



TECHNICAL MEMORANDUM 4-2

Special-Status Wildlife – Bats

Yuba River Development Project FERC Project No. 2246

November 2012

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EXECUTIVE SUMMARY

In 2012, Yuba County Water Agency (YCWA) gathered information concerning special-status bats that could potentially be affected by the Yuba River Development Project (Project). The study area included all Project facilities and recreation areas within the existing Federal Energy Regulatory Commission's (FERC) Project Boundary.¹

The study was conducted in four steps: 1) initial reconnaissance of Project facilities (dams, powerhouses, and associated buildings) and recreation areas (campgrounds, boat ramps and day use areas); 2) performance of focused surveys, which included mist netting and acoustical monitoring at six mist net sites; 3) Long Term Acoustic Monitoring (LTAM) at four sites selected in consultation with Relicensing Participants; and 4) analysis of acoustic data.

Initial reconnaissance to determine bat monitoring sites was performed on March 12 and 13, and April 30, 2012. Fourteen structures were found to have signs of bat use (e.g., presence of bats, guano or staining). Of those, 12 were restrooms associated with recreation areas, and two were Project facilities (i.e., New Colgate Administration and Shop Building, which is located within the New Colgate Powerhouse Yard and Narrows 2 Powerhouse). While performing focused surveys, YCWA found bats roosting at four additional structures: 1) underneath the concrete road deck above the inlet to the Camptonville Tunnel; 2) the interior of the Camptonville Tunnel; 3) the Emerald Cove Marina General Store; and 4) the New Colgate Administration and Shop Building.

Based on the initial reconnaissance, six sites were selected for focused surveys and four sites were selected for LTAM. Focused surveys were performed at: 1) Our House Diversion Dam; 2) Log Cabin Diversion Dam; 3) Dark Day Boat Launch; 4) Schoolhouse Family Campground; 5) downstream of New Bullards Bar Dam; and 6) Yuba River riparian margin immediately adjacent to the New Colgate Powerhouse Yard.² Each of the focused survey sites were surveyed twice, with the first survey occurring between July 23 and 28, 2012, and the second survey occurring between September 3 and 8, 2012. LTAM was performed at following locations: 1) outflow of the Camptonville Tunnel; 2) downstream of New Bullards Bar Dam; 3) New Colgate Powerhouse; and 4) Narrows 2 Powerhouse. LTAM began on April 1, 2012 at the New Bullards Bar Dam, New Colgate Powerhouse, and Narrows 2 Powerhouse sites. Monitoring at the outflow of the Camptonville Tunnel was delayed until July 24 because of unsafe access to the site due to high flows. Monitoring at all four sites continued through October 31, 2012.

YCWA captured 29 individual bats during focused surveys. Of those, 26 were identified to species: 19 Yuma myotis (*Myotis yumanensis*); three big brown bat (*Eptesicus fuscus*); two little

¹ The existing FERC Project Boundary is the area that YCWA uses for normal Project operations and maintenance (O&M) and is shown on Exhibits G, J and K of the current License.

² Due to safety concerns regarding energized equipment, focused survey equipment (mist nets) could not be used within the New Colgate Powerhouse yard, thus YCWA selected the riparian margin between the New Colgate Powerhouse Yard and Yuba River.

brown myotis (*Myotis lucifugus*); one canyon bat (*Parastrellus hesperus*); and one fringed myotis (*Myotis thysanodes*). The three remaining individuals escaped from the mist nets prior to removal, but were identified as belonging to the genus *Myotis*. Bats were captured at all six of the focused survey sites. Yuma myotis was captured at all sites except Our House Diversion Dam. Big brown bats were captured at two sites (i.e., Log Cabin Diversion Dam and Schoolhouse Family Campground). Little brown myotis were captured at two sites (i.e., Schoolhouse Family Campground and below New Bullards Bar Dam). A single fringed myotis and canyon bat were captured at Our House Diversion Dam.

While mist netting, YCWA utilized acoustic monitoring to identify five additional bat species. These species included Townsend's big-eared bat (*Corynorhinus townsendii*), spotted bat (*Euderma maculatum*), Western red bat (*Lasiurus blossevillii*), hoary bat (*Lasiurus cinereus*), and Western long-eared bat (*Myotis evotis*). In addition, YCWA recorded calls from bat species that were lumped into one of three groups: the 50 kilohertz (kHz) *Myotis*, which includes California myotis (*Myotis californicus*) and Yuma myotis; the 40 kHz *Myotis*, which includes Western small-footed bat (*Myotis ciliolabrum*), long-legged bat (*Myotis volans*), and little brown myotis; and the 25 kHz bats, which includes pallid bat (*Antrozous pallidus*), big brown bat, and silver-haired bat (*Lasionycteris noctivagans*). Species within these groups have call characteristics that are similar, making them difficult to identify via acoustic analysis. The presence of discriminating characteristics (e.g., social calls, or calls exceeding specific frequencies) allows distinction between species within each group. However, discriminating characteristics are not always present among recorded calls, thus the eight species are often placed into their respective groups.

Species recorded during LTAM included pallid bat, Townsend's big-eared bat, spotted bat, Western red bat, hoary bat, Western long-eared myotis, fringed myotis, and canyon bat. YCWA also recorded calls from the 50 kHz *Myotis*, 40 kHz *Myotis*, and 25 kHz bats acoustic groups. All species and acoustic groups except pallid bat, fringed myotis and canyon bat were recorded at all four LTAM sites. Canyon bat was recorded at three sites (i.e., New Bullards Bar Dam, Colgate Powerhouse, and Narrows 2 Powerhouse). Both pallid bat and fringed myotis were recorded at Camptonville Tunnel and Colgate Powerhouse.

Of the 13 species identified above, four are special-status species: 1) pallid bat (California Department of Fish and Game – Species of Special Concern, or SSC, and Forest Service Sensitive Species, or FSS); Townsend's big-eared bat (SSC and FSS); Western red bat (SSC and FSS); and spotted bat (SSC).

As part of the study, YCWA also classified structures containing signs of bat use (e.g., guano, staining or the presence of bats) as one of four roost types: 1) night; 2) day; 3) maternity; and 4) winter hibernacula. YCWA identified 17 night roosts, 12 associated with recreation area restrooms and 5 associated with Project facilities. YCWA also identified three active day roosts. While no maternity roosts were identified, the capture of reproductive adult bats suggests that maternity roosts may be present within the study area. No winter hibernacula roosts were identified.

This study was conducted according to the FERC-approved Study 4.2, Special-Status Wildlife – Bats, with three variances. First, the FERC-approved study specified that the period for LTAM would begin on April 1, 2012 and continue through October 31, 2012. An equipment malfunction resulted in the loss of all acoustic data for the month of April at the New Bullards Bar Dam LTAM site, and safety concerns over access (i.e., high flows) prevented deployment of equipment at the Camptonville Tunnel outlet until July 24, 2012. The variance did not affect the study because a review of the other two sites' LTAM data suggests that species composition increased with the onset of summer, and that species present in July, August and September were likely present in April, May, or June.

Second, the FERC-approved study specified that acoustic monitoring was to occur at all mist net sites, during both the July and September surveys. During the September mist net surveys, an equipment malfunction resulted in the loss of acoustic data at Our House Diversion Dam, Log Cabin Diversion Dam, Dark Day Boat Launch, and Schoolhouse Family Campground. The equipment malfunction affected YCWA's ability to identify bat species present at these four sites, and may have resulted in identification of fewer species at these sites than during the focused surveys performed in July. However, the number of species present in the study area during the September focused surveys was expected to be less than or equal to those identified in July because some bat species (e.g., hoary bat, western red bat, silver-haired bat) may have already begun migration to winter hibernacula, and therefore, YCWA believes that this variance did not negatively reflect the overall species composition in the study area.

Third, the FERC-approved study specified the study would be completed by the end of October 2012. This study required collection of acoustic data through October 31, 2012, and thus retrieval, analysis, and inclusion of the acoustic data into the technical memorandum could not have been completed on or before October 31, 2012. This resulted in a slight delay of study completion. The delay did not affect the study or overall Relicensing schedule.

The study is complete.

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Table of Contents		
Section No.	Description	Page No.
1.0	Goals and Objectives	1
2.0	Methods.....	1
2.1	Study Area	1
2.2	Field Surveys	3
2.2.1	Initial Reconnaissance	3
2.2.2	Focused Surveys	4
2.2.3	Long Term Acoustic Monitoring.....	5
2.2.4	Acoustic Data Analysis.....	8
3.0	Results.....	9
3.1	Initial Reconnaissance	9
3.2	Focused Surveys	10
3.2.1	Mist Net Sampling	10
3.2.2	Acoustic Sampling.....	11
3.2.3	Long Term Acoustic Monitoring.....	12
4.0	Discussion	14
4.1	Bat Roosts	16
5.0	Study-Specific Consultation	18
5.1	Agency Consultation.....	18
5.2	Submission of CNDDDB Forms	19
6.0	Variances from FERC-Approved Study	19
7.0	Attachments to This Technical Memorandum.....	19
8.0	References Cited	20

List of Figures		
Figure No.	Description	Page No.
2.1-1.	Special-status bat study area, focused survey and LTAM sites.....	2
2.2-1.	Camptonville Tunnel outflow LTAM site.	6
2.2-2.	New Bullards Bar Dam LTAM site.	6
2.2-3.	New Colgate Powerhouse LTAM site.	7
2.2-4.	Narrows 2 Powerhouse LTAM site.	7

Table No.	List of Tables Description	Page No.
2.2-1.	Special-status bat species with the potential or known to occur in the Project Vicinity.	3
2.2-2.	Project and recreation facilities within the study area.	4
3.1-1.	Observations of bat sign during reconnaissance survey of the Yuba River Development Project in 2012.....	10
3.2-1.	2012 mist net survey results.....	11
3.2-2.	2012 active acoustic monitoring results.....	11
3.2-3.	Long Term Acoustic Monitoring data summary.	12
4.0-1.	Bat species recorded via acoustic monitoring and or captured during mist net surveys in the study area.	15

List of Attachments

Attachment 4-2A	Completed Mist Net Sampling Data Sheets
Attachment 4-2B	Raw Acoustic Data

TECHNICAL MEMORANDUM 4-2

SPECIAL-STATUS WILDLIFE – BATS³

Yuba County Water Agency's (YCWA) continued operation and maintenance of the Yuba River Development Project (Project), Federal Energy Regulatory Commission's (FERC) Project No. 2246, may have the potential to affect special-status⁴ bats.

1.0 Goals and Objectives

The goal of this study was to provide the data necessary to perform an analysis of how special-status bats may be affected by the No-Action alternative and YCWA's Proposed Project.

The objective of this study was to gather the information necessary to perform this analysis.

2.0 Methods

2.1 Study Area

The study area consisted of the area within the existing FERC Project Boundary,⁵ and is shown in Figure 2.1-1.

³ This technical memorandum presents the results for Study 4.2, *Special-Status Wildlife- Bats*, which was included in YCWA's August 17, 2011 Revised Study Plan for Relicensing of the Yuba River Development Project, and approved by FERC in its September 30, 2011 Study Plan Determination. There were no modifications to Study 4.2 subsequent to FERC's September 30, 2011 Study Determination.

⁴ Special-status wildlife are considered those species: 1) found on National Forest System (NFS) land and formally listed by the United States Department of Agriculture, Forest Service as a Sensitive Species (FSS) or a Management Indicator Species (MIS); 2) listed under the Federal Endangered Species Act (ESA) as Proposed or a Candidate for listing as endangered or threatened or proposed for delisting; 3) listed under the California Endangered Species Act (CESA) as Proposed for listing as endangered or threatened or proposed for delisting; or 5) formally listed by California Department of Fish and Game (CDFG) as a Species of Special Concern (SSC).

⁵ The existing FERC Project Boundary is the area that YCWA uses for normal Project operations and maintenance (O&M), including recreation campgrounds around New Bullards Bar Reservoir, and is shown on Exhibits G, J and K of the current License.

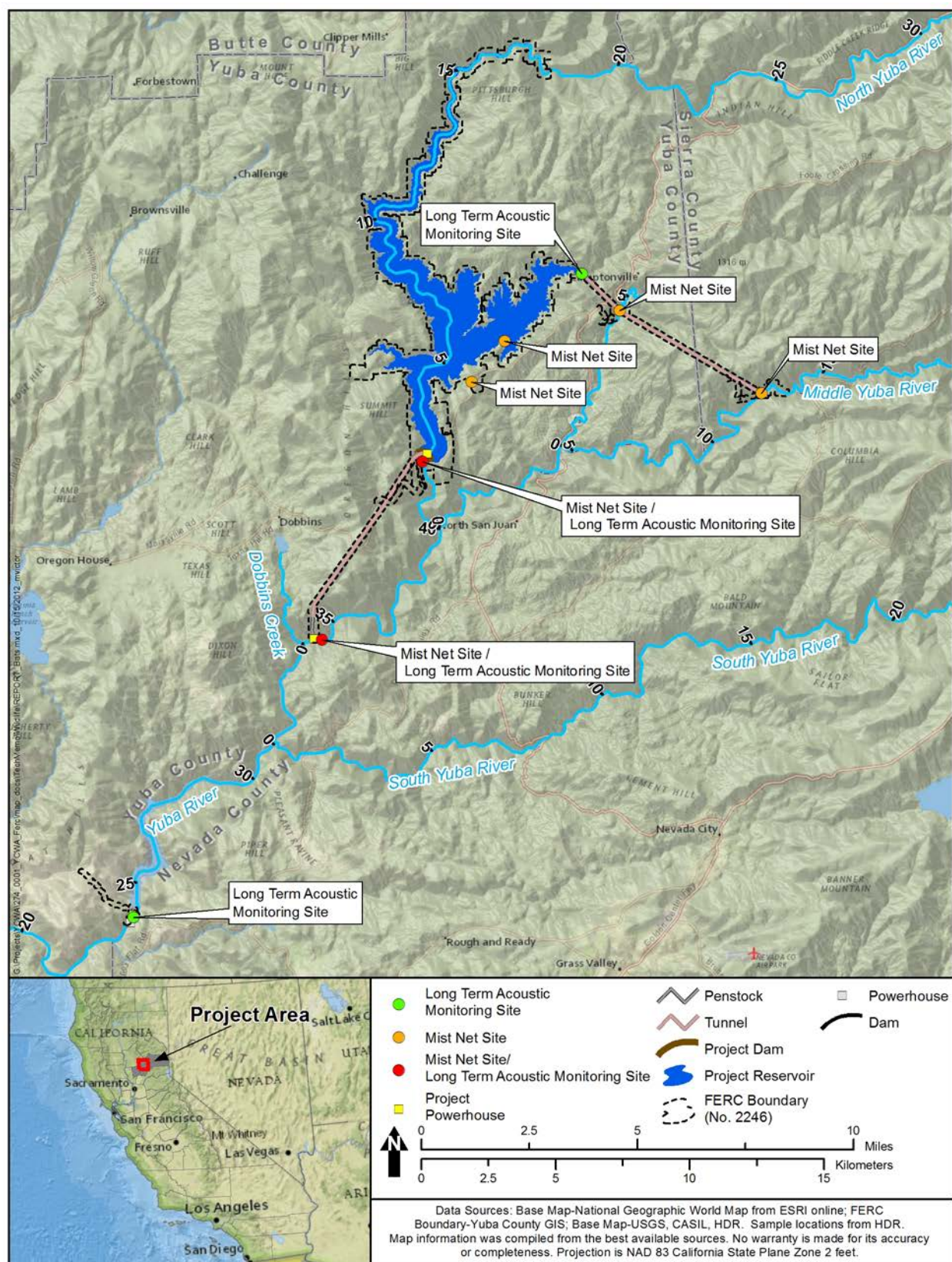


Figure 2.1-1. Study area for the Special-status Bats Study.

2.2 Field Surveys

The study was performed in four steps: 1) initial reconnaissance and data gathering; 2) focused surveys; 3) Long Term Acoustic Monitoring (LTAM); and 4) analysis of acoustic data. Each of these steps is described in greater detail below.

2.2.1 Initial Reconnaissance

Prior to reconnaissance, YCWA identified special-status bats known or with the potential to occur within the Project Vicinity.⁶ Information regarding potentially occurring special-status bats in the vicinity of the Project was obtained from two sources. The first source was the California Department of Fish and Game (CDFG), California Wildlife Habitat Relationships program, which gave a general prediction of species that may occur, based on available habitat (CDFG 2008). The second source was the CDFG's California Natural Diversity Database, which provided information regarding known occurrences of special-status bats in the Project Vicinity (CDFG 2012). Based on these sources, five special-status bats have the potential or are known to occur in the Project Vicinity (Table 2.2-1)

Table 2.2-1. Special-status bat species with the potential or known to occur in the Project Vicinity.

Bat Species	Special Status ¹	Suitable Habitat	Occurrence in Project Vicinity
Western red bat <i>Lasiurus blossevillii</i>	FSS, SSC	Ranges from sea level up through mixed conifer forests; roosts in foliage, forages in open areas.	1. Oregon House Quad (Porter Creek) 2. Strawberry Valley Quad (Sly Creek Reservoir – non Project)
spotted bat <i>Euderma maculatum</i>	SSC	Ranges from sea level up to 9,800 feet (ft) in arid deserts, grasslands and mixed conifer forests.	Potentially occurs within suitable habitat.
Townsend's big-eared bat <i>Corynorhinus townsendii</i>	FSS, SSC	Ranges from sea level up to 10,300 ft; roosts in buildings, mines, tunnels, and caves; feeds along habitat edges.	Potentially occurs within suitable habitat.
pallid bat <i>Antrozous pallidus</i>	FSS, SSC	Ranges from sea level up to 8,000 ft; roosts in caves, crevices and buildings, and forages in a variety of open habitats.	1. Strawberry Valley Quad (Sly Creek Reservoir – non Project)
Western mastiff bat <i>Eumops perotis</i>	SSC	Ranges from sea level up to 8,700 ft; roosts in rock crevices, outcroppings and buildings.	Potentially occurs within suitable habitat.

¹ FSS = Forest Service Sensitive Species (CDFG 2011)

SSC = CDFG Species of Special Concern (CDFG 2011)

On March 12 and 13, and April 30, 2012, YCWA inspected Project facilities and recreation areas within the study area (Table 2.2-2). At each location, YCWA noted foraging opportunities and flight corridors and performed a visual inspection of Project structures. The visual inspection consisted of examining the interior and exterior of Project facilities (e.g., powerhouses, storage buildings, public restrooms at campgrounds, kiosks, etc.) for active bat roosts and/or signs of past use, including guano and urine staining. For active roosts, YCWA determined if the roost was a maternity, day and/or night roost or a winter hibernacula. Observed bat activity was documented on standardized data sheets, photographed and roost locations recorded with a

⁶ For the purposes of the Relicensing, the Project Vicinity is defined as the area surrounding the Project in the order of a county or United States Geological Survey (USGS) 1:24,000 topographic quadrangle

Global Positioning System (GPS). YCWA used the information collected during the initial reconnaissance to prioritize locations for focused bat surveys.

Table 2.2-2. Project and recreation facilities within the study area.

Project Feature	Project Recreation Facility
NEW COLGATE DEVELOPMENT	
Our House Diversion Dam	New Bullards Bar – Emerald Cove Marina Boat Launch
Lohman Ridge Diversion Tunnel	New Bullards Bar – Dam Overlook
Log Cabin Diversion Dam	New Bullards Bar – Moran Road Boat Launch
Camptonville Diversion Tunnel	New Bullards Bar – Dark Day Boat Ramp
New Bullards Bar Dam	New Bullards Bar – Dark Day Campground
New Colgate Power Tunnel	New Bullards Bar – Schoolhouse Family Campground
New Colgate Powerhouse	New Bullards Bar – Hornswoggle Group Campground
NEW BULLARDS FISH RELEASE DEVELOPMENT	
New Bullards Minimum Flow Powerhouse	None
NARROWS 2 DEVELOPMENT	
Narrows 2 Powerhouse	None

2.2.2 Focused Surveys

YCWA selected locations for focused surveys (i.e., acoustic sampling and mist net survey sites) based on evidence of bat activity found during the initial reconnaissance survey performed on March 12 and 13, 2012. Six sites were selected for acoustic and mist net surveys (Figure 2.1-1): 1) Our House Diversion Dam; 2) Log Cabin Diversion Dam; 3) Dark Day Boat Launch; 4) Schoolhouse Group Campground; 5) base of New Bullards Bar Dam; and 6) New Colgate Powerhouse. The sites were selected because they had structures that contained evidence of bat use and habitats (e.g., riparian, open water, rocky outcrops, and open areas) representative of the study area. Each of the locations was sampled once between July 23 and 28, 2012, and again between September 3 and 8, 2012.

Anabat SD1™ bat detector systems (Titley Scientific™, East Brisbane, Australia) were used to conduct acoustic sampling of bats in conjunction with mist net sampling. Acoustic sampling was conducted during peak bat activity, beginning at dusk and continuing until activity ceased or midnight, whichever occurred first, to record ultrasonic echolocation calls of bats in flight. This acoustic sampling was separate from the LTAM sampling described below. Anabat SD1™ detectors were programmed to automatically record echolocation calls and save them to a compact flash (CF) card for later analysis. If a bat roost was adjacent to a mist net site, Anabat units were oriented so that bats entering or exiting the roost were recorded. If no known roosts were present, units were placed in adjacent foraging habitat or flight corridors.

Mist net sampling for bats utilized mist nets obtained from Avinet, Inc. (Dryden, New York). Mist nets, measuring 19.7, 29.5, and 39.4 feet (ft) wide, were used to capture bats. All nets were constructed with 1.5-inch mesh, contained four shelves, and measured 8.5 ft in height. Two 12-ft-long painter's poles, guyed with rope, were used to support each net.

One night was required to complete one mist net survey at each location. Mist net surveys began with the assembly of nets at least one hour before sunset. Depending on available space, between one and three nets were used at each site. Nets were placed in close proximity to

Project structures, over or immediately adjacent to water and in flight corridors between potential roosting structures and foraging habitat. Mist nets were opened about 15 minutes after sunset, and remained open until bat activity ceased or at midnight, whichever occurred first. Nets were checked every 15 minutes for captured bats. Overall, 24 mist nets were open for a total of 432 hours at Project mist net survey locations.

Captured bats were handled in accordance with CDFG's Scientific Collecting Permits/Letter Permits guidelines. The handling guidelines are intended to prevent the spread of White-nose Syndrome in bats and followed the United States Fish and Wildlife Service (USFWS) – Version 01.25.2011 *White-Nose Syndrome Decontamination Protocol - Supporting Decontamination Documentation for Researchers (WNS Decontamination Supplement 2 of 2)* (USFWS 2011).

Each bat captured was identified to species via comparison of physical features (e.g., forearm length, ear length, tragus shape, presence or absence of calcar keel, weight, and fur color) to those presented in the key, *Bats of the Northwestern United States* (Bat Conservation International 2008). For each captured bat, the length of the forearm and ear were measured with a fractional dial caliper, and the bat was weighed using a 100 gram Pesola scale. YCWA also determined the sex, breeding status (reproductive or non-reproductive), as well as age (adult or juvenile) for each individual. All information was recorded on a standardized data sheet.

2.2.3 Long Term Acoustic Monitoring

YCWA assessed the study area for sites that would be suitable for deployment of LTAM equipment. The assessment occurred on March 12 and 13, and April 30, 2012 and consisted of site visits. YCWA considered locations that allowed for secure deployment of the LTAM equipment, while providing the ability to monitor habitat types representative of the project.

After the March 12 and 13 site visit, three sites were selected for LTAM. After consultation with Relicensing Participants and the April 30, 2012 assessment, a fourth site was selected. The four sites were selected because they allowed for acoustic monitoring of various habitat types (e.g., riparian, rock outcroppings, open water, and rivers) and Project features (e.g., dams and powerhouses). Furthermore, the four sites had the lowest potential for equipment vandalism. The selected sites were: 1) the outflow of the Camptonville Tunnel (Figure 2.2-1); 2) the base of New Bullards Bar Dam, immediately downstream of the low level outlet valve pool (Figure 2.2-2); 3) the riparian margin of the Yuba River immediately adjacent to New Colgate Powerhouse Yard (Figure 2.2-3); and 4) Narrows 2 Powerhouse (Figure 2.2-4).



Figure 2.2-1. Camptonville Tunnel outflow LTAM site.



Figure 2.2-2. New Bullards Bar Dam LTAM site.



Figure 2.2-3. New Colgate Powerhouse LTAM site.



Figure 2.2-4. Narrows 2 Powerhouse LTAM site.

LTAM began on April 1, 2012 at the base of New Bullards Bar Dam, immediately downstream of the low level outlet valve pool, the riparian margin of the Yuba River, immediately adjacent to New Colgate Powerhouse, and Narrows 2 Powerhouse. Monitoring at the outflow of the Camptonville Tunnel was delayed until July 24, as a result of unsafe access to the site because of high flows. Monitoring at all four sites continued through October 31, 2012.

During LTAM, all detectors were programmed using the delayed start mode, which allowed them to switch from sleep to standby one hour before sunset and switch back to sleep one hour after sunrise. While in sleep mode, the detector was essentially shut off, in order to preserve battery power and reduce the amount of unrelated data (e.g., rustling leaves, ultrasonic noise from bugs, etc) saved to the CF card. While in standby, the detectors continuously monitored for bat calls. Once a bat call was detected, it triggered the Anabat SD1™ to record and save the call to the CF card. All calls were saved as an individual Anabat call file, with the date and time of the recording as the file name.

All sites were visited at least once per month in order to download recorded calls and perform general maintenance of equipment, if necessary. Upon download, data from each detector was saved to folders that corresponded to the site location (e.g., New Colgate Powerhouse) and period for which monitoring occurred (e.g., July). Call files were further organized into folders that specified the date recorded (e.g., 20120710). The latter was performed by the software during data transfer from the CF cards to a laptop computer.

2.2.4 Acoustic Data Analysis

Analysis of all acoustic data collected was performed with AnalookW™ (Analook) software, developed by Chris Corbin (version 3.8, March 8, 2011). Analook allows users to view and analyze real time or prerecorded Anabat call files. Files are displayed as a sonogram, with time on the X-axis and frequency on the Y-axis. This display allows identification of call characteristics, such as maximum and minimum frequency, characteristic frequency and call duration. Other call characteristics displayed include shape and the presence of harmonics, which are useful in the identification of some species. To analyze large batches of files, users can program Analook's scan feature to identify individual call files from a specific species. Once identified by the program, all call files from a batch can be separated and viewed on a species-by-species basis.

All Anabat call files were run through species-specific scans, tailored to identify call sequences from special-status bats that are known or have the potential to occur in the Project Vicinity. The species-specific scans identified each file that possessed specific call characteristics for a species of interest. The identified files were saved to a separate folder that corresponded to the site and month in which the call was recorded. After all scans were completed, they were reviewed for the presence of valid call sequences.⁷ Additionally, a species-specific filter was applied to each call sequence during scan reviews. The filter allowed YCWA to identify call characteristics by highlighting them.

⁷ A valid call sequence must contain more than two pulses and display call characteristics specific to the species of interest.

After the scans were reviewed, call files were placed into one of three categories: 1) known; 2) unknown; and 3) unconfirmed bat species. The known category contained call files with definitive species identification. The unknown category contained call files with species that could not be identified. The unconfirmed category was for call files which contained species-specific characteristics, but indefinite species identification.

Similarities in call characteristics make it difficult to identify eight species of bats present in California via acoustic analysis. The eight species include Yuma myotis (*Myotis yumanensis*), Western small-footed myotis (*Myotis ciliolabrum*), pallid bat (*Antrozous pallidus*), California myotis (*Myotis californicus*), long-legged myotis (*Myotis volans*), little brown myotis (*Myotis lucifugus*), big brown bat (*Eptesicus fuscus*), and silver-haired bat (*Lasionycteris noctivagans*). Of these, only pallid bat are considered special-status.

For acoustic analysis, the above eight species fall into one of three groups. The first group is known as 50 kilohertz (kHz) *Myotis* and contains California myotis and Yuma myotis. The second group is known as 40 kHz *Myotis* and contains Western small-footed myotis, long-legged myotis, and little brown bat. The third group is known as 25 kHz bats and contains pallid bat, big brown bat, and silver-haired bat. Call characteristics of the species in the 40 and 50 kHz groups are nearly identical, and grouping them is a widely accepted practice for analysis of bat calls. All three species in the third group may be identified to species, if specific call characteristics are present. The specific call characteristics include: 1) social calls for pallid bat (less steep pulses sweeping from 30 to 10 kHz and generally in triplicate); 2) calls exceeding 65 kHz, which are representative of big brown bat; and 3) the presence of flat calls ≥ 26 kHz, which are diagnostic of silver-haired bat. If the specific call characteristics described above were absent from the call sequence, the call files were placed in the 25 kHz group.

3.0 Results

3.1 Initial Reconnaissance

On March 12 and 13, and April 30, 2012, YCWA inspected Project facilities and recreation areas and located 14 Project-related structures with signs of bat use (Table 3.1-1). Of those, two were Project facilities (i.e., New Colgate Powerhouse Administration and Shop Building, which is located within the New Colgate Powerhouse Yard and Narrows 2 Powerhouse) and the remaining 12 were restrooms associated with recreation areas (i.e., Emerald Cove Marina Boat Launch, Dark Day Boat Ramp restroom, Schoolhouse Family Campground restrooms, Hornswoggle Group Campground restrooms). While not part of the initial reconnaissance survey, additional observations of bat use, specifically the presence of bats on or within structures, were noted during mist net surveys, and those observations are included in Table 3.1-1.

Table 3.1-1. Observations of bat sign during reconnaissance survey of the Yuba River Development Project in 2012.

Facility	Observations
NEW COLGATE DEVELOPMENT	
Our House Diversion Dam	Suitable foraging habitat present at dam, no sign of roosting on dam.
Lohman Ridge Diversion Tunnel	Suitable foraging habitat present at tunnel entrance and exit, no evidence of roosting found during reconnaissance.
Log Cabin Diversion Dam	Suitable foraging habitat present at dam, no sign of roosting on dam.
Camptonville Diversion Tunnel	Suitable foraging habitat present at tunnel entrance and exit, no evidence of roosting found during reconnaissance. However, bats were observed entering and exiting tunnel and roosting on concrete exterior immediately adjacent to tunnel entrance, during mist netting on July 24 and September 24, 2012.
New Bullards Bar Dam	Suitable foraging habitat present below dam, no sign of roosting on dam. Canyon walls adjacent to dam appear to be suitable for roosting.
New Colgate Power Tunnel	Tunnel submerged and inaccessible.
New Colgate Powerhouse	Suitable foraging habitat present surrounding powerhouse. YCWA staff reported bats inside the New Colgate Administration & Shop Building. Day roost observed within an exterior concrete structure of the New Colgate Admin & Shop Building during mist net surveys.
New Bullards Bar – Dark Day Boat Ramp	Guano found on interior and exterior of restroom.
New Bullards Bar – Dark Day Campground	Guano found on interior and exterior of restroom.
New Bullards Bar – Schoolhouse Family Campground	Guano found on interior and exterior of all restrooms.
New Bullards Bar – Hornswoggle Group Campground	Guano found on interior and exterior of restrooms.
New Bullards Bar – Moran Road Boat Launch	No evidence of roosting present, but restroom has many small openings that could provide access to interior of building for roosting.
New Bullards Bar – Dam Overlook	No evidence of roosting, but restroom has many small openings that could provide access to interior of building for roosting.
New Bullards Bar – Emerald Cove Marina Boat Ramp	Single piece of guano located on exterior of restroom. Active day roost at Emerald Cove Marina General Store.
NEW BULLARDS FISH RELEASE DEVELOPMENT	
New Bullards Minimum Flow Powerhouse	No evidence of roosting; building appears to be well sealed.
NARROWS 2 DEVELOPMENT	
Narrows 2 Powerhouse	Small amount of staining and guano found in stairwell accessing powerhouse.

3.2 Focused Surveys

3.2.1 Mist Net Sampling

Mist net surveys were conducted at six locations within the study area between July 23 and 28, and again between September 3 and 8, 2012. Five bat species were captured and identified, and three individuals of unknown species were captured, but escaped prior to removal from the net. Of those captured, none were special-status species. Completed mist net sampling data sheets are located in Attachment 4.2A. Yuma myotis was the most commonly captured species, with 19 individuals captured at five of the six mist net sites. Big brown bat was the second most captured species, with three individuals captured, one at Log Cabin Diversion Dam and two at Schoolhouse Family Campground. Little brown myotis was the third most captured species, with two individuals captured, one at Schoolhouse Family Campground and one below New Bullards Bar Dam. A single fringed myotis (*Myotis thysanodes*) and a single canyon bat (*Parastrellus hesperus*) were captured, both at Our House Diversion Dam. Results of the mist nest surveys are summarized in Table 3.2-1.

Table 3.2-1. 2012 mist net survey results.

Survey Location	Date	Species (number of individuals captured)					
		EPFU	MYLU	MYTH	MYU	PAHE	MY sp.
Our House	7/23/2012	--	--	1	--	1	--
Diversion Dam	9/3/2012	--	--	--	--	--	--
Log Cabin	7/24/2012	--	--	--	--	--	--
Diversion Dam	9/4/2012	1	--	--	1	--	1
Dark Day	7/25/2012	--	--	--	2	--	--
Campground and Boat Ramp	9/5/2012	--	--	--	--	--	2
Schoolhouse	7/26/2012	2	--	--	2	--	--
Family Campground	9/6/2012	--	1	--	1	--	--
Below New Bullards Bar Dam	7/27/2012	--	--	--	2	--	--
	9/7/2012	--	1	--	2	--	--
New Colgate Powerhouse	7/28/2012	--	--	--	5	--	--
	9/8/2012	--	--	--	4	--	--
Total	--	3	2	1	19	1	3

Key:

EPFU – big brown bat (*Eptesicus fuscus*)
MYLU – little brown myotis (*Myotis lucifugus*)
MYTH – fringed myotis (*Myotis thysanoides*)
MYU – Yuma myotis (*Myotis yumanensis*)
PAHE – canyon bat (*Parastrellus hesperus*)
MY sp. – Unknown *Myotis* sp.

3.2.2 Acoustic Sampling

Acoustic sampling was conducted in conjunction with mist net surveys between July 23 and 28, and again between September 3 and 8, 2012. However, due to an equipment malfunction, acoustic data collected on September 3, 4, 5, and 6 was lost. Table 3.2-2 displays acoustic data collected at all six mist net sites (raw acoustic data are included in Attachment 4.2B). Based on acoustic sampling, five additional bat species were identified at the six focused survey sites. Of these, three are special-status bat species: 1) Townsend's big-eared bat (*Corynorhinus townsendii*); 2) spotted bat (*Euderma maculatum*); and 3) Western red bat (*Lasiurus blossevillii*). The remaining two species were hoary bat (*Lasiurus cinereus*) and Western long-eared myotis (*Myotis evotis*).

Table 3.2-2. 2012 active acoustic monitoring results.

Survey Location	Date ¹	Species recorded									
		25kHz Species	40kHz <i>Myotis</i>	50 kHz <i>Myotis</i>	COTO	EUMA	LABL	LACI	MYEV	MYTH	PAHE
Our House	7/23/2012	X	--	X	--	--	X	X	--	X	X
Diversion Dam	9/3/2012	M	M	M	M	M	M	M	M	M	M
Log Cabin	7/24/2012	X	--	X	--	--	X	--	--	--	X
Diversion Dam	9/4/2012	M	M	M	M	M	M	M	M	M	M
Dark Day	7/25/2012	X	--	X	X	--	X	X	--	--	--
Campground and Boat Ramp	9/5/2012	M	M	M	M	M	M	M	M	M	M
Schoolhouse	7/26/2012	X	--	X	--	--	--	--	X	--	--
Family Campground	9/6/2012	M	M	M	M	M	M	M	M	M	M
Below New Bullards Bar Dam	7/27/2012	X	--	X	P	--	--	--	--	--	--
	9/7/2012	--	--	X	--	--	X	--	--	--	X

Table 3.2-2. (continued)

Survey Location	Date ¹	Species recorded									
		25kHz Species	40kHz <i>Myotis</i>	50 kHz <i>Myotis</i>	COTO	EUMA	LABL	LACI	MYEV	MYTH	PAHE
New Colgate Powerhouse	7/28/2012	X	--	X	--	--	X	X	--	--	X
	9/8/2012	X	X	X	P	X	X	X	X	--	X

Key:

“X” indicates that the species was recorded.

“P” indicates that a recorded call is suggestive of a species, but due to clutter, presence of other species, or fragmentation, identification is not absolute.

“M” signifies equipment malfunction.

25 kHz species are a group of bats that echolocate in the 25 kHz range and are difficult to differentiate because of similarities in call structure. This group includes big brown bat (*Eptesicus fuscus*), silver-haired bat (*Lasionycteris noctivagans*), and pallid bat (*Antrozous pallidus*). However, these three species may be identified individually, if species-specific call characteristics are present (e.g., social calls for pallid bat, calls exceeding 65 kHz for big brown bats, the presence of flat calls, ≥ 26 kHz, for silver-haired bat).

40 kHz *Myotis* are bats that echolocate in the 40 kHz range and are difficult to identify because of similarities in call structure. This group includes Western small-footed myotis (*Myotis ciliolabrum*), little brown myotis (*Myotis lucifugus*), and long-legged myotis (*Myotis volans*).

50 kHz *Myotis* are bats that echolocate in the 50 kHz range and are difficult to identify because of similarities in call structure. This group includes Yuma myotis (*Myotis yumanensis*) and California myotis (*Myotis californicus*).

COTO – Townsend’s big-eared bat (*Corynorhinus townsendii*)

EUMA – spotted bat (*Euderma maculatum*)

LABL – Western red bat (*Lasiurus blossevillei*)

LACI – hoary bat (*Lasiurus cinereus*)

MYEV – Western long-eared myotis (*Myotis evotis*)

MYTH – fringed myotis (*Myotis thysanodes*)

PAHE – canyon bat (*Parastrellus hesperus*)

¹ During the September mist net surveys, the Anabat unit, and a backup unit, experienced internal battery failure, and thus, no acoustic data was recorded at Our House Diversion Dam, Log Cabin Diversion Dam, Dark Day Campground and Boat Launch, and Schoolhouse Family Campground. Acoustic data for New Bullards Bar Dam and Colgate Powerhouse was obtained from the LTAM units at those sites.

3.2.3 Long Term Acoustic Monitoring

Three Anabat SD1™ detectors were deployed on April 1, 2012 at New Bullards Bar Dam, New Colgate Powerhouse and Narrows 2 Powerhouse, and remained in operation through October 31, 2012. A fourth Anabat SD1™ detector was deployed at the Camptonville Tunnel outflow to New Bullards Bar Reservoir on July 24, 2012, and remained in operation through October 31, 2012. All three acoustic groups (i.e., 25 kHz species, 40 kHz *Myotis*, and 50 kHz *Myotis*) were found to be present in the study area along with eight individual species. Table 3.2-3 summarizes the acoustic data collected at each of the four sites (raw acoustic data are in Attachment 4.2B).

Table 3.2-3. Long Term Acoustic Monitoring data summary.

Survey Location	Month	Species										
		25 kHz Species	40 kHz <i>Myotis</i>	50 kHz <i>Myotis</i>	ANPA	COTO	EUMA	LABL	LACI	MYEV	MYTH	PAHE
Camptonville Tunnel ¹	July	X	X	X	--	--	--	X	--	--	--	--
	August	X	X	X	--	--	X	X	X	--	--	--
	September	X	X	X	--	--	--	X	X	X	--	--
	October	X	X	X	P	P	--	X	X	--	X	--
New Bullards Bar Dam	April	M	M	M	M	M	M	M	M	M	M	M
	May	--	--	X	--	--	--	--	--	--	--	--
	June	--	--	X	--	--	--	--	--	--	--	--
	July	X	X	X	--	P	X	X	--	X	--	X
	August	X	X	X	--	--	X	X	--	X	--	X
	September	X	X	X	--	P	X	X	P	--	--	X
	October	X	X	X	--	--	X	--	--	--	--	--

Table 3.2-3. (continued)

Survey Location	Month	Species										
		25 kHz Species	40 kHz <i>Myotis</i>	50 kHz <i>Myotis</i>	ANPA	COTO	EUMA	LABL	LACI	MYEV	MYTH	PAHE
New Colgate Powerhouse	April	X	--	X	--	--	--	--	X	--	--	X
	May	X	X	X	P	P	X	--	X	--	--	X
	June	X	X	X	P	P	X	X	X	--	--	X
	July	X	X	X	P	P	X	X	X	X	--	X
	August	X	X	X	P	P	--	X	X	X	--	X
	September	X	X	X	--	X	X	X	X	--	--	X
	October	X	X	X	P	--	X	X	X	--	X	X
Narrows 2 Powerhouse	April	X	X	X	--	P	X	X	X	--	--	X
	May	X	--	X	--	--	X	X	X	--	--	X
	June	X	--	X	--	--	--	X	--	--	--	X
	July	X	--	X	--	P	--	X	X	--	--	X
	August	X	X	X	--	--	--	X	X	X	--	X
	September	X	X	X	--	--	X	X	--	--	--	X
	October	X	--	X	--	--	--	X	X	--	--	X

Key:

“X” indicates that the species was recorded.

“P” indicates that a recorded call is suggestive of a species, but due to clutter, presence of other species, or fragmentation, identification is not absolute.

“M” signifies equipment malfunction.

25 kHz species are a group of bats that echolocate in the 25 kHz range and are difficult to differentiate because of similarities in call structure. This group includes big brown bat (*Eptesicus fuscus*), silver-haired bat (*Lasionycteris noctivagans*), and pallid bat (*Antrozous pallidus*). However, these three species may be identified individually, if species-specific call characteristics are present (e.g., social calls for pallid bat, calls exceeding 65 kHz for big brown bats, the presence of flat calls, ≥26 kHz, for silver-haired bat).

40 kHz *Myotis* are bats that echolocate in the 40 kHz range and are difficult to identify because of similarities in call structure. This group includes Western small-footed myotis (*Myotis ciliolabrum*), little brown myotis (*Myotis lucifugus*), and long-legged myotis (*Myotis volans*).

50 kHz *Myotis* are bats that echolocate in the 50 kHz range and are difficult to identify because of similarities in call structure. This group includes Yuma myotis (*Myotis yumanensis*) and California myotis (*Myotis californicus*).

ANPA – pallid bat

COTO – Townsend’s big-eared bat (*Corynorhinus townsendii*)

EUMA – spotted bat (*Euderma maculatum*)

LABL – Western red bat (*Lasiurus blossevillei*)

LACI – hoary bat (*Lasiurus cinereus*)

MYEV – Western long-eared myotis (*Myotis evotis*)

PAHE – canyon bat (*Parastrellus hesperus*)

¹ Due to safety concerns regarding access, LTAM equipment was not deployed at this site until July 24, 2012. The species listed for the month of July may not be inclusive of all species present in July.

Acoustic data collected during the course of this study allowed YCWA to identify bat species present in the study area between April 1 and October 31, 2012. However, equipment malfunctions at the New Bullards Bar Dam survey site resulted in a loss of acoustic data recorded in the month of April.

With respect to species distribution, the 50 kHz *Myotis* group was present at all sites during all months in which acoustic data was available. As previously indicated the 50 kHz *Myotis* group is comprised of two bat species, Yuma myotis and California myotis. Of those only Yuma myotis was captured and identified during YCWA’s focused surveys. The capture and confirmation of only Yuma myotis should not eliminate the potential for California myotis to occur in the study area, especially since both species have similar habitat preferences.

The 25 kHz bat group was the second most recorded group of bats in the study area. Like the 50 kHz *Myotis*, the 25 kHz bat group was recorded at all LTAM sites, but unlike the 50 kHz *Myotis*, the 25 kHz bat group was not confirmed during all months. This absence was limited to New Bullards Bar Dam and the months of April (equipment malfunction), May and June. The 25 kHz bat group is comprised of three species, big brown bat, silver-haired bat, and pallid bat. Of

those, YCWA captured and confirmed the presence of big brown bat. However, LTAM data suggested that pallid bat could be present in the study area as well. Some of the calls from the Camptonville Tunnel (October), and Colgate Powerhouse (May, June, July, August, and October) sites possessed characteristics indicative of pallid bat. These included measured parameters such as characteristic frequencies in the 29 to 31 kHz range and call durations between 3 and 7 milli-seconds; as well as characteristics visible on a sonogram such as simple curved frequency modulated sweeps without “flair” (Humboldt State University Bat Lab 2008). However, all of these suggestive calls were found to be lacking social calls, which are diagnostic of pallid bat, contained additional calls from other species of bats, or were of low quality (cluttered or fragmented calls).

The 40 kHz *Myotis* group was also recorded at all LTAM sites, but was not confirmed during all months. The absence of 40 kHz *Myotis* group calls occurred at New Bullards Bar Dam (May and June), Colgate Powerhouse (April), and Narrows 2 Powerhouse (May, June, July, and October). The 40 kHz *Myotis* group is comprised of three species, Western small-footed myotis, little brown myotis, and long-legged myotis. Of those, YCWA captured and confirmed the presence of little brown myotis in the study area. The capture and confirmation of only one species from this group (little brown myotis) does not eliminate the potential for the other two species to occur in the study area.

Of the eight individual species whose presences was either confirmed or suggested by LTAM five occurred or potentially occurred at all four LTAM sites. These five species included Townsend’s big-eared bat, spotted bat (*Euderma maculatum*), Western red bat, hoary bat, and Western long-eared bat. However, none of these five species were recorded during all months in which acoustic monitoring occurred. Of the three remaining species, canyon bat was the most common and recorded at New Bullards Bar Dam (July, August, and September), New Colgate Powerhouse (all months) and Narrows 2 Powerhouse (all months). Pallid bat and fringed myotis were both recorded at Camptonville Tunnel and New Colgate Powerhouse.

4.0 Discussion

Mist net surveys, acoustic sampling and LTAM were used to determine presence and distribution of special-status bats in the study area. Through captures and acoustic monitoring YCWA identified 13 bat species. Of these, three are considered special-status by the CDFG and United States Department of Agriculture, Forest Service: pallid bat, Townsend’s big-eared bat, and Western red bat. One species, spotted bat, is considered special-status by the CDFG only (CDFG 2011). Table 4.0-1 provides a summary of all bat species documented at all focused survey and LTAM sites, and land ownership at each site.

Table 4.0-1. Bat species recorded via acoustic monitoring and or captured during mist net surveys in the study area.

Location	Land Ownership ¹	Species and Special Status													
		25 kHz Species	40 kHz <i>Myotis</i> species	50 kHz <i>Myotis</i> species	ANPA ^{2,3}	COTO ^{2,3}	EPFU	EUMA ³	LABL ^{2,3}	LACI	MYEV	MYLU	MYTH	MYYU	PAHE
Our House Diversion Dam	Forest Service	X	--	X	--	--	--	--	X	X	--	--	X	--	X
Log Cabin Diversion Dam	Forest Service	X	--	X	--	--	X	--	X	--	--	--	--	X	X
Camptonville Tunnel	Forest Service	X	X	X	P	P	--	X	X	X	X	--	X	--	--
Dark Day Campground and Boat Ramp	YCWA	X	--	X	--	--	--	--	X	X	--	--	--	X	--
Schoolhouse Family Campground	Forest Service	X	--	X	--	--	X	--	--	--	X	X	--	X	--
Below New Bullards Bar Dam	YCWA	X	X	X	P	P	--	X	X	P	X	X	--	X	X
New Colgate Powerhouse	YCWA	X	X	X	P	X	--	X	X	X	X	--	X	X	X
Narrows 2 Powerhouse	USACE	X	X	X	--	P	--	X	X	X	X	--	--	--	X

Key:

“X” indicates that the species was recorded.

“P” indicates that a recorded call is suggestive of a species, but due to clutter, presence of other species, or fragmentation, identification is not absolute.

25 kHz species are a group of bats that echolocate in the 25 kHz range and are difficult to differentiate because of similarities in call structure. This group includes big brown bat (*Eptesicus fuscus*), silver-haired bat (*Lasionycteris noctivagans*), and pallid bat (*Antrozous pallidus*). However, these three species may be identified individually, if species-specific call characteristics are present (e.g., social calls for pallid bat, calls exceeding 65 kHz for big brown bats, the presence of flat calls, ≥26 kHz, for silver-haired bat).

40 kHz *Myotis* are bats that echolocate in the 40 kHz range and are difficult to identify because of similarities in call structure. This group includes Western small-footed bat (*Myotis ciliolabrum*), little brown myotis (*Myotis lucifugus*), and long-legged bat (*Myotis volans*).

50 kHz *Myotis* are bats that echolocate in the 50 kHz range and are difficult to identify because of similarities in call structure. This group includes Yuma myotis (*Myotis yumanensis*) and California myotis (*Myotis californicus*).

ANPA – pallid bat

COTO – Townsend’s big-eared bat (*Corynorhinus townsendii*)

EPFU – big brown bat

EUMA – spotted bat (*Euderma maculatum*)

LABL – Western red bat (*Lasiurus blossevillei*)

LACI – hoary bat (*Lasiurus cinereus*)

MYEV – Western long-eared myotis (*Myotis evotis*)

MYLU – Yuma myotis

MYTH – fringed myotis (*Myotis thysanodes*)

PAHE – canyon bat (*Parastrellus hesperus*)

¹ Forest Service: USDA Forest Service administered lands; YCWA: lands under ownership of Yuba County Water Agency, USACE: U.S. Army Corps of Engineers administered lands.

² FSS = Forest Service Sensitive Species (CDFG 2011)

³ SSC = CDFG Species of Special Concern (CDFG 2011)

4.1 Bat Roosts

Bats often roost on or within man-made structures. These structures include, but are not limited to, storage sheds, attics, woodpiles, bridges, mines and tunnels. With the exception of mines and some tunnels, man-made structures that provide suitable roosting habitat are composed of concrete or wood materials, or a combination of both. The extent to which bats utilize man-made structures depends upon many variables, including size of the structure, internal and external temperature, proximity to foraging opportunities, protection from predators, and the species occupying the roost. The presence of bat signs, such as guano, and staining, and sightings or reports of bats themselves help to determine the extent of use (infrequent or continuous), as well as the type of roost (e.g., day, night, maternity, or winter). As part of the study, YCWA classified all roosts found within the Project study area. Each roost was classified as one or more of the following:

- **Night Roosts.** A night roost is a feature that allows for rest between foraging bouts, digestion of prey, escape from predators, and shelter from the weather. Night roosts may also have social purposes. Night roosts are typically sites or structures that retain a higher than ambient temperature. The elevated temperatures associated with night roosts aid in maintaining higher metabolism necessary for digestion.
- **Day Roosts.** A day roost is a feature where bats spend the non-active period of the day, resting or in torpor, depending on weather conditions. Day roosts provide shelter from the elements and safety from predators.
- **Maternity Roosts.** A maternity roost is a feature that provides protection from the elements and predators, while providing the correct thermal environment for rearing of young. Maternity roosts tend to be warmer in temperature because breeding females need to maintain a high metabolism to aid in lactation. According to Tuttle and Taylor (1998), maternity roost thermal requirements are species dependent, but generally remain between 70°F and 90°F. However, Townsend's big-eared bat maternity roosts have been discovered in sites where ambient temperatures are as low as 60°F. Species that form large colonies can be found raising young in mines with ambient temperatures as low as 56°F, but prefer 66°F or higher.
- **Winter Hibernacula.** A winter hibernacula is an area used by bats during colder winter months. During this time, bats enter torpor, receiving nourishment from fat storage gained during summer months. Many species will awaken for brief periods of time to stretch, but will resume torpor. Bats, such as the Townsend's big-eared bat, will hibernate for short periods of time and often resume feeding behavior during warm winter spells (Tuttle & Taylor 1998). Airflow and temperature are key determinants in use of structures, such as tunnels and adits, as hibernacula. Temperatures within these roost sites are generally below 53°F at the onset of hibernation and remain between 34°F and 50°F by midwinter. Structures that have a varying temperature regime allow bats to find suitable temperatures during warm or cold winters (Tuttle and Taylor 1998).

During the initial reconnaissance, YCWA found signs of bat use (e.g., guano, staining or employee reported sightings of bats) at both Project powerhouses and at nearly all restrooms

associated with recreation facilities. While mist netting, YCWA observed bats entering and exiting the Camptonville Tunnel at Log Cabin Diversion Dam, as well as an exterior concrete structure that is part of the New Colgate Administration & Shop Building. Based on the results of the initial reconnaissance and data collected while mist netting, YCWA was able to identify three active day roosts and 17 night roosts.

Project Facilities used as a Night Roost

Night roosts had varying amounts of guano and/or staining, which ranged from a few pieces to more than 100, or had staining over small or large areas of walls. Of the 17 structures used as night roosts, 12 were restrooms located in campgrounds or at boat launches: Dark Day Boat Launch (one restroom), Dark Day Campground (three restrooms), Schoolhouse Family Campground (four restrooms), Hornswoggle Group Campground (three restrooms), and Emerald Cove Boat Ramp (one restroom). The remaining night roosts were located under the concrete road deck immediately adjacent to the entrance of the Camptonville Tunnel, within the Camptonville Tunnel, the New Colgate Administration & Shop Building (YCWA staff reported two bats in an interior stairwell, and during mist net surveys bats were observed entering and exiting an exterior concrete structure, which consists of four vertical slots that are more than 20 ft tall, 5 ft wide and 3 ft deep), and in the stairwell that accesses Narrows 2 Powerhouse.

With respect to identification of species actively roosting at the facilities listed above, YCWA only observed big brown bats roosting on the exterior of Schoolhouse Family Campground restrooms. For the remaining sites where evidence of night roosts was found, YCWA was unable to identify which species were using the roosts. However, capture and acoustic data collected at the Dark Day Boat Launch, New Colgate Administrative and Shop Building, and Camptonville Tunnel suggests that Yuma myotis and big brown bats may be associated with these three night roosts. Furthermore, both Yuma myotis and big brown bats are known for their propensity to roost in anthropomorphic structures (Western Bat Working Group 2005a, 2005b).

Project Facilities used as a Day Roost

Three structures were found to have active day roosts, including the Camptonville Tunnel, Emerald Cove Marina General Store, and the New Colgate Administrative and Shop Building structure. The Camptonville Tunnel day roost is located within the tunnel itself, but due to safety concerns associated with entering the tunnel, the exact location of the roost is unknown. Furthermore, the species associated with Camptonville Tunnel are also unknown, but like the night roost, it is believed that Yuma myotis and big brown bats are likely occupants. The Emerald Cove Marina General Store day roost is located within the eaves of the main building. Based on the size of the access points, YCWA believes the roosting bats to be from the genus *Myotis*. The New Colgate Administrative and Shop Building day roost is located within the exterior concrete structure (described above). YCWA believes that the nine Yuma myotis captured at this site in July (5) and September (4) are a few of the individuals observed emerging from the structure.

Project Facilities used as a Maternity Roost

YCWA was unable to identify any maternity roosts. However, many of the bats captured during the July mist netting effort were found to be reproductive (lactating females and scrotal males). These species included Yuma myotis and big brown bat. The presence of reproductive individuals suggests that maternity roosts are present in the Project Vicinity. It is likely that the same roosts that serve as day roosts may also serve as maternity roosts.

Project Facilities used as Winter Hibernacula

Like maternity roosts, YCWA was unable to locate any winter hibernacula. With the exception of the hoary bat, Western red bat and silver-haired bat, bats documented in the study area tend to overwinter within, or near, their summer range, suggesting that many of them may have winter hibernacula nearby.

5.0 Study-Specific Consultation

The FERC-approved study included two study-specific consultations, each of which is discussed below.

5.1 Agency Consultation

The FERC-approved study required YCWA to:

...invite Relicensing Participants into the field to comment on the location of both acoustic and mist net sampling sites.

YCWA invited Relicensing Participants into the field to comment on the location of both acoustic and mist net sampling sites that had been previously identified during Initial Reconnaissance. The field visit was scheduled on Wednesday, March 28, 2012, and a notice of the field visit was posted on YCWA's Relicensing Event Calendar on the Project SharePoint Website (www.ycwa-relicensing.com).

Attendees of the field visit included Justin Tortosa, Senior Wildlife Biologist, HDR; Adam Bunger, Associate Scientist, HDR; and Marilyn Tierney, District Biologist, Yuba River Ranger District, Tahoe National Forest.

On April 13, 2012, YCWA convened a conference call with Marilyn Tierney, MaryLisa Lynch, Biologist for the CDFG, and Sharon Stohrer, Staff Environmental Scientist for the CDFG, to discuss the March 28, 2012 field visit. During the conference call, attendees agreed that the three sites selected for LTAM and six sites selected for mist netting were suitable. However, attendees requested that a fourth LTAM unit be placed at the outflow of the Camptonville Tunnel to New Bullards Bar Reservoir. YCWA agreed to adding the location of the fourth unit, but delayed installation until July 24, due to high flows.

5.2 Submission of CNDDDB Forms

On November 9, 2012 YCWA submitted the appropriate CNDDDB forms to the CDFG's Biogeographic Data Branch.

6.0 Variances from FERC-Approved Study

This study was conducted according to the FERC-approved Study 4.2, *Special-Status Wildlife – Bats*, with three variances. The first variance was in regards to the LTAM period. The FERC-approved study specified that the period for LTAM would begin on April 1, 2012 and continue through October 31, 2012. An equipment malfunction resulted in the loss of all acoustic data for the month of April at the New Bullards Bar Dam LTAM site, and safety concerns over access (high flows) prevented deployment of equipment at the Camptonville Tunnel outlet until July 24, 2012. It is believed that this variance did not affect the study because a review of the other two sites' LTAM data suggests that species composition increased with the onset of summer, and that species present in July, August and September were likely present in April, May, or June.

The second variance was in regards to acoustic monitoring at mist net sites. The FERC-approved study specified that acoustic monitoring was to occur at all mist net sites, during both the July and September surveys. During the September mist net surveys, an equipment malfunction resulted in the loss of acoustic data at Our House Diversion Dam, Log Cabin Diversion Dam, Dark Day Boat Launch, and Schoolhouse Family Campground. The equipment malfunction affected YCWA's ability to identify bat species present at these four sites, and may have resulted in identification of fewer species at these sites than during the focused surveys performed in July. However, the number of species present in the study area during the September focused surveys was expected to be less than or equal to those identified in July. The reason for this is that some bat species (e.g., hoary bat, western red bat, silver-haired bat) may have already begun migration to winter hibernacula and therefore YCWA believes that this variance did not negatively reflect on the overall species composition in the study area.

The third variance was in regards to study completion. The FERC-approved study specified the study would be completed by the end of October 2012. This study required collection of acoustic data through October 31, 2012, and thus retrieval, analysis and inclusion of the acoustic data into Technical Memorandum 4-2 could not have been completed on or before October 31, 2012. This resulted in a slight delay of study completion. The delay did not affect the study or overall Relicensing schedule.

7.0 Attachments to This Technical Memorandum

This technical memorandum includes two attachments:

- Attachment 4-2A Completed Mist Net Sampling Data Sheets [1 Adobe pdf file: 443 KB; 20 pages formatted to print on 8-½ by 11 inch paper]

- Attachment 4-2B Raw Acoustic Data [1 Adobe pdf file: 12 KB; 4 pages formatted to print double sided on 8-½ by 11 inch paper]

8.0 References Cited

Bat Conservation International. 2008. *Bat of the Northwestern United States*. Bat Conservation International, Inc. BCM Workshop 2008.

California Department of Fish and Game (CDFG). California Interagency Wildlife Task Group. 2008. CWHR Version 8.2 personal computer program. Sacramento, CA.

_____. 2011. Special Animals (898 taxa). State of California. The Natural Resource Agency Department of Fish and Game Biogeographic Data Branch California Natural Diversity Database. Sacramento, California. January 2011. Available online: <<http://www.dfg.ca.gov/biogeodata/cnddb/pdfs/SPAnimals.pdf>>. Accessed August 28, 2012.

_____. 2012. California Natural Diversity Database (CNDDDB). RareFind Version 4. Available online: <<https://nrmsecure.dfg.ca.gov/cnddb/view/query.aspx>>. Accessed February, 2012. California Department of Fish and Game, Biogeographic Data Branch. Sacramento, CA.

Humboldt State University Bat Lab. 2008. Echolocation call characteristics of Pacific Northwest bats. Humboldt State University. Arcata, CA. February 2008.

Tuttle, M. D. and D. A. Taylor. 1998. Bats and Mines. Resource Publication No. 3. Bat Conservation International, Inc. Austin, Texas.

United States Department of Interior, Fish and Wildlife Service (USFWS). 2011. White-Nosed Syndrome Decontamination Protocol – Version 01.25.2011. Supporting Decontamination Documentation for Researchers (WNS Decontamination Supplement 2 of 2). Available online: <<http://www.wbwg.org/conservation/whitenosesyndrome/whitenose.html>>. Accessed July, 2012.

Western Bat Working Group. 2005a. Species Accounts Yuma myotis (*Myotis yumanensis*). Prepared by M. A. Bogan, E. W. Valdez, and K. W. Navo. Available online: <http://www.wbwg.org/speciesinfo/species_accounts/vespertilionidae/myyu.pdf>. Accessed October 2012.

_____. 2005b. Species Accounts Big Brown Bat (*Eptesicus fuscus*). Prepared by Mark Perkins. Available online: <http://www.wbwg.org/speciesinfo/species_accounts/vespertilionidae/epfu.pdf>. Accessed October, 2012.

Technical Memorandum 4-2

Special-Status Wildlife - Bats

Attachment 4-2A

Completed Mist Net Sampling Data Sheets

Yuba River Development Project
FERC Project No. 2246

November 2012

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BAT CAPTURE DATA FORM

Client and Project Name: YALOWA YRDP Location (site name, county, nearest town): Deer Haven Dam, Yellow County

Date: 7/23/12 Start Time: 2045 End Time: 2130 Recorder(s): STAB Adjacent roosting structure: Poles, Trees,

UTM (E): _____ UTM(N): _____ Start Temp: 10°C End Temp: 65°F %clouds: 0

Habitat: Lowland oak + pine Capture Technique: (# and type) 2 6m net 1 9m net _____

_____ 18m net _____ harp trap _____

_____ with wings _____

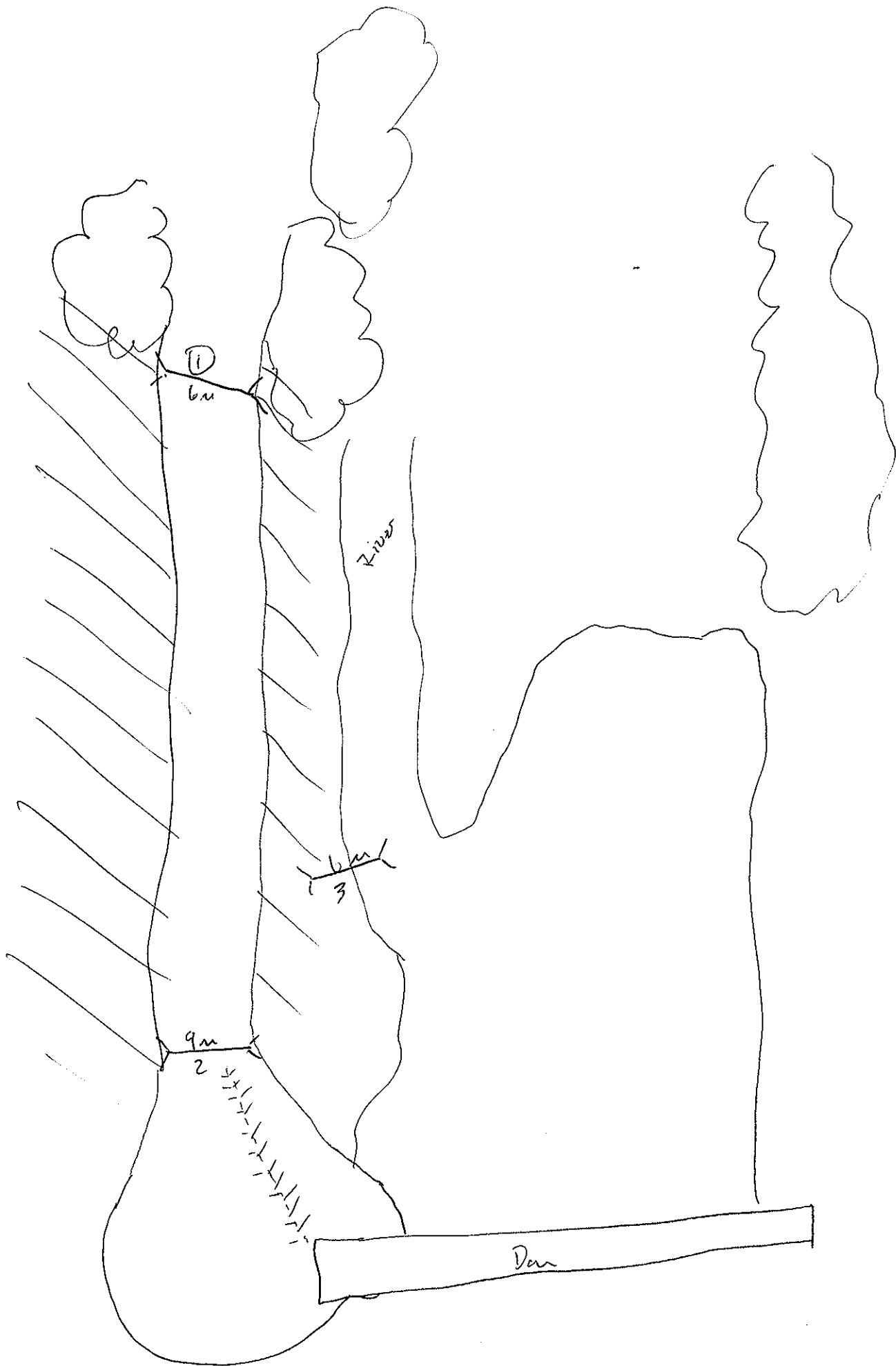
Set Over/Near Water? YES NO - If "yes" dimensions of Pool-size: 50 W x 100 L and of "swoop-zone": _____ W x _____ L (put diagram on back) set out and bat

present out of activity

Please use separate data-forms for net-caught vs. trap-caught bats; or otherwise indicate bats caught with different methods.

TIME	SPECIES	SEX (M/F)	AGE (J/A)	REPRODUCTIVE STATUS (M:S/NR) (F:P/L/PL/NR)	FA (MM)	EAR (MM)	WEIGHT (G)	SET	BAND OR MARKING (COMMENTS)
1. 21:24	<u>Parus Penns. versicolor</u>	<u>F</u>	<u>A</u>	<u>F:L</u>	<u>29.91</u>	<u>8</u>	<u>6.5</u>	<u>2</u>	<u>21:43 - V.C.</u>
2. 21:27	<u>Myo. THY</u>	<u>M</u>	<u>A</u>	<u>M:S</u>	<u>39.27</u>	<u>12.2</u>	<u>6.0</u>	<u>1</u>	<u>23:43 - V.C.</u>
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PLEASE DRAW DIAGRAM OF SET-UP ON BACK. NOTES ON BACK: YES NO



BAT CAPTURE DATA FORM

Client and Project Name: YCLA, YLDP Location (site name, county, nearest town): Los Cabon Diversion, Sierra Bonifacio
 Date: 7/24/12 Start Time: 20:35 End Time: 23:36 Recorder(s): JTAB Adjacent roosting structure: Discs, Trees, Tower

UTM (E): _____ UTN(N): _____ Start Temp: 66.9 End Temp: _____ %clouds: 0

Habitat: Deciduous pine, H2D Capture Technique: (# and type) 1 6m net 1 9m net 12m net

_____ 18m net _____ harp trap

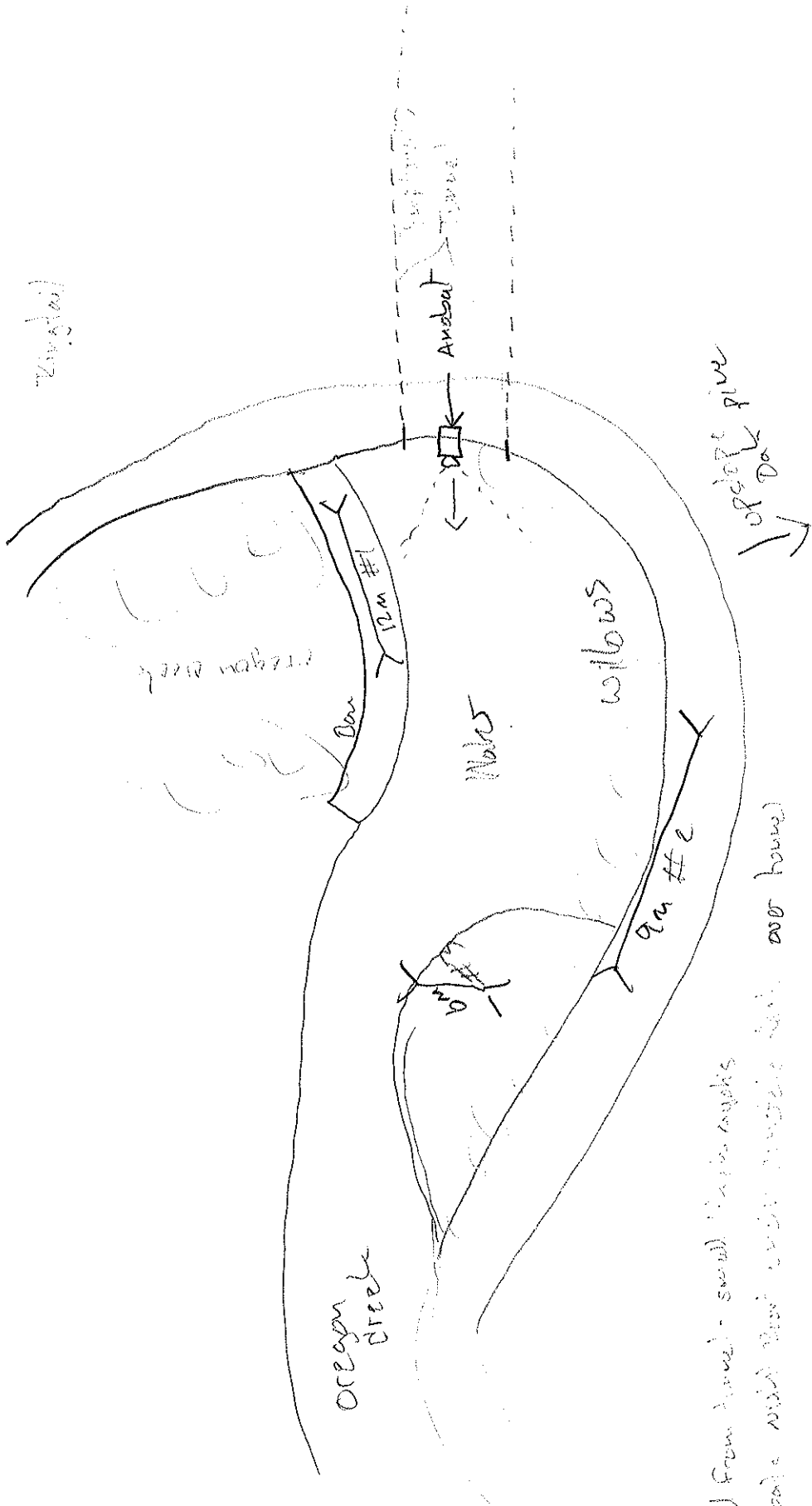
Set Over/Near Water YES NO - If "yes" dimensions of Pool-size: 3DW x 5DL and of "swoop-zone": 3DW x 1DDL (put diagram on back)

Please use separate data-forms for net-caught vs. trap-caught bats; or otherwise indicate bats caught with different methods.

TIME	SPECIES	SEX (M/F)	AGE (J/A)	REPRODUCTIVE STATUS (M:S/NR) (F:P/L/PL/NR)	FA (MM)	EAR (MM)	WEIGHT (G)	SET	BAND OR MARKING (COMMENTS)
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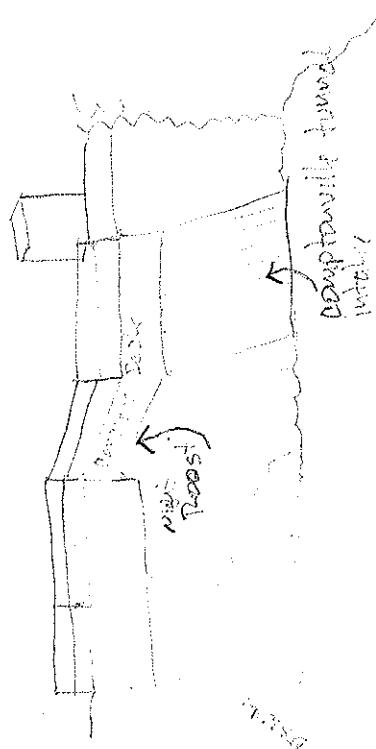
PLEASE DRAW DIAGRAM OF SET-UP ON BACK. NOTES ON BACK: YES NO

Kingfisher



Oregon River

Emerging from tunnel - small Kingfisher's
large hole with blue water inside hole over house



Accessed

willows

Log Cabin Division
Impoundment

Log Cabin Division

BAT CAPTURE DATA FORM

Client and Project Name: YALOWA, YRDP Location (site name, county, nearest town): Dark Day Boat Launch, Yuba, Pennsylvania

Date: 7/25/12 Start Time: 20:30 End Time: 21:12 Recorder(s): JT, AB Adjacent roosting structure: Trees, Barn

UTM (E): _____ UTM(N): _____ Start Temp: 72°F End Temp: _____ %clouds: 0

Habitat: Day, R. Pine, Oak, Lake Capture Technique: (# and type) 2-6m net 18m net harp trap

7 40DD + surface acs

Set Over/Near Water: YES/NO - If "yes" dimensions of Pool-size: W x L and of "swoop-zone": W x L (put diagram on back)

Please use separate data-forms for net-caught vs. trap-caught bats; or otherwise indicate bats caught with different methods.

TIME	SPECIES	SEX (M/F)	AGE (J/A)	REPRODUCTIVE STATUS (M:S/NR) (F:P/L/PL/NR)	FA (MM)	EAR (MM)	WEIGHT (G)	SET	BAND OR MARKING (COMMENTS)
1.	<u>WYO VJM</u>	<u>M</u>	<u>A</u>	<u>M:NR</u>	<u>25.174</u>	<u>11.17</u>	<u>27.50</u>		
2.	<u>WYO VJM</u>	<u>F</u>	<u>J</u>	<u>F:NR</u>	<u>30.0</u>	<u>11.17</u>	<u>32.51.5-4.5</u>		
3.	<u>WYO VJM</u>	<u>F</u>	<u>A</u>	<u>F:NR</u>	<u>25.29</u>	<u>11.19</u>	<u>37.21.5-2.5</u>		
4.	<u>WYO VJM</u>	<u>F</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>		<u>ESCAPED NET</u>
5.	<u>WYO VJM</u>	<u>M</u>	<u>A</u>	<u>M:S</u>	<u>34.0</u>	<u>11.0</u>	<u>37.5-32.55</u>		
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PLEASE DRAW DIAGRAM OF SET-UP ON BACK. NOTES ON BACK: YES NO

PAGE _____ OF _____

BAT CAPTURE DATA FORM

Client and Project Name: YDWA, YEDP, SS Bat study Location (site name, county, nearest town): Sandwich, Alb, Vt, Comptonville

Date: 7/24/12 Start Time: 20:26 End Time: 0:00 Recorder(s): STAB Adjacent roosting structure: Forest, Barns

UTM (E): _____ UTN(N): _____ Start Temp: 70°C End Temp: 66°F %clouds: 0

Habitat: Oak pine Capture Technique: (# and type) 2 6m net _____ 9m net _____

_____ 18m net _____ harp trap

Set Over/Near Water: YES ☒ NO ☐ If "yes" dimensions of Pool-size: _____ W x _____ L and of "swoop-zone": _____ W x _____ L (put diagram on back)

Please use separate data-forms for net-caught vs. trap-caught bats; or otherwise indicate bats caught with different methods.

TIME	SPECIES	SEX (M/F)	AGE (J/A)	REPRODUCTIVE STATUS (M:S/NR) (F:P/L/PL/NR)	FA (MM)	EAR (MM)	WEIGHT (G)	SET	BAND OR MARKING (COMMENTS)
1. 22:15	MYO VUM	F	J	F=N/R	32	11	33.5-31.5	2	—
2. 23:00	EPT FUS	M	A	M=N/R	48	14	15	1	—
3. 23:00	EPT FUS	F	A	F=PL	51	12	55-51.5-33.5	2	—
4. 23:42	MYO VUM	F	J	F=N/R	34	10	5	1	—
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PLEASE DRAW DIAGRAM OF SET-UP ON BACK. NOTES ON BACK: YES NO

PAGE _____ OF _____



BAT CAPTURE DATA FORM

Client and Project Name: YDWA, YRDP Location (site name, county, nearest town): Below New Blaine, Barre
 Date: 7/27/12 Start Time: 2020 End Time: 2330 Recorder(s): JMT Adjacent roosting structure: None, Division
 UTM (E): _____ UTN(N): _____ Start Temp: 70°F End Temp: 65°F %clouds: 0 Found for some
construction

Habitat: Sockhill red cliff + water Capture Technique: (# and type) 1 6m net 9m net
18m net harp trap

Set Over/Near Water: YES/NO - If "yes" dimensions of Pool-size: 2 W x 40 L and of "swoop-zone": 10 W x 20 L (put diagram on back)

Please use separate data-forms for net-caught vs. trap-caught bats; or otherwise indicate bats caught with different methods.

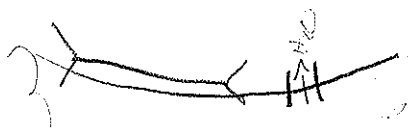
TIME	SPECIES	SEX (M/F)	AGE (I/A)	REPRODUCTIVE STATUS (M:S/NR) (F:P/L/PL/NR)	FA (MM)	EAR (MM)	WEIGHT (G)	SET	BAND OR MARKING (COMMENTS)
1. 22:15	<u>myo yun</u>	<u>M</u>	<u>A</u>	<u>M=S</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>1</u>	<u>—</u>
2. 22:15	<u>myo yun</u>	<u>F</u>	<u>A</u>	<u>F=L</u>	<u>34</u>	<u>11</u>	<u>6</u>	<u>1</u>	<u>—</u>
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PLEASE DRAW DIAGRAM OF SET-UP ON BACK. NOTES ON BACK: YES NO

PAGE _____ OF _____

✓ - Divergent
flow

SVR



low level
cattle pool
for new Bullards
Bar Den

BAT CAPTURE DATA FORM

Client and Project Name: YDWA, Y2DP Location (site name, county, nearest town): Yuba River to Delta P1
 Date: 7/20/12 Start Time: 2030 End Time: 224 Recorder(s): JA AB Adjacent roosting structure: diff. trees
 UTM (E): _____ UTM(N): _____ Start Temp: 78°F End Temp: 68 %clouds: 0

Habitat: cont. oak + pine Capture Technique: (# and type) 1 6m net 9m net harp trap
Yuba River 50m wide Yuba River 18m net harp trap

Set Over/Near Water: YES NO - If "yes" dimensions of Pool-size: W x L and of "scoop-zone": W x L (put diagram on back)

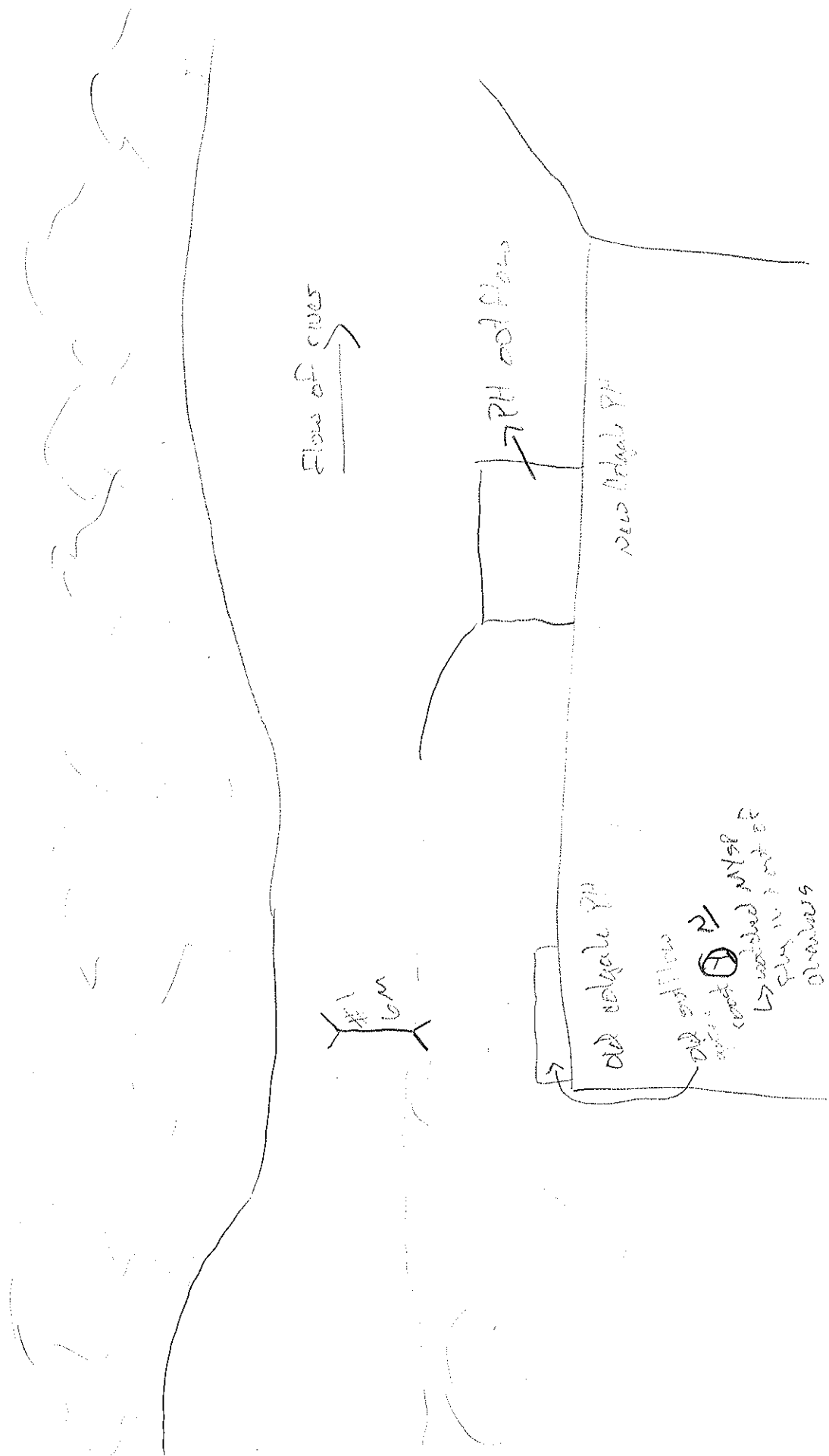
Please use separate data-forms for net-caught vs. trap-caught bats; or otherwise indicate bats caught with different methods.

TIME	SPECIES	SEX (M/F)	AGE (J/A)	REPRODUCTIVE STATUS (M:S/NR) (F:P/L/PL/NR)	FA (MM)	EAR (MM)	WEIGHT (G)	SET	BAND OR MARKING (COMMENTS)
1. 20:36	MYO YUM	M	J	M:NR	31	10	4.5	1	—
2. 21:08	MYO YUM	F	J	F:NR	32	10	—	1	—
3. 21:08	MYO YUM	M	A	M:S	35	11	37-31.5=5.5	1	—
4. 21:31	MYO YUM	F	A	F:L	34	13	38.5-31.5=7	1	—
5. 22:20	MYO YUM	F	A	F:L	32	11	37-31.5=5.5	1	Missing Fur and Sew
6.									
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PLEASE DRAW DIAGRAM OF SET-UP ON BACK. NOTES ON BACK: YES NO

PAGE _____ OF _____

MYPO Present in all 4 old flow drainages
 given Age + sex + reproductive status it appears this is
 a maturing Roost



Flow of river
 →

16M

BAT CAPTURE DATA FORM

Client and Project Name: YOLA, YROP Location (site name, county, nearest town): Dortchese Division Dam, Sierra County, Davenport
 Date: 9/3/12 Start Time: 1928 End Time: 2223 Recorder(s): JT RL Adjacent roosting structure: Rock, Trees, Dam

UTM (E): _____ UTM(N): _____ Start Temp: 17°F End Temp: 60 %clouds: 0

Habitat: Oak, foothill pine Capture Technique: (# and type) 1 6m net 1 9m net

→ 2 hrs + 1 hr pool, behind Dam
 Set Over (Near Water): YES/NO - If "yes" dimensions of Pool-size: 50m 100m 50 W x 200m L and of "swoop-zone": 50 W x 200m L (put diagram on back)

Please use separate data-forms for net-caught vs. trap-caught bats; or otherwise indicate bats caught with different methods.

TIME	SPECIES	SEX (M/F)	AGE (J/A)	REPRODUCTIVE STATUS (M:S/NR) (F:P/L/PL/NR)	FA (MM)	EAR (MM)	WEIGHT (G)	SET	BAND OR MARKING (COMMENTS)
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PLEASE DRAW DIAGRAM OF SET-UP ON BACK. NOTES ON BACK: YES NO

PAGE 1 OF 1

BAT CAPTURE DATA FORM

Client and Project Name: YoloA, VEDP Location (site name, county, nearest town): Log Cabin DD, Campbellville
 Date: 8/4/12 Start Time: 1930 End Time: 2310 Recorder(s): ST EK Adjacent roosting structure: Danpherville Division Tunnel, Dam, Forest
 UTM (E): _____ Start Temp: 73° End Temp: 60° %clouds: _____
 Habitat: Dan Southwill pine Capture Technique: (# and type) 2.6m net 1 9m net
 _____ 18m net _____ harp trap
 _____ ^{+150m}

Set Over/Near Water: YES NO – If “yes” dimensions of Pool-size: 20 W x 21 L and of “swoop-zone”: 30 W x 1 L (put diagram on back)

Please use separate data-forms for net-caught vs. trap-caught bats; or otherwise indicate bats caught with different methods.

TIME	SPECIES	SEX (M/F)	AGE (J/A)	REPRODUCTIVE STATUS (M:S/NR) (F:P/L/PL/NR)	FA (MM)	EAR (MM)	WEIGHT (G)	SET	BAND OR MARKING (COMMENTS)
1. 2009	MY VU (?)	-	-	-	-	-	-	1	Had wet skin lot
2. 2018	MY spp.?	-	-	-	-	-	-	1	500000
3. 2045	EPFU	M	A	NS	47	13	14.5	1	NA
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PLEASE DRAW DIAGRAM OF SET-UP ON BACK. NOTES ON BACK: YES NO

PAGE _____ OF _____

BAT CAPTURE DATA FORM

Client and Project Name: YDWA Y20P Location (site name, county, nearest town): Dark Day Boat Launch, Campbellville

Date: 2/5/12 Start Time: 1920 End Time: 2232 Recorder(s): JT RL Adjacent roosting structure: Pistone Bldg

UTM (E): _____ UTN(N): _____ Start Temp: 78°F End Temp: 71°F %clouds: 100

Habitat: Day for Powdermill Pine Capture Technique: (# and type) 26m net _____ 9m net

_____ 18m net _____ harp trap

Set Over/Near Water: YES/NO _____ If "yes" dimensions of Pool-size: _____ W x _____ L and of "swoop-zone": _____ W x _____ L (put diagram on back)

Please use separate data-forms for net-caught vs. trap-caught bats; or otherwise indicate bats caught with different methods.

TIME	SPECIES	SEX (M/F)	AGE (J/A)	REPRODUCTIVE STATUS (M:S/NR) (F:P/L/PL/NR)	FA (MM)	EAR (MM)	WEIGHT (G)	SET	BAND OR MARKING (COMMENTS)
1. 1940	MY spp	—	—	—	—	—	—	1	Bat #1 F #2
2. 2120	MY spp	—	—	—	—	—	—	2	Bat in net as col. supposed to be 2nd was 1st. Bat alone in net. Bat was sufficiently wild by the net to prevent escape
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PLEASE DRAW DIAGRAM OF SET-UP ON BACK. NOTES ON BACK: YES NO

PAGE _____ OF _____

→ save as last time
Audible not present above parking lot (mask off or spotted)

BAT CAPTURE DATA FORM

Client and Project Name: WDA, YDP Location (site name, county, nearest town): Silverado Hwy NG
 Date: 9/19/12 Start Time: 1920 End Time: 2316 Recorder(s): JT RK Adjacent roosting structure: Redwood

UTM (E): _____ UTN(N): _____ Start Temp: 71 End Temp: 63 %clouds: 0

Habitat: Duke woodland Capture Technique: (# and type) 1 6m net 1 9m net

_____ 18m net _____ harp trap

Set Over/Near Water: YES/NO NO If "yes" dimensions of Pool-size: _____ W x _____ L and of "swoop-zone": _____ W x _____ L (put diagram on back)

Please use separate data-forms for net-caught vs. trap-caught bats; or otherwise indicate bats caught with different methods.

TIME	SPECIES	SEX (M/F)	AGE (J/A)	REPRODUCTIVE STATUS (M:S/NR) (F:P/L/PL/NR)	FA (MM)	EAR (MM)	WEIGHT (G)	SET	BAND OR MARKING (COMMENTS)
1. 1940	MYLU	F	A	NR	34	?	4.5	2	left ear missing / injured
2. 2220	MYVD	-	-	-	-	-	-	-	Escaped through netting in set when I began to remove
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PLEASE DRAW DIAGRAM OF SET-UP ON BACK. NOTES ON BACK: YES NO

PAGE _____ OF _____

BAT CAPTURE DATA FORM

Client and Project Name: YOLA, YRDP Location (site name, county, nearest town): Bates 103B
 Date: 9/7/12 Start Time: 1920 End Time: 2230 Recorder(s): IT SP Adjacent roosting structure: Early Bypass tower

UTM (E): _____ UTM(N): _____ Start Temp: 75°F End Temp: 70 %clouds: 0

Habitat: Dale woodland, margin Capture Technique: (# and type) 6m net 12m net
 _____ 18m net _____ harp trap

Set Over/Near Water: YES/NO - If "yes" dimensions of Pool-size: 4DW x 4D and of "swoop-zone": 4DW x 4D (put diagram on back)

Please use separate data-forms for net-caught vs. trap-caught bats; or otherwise indicate bats caught with different methods.

TIME	SPECIES	SEX (M/F)	AGE (J/A)	REPRODUCTIVE STATUS (M:S/NR) (F:P/L/PL/NR)	FA (MM)	EAR (MM)	WEIGHT (G)	SET	BAND OR MARKING (COMMENTS)
1. 20:15	MYLU	F	A	NR	34	11.0	5	1	
2. 21:15	MYLU	M	J	NR	34	11	5	1	
3. 21:45	MYLU	-	-	-	-	-	5.5	1	ESCAED 74 B54
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PLEASE DRAW DIAGRAM OF SET-UP ON BACK. NOTES ON BACK: YES NO

PAGE _____ OF _____

→ same as July

BAT CAPTURE DATA FORM

Client and Project Name: YOWA YRDP Location (site name, county, nearest town): Colebrook PH, Dobbins
 Date: 9/8/12 Start Time: 1940 End Time: 2100 Recorder(s): JTSF Adjacent roosting structure: Colebrook PH

UTM (E): _____ UTN(N): _____ Start Temp: 80 End Temp: _____ %clouds: _____

Habitat: _____ Capture Technique: (# and type) 1 6m net 9 9m net
YOWA River 18 18m net harp harp trap

Set Over/Near Water: YES NO - If "yes" dimensions of Pool-size: W x L and of "swoop-zone": W x L (put diagram on back)

Please use separate data-forms for net-caught vs. trap-caught bats; or otherwise indicate bats caught with different methods.

TIME	SPECIES	SEX (M/F)	AGE (J/A)	REPRODUCTIVE STATUS (M:S/NR) (F:P/L/PL/NR)	FA (MM)	EAR (MM)	WEIGHT (G)	SET	BAND OR MARKING (COMMENTS)
1. 19:50	MYLU	M	J	NK	34	11	5.0	1	
2. 20:05	MYLU	F	J	NK	32	11	6.0	1	SS 020450
3. 20:22	MYLU	F	J	PL	34	12	7.0	1	
4. 20:20	MYLU	F	J	-	34	11	5.5	1	
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PLEASE DRAW DIAGRAM OF SET-UP ON BACK. NOTES ON BACK: YES NO

PAGE 1 OF 1

→ same July

Technical Memorandum 4-2

Special-Status Wildlife - Bats

Attachment 4-2B

Raw Acoustic Data

Yuba River Development Project
FERC Project No. 2246

November 2012

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Attachment 4-2B of Technical Memorandum 4-2 – Special-Status Wildlife - Bats consists of one DVD containing ANABAT acoustic data files for YCWA's Yuba River Development Project. Due to size, the files on the DVD cannot be uploaded to FERC's e-Library system. Licensee will file a copy of the DVD with FERC.

A copy of the DVD can be obtained by contacting:

Curt Aikens
General Manager
Yuba County Water Agency
Office 530.741.6278 x115
caikens@ycwa.com
www.ycwa.com

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