m) elevation, and occurring within 0.5 miles (0.8 km) of Project affected river reaches. Survey sites for the MYLF are located at pond, lake, stream, and associated wet meadow habitats above 5,000 feet (1,524 m), and occurring within 1.25 miles (2.0 km) of Project affected lakes, rivers and streams. Surveys for Yosemite toads will be conducted within 1 mile (1.6 km) of Project-affected wet meadows, lakes, and ponds above 6,000 feet.

The California Department of Fish and Game (CDFG) has planned amphibian studies within the Project area during the summer of 2002 that coincide with the present study. To avoid repetitive surveys, we have consulted with CDFG to coordinate our survey efforts, and we have omitted sites that have been targeted for surveys by CDFG. Sites removed from our study consist primarily of small lakes in the vicinity of Caples Creek, Pyramid Creek, and Lake Aloha (however, we will survey the perimeter of Lake Aloha). All selected survey sites are summarized in Attachment A and depicted in Attachment B.

3.2 Field Surveys

Surveys for CRLF will be conducted according to the USFWS's *Guidance on Site Assessment and Field Surveys for California Red-legged Frog* (1997). Field surveys for the remaining species will consist of visual encounter surveys, and will include concurrent habitat assessments of all sites. Surveys for FYLF, MYLF, and Yosemite toads will be conducted following protocols outlined in one or more of the subsequent references: PG&E (2001), Lind (1997), Thoms et al. (1997), Fellers and Freel (1995), and Crump and Scott (1994). In addition, we have incorporated resource agency recommendations (i.e., USFWS, CDFG), and current MYLF dispersal data (Pope and Mathews 2001), to develop species-specific survey methodologies.

3.2.1 Survey Protocol for California Red-legged Frog

Survey methods will follow those described in the USFWS's *Guidance on Site Assessment and Field Surveys for California Red-legged Frogs (*dated February 18, 1997)(USFWS 1997). In accordance with these guidelines, two diurnal surveys and two nocturnal surveys will be conducted at each potential habitat area. All previously selected and accessible sites will be surveyed for the presence of CRLFs. Specific survey methodologies are described below:

Survey Procedures

Surveyors will walk along the entire shore visually scanning all shoreline areas with binoculars. In water bodies covered with floating vegetation, both the shoreline and surface of the water will be scanned. Surveyors will avoid crushing potential frog cover such as rootballs and overhanging banks, and avoid disturbing sediments and vegetation that may harbor egg masses or larva. When possible, and without causing harassment, photographs will be taken of CRLFs observed during

surveys. Day surveys will be conducted on clear, sunny days. Night surveys to detect eye shines will be conducted on warm still nights between one hour after sunset and 12 midnight. A flashlight or headlamp powered by one 6-volt or four to six D-cell batteries will be used to assist surveyors with detection efforts.

Schedule

Visual encounter surveys will be conducted at selected sites four times, twice during the day and twice at night, between May 1 and November 1, 2002. Before repeating surveys at a given site, surveyors will wait at least twenty-four hours.

Reporting Results of CRLF Field Surveys

Any information on California red-legged frog distribution resulting from field surveys will be sent to the CNDDB, administered by the CDFG. Copies of the CNDDB form will be submitted to both the USFWS and CDFG. Results of CRLF surveys will be summarized in the final Project 184 Amphibian Survey document.

3.2.2 Survey Protocol for Foothill Yellow-legged Frog and Mountain Yellow-legged Frog

Visual Encounter Survey Procedures

Teams of two surveyors each will conduct all surveys following amphibian-sampling procedures described in Fellers and Freel (1995). This includes using binoculars to scan ahead for frogs basking or sitting on banks and exposed areas. When possible, surveyors will wade through the water and randomly use a dip net in aquatic microhabitats, such as beneath overhanging banks and within floating and emergent vegetation. Surveyors will occasionally wave nets or sticks over bank vegetation to flush hiding frogs. At all times, caution will be used to avoid trampling egg masses.

Variations in survey approach will be dependent upon the type of habitat being surveyed (e.g., river, stream, pool, wet meadow, etc.), and the quality and extent of available habitat. Differences in survey approach are briefly addressed below. The specific survey area of each aquatic feature will be based on the following guidelines:

- *Wet Meadows* – Distinct aquatic habitat units contained within the meadow (e.g., stream, pond, etc.) will be searched visually, and dip-netted along their perimeter. The deeper portions of water bodies will be scanned with binoculars. No more than two-person hours will be spent on each significant water body. When not following an obvious channel, surveyors will meander through the meadow making approximately 10 m wide passes, while searching for standing water and shallow potholes to survey.

- *River and Tributary Sites* – Two individuals, working in tandem, will follow linear or meandering transects to search along river and stream sections. When possible, river surveys will begin at the downstream end of the site, and continue along one bank. If suitable habitat is present on the opposite bank, surveyors will cross the river and survey the opposite bank once the first bank is completed. When surveyors encounter areas lacking suitable amphibian habitat they will cease the survey, and progress to the next survey location.

  Tributary streams that are narrow will be surveyed in one direction, starting downstream and moving upstream (if possible). Two surveyors will search both banks simultaneously. Larger streams, which do not permit surveying both banks simultaneously, will be surveyed using the method described for rivers. Areas lacking suitable amphibian habitat will be bypassed and searching will resume once appropriate habitat is encountered. The distance and locations of suitable (searched) and unsuitable habitat will be mapped on topographic maps or site sketches. If the gradient becomes too steep, making it dangerous to continue, the survey will stop at that point.

- *Ponds* – Small ponds will be surveyed by wading along the perimeter and netting (dip-net) in the shallow waters. Larger ponds will be sampled using an approach that differentiates three survey zones: 1) the waterline – where water and upland meet, 2) the shallow water zone- the waterline out to a depth that can be waded safely (i.e., up to 1 m deep), and 3) the shore zone- the area surrounding the pond within 3 m of the waterline. Surveyors, working either in tandem or individually, will search each zone for a maximum search time of two man-hours (one hour per surveyor).

- *Lakes* – Lake survey methods will depend upon the extent of the habitat. Small lakes will be surveyed along their entire perimeter. For large lakes, surveys will be conducted at all

suitable locations along the lake perimeter. Locations of suitable (searched) and unsuitable habitat will be mapped on topographic maps or site sketches.

Survey Schedule

- *Foothill Yellow-legged Frog* – Because FYLF egg masses are difficult to locate, surveys will be aimed at detecting tadpoles and adult frogs. One survey will be conducted between July and September to identify FYLF adults, larva, or egg masses. If larva or egg masses are encountered during the initial site visit, a second survey will be conducted the site will be resurveyed 2 to 4 weeks later.

- *Mountain Yellow-legged Frogs* - One survey for MYLF adults and larvae will be conducted between July and September. Generally, overwintering MYLF tadpoles become active and adults emerge from hibernation sites soon after the ice begins to melt in streams, lakes, and ponds. Accordingly, snowmelt and river and stream conditions will be monitored to determine the most appropriate time to commence surveys. If larva or egg masses are encountered during the initial site visit, the site will be resurveyed 2 to 4 weeks later.

3.2.3 Survey Protocol for Yosemite Toad

Visual Encounter Surveys Procedures

Surveys will be conducted using a modified approach to the Thoms et al (1997), and Fellers and Freel (1995) methodology. During YT searches, a team of two surveyors will visually scan the survey area for exposed YT, and use a long-handled dip-net net to search through emergent vegetation and appropriate microhabitats for toads and tadpoles.

The survey approach will depend on the type and extent of aquatic habitat being surveyed (e.g., lentic sites, ponds, wet meadows). A brief summary of survey approaches specific to aquatic habitat type was provided in the previous section, for MYLF and FYLF surveys.

Survey Schedule

One YT survey will be conducted at each site between April and August 1, depending on environmental conditions. To determine the most appropriate time to initiate surveys, we will monitor the spring snowmelt to detect the formation of snowmelt ponds within the meadows. If larvae or egg masses are encountered during the initial site visit, the site will be resurveyed 2 to 4 weeks later.

3.2.4 General Procedures For All Amphibian Surveys

Recording Data

Aerial photographs will be used to denote the location of all encountered target species, site boundaries, and the search patterns used. If aerial photographs are not available, the survey site will be drawn on the back of the data sheet and onto topographic maps. The length of survey transects, along with the search time, will be recorded onto standardized data sheets.

Data on target species encountered during surveys, including the individual's size, sex, lifestage, and behavior, will be recorded onto standardized survey data sheets. Where possible, detected target species will be photographed to document their location relative to aquatic features. In addition, weather conditions at the time of the encounter, and the specific microhabitat parameters where the encounter took place, also will be recorded. Such parameters include substrate type, distance and orientation of sighting from shore, water temperature, depth, velocity and pH. The location of the encounter will be recorded by GPS.

During the course of amphibian surveys, the presence of western pond turtles (*Clemmys marmorata*) (WPT) will be recorded. Surveyors will use binoculars to search for basking turtles, or turtles emerging or entering the water, at all amphibian survey sites. When WPT sightings occur, microhabitat data will be documented, and the location of the encounter will be recorded by GPS. Non-target reptile and amphibian species observed during visual encounter surveys will be recorded on topographic maps, and mapped by auto CAD.

Analysis Methods

Based on data collected during this study and other available information, descriptions of the following will be prepared for each species:

1. general physical and biological characteristics of survey areas
2. specific characteristics of each selected monitoring site
3. location and distribution of each life stage encountered
4. microhabitat conditions where each life stage was encountered

Maps will be prepared showing the locations of potential habitat, selected monitoring sites, and life stages of each species encountered. In addition, relative abundance data will be calculated at all sites for each life stage to facilitate comparisons of relative abundance between sites and between monitoring events.

Field Documentation and Quality Assurance/ Quality Control Procedures

Standardized field data sheets will be used during the study, and will be reviewed for completeness and accuracy at the end of each survey prior to leaving a survey site. To maintain consistency with other Yosemite toad surveys conducted by USFS, we will use data sheets provided by USFS.

Products

We will generate a final technical report, available both electronically and in hard copy, at the completion of the amphibian study. The report will present presence/absence data, numbers of individuals of each life stage observed, locality data including GPS coordinates of encounters, and site habitat assessments.

4.0 REFERENCES

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ATTACHMENT A

EID Project 184 Amphibian Survey Sites

Attachment A. EID Project 184 Amphibian Survey Sites

Reach/Site No.	Habitat*	Location
Reach 1- Lower South Fork American River		
105R	River	downstream of Dam
110R	River	-
115T	Tributary	Silver Creek
120R	River	-
125T	Tributary	Soldier Creek
130R	River	-
135R	River	-
140F	Forebay	-
145P	Pond	-
150S	Spring	-
155S	Spring	Spring Valley
160S	Spring	Van Vleck
TOTAL SITES: 12		
Reach 2 - Downstream of Diversion Dam SFAR		
205DT	Diverted Tributary	Esmeralda Creek
210DT	Diverted Tributary	Ogilby Creek
215T	Tributary	Short Place
220R	River	Maple Grove
225T	Tributary	Plum Creek
230DT	Diverted Tributary	Bull Creek
235R	River	-
240R	River	While Hall
245DT	Diverted Tributary	Mill Creek
250DT	Diverted Tributary	Alder Creek
255R	River	-
260R	River	29-mile Guard Station
265DT	Diverted Tributary	No-Name Creek
270DT	Diverted Tributary	Carpenter Creek
275S/P	Spring and Ponds	White Meadow
280P	Ponds	-
285S	Spring	Short Place
290S	Spring	-
TOTAL SITES: 18		
Reach 3 - Upstream of Diversion Dam SFAR		
305R	Tributary	-
310T	Tributary	-
315T	Tributary	Station Creek
320T	Tributary	Forni Creek
325T	Tributary	Cody Creek
326L	Small Lake	
TOTAL SITES: 6		

* Habitat designations are preliminary, and may change following further characterization in the field.

Attachment A (*cont.*)

Reach/Site No.	Habitat	Location
405T	Tributary	Sayles Canyon
410T/L	Tributary and Lake	Bryan Creek and lake
415M/L	Meadow and Lake	Lake Audrian and meadow
420T/M	Tributary and Meadow	Huckleberry Flat
425L	Lake	-
430DT	Diverted Tributary	Echo Creek
435M	Meadow	Osgood Swamp
440T	Tributary	Camp Harvey
455LP	Lakes	Echo Lakes
TOTAL SITES: 9		

Reach 5 - Pyramid Creek and Lake Aloha

505R	River	Pyramid Creek
550LP	Lake	Aloha Lake
TOTAL SITES: 2		

Reach 6 - Silver Fork American River

605R	River	SFAR/Silver Fork AR Confluence
610T	Tributary	Beanville Creek
615R	River	China Flat
620T	Tributary	Middle Creek
625T	Tributary	Long Canyon
630R	River	Silver Fork AR
631T	Tributary	Girard Creek
635T	Tributary	Hell's Delight
640T	Tributary	Bark Shanty
641T	Tributary	Mule Canyon
642T	Tributary	Martin Creek
645T	Tributary	Sherman Canyon
646T	Tributary	North Trajedy
TOTAL SITES: 13		

Reach 7 - Upper Silver Fork AR and Silver Lake

705R	River	-
710M	Meadow	Silver Fork Meadow
715R	River	-
716L	4 small lakes	
717L	lake/pond	
719L	3 small lakes	
720T	Tributary	Oyster Creek

* Habitat designations are preliminary, and may change following further characterization in the field.

Attachment A (*cont.*)

Reach/Site No.	Habitat	Location
721L	Lake	
722L	3 small lakes	
724L	Lake	
725L	6 small lakes	
726L	3 small lakes	
728L	Lake	
750LP	Lake Parimeter	Silver Lake
751IT	Inlet Tributary	(Hidden Lake)
752IT	Inlet Tributary	(Summit Meadow Lake)
753IT	Inlet Tributary	(Camp Silverado)
TOTAL SITES: 20		

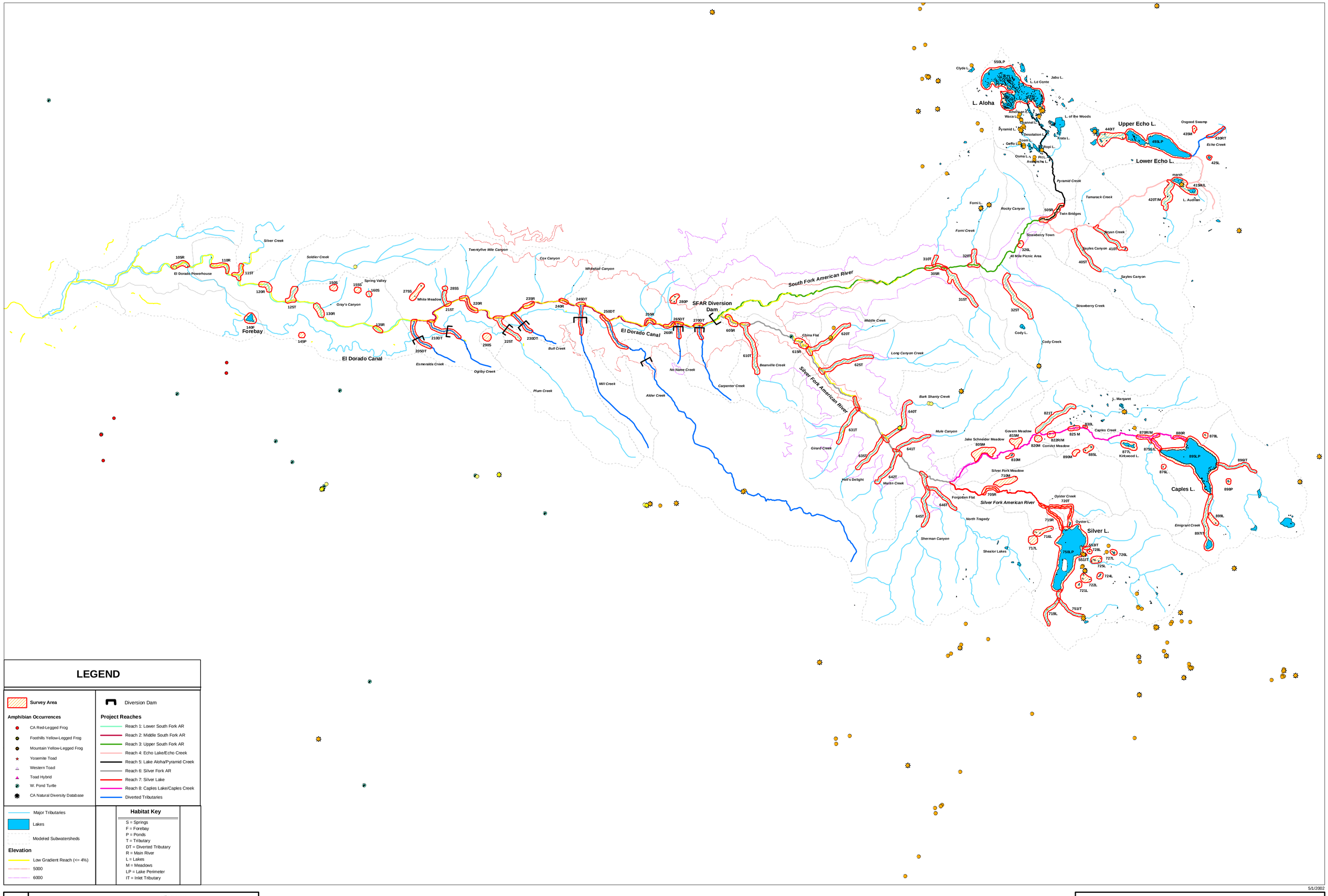
Reach 8 - Caples Creek and Caples Lake

805M	Meadow	Jack Schneider Meadow
810M	Meadow	(spring)
815M	Meadow	Government Meadow
820M	Meadow	Convict Meadow
821T	Tributary	-
822R/M	River and Meadow	-
830L	Lakes	-
870R/M	River and Meadow	Caples/Spillway Confluence
875SC	Spillway Channel	Spillway Channel
876L	Small lake	
877L	Lake	Lake Kirkwood
878L	Lake	
880R	River	(Caples Lake/Caples Creek
885L	Lakes	(HWY88 Look Out Point)
890M	Meadows	(HWY 88)
895LP	Lake Parimeter	Caples Lake
896IT	Inlet Tributary	Woods Creek
897IT	Inlet Tributary	Emigrant Creek and Emigrant Lake
898L	Small Lake	
899T/L	Tributary with small lakes	
TOTAL SITES: 20		

* Habitat designations are preliminary, and may change following further characterization in the field.

ATTACHMENT B

Site Maps



LEGEND

Survey Area

Amphibian Occurrences

- CA Red-Legged Frog
- Foothills Yellow-Legged Frog
- Mountain Yellow-Legged Frog
- Yosemite Toad
- Western Toad
- Toad Hybrid
- W. Pond Turtle
- CA Natural Diversity Database

Major Tributaries

Lakes

Modeled Subwatersheds

Elevation

- Low Gradient Reach (<= 4%)
- 5000
- 6000

Diversion Dam

Project Reaches

- Reach 1: Lower South Fork AR
- Reach 2: Middle South Fork AR
- Reach 3: Upper South Fork AR
- Reach 4: Echo Lake/Echo Creek
- Reach 5: Lake Aloha/Pyramid Creek
- Reach 6: Silver Fork AR
- Reach 7: Silver Lake
- Reach 8: Caples Lake/Caples Creek
- Diverted Tributaries

Habitat Key

S = Springs
F = Forebay
P = Ponds
T = Tributary
DT = Diverted Tributary
R = Main River
L = Lakes
M = Meadows
LP = Lake Perimeter
IT = Inlet Tributary

0 1.5 3 6 Kilometers

0 0.45 0.9 1.8 2.7 3.6 4.5 Miles

5/1/2002

EID Project 184 Amphibian Survey Map

PRICE GEOGRAPHIC CONSULTING
2004 Adobe Trail – Placerville, California 95667
Office (530) 626-1964 – atpricellcalweb.com

EL DORADO IRRIGATION DISTRICT

Species occurrences provided by USFS and CDFG

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS