SACRAMENTO MUNICIPAL UTILITY DISTRICT
UPPER AMERICAN RIVER PROJECT
(FERC NO. 2101)

BATS
TECHNICAL REPORT

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6.2 Bat Study Plan

6.2.1 Pertinent Issue Questions

The bat study addresses Terrestrial Resource Issue Questions:

7(c). "What are the relevant and known factors (limiting and beneficial) affecting special status bat populations in the Project area and how/where are these factors influenced by Project operation and maintenance?"

11. "Where and to what extent has the Project created or affected bat roosts and foraging habitat?"

6.2.2 Background

Bats are closely associated with hydroelectric projects where many species are known to roost in dams, powerhouses, adits, and other project structures. Many bats also forage preferentially over project reservoirs and streams or on insects attracted to project lights. Bats are highly sensitive to disturbance, especially at roost sites. Operation, maintenance, and management of Project facilities may have both beneficial and adverse effects on bats in the vicinity of the UARP. The Initial Information Package for the UARP (SMUD 2001) identifies the following 17 species of bats with the potential to occur in the vicinity of the Project.

Common Name	Foraging Habitat	Roosting Habitat
Fringed myotis	Open areas and over water	Generalist: buildings, mines, caves, crevices
Little brown myotis	Open areas and over water	Caves, mines, snags
Yuma myotis	Open forest and over water	Generalist: buildings, mines, caves, crevices
California myotis	Open areas and over water	Snags, trees, rocks
Long-eared myotis	Gleans off of foliage, trees, ground	Tree bark, cavities, snags, caves, mines, rocks
Long-legged myotis	Open forest and over water	Tree bark, cavities, buildings, crevices, mines
Western small-footed myotis	Open forest and over water	Caves, mines, talus, buildings, bark
Hoary bat	Forest and over water	Dense tree foliage
Western red bat	Open areas	Tree foliage, especially in riparian forests
Spotted bat	Over water, meadows, open forests	Cliffs, crevices, caves, buildings
Silver-haired bat	Over water and forest openings	Snags, buildings, crevices, caves, mines, bark
Townsend's big-eared bat	Open areas	Caves, mines
Pallid bat	Woodlands	Caves, mines, crevices, buildings, snags
Big brown bat	Open areas and over water	Snags, trees, caves, mines, crevices
Western pipistrelle	Open areas and over water	Crevices
Western mastiff bat	Open forests, meadows, agriculture	Cliffs, crevices, some buildings and trees.
Brazilian free-tailed bat	Open woodlands, shrublands	Caves, mines, crevices, buildings

6.2.3 Study Objectives

The objectives of the bat study are to: 1) determine which species of bats occur in the study area; 2) locate active bat roosts that could be affected by Project-related activities; and 3) identify measures for the protection of bat roosts and foraging habitat that may be adversely affected by the Project.

6.2.4 Study Area and Sampling Sites

The study area includes all suitable roosting and foraging habitat within 0.25-mile of Project dams, powerhouses, adits, switchyards, penstocks, reservoirs, rights-of-way, and developed recreation sites associated with the project. Sampling sites will be determined during field reconnaissance. The project area may be modified based on activities (e.g., operational, recreational) that are determined by the Terrestrial TWG to have a potential effect on roost sites. Field studies will be restricted to those lands where the Licensee has legal access (e.g., ownership/easement rights, public lands) and will not occur on private lands without prior permission from the landowner.

6.2.5 Information Needed From Other Studies

Important information will be derived (at a minimum) from the Vegetation Mapping, Riparian, Wetland, Lands Management, Recreation, and Hydrologic Model studies.

6.2.6 Study Methods and Schedule

A reconnaissance of the entire study area will be performed during early spring 2002 to determine the location of trapping sites in late spring/early summer 2002. A recommendation on the number and location of trap sites will be presented to Eldorado National Forest (ENF) biologists for review and approval prior to initiation of the trapping effort. Mist nets and/or harp nets will be used to capture bats and determine species occurrence. In most cases, trapping sites are selected near identified roost sites and/or within narrow flight corridors between roost sites and foraging habitat (e.g., within stream channels and ravines adjacent to a reservoir). All bat captures will be documented by species, sex, age, reproductive status, location, habitat descriptors, and other parameters deemed appropriate. Voucher calls will be recorded for captured bats as they are released. Trapping will be supplemented by acoustic sampling using an Anabat II detection system or other suitable acoustic detection equipment. Potential day and night roosts in Project facilities/features will be inspected visually for evidence of bat use (e.g., bats, guano, staining). Prior to initiating bat trapping efforts, the necessary collecting permit and Memorandum of Understanding will be obtained from the California Department of Fish and Game (CDFG).

6.2.7 Analysis

Study results will be evaluated with respect to both positive and adverse effects related to the Project. Trapping, roost site inspections, and acoustic detections will provide evidence of species distribution and habitat utilization (e.g., foraging/roosting) within the study area. An assessment will be made of the degree of risk to foraging and roosting bats due to Project-related operations, maintenance, and management, as well as management of recreational facilities. The analysis will include recommendations for protections and enhancement of roosting and foraging habitat for special status bats that are affected by the Project.

6.2.8 Study Output

Study results will be presented to the Terrestrial Resources Technical Working Group (TWG) and Plenary Group toward the end of 2002. However, the ultimate study output will be a written report that includes the issues addressed, objectives, study area, methods, analysis, results, discussion, and conclusions. The reports will be prepared in a format that allows the information to be inserted directly into the Licensee-prepared Draft Environmental Assessment that will be submitted to FERC with the Licensee's application for a new license.

6.2.9 Preliminary Estimated Study Cost

A preliminary estimated study cost will be prepared after the Plenary Group approves the plan.

6.2.10 TWG and Plenary Group Endorsement

On April 16, 2002 the following participants gave TWG approval to the plan: USFS, BLM and SMUD.

On May 1, 2002 the following participants gave Plenary Group approval to the plan: USFS, BLM, USFWS, Taxpayers of El Dorado County, Friends of El Dorado County, Camp Lotus, El Dorado County Water Agency, El Dorado County, Placer County Water Agency, California Department of Fish and Game, California State Water Resources Control Board, Pacific Gas and Electric and Friends of the River. None of the participants at the meeting said they could not “live with” this study plan.

6.2.11 Literature Cited

SMUD (Sacramento Municipal Utility District). 2001. Initial Information Package for Relicensing of the Upper American River Project (FERC Project No. 2101). Sacramento. July 2001.

BATS
TECHNICAL REPORT

SUMMARY

This technical report describes the results of bat studies conducted during 2002 and 2003 for relicensing of SMUD's Upper American River Project (UARP). Trapping was conducted at 19 locations in the study area from July 15-25, 2002 and on August 13-14, 2003. Five species of bats were captured among six trapping locations and none were captured at the remaining 13 sites. The captured species were Yuma myotis, fringed myotis, California myotis, big brown bat, and Brazilian free-tailed bat. All of these species are afforded special status designations by the State of California, United States Department of Agriculture, or the Western Bat Working Group. Yuma myotis was captured at the most locations and in the greatest number. Roost inspections were performed at 43 UARP facilities, developed recreation facilities, and non-UARP bridges. A large night roost, used primarily by Brazilian free-tailed bats, was found at White Rock Powerhouse. Smaller roosts were found under non-UARP bridges along Ice House Road at the crossings of Tells Creek, Big Silver Creek, and Jones Fork Silver Creek, which are located from 0.26- to 0.48-mile upstream of the maximum surface elevation (high water line) of Union Valley Reservoir. A fourth roost was found under the Ice House Road bridge-crossing of South Fork Silver Creek approximately 0.82-mile downstream from Ice House Reservoir.

1.0 INTRODUCTION

This technical report is one in a series of reports prepared by Devine Tarbell & Associates, Inc. (DTA) for the Sacramento Municipal Utility District (SMUD) as an appendix to SMUD's application to the Federal Energy Regulatory Commission (FERC) for a new license for the Upper American River Project (UARP or Project). The report addresses bats and includes the following sections:

- **BACKGROUND** – Summarizes the applicable study plan approved by the UARP Relicensing Plenary Group; a brief description of the issue questions addressed, in part, by the study plan; the objectives of the study plan; the study area, and agency information requests. In addition, requests by resource agencies for additions to and modifications of this technical report are described in this section.
- **METHODS** – A description of the methods used in the study, including a listing of study sites.
- **RESULTS** – A description of the most important data.
- **ANALYSIS** - An analysis of the results, where appropriate.
- **LITERATURE CITED** – A listing of all literature cited in the report.

This technical report does not include a detailed description of the UARP Alternative Licensing Process (ALP) or of the UARP, which can be found in the following sections of SMUD's application for a new license: The UARP Relicensing Process, Exhibit A (Project Description), Exhibit B (Project Operations), and Exhibit C (Construction).

In addition, this technical report does not include a discussion of the effects of the UARP on bats and related environmental resources, nor does the report include a discussion of appropriate protection, mitigation and enhancement (PM&E) measures. An impacts discussion regarding the UARP is included in the applicant-prepared preliminary draft environmental assessment (PDEA) document, which is part of SMUD's application for a new license. Development of resource measures will occur in settlement discussions, which will commence in early 2004, and will be reported in the PDEA.

2.0 BACKGROUND

2.1 Bat Study Plan

At least 17 species of bats occur or potentially occur in the UARP vicinity (SMUD 2001) (Table 2.1-1). Of these 17 species, 12 have been afforded special status designations (e.g., federal and/or state species of concern, USFS sensitive species, or Western Bat Working Group (WBWG) designation for high priority/imperiled bat species). In response to the status and protections afforded bats under the California Fish and Game Code, Eldorado National Forest Land and Resource Management Plan (LRMP), and various state and federal management directives, the UARP Terrestrial Resources Technical Working Group (TWG) developed the UARP Bats Study Plan. The Terrestrial Resources TWG approved this plan on April 16, 2002, and the UARP Relicensing Plenary Group approved the plan on May 1, 2002. The study plan was designed to address, in part, the following issue questions developed by the Plenary Group:

Issue Question 7(c)	What are the relevant and known factors (limiting and beneficial) affecting special status bat populations in the UARP area and how/where are these factors influenced by UARP operations and maintenance?
Issue Question 11.	Where and to what extent has the UARP created or affected bat roosts and foraging habitat?

The objectives of the study plan were to:

1. Determine which species of bats occur in the study area.

2. Locate active bat roosts that could be affected by UARP-related activities.

3. Identify measures for the protection of bat roosts and foraging habitat that may be adversely affected by the UARP.

The study area included all suitable roosting and foraging habitat within 0.25-mile of UARP dams, powerhouses, adits, switchyards, penstocks, reservoirs, right-of-way, and developed recreation sites associated with the UARP. Specific sampling sites were determined during field reconnaissance (see Methods, Section 3.0).

Table 2.1-1. Confirmed or potentially occurring bat species in the UARP study area and their expected foraging and roosting habitat.			
Common Name	**Scientific Name**	**Foraging Habitat**	**Roosting Habitat**
Family Vespertilionidae:			
Fringed myotis[2, 4, 5]	*Myotis thysanodes*	Open areas and over water	Buildings, mines, caves, crevices
Little brown myotis	*Myotis lucifugus*	Open areas and over water	Caves, mines, snags
Yuma myotis[1, 2]	*Myotis yumanensis*	Open forest and over water	Buildings, mines, caves, crevices
California myotis	*Myotis californicus*	Open areas and over water	Snags, trees, rocks
Long-eared myotis[2, 4]	*Myotis evotis*	Gleans off of foliage, trees, ground	Tree bark, cavities, snags, caves, mines, rocks
Long-legged myotis[2, 4, 5]	*Myotis volans*	Open forest and over water	Tree bark, cavities, buildings, crevices, mines
Western small-footed myotis[2, 4]	*Myotis ciliolabrum*	Open forest and over water	Caves, mines, talus, buildings, bark
Hoary bat[4]	*Lasiurus cinereus*	Forest and over water	Dense tree foliage
Western red bat[4]	*Lasiurus blossevilli*	Open areas	Tree foliage, especially in riparian forests
Spotted bat[1, 2, 4, 5]	*Euderma maculatum*	Over water, meadows, open forests	Cliffs, crevices, caves, buildings
Silver-haired bat [5]	*Lasionycteris noctivagans*	Over water and forest openings	Snags, buildings, crevices, caves, mines, bark
Townsend's big-eared bat[1, 2, 3, 5]	*Corynorhinus townsendii*	Open areas	Caves, mines
Pallid bat[1, 3]	*Antrozous pallidus*	Woodlands	Caves, mines, crevices, buildings, snags
Big brown bat	*Eptesicus fuscus*	Open areas and over water	Snags, trees, caves, mines, crevices
Western pipistrelle	*Pipistrellus hesperus*	Open areas and over water	Crevices
Family Mollosidae:			
Western mastiff bat[1, 2, 4]	*Eumops perotis*	Open forests, meadows, agriculture	Cliffs, crevices, some buildings and trees.
Brazilian free-tailed bat[5]	*Tadarida brasiliensis*	Open woodlands, shrublands	Caves, mines, crevices, buildings

[1] California species of special concern
[2] Federal Category 2 candidate for listing by the U.S. Fish and Wildlife Service as Threatened or Endangered.
[3] USFS sensitive species
[4] Sierra Nevada Framework species of moderate-high vulnerability and species of concern
[5] western Bat Working Group designation for high priority/imperiled bat species

2.2 Water Year Types

The information in this subsection is provided for informational purposes, as requested by agencies. The derivation of water year types is described in the *Water Quality Technical Report*. Table 2.2-1 presents water types for the period that is pertinent to this *Bats Technical Report*.

Table 2.2-1. Water year types applied to individual months of years 2001-2003 (D=Dry; BN=Below Normal).												
Year	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**June**	**July**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
2002	D	BN	BN	BN	BN	BN	BN	BN	BN	BN	BN	BN
2003	BN	BN	BN	D	BN	BN	BN	BN	BN	BN	BN	BN

2.3 Agency Requested Information

In a letter dated December 17, 2003 to SMUD, the agencies identified, by study, information they believed they needed to begin settlement discussions with the understanding that additional information might be requested. While the Bat Study was not specifically addressed, the agencies general comment regarding terrestrial studies is pertinent:

- Shape files will need to include survey locations and positive sightings/responses.
- Spreadsheet formats that include: bats, bald eagle/osprey, mesocarnivores, goshawks, California spotted owl, willow flycatcher, rare plants, noxious weeds.

    - Location
    - Date
    - Species observed/captured and specific UTM coordinates
    - Habitat composition
    - On site (In situ) verification of WHR habitat types
    - Method of capture
    - Nest locations
    - Activity centers

Bat survey and capture locations are shown graphically in Figure 4.1-1 (Appendix A). Pertinent data collected during the bat study are provided on the completed field data forms (Appendix B) and summarized in Section 4.0, Results.

In a letter dated May 13, 2004, the agencies stated in regards to the *Bats Technical Report* (February 2004) the following:

- Issue Question 11 and Objective 3 of the study plan relate to roosting and foraging habitat for bats. The existing study plan evaluates bat roosts at Project facilities and no additional studies for 2004 are identified related to bat roosts.

  Related to Issue Question 11 and Objective 3, the extent that Project facilities provide foraging habitat has not been evaluated. Bats often forage on the insects that are attracted to artificial lighting. An evaluation of Project facility lighting and its relationship to bat foraging needs to be conducted. This evaluation should include a listing of Project facilities with artificial outdoor lighting, the nature of the lighting, and use by foraging bats. The information will be used to evaluate Project effects on bats.

The Terrestrial Resources TWG met on June 7, 2004 to consider "conclusions" relative to bats and to develop recommendations for consideration by the Settlement Negotiations Group. The TWG agreed on the following general conclusions:

1. The Issue Questions and Objectives stated in the Bat Study Plan are adequately addressed by the information provided in the *Bats Technical Report*.

2. Methods employed were adequate to address Issue Questions and Objectives.

3. There is no known negative effect of UARP operations and maintenance on bat roosting and foraging. The UARP may provide significant benefits for bats at most UARP locations.

Based on the conclusions of the TWG at its meeting on June 7, 2004, SMUD believes that an evaluation of UARP facility lighting and its relationship to bat foraging is not warranted. Most UARP facilities require lighting for safety and security purposes. Bats are known to be opportunistic foragers (Pierson and Rainey 1994), that will prey on insects attracted to light sources (Blake, Hutson, et al. 1994; Rydell and Baagoe 1996; Swensson and Rydell 1998). SMUD considers this a UARP benefit to bats that requires no further study. However, the Terrestrial Resources TWG developed the following recommendations for consideration by the Settlement Negotiations Group.

- SMUD should coordinate with state and federal resource agencies and other interested entities in development of a bat management plan. This plan should consider the following actions:

    1. The Loon Lake Chalet attic has in the past supported roosting bats and may present a human health hazard. The attic area could be assessed to restrict bat access by screening or other means. Alternative roosting opportunities could be provided by installing an artificial roost structure atop the Loon Lake Chalet;
    2. The White Rock Powerhouse parking area below the switchyard deck has supported a significant bat roost in the past. Any change in the design of this area should be coordinated with resource management agencies;
    3. Gates at tunnel adits should be evaluated to determine if adequate access is provided to bats at the exclusion of human entry;
    4. To be considered only as an enhancement measure, SMUD could consider cooperating with El Dorado County Department of Transportation to install bat roosts under bridges on Ice House Road;
    5. To minimize human contact, any new UARP or recreational facilities should be evaluated to discourage bat roosting or foraging. Installation of artificial roosts can be considered on a case-by-case basis; and
    6. SMUD supports the concept of the ongoing Engineering, Education, and Enforcement ("Triple Es") programs as administered by the Forest Service. There may be an opportunity to contribute to this program for the protection of bats (e.g., interpretive outreach).

3.0 METHODS

3.1 Bat Trapping, Roost Surveys, and Acoustic Surveys

The study methods conformed to those approved by the UARP Relicensing Plenary Group in the Bats Study Plan. These methods were based on commonly used survey techniques and

recommendations (Kunz and Kurta 1988, Thomas and LaVal 1988, Thomas and West 1989, and MELP 1998). Initially, daytime field reconnaissance was conducted on May 14 and 15, 2002 to determine bat usage of UARP facilities from Loon Lake Reservoir westward to White Rock Powerhouse. These visits generated information on potential day and night roost sites, foraging habitats and flight corridors, and preferred locations for subsequent trapping efforts. Foraging habitats and, perhaps more importantly, flight corridors often provide optimal opportunities for mist net placement (Kunz and Kurta 1988, Thomas and West 1989, Nagorsen and Brigham 1993). Flight corridors refer to any feature that channels bats in flight between roost sites and foraging sites. Research suggests that bats do not always echolocate during flights to and from known foraging and roosting sites (Thomas and West 1989), and therefore, may be less able to detect and avoid nets than when actively echolocating.

Daytime and nighttime roost surveys were performed at 43 SMUD UARP facilities, developed recreation facilities, and non-UARP bridges along Ice House Road. Evidence of bat roosting and potential foraging areas were documented at these sites although access to the interior of some powerhouses and appurtenant structures was not available during site visits. However, roosting evidence was generally discernable at all facilities through external evidence including the presence and amount of guano build-up and bodily staining on the surface of roost entrances, walls, and/or ceilings (Thomas and LaVal 1988, Adam and Hayes 2000).

Bat trapping and acoustic detection surveys were conducted at 19 locations in the study area from July 15 through 25, 2002 and on August 13 and 14, 2003 (see Results, Section 4.1). Selection of trapping sites was based on several factors: 1) distance from a UARP facility (i.e. < 0.25-mile); 2) distribution of suitable bat foraging habitat; 3) proximity of known or potential roost sites; and 4) overall feasibility of site access and placement of trapping equipment. Mist netting was the primary technique use to capture and identify bats. At each trapping location, mist nets were set up before dark and oriented to provide optimal coverage and maximize chances of capturing bats. In most situations, nets were set from about three to four feet above ground (i.e., above shrubs and low-growing vegetation) to approximately 10 feet above the ground. Nets were monitored continuously from time of net deployment to when bat activity diminished (i.e., as determined by direct observation of bats in flight and use of an Anabat II echo-location detection instrument). Generally, bat activity diminishes following an initial period of drinking and foraging after emergence from a roost (Hayes 1997). Following capture, bats were removed from the nets and processed. Processing of bats involved species identification through weighing, measuring forearm and ear lengths, and characterization of pelage color. Sex, age class, and reproductive status (i.e., examination of testes in males and nipple development in females) were also documented for captured individuals. All measurements were recorded on field data sheets along with additional notes regarding overall condition, temperament, and specific capture location (Appendix B). Trapping and handling of bats was authorized by the California Department of Fish and Game under individual Scientific Collecting Permits and a Memorandum of Understanding dated July 8, 2002 (Appendix C).

To facilitate species identification, recordings were made of echolocation calls emitted by bats foraging near trap sites and of captured bats upon their release (i.e., voucher calls). Voucher calls using Anabat II recordings of sufficient quality can be a useful tool in confirming the

identification of captured bats that are morphologically similar to one or more other species. For some taxa, however, Anabat II recordings can only be reliably categorized to broad species groups and not identified to species (Seidman and Zabel 2001).

3.2 Incidental Observations

Biologists engaged in these field surveys also recorded incidental observations of wildlife for purposes of generating a comprehensive species list for the overall UARP area. Data recorded for each observation generally included species, date of observation, location, and any remarkable behavior or activity exhibited by the animals observed.

4.0 RESULTS

4.1 Bat Captures

4.1.1 Mist Net Captures

Five bat species were captured among six of the 19 sites where trapping was performed in 2002 and 2003 (Table 4.1-1; Figure 4.1-1, Appendix A; Appendix B). No bats were captured at the remaining 13 trapping sites. Species captured were: Yuma myotis, California myotis, fringed myotis, big brown bat, and Brazilian free-tailed bat. Bats were captured in 2002 at Junction Reservoir Dam, Brush Creek Dam, Slab Creek Power House, Jones Fork Powerhouse, and White Rock Powerhouse (Table 4.1-1). In 2003, bats were captured at the entrance (i.e., adit) of the Camino Tunnel. Yuma myotis was documented at the most sites (5): Junction Reservoir Dam, Brush Creek Dam, Slab Creek Powerhouse, White Rock Powerhouse and Camino Tunnel Adit). The four other species captured were each from only one trap site. California myotis was captured at Junction Reservoir Dam, fringed Myotis was captured at Jones Fork Powerhouse, big brown bat was captured at Camino Tunnel Adit, and Brazilian free-tailed bat was captured at White Rock Powerhouse.

Table 4.1-1. Bat trapping locations and captures at Upper American River Project facilities, 2002-2003.

Date	Trapping Hours	Net Length(s) (meters)	Facility/UTM[1]	Species Captured (No. of individuals)
July 15, 2002	2030-2315	54m (3x6m, 2x9m, 1x18m)	Loon Lake Intake 731756E 4318275N	None
July 16, 2002	2045-2315	39m (2x6m, 1x9m, 1x18m)	Robb's Peak Forebay 726315E 4314126N	None
July 16, 2002	2100-0000	39m (2x6m, 1x9m, 1x18m)	Robb's Peak Powerhouse 727422E 430861N	None
July 17, 2002	2100-2340	39m (2x6m, 1x9m, 1x18m)	Gerle Creek Dam 725799E 4316247N	None
July 17, 2002	2045-2315	39m (2x6m, 1x9m, 1x18m)	Gerle Creek Tunnel Adit/Canal 726082E 4316005N	None
July 18, 2002	2030-2315	39m(2x6m, 1x9m, 1x18m)	Union Valley Dam 721796E 4304849N	None
July 18, 2002	2045-2352	39m(2x6m, 1x9m, 1x18m)	Junction Reservoir Dam Intake 720688E 430337N	*Myotis yumanensis* (1) *Myotis thysanodes* (1)

Table 4.1-1. Bat trapping locations and captures at Upper American River Project facilities, 2002-2003.				
Date	**Trapping Hours**	**Net Length(s) (meters)**	**Facility/UTM[1]**	**Species Captured (No. of individuals)**
July 19, 2002	2045-2345	45m(3x6m, 1x9m, 1x18m)	Brush Creek Dam 706498E 4298499N	*Myotis yumanensis* (2)
July 19, 2002	2045-2335	39m(2x6m, 1x9m, 1x18m)	Camino Powerhouse 706472E 4296769N	None
July 20, 2002	2030-0030	45m(3x6m, 1x9m, 1x18m)	Slab Creek Powerhouse 699941E 4294042N	*Myotis yumanensis* (34)
July 21, 2002	2030-2300	36m (3x6m, 1x18m)	Jaybird Canyon Tunnel Adit 717197E 4301915N	None
July 22, 2002	2045-2300	33m (4x6m, 1x9m)	Loon Lake Powerhouse 731452E 4318488N	None
July 23, 2002	2030-2300	27m (3x6m, 1x9m)	Ice House Dam Outflow 729138E 4300485N	None
July 23, 2002	2045-2315	39m(2x6m, 1x9m, 1x18m)	Jones Fork Powerhouse 727255E 4303430N	*Myotis californicus* (2)
July 24, 2002	2045-2245	39m (2x6m, 1x9m, 1x18m)	Camino Dam 713847E 4300603N	None
July 24, 2002	2050-2230	39m (2x6m, 1x9m, 1x18m)	Jaybird Powerhouse 714243E 4301205N	None
July 25, 2002	2030-2255	66m(2x6m, 2x9m, 2x18m)	White Rock Powerhouse 692253E4293033N	*Myotis yumanensis* (12) *Tadarida brasiliensis (*13)
August 13, 2003	1955-2230	21m (2x6m, 1x9m)	Slab Creek Dam Tunnel Adit 710124E 4298866N	None
August 14, 2003	2022-2350	36m (3x6m, 1x18m)	Camino Tunnel Adit 699512E 4293879N	*Myotis yumanensis* (2) *Eptesicus fuscus* (1)

[1] UTM are in zone 10s and meters

4.1.2 Bridge Roost Captures

In addition to mist net captures, three bat species were captured by hand during 2002 beneath three non-UARP bridges on Ice House Road near Ice House and Union Valley reservoirs. Captures at the South Fork Silver Creek Bridge (0.82-mile below Ice House Dam) and Jones Fork Silver Creek Bridge (0.26-mile above Union Valley Reservoir high water line) (Figure 4.1-1, Appendix A), yielded six individual Yuma myotis. In addition, Brazilian free-tailed bats (five individuals) and big brown bat (one individual) were captured at the Ice House Road Bridge spanning Big Silver Creek (0.48-mile above the Union Valley Reservoir high water line) (Figure 4.1-1, Appendix A).

4.2 Roost Searches

As previously stated, three bat species were observed (and several individuals captured) beneath four bridges on Ice House Road, which were being used as night roosts. These bridges spanned South Fork Silver Creek, Jones Fork Silver Creek, Big Silver Creek and Tells Creek (Table 4.2-1). The bridge spanning Big Silver Creek had the greatest number of bats present (>300 individuals) while the bridges spanning South Fork Silver Creek and Jones Fork Silver Creek

had 20 and 10-15 individuals, respectively. The bridge spanning Tells Creek (0.43-mile above the Union Valley Reservoir high water line) had the smallest number of individuals at five. Probable roosts were also located at three UARP facilities (Robb's Peak Powerhouse, Gerle Creek Dam, and Loon Lake Powerhouse) and one recreational facility (Loon Lake Chalet) based on the presence of staining or small amounts of guano: (Table 4.2-1).

Table 4.2-1. Results of roost surveys at Upper American River Project facilities.

Location	Survey results
Project Facilities	
Loon Lake Intake Structure	No bat evidence observed
Robb's Peak Forebay	No bat evidence observed
Robb's Peak Powerhouse	Some guano observed under the crane
Gerle Creek Dam	A small amount of guano were observed
Gerle Creek Tunnel Adit and Gerle Canal	Bo bat evidence observed
Union Valley Dam	No bat evidence observed
Junction Reservoir Dam and Intake [1]	No bat evidence observed
Brush Creek Dam [1]	No bat evidence observed
Camino Powerhouse	No bat evidence observed
Camino Tunnel Adit [1]	No bat evidence observed
Slab Creek Powerhouse [1]	No bat evidence observed
Slab Creek Tunnel Adit	No bat evidence observed
Jaybird Canyon Tunnel Adit	No bat evidence observed
Loon Lake Powerhouse	Some staining in entry way with guano deposits in several locations
Ice House Dam Outflow	No bat evidence observed
Jones Fork Powerhouse [1]	No bat evidence observed
Camino Dam	No bat evidence observed
Jaybird Powerhouse	No bat evidence observed
White Rock Powerhouse [1]	Large amounts of staining and guano present
Recreation Facilities	
Loon Lake Campgrounds	
Loon Lake	No bat evidence observed
Loon Lake Chalet	Staining observed at the eve of the chalet
North Shore RV	No bat evidence observed
Red Fir Group	No bat evidence observed
Gerle Creek Campgrounds	
Gerle Creek	No bat evidence observed
South Fork	No bat evidence observed
Union Valley Campgrounds	
SMUDEA	No bat evidence observed
Yellow Jacket	No bat evidence observed
Wolf Creek	No bat evidence observed
Camino Cove	No bat evidence observed
Westpoint	No bat evidence observed
Fashoda	No bat evidence observed
Sunset	No bat evidence observed
Big Silver Group	No bat evidence observed
Wench Creek/Azalea Cove	No bat evidence observed
Ice House Reservoir Campgrounds	
Ice House	No bat evidence observed

Table 4.2-1. Results of roost surveys at Upper American River Project facilities.	
Location	**Survey results**
Northwind	No bat evidence observed
Strawberry Point	No bat evidence observed
Bridges	
South Fork Silver Creek	20 bats present. Staining along supporting rafters of bridge[1]
Jones Fork Silver Creek	10-15 bats present. Staining along supporting rafters of bridge[1]
Big Silver Creek	300+ bats present. Abundant staining along supporting rafters of bridge[1]
Tells Creek	5 bats present. Staining along supporting rafters of bridge
South Fork Rubicon River	No bat evidence observed
Gerle Creek	No bat evidence observed

[1] Sites with captures. See text, Section 4.1.

4.3 Anabat II Surveys

Analysis of Anabat II recordings confirmed the presence of bats at five sites where trapping was unsuccessful: Camino Dam, Gerle Creek Tunnel Adit, Ice House Dam, Robbs Peak Powerhouse, and Union Valley Reservoir. However, efforts to assign these echolocation calls to specific species were inconclusive but suggest that the recordings could be from one of two families: *Vespertilionidae* and *Mollosidae* (Table 2.1-1). Spotted bat, a Vespertilionid species and one of the few bats that can be detected through echolocation vocalizations audible to humans, was not detected at any of the sites. Bats of undetermined species were also observed in flight at all trapping locations, whether or not individuals were captured in mist nets or detected acoustically with Anabat II.

4.4 Incidental Observations

Biologists recorded 140 species of birds and mammals during UARP field studies including this Bat Study. These incidental observations are provided in Appendix D of the *Waterfowl Nesting Habitat Technical Report*.

5.0 ANALYSIS

5.1 Occurrence and Roosting by Bats at UARP Facilities

All 17 species of bats that occur or potentially occur within the study area are insectivorous and use echolocation for navigation and foraging. These species often forage over open habitats such as water, forest, meadows, and occasionally agricultural areas. Thirteen of these species roost colonially and four roost solitarily. The lands surrounding UARP facilities contain many of the physical and biological components needed to satisfy the foraging and/or roosting habitat requirements of these bats, including the five species captured during this study. The few active roosts found at UARP facilities were all located beneath concrete structures such as the entrance to the Loon Lake Powerhouse and beneath the substation deck at White Rock Powerhouse. Active roosts were also located beneath several non-UARP bridges along Ice House Road. In general, inspections performed for this study confirmed that most UARP facilities are well sealed, with few openings of sufficient size to allow access by bats. However, the presence of

bats at all trapping locations suggests that bats are roosting in nearby natural sites such as crevices, snags, cliffs, or tree bark, rather than roosting in UARP facilities.

5.2 Echolocation Analysis

Anabat II recordings of bat vocalizations had limited value in this study. The analysis of recorded echolocation calls for species identification is limited by the length of the call, the distance of the recording device to the bat, and the orientation of the bat relative to the device (O'Farrell et al. 1999). Incomplete calls or "clutter" within calls resulting from the surrounding vegetation, wind, and other bat activity can limit the clarity and ultimate efficacy of recorded calls. Each of these factors is believed to have contributed to relatively poor quality of calls recorded during this study. In addition to the quality of a call, the variability within calls of an individual bat can also limit the use of a call. Bats vary their call regularly in response to their environment and their activity (Kalko 1995, Kalko and Schnitzler 1993, Obist 1995, and Schnitzler and Kalko 1998). This variability among the calls of individual bats coupled with the variation found among species compounds the difficulty of using acoustical analysis for species identification.

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APPENDIX A

FIGURE 4.1-1. UPPER AMERICAN RIVER PROJECT BAT TRAPPING LOCATIONS AND RESULTS

Bat Species Key

EPFU : *Eptesicus fuscus*
MYCA : *Myotis californicus*
MYTH : *Myotis thysanodes*
TABR : *Tadarida braziliensis*
MYYU : *Myotis yumanensis*

Loon Lake Reservoir
Loon Lake Powerhouse
Loon Lake Intake Structure
Gerle Creek Dam
Loon Lake Tunnel Adit
Robbs Peak Intake and Dam
Robbs Peak Powerhouse
5 observed
Tells Creek Bridge
300+ observed
1 EPFU
5 TABR
Big Silver Creek Bridge
Union Valley Reservoir
Union Valley Dam
Jones Fork Powerhouse
10-15 observed
3 MYYU
Jones Fork Silver Creek Bridge
1 MYYU
1 MYTH
Junction Reservoir Dam
2 MYCA
Jaybird Powerhouse
Jaybird Tunnel Adit
Ice House Dam
Ice House Reservoir
20 observed
3 MYYU
South Fork Silver Creek Bridge
Camino Dam
Brush Creek Dam
2 MYYU
Camino Tunnel Adit
1 EPFU
2 MYYU
Camino Powerhouse
12 MYYU
13 TABR
34 MYYU
Slab Creek Powerhouse
White Rock Tunnel Adit
White Rock Powerhouse
Jenkinson Lake

Upper American River Project

SMUD

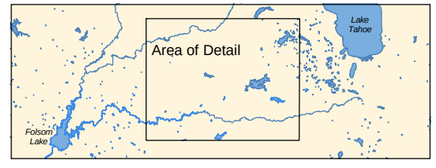
Figure 4.1-1
UARP Bat Trapping Locations and Results 2002-2003

Bat Trap Sites
- Bats Captured
- Bats Not Captured

- Bat Roost
- Bat Roost and Captured

- Divided Highway
- County Roads
- Other Roads

- Adit
- Canal
- Channel
- Penstock
- Tunnel
- Dam
- Wilderness Boundary



N

SCALE 1:150,000

0 1 2 3 4 Miles

Prepared by VESTRA Resources, Inc., Redding. CA. Jan. 22, 2004

APPENDIX B

FIELD DATA FORMS USED IN THE UPPER AMERICAN RIVER PROJECT BAT STUDY

BAT SURVEY FORM

Observers: (SK) RW DM JW Date: 7/16/22 Page: 1 of 1

Area/Job Name: DARP Site Name/Number Loon Lake Intake Structure

Survey Location: T._____ N or S, R._____ E or W, S_____, QQ (1/16)_____ of Q (1/4)_____

UTM zone:____ Coordinates: E(x) 120° 19.491' , N(y) 38° 56.98' , Source: GARMIN GPSIII (+)

Survey Location *(Create Diagram of Survey Site and Net Placement on back side of page)*

Aerial Photo: Yes No Nearest Water: Pond (Lake) River Creek Estuary Marine Elevation: 6410

Distance to Water: (Over) (Adjacent) 15m to H2O Other: _____m Pool Size (LxW) 76, 200sqf

Overall Site Canopy Cover: 45 % # of Canopy Layers: 2 Define Lodge Pole, Red Fir

Potential Roost Sites: Cliffs (Forest) (Conifer) Deciduous) (Snags) Buildings Bridges Other:_____

Roost Observed? Yes (No) Nets: 3 6m, 2 9m, 1 18m, Harp Trap(s) (size)_____

Roost Description: _____

Habitat Type Description: Parking area surrounded by short 1st Layer Tree, along Shore, 1 net set in open ~ 2 ft wide

Nearest Project Facility: Loon Lake intake structure Distance: Ramp for nets Miles 5' → 150'

Environmental Conditions Official Sunset: 2050 Source:_____

Begin Survey 2032 End Survey 2316 Temp. at start 61°F Temp. at end 52°

Time	Visibility			Audio to 100m	Precipitation			Wind Speed and Direction (from)	Comments
	Cloud Height	Cloud Cover	Visible Distance		Rain	Fog	Other/Notes		
2045	NA	5%	>10mi	campers Dogs	N	N	clear clouds distant	1 N	mountains obstruct visible distance
2315			no change						

For Rain and Fog: N - None, L - Light, M - Moderate, H - Heavy

Wind: 0= <1mph (<1.6Kmph) [Calm]

1=1-3 (1.6-4.8) [Light Air: smoke drifts]

2=4-7 (6.4-11.3) [Light Breeze: Leaves rustle, can feel wind on your face]

3=8-12 (12.9-19.3) [Gentle Breeze: Leaves and twigs move around. Light weight flags extend]

4=13-18 (20.9-29.0) [Moderate Breeze: Moves thin branches, raises dust and paper]

5=19-24 (30.6-38.6) [Fresh Breeze: Moves branches, trees sway]

6=25-31 (40.2-50.0) [Strong Breeze: Large tree branches move, open wires (such as telegraph wires) begin to "whistle", umbrellas are difficult to keep under control]

7=32-38 (51.5-61.2) [Moderate Gale: Large trees begin to sway, noticeably difficult to walk]

8=39-46 (62.8-74.0) [Fresh Gale: Twigs and small branches are broken from trees, walking into the wind is very difficult]

No Captures

Loon
Lake
Forest
18
6
Intake
Loon Lake
PH

BAT SURVEY FORM

Observers: JK & JW Date: 7/14/02 Page: 1 of 1

Area/Job Name: JARP BATS Site Name/Number Rabbit Peak Forebay

Survey Location: T._____ N or S, R._____ E or W, S_____, QQ (1/16)_____ of Q (1/4)_____

UTM zone:_____ Coordinates: W (x) 120° 23.319', N(y) 30° 66.815', Source:_____

Survey Location *(Create Diagram of Survey Site and Net Placement on back side of page)*

Aerial Photo: Yes No Nearest Water: (Pond) Lake River Creek Estuary Marine Habitat Type: Forebay Pond/Lake Elevation: 5231'

Distance to Water: (Over) (Adjacent) Other - _____m Pool Size (LxW) 30 meet ~ 100m x 60m

Overall Site Canopy Cover: 1 % # of Canopy Layers: 2 Define: 1 Shrub, 1 tree

Potential Roost Sites: Cliffs (Forest) (Conifer) (Deciduous) (Snags) (Buildings) (Bridges) Other: Rock outcrops.

Roost Observed? Yes (No) Nets: 2 6m, 1 9m, 1 18m, Harp Trap(s) (size) —

Roost Description: none

Habitat Type Description: Fir woodland community surrounding intake & Parking lot 15m

Nearest Project Facility: Rabbit Peak Intake Distance: ~~3 Miles~~

Environmental Conditions Official Sunset: 20:30 Source: RW.

Begin Survey 20:45 End Survey 23:15 Temp. at start 61° Temp. at end 51°

Time	Visibility			Audio to 100m	Precipitation			Wind Speed and Direction (from)	Comments
	Cloud Height	Cloud Cover	Visible Distance		Rain	Fog	Other/Notes		
2045	∞	∞	∞	Y	N	N	—	∞	beautiful night.
2315	no change.								

For Rain and Fog: N - None, L - Light, M - Moderate, H - Heavy

Wind: 0= <1mph (<1.6Kmph) [Calm]

1=1-3 (1.6-4.8) [Light Air: smoke drifts]

2=4-7 (6.4-11.3) [Light Breeze: Leaves rustle; can feel wind on your face]

3=8-12 (12.9-19.3) [Gentle Breeze: Leaves and twigs move around, Light weight flags extend]

4=13-18 (20.9-29.0) [Moderate Breeze: Moves thin branches, raises dust and paper]

5=19-24 (30.6-38.6) [Fresh Breeze: Moves branches, trees sway]

6=25-31 (40.2-50.0) [Strong Breeze: Large tree branches move, open wires (such as telegraph wires) begin to "whistle", umbrellas are difficult to keep under control]

7=32-38 (51.5-61.2) [Moderate Gale: Large trees begin to sway, noticeably difficult to walk]

8=39-46 (62.8-74.0) [Fresh Gale: Twigs and small branches are broken from trees, walking into the wind is very difficult]

No Captures

Creek
Rock outcrops
w/ manzanita
16m
Bridge
H2O
18m
6m
9m
PARKING
H2O
Rockoutcrops
w/ Conifer
Forest
Intake
Road

BAT SURVEY FORM

Observers: FG, BM Date: July 16, 2002 Page: 1 of 1

Area/Job Name: SNUD, UARP Site Name/Number: Robb Peak Powerhouse

Survey Location: T._____ N or S, R._____ E or W, S._____, QQ (1/16)_____ of Q (1/4)_____

UTM zone:____ Coordinates: E(x)_____, N(y)_____, Source:_____

Survey Location *(Create Diagram of Survey Site and Net Placement on back side of page)*

Aerial Photo: Yes No Nearest Water: Pond (Lake) River Creek Estuary Marine Elevation: 4,870

Distance to Water: Over (Adjacent) 1-3m Other - _____m Pool Size (LxW) 277, 290 sf

Overall Site Canopy Cover: 10 % # of Canopy Layers: 2 Define Conifers trees/bushes scattered along river edge

Potential Roost Sites: Cliffs Forest (Conifer) Deciduous) Snags (Buildings) Bridges Other: powerhouse crane

Roost Observed? Yes (No) Nets: 2 6m, 1 9m, 1 18m, Harp Trap(s) (size)_____

Roost Description: _____

Habitat Type Description: Parking lot for boaters along water's edge w/ scattered pines & other conif. trees

Nearest Project Facility: Powerhouse Distance: 0.1 Miles

Environmental Conditions Official Sunset: 2030 Source:_____

Begin Survey 2100 End Survey 1200am Temp. at start 61° Temp. at end 61°

Time	Visibility			Audio to 100m	Precipitation			Wind Speed and Direction (from)	Comments
	Cloud Height	Cloud Cover	Visible Distance		Rain	Fog	Other/Notes		
2215	N/A	N	>1 mi	DET	N	N	N	0	

For Rain and Fog: N - None, L - Light, M - Moderate, H - Heavy

Wind: 0= <1mph (<1.6Kmph) [Calm]

1=1-3 (1.6-4.8) [Light Air: smoke drifts]

2=4-7 (6.4-11.3) [Light Breeze: Leaves rustle, can feel wind on your face]

3=8-12 (12.9-19.3) [Gentle Breeze: Leaves and twigs move around. Light weight flags extend]

4=13-18 (20.9-29.0) [Moderate Breeze: Moves thin branches, raises dust and paper]

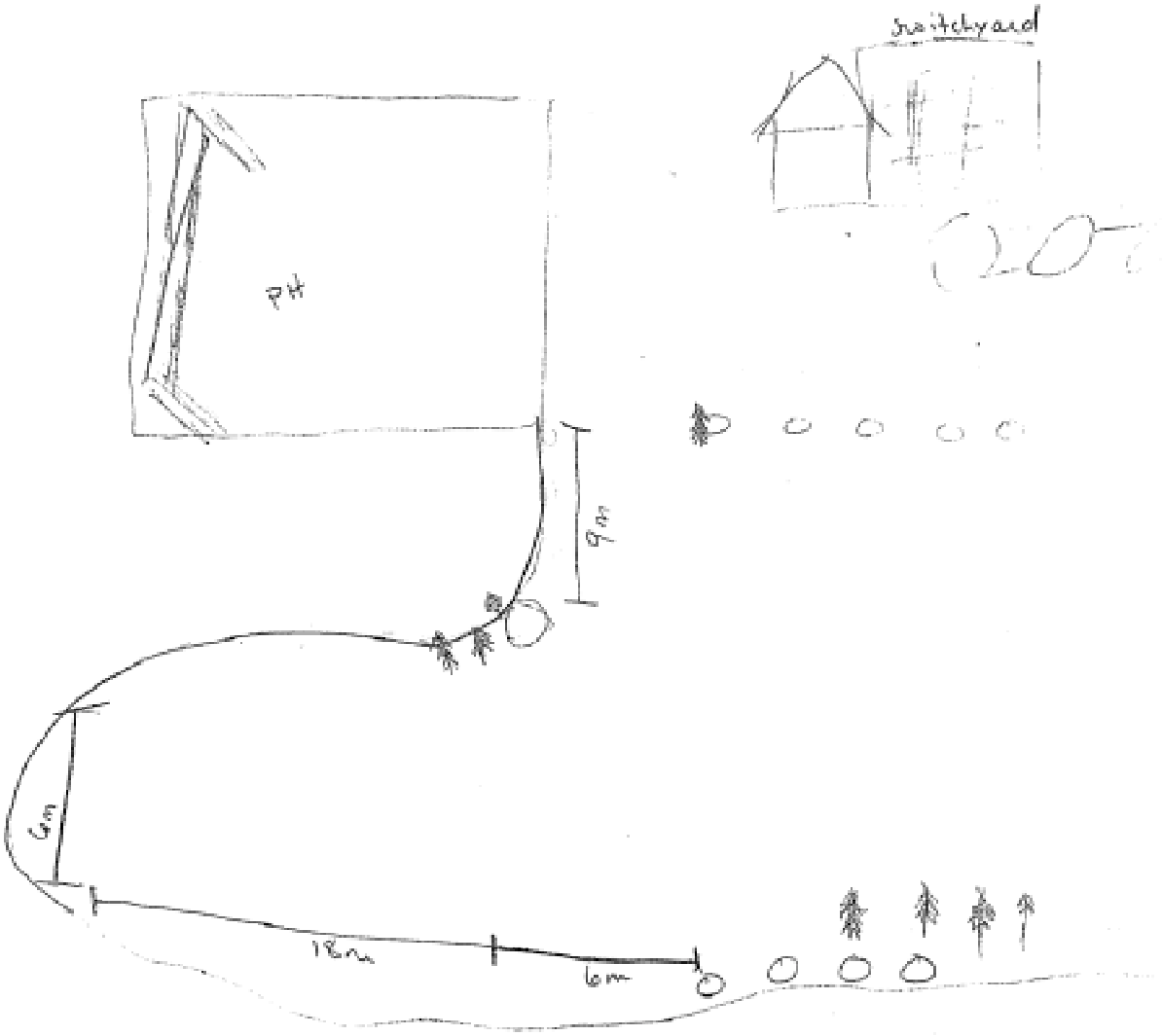
5=19-24 (30.6-38.6) [Fresh Breeze: Moves branches, trees sway]

6=25-31 (40.2-50.0) [Strong Breeze: Large tree branches move, open wires (such as telegraph wires) begin to "whistle", umbrellas are difficult to keep under control]

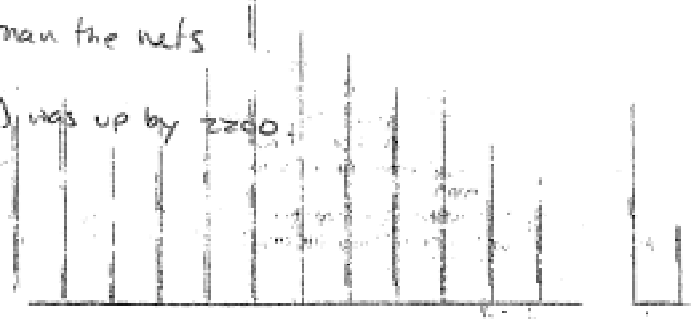
7=32-38 (51.5-61.2) [Moderate Gale: Large trees begin to sway, noticeably difficult to walk]

8=39-46 (62.8-74.0) [Fresh Gale: Twigs and small branches are broken from trees, walking into the wind is very difficult]

No Captures



- bats flying all over, made some recordings
- Seemed to fly much higher than the nets
- last net (6m, connected to 18m) was up by 2200



1/2

BAT SURVEY FORM

Observers: EG, DLL Date: 7/17/02 Page: 1 of 1

Area/Job Name: SNUD, VARP Site Name/Number: Gerle Dam

Survey Location: T._____ N or S, R._____ E or W, S_____, QQ (1/16)_____ of Q (1/4)_____

UTM zone:_____ Coordinates: E(x)_____, N(y)_____, Source:_____

Survey Location *(Create Diagram of Survey Site and Net Placement on back side of page)*

Aerial Photo: Yes No Nearest Water: Pond (Lake) River (Creek) Estuary Marine canal Elevation: 5,231'

Distance to Water: Over (Adjacent) Other - _____m Pool Size (LxW) 1,200 sf

Overall Site Canopy Cover: 10 % # of Canopy Layers: 3 Define: conifers scattered alongside dam, intact and canal

Potential Roost Sites: (Cliffs) Forest ((Conifer) / Deciduous) (Snags) (Buildings) (Bridges) Other:_____

Roost Observed? Yes (No) Nets: 2 6m, 1 9m, 1 18m, Harp Trap(s) (size)_____

Roost Description: _____

Habitat Type Description: Riverside dam, lake, canal & intake. Structure are some cliffs, grassy shrubs and a variety of trees/shrubs

Nearest Project Facility: Dam, intake, canal Distance: 10 feet next to facility's on development

Environmental Conditions Official Sunset: 2030 Source:_____

Begin Survey 2100 End Survey 1140 Temp. at start 73° Temp. at end 61°

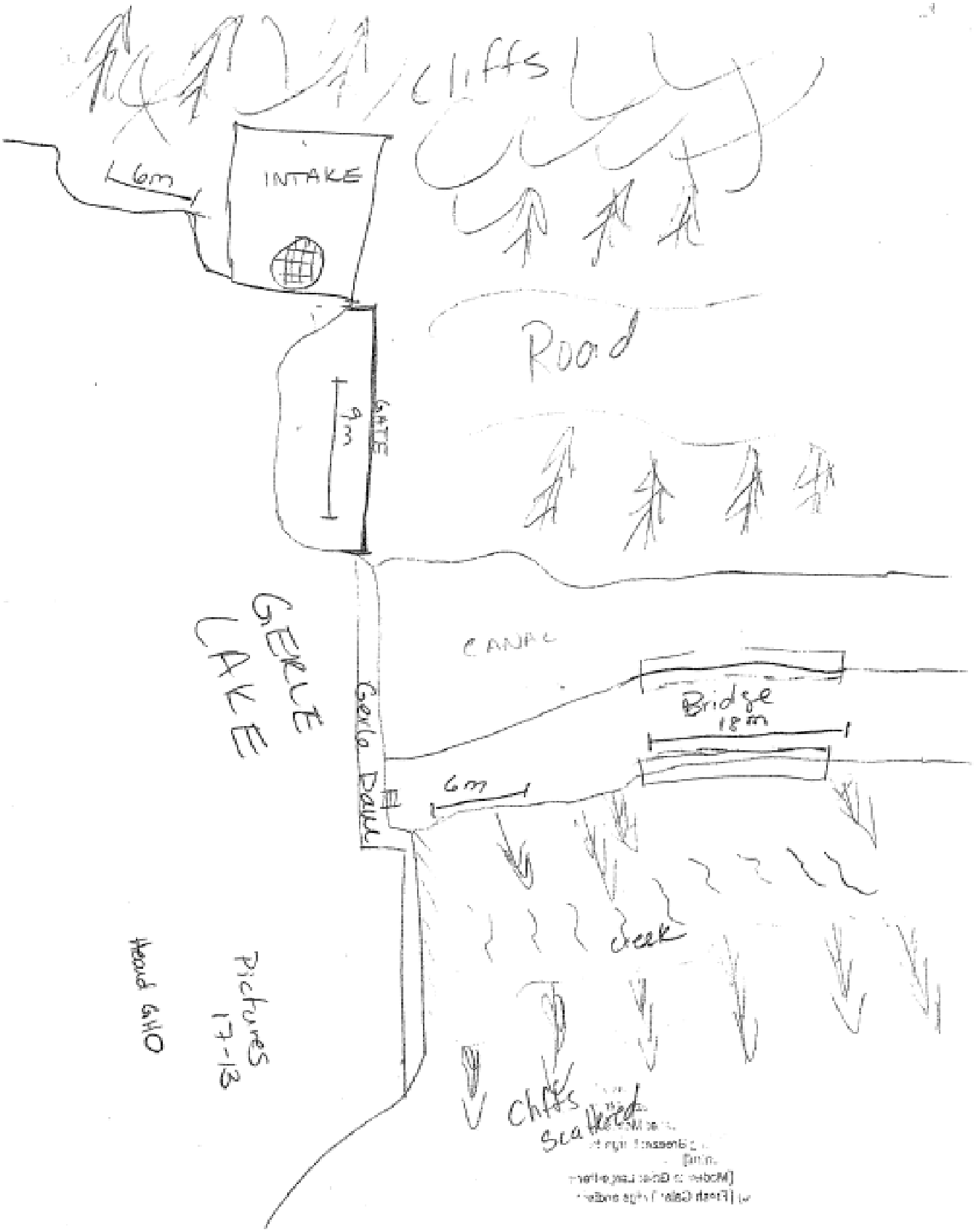
last net down

Time	Visibility			Audio to 100m	Precipitation			Wind Speed and Direction (from)	Comments
	Cloud Height	Cloud Cover	Visible Distance		Rain	Fog	Other/Notes		
2100	20,000ft ?	25%	15mi	4-5 people	N	N	N	0	

For Rain and Fog: N - None, L - Light, M - Moderate, H - Heavy

Wind: 0= <1mph (<1.6Kmph) [Calm]
1=1-3 (1.6-4.8) [Light Air: smoke drifts]
2=4-7 (6.4-11.3) [Light Breeze: Leaves rustle, can feel wind on your face]
3=8-12 (12.9-19.3) [Gentle Breeze: Leaves and twigs move around. Light weight flags extend]
4=13-18 (20.9-29.0) [Moderate Breeze: Moves thin branches, raises dust and paper]
5=19-24 (30.6-38.6) [Fresh Breeze: Moves branches, trees sway]
6=25-31 (40.2-50.0) [Strong Breeze: Large tree branches move, open wires (such as telegraph wires) begin to "whistle", umbrellas are difficult to keep under control]
7=32-38 (51.5-61.2) [Moderate Gale: Large trees begin to sway, noticeably difficult to walk]
8=39-46 (62.8-74.0) [Fresh Gale: Twigs and small branches are broken from trees, walking into the wind is very difficult]

No Captures


Cliffs
6m
INTAKE
Road
9
3
GATE
GERLE LAKE
CAMP
Gerle Dam
Bridge
18m
6m
Creek
Cliffs
Scattered
Pictures
17-18
Head GNO

BAT SURVEY FORM

Observers: JW & JK Date: 7/17 Page: 1 of 1

Area/Job Name: HARP Surveys Site Name/Number Gerlie Creek adit & canal

Survey Location: T._____ N or S, R._____ E or W, S_____, QQ (1/16)_____ of Q (1/4)_____

UTM zone:_____ Coordinates: ~~E(x)~~ 120° 23.446' N(y) 38° 57.882' Source:_____

Survey Location *(Create Diagram of Survey Site and Net Placement on back side of page)*

Aerial Photo: Yes No Nearest Water: Pond Lake River (Creek) Estuary Marine Elevation:_____

Distance to Water: (Over) (Adjacent) Other - _____m Pool Size (LxW) 13 W x ? Length

Overall Site Canopy Cover: 7 % # of Canopy Layers: 3 Define herbaceous, shrub & tree

Potential Roost Sites: (Cliffs) Forest (Conifer/Deciduous) Snags Buildings (Bridges) Other: Adit

Roost Observed? Yes (No) Nets: 2 6m, 1 9m, 1 18m, Harp Trap(s) (size) —

Roost Description: —

Habitat Type Description: mixed conifer, primarily ponderosa pine, sugar pine & incense cedar.

Nearest Project Facility: Gerlie creek Dam Distance: 0.5 Miles

Environmental Conditions Official Sunset: 2030 Source: FW

Begin Survey 2015 End Survey 2315 Temp. at start 70° Temp. at end 61°

Time	Visibility			Audio to 100m	Precipitation			Wind Speed and Direction (from)	Comments
	Cloud Height	Cloud Cover	Visible Distance		Rain	Fog	Other/Notes		
2015	5,000	5%	10+mi	Y	N	N	N	—	—
2315	—	no	change		—				

For Rain and Fog: N - None, L - Light, M - Moderate, H - Heavy

Wind: 0= <1mph (<1.6Kmph) [Calm]

1=1-3 (1.6-4.8) [Light Air: smoke drifts]

2=4-7 (6.4-11.3) [Light Breeze: Leaves rustle, can feel wind on your face]

3=8-12 (12.9-19.3) [Gentle Breeze: Leaves and twigs move around. Light weight flags extend]

4=13-18 (20.9-29.0) [Moderate Breeze: Moves thin branches, raises dust and paper]

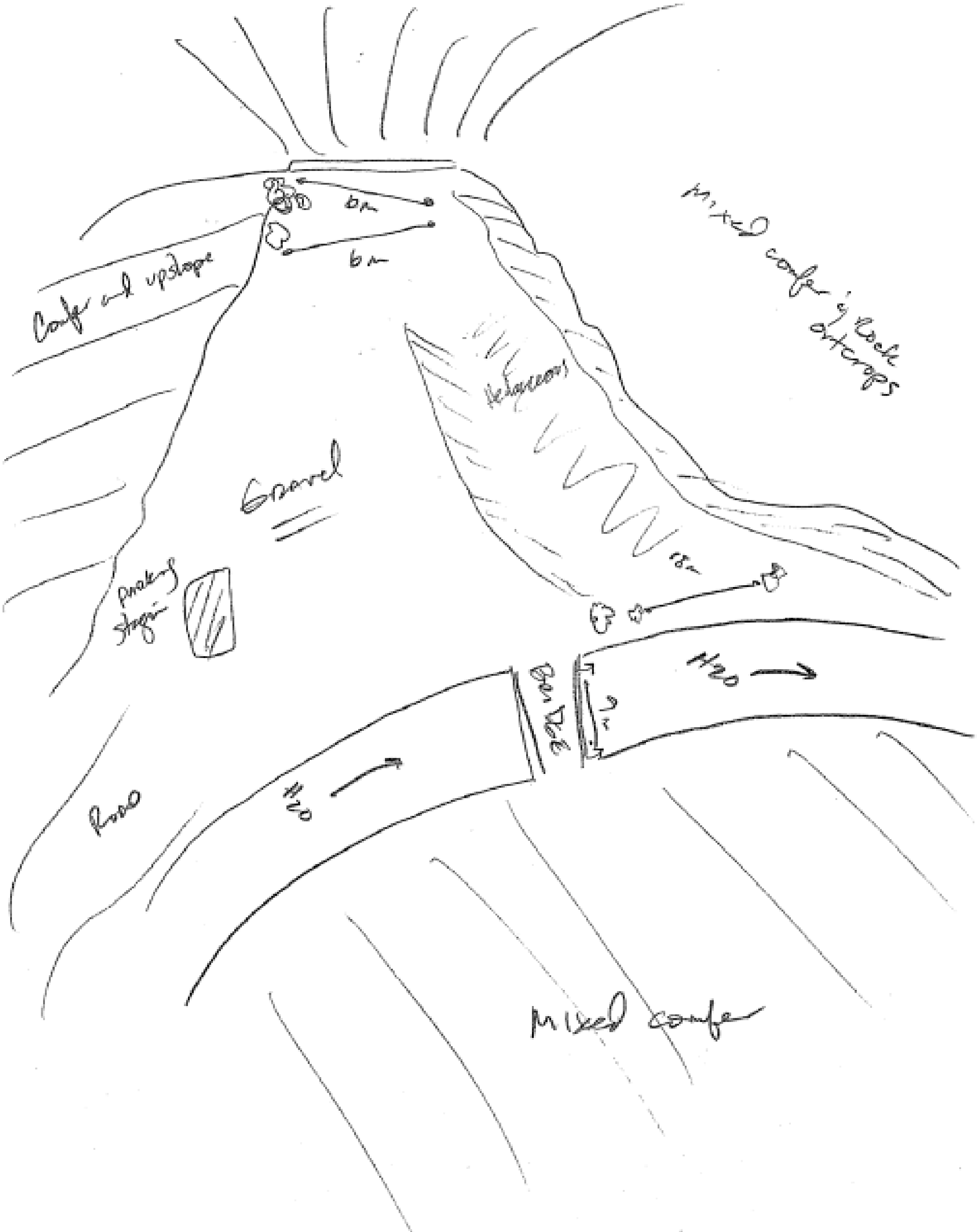
5=19-24 (30.6-38.6) [Fresh Breeze: Moves branches, trees sway]

6=25-31 (40.2-50.0) [Strong Breeze: Large tree branches move, open wires (such as telegraph wires) begin to "whistle", umbrellas are difficult to keep under control]

7=32-38 (51.5-61.2) [Moderate Gale: Large trees begin to sway, noticeably difficult to walk]

8=39-46 (62.8-74.0) [Fresh Gale: Twigs and small branches are broken from trees, walking into the wind is very difficult]

No Captures



6m
6m
Gravel
Bridge
H2O
H2O
7m
Road
Mixed conifer

BAT SURVEY FORM

Observers: CDW, JK Date: 7/18/02 Page: 1 of 2

Area/Job Name: SNWS, VARP Site Name/Number Juniper Reservoir Dam & Intake

Survey Location: T._____ N or S, R._____ E or W, S_____, QQ (1/16)_____ of Q (1/4)_____

UTM zone:_____ Coordinates: E(x)_____, N(y)_____, Source:_____

Survey Location *(Create Diagram of Survey Site and Net Placement on back side of page)*

Aerial Photo: Yes No Nearest Water: Pond (Lake) (River) Creek Estuary Marine Elevation: 4,450'

Distance to Water: Over (Adjacent) Other - _____m Pool Size (LxW) 3250 sf

Overall Site Canopy Cover: 10 % # of Canopy Layers: 3 Define: conifers along road/cliff & besides nets

Potential Roost Sites: (Cliffs) (Forest (Conifer)/ Deciduous) (Snags) Buildings (Bridges) Other:_____

Roost Observed? Yes (No) Nets: 2 6m, 1 9m, 1 18m, Harp Trap(s) (size)_____

Potential Roost Description: Around 20 off of bridge (between) to intake, we observed bats flying. Rock or trees probably provide roost structure

Habitat Type Description: Road in cliff going to Dam - cliff has forest, snags and many rock outcrops, other side of road is steep cliff with some trees

Nearest Project Facility: Dam, Intake Distance: 25ft ~~Miles~~ to intake

Environmental Conditions Official Sunset: 2050 Source:_____

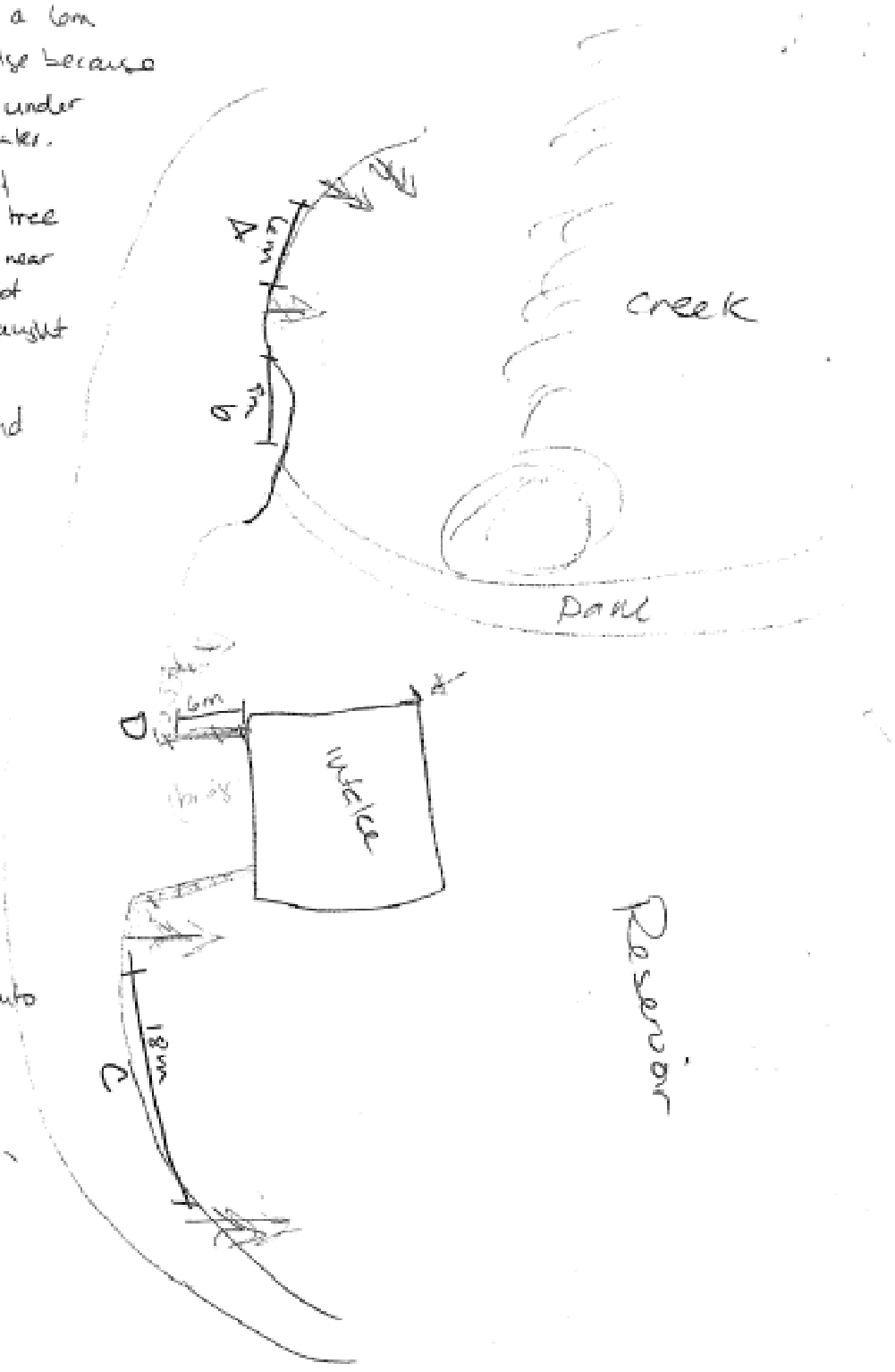
Begin Survey 2045 End Survey 2352 Temp. at start 75° Temp. at end_____ ? see end of JK notes.

Time	Visibility			Audio to 100m	Precipitation			Wind Speed and Direction (from)	Comments
	Cloud Height	Cloud Cover	Visible Distance		Rain	Fog	Other/Notes		
2040	30,000	15%	1m	birds	N	N	N	1, NE	Mt. canyon
2152	"	25%	"		N	N	N	2, NE	wind picks up.
2352	"	85%	"	car	N	N	N	2, NE	thin clouds overhead

For Rain and Fog: N - None, L - Light, M - Moderate, H - Heavy

Wind: 0= <1mph (<1.6Kmph) [Calm]
1=1-3 (1.6-4.8) [Light Air: smoke drifts]
2=4-7 (6.4-11.3) [Light Breeze: Leaves rustle, can feel wind on your face]
3=8-12 (12.8-19.3) [Gentle Breeze: Leaves and twigs move around. Light weight flags extend]
4=13-18 (20.9-29.0) [Moderate Breeze: Moves thin branches, raises dust and paper]
5=19-24 (30.6-38.6) [Fresh Breeze: Moves branches, trees sway]
6=25-31 (40.2-50.0) [Strong Breeze: Large tree branches move, open wires (such as telegraph wires) begin to "whistle", umbrellas are difficult to keep under control]
7=32-38 (51.5-61.2) [Moderate Gale: Large trees begin to sway, noticeably difficult to walk]
8=39-46 (62.8-74.0) [Fresh Gale: Twigs and small branches are broken from trees, walking into the wind is very difficult]

@ 2145 added a 6m off bridge because many bats flew under bridge & over water. Also seemed that bats utilized tree & small cave near tree to N of intake. Caught 2 bats in this net - occurred more often around intake bridge. Records indicate potential roost. Several bats were observed flying to that area, It looks like a piece of metal from building in caving off. Number of bats seemed to peak Again @ 2352 and this was when they were observed going to intake hole and near tree. Not much activity around net. The three other nets were pulled down @ 2345



Junction Reservoir and Dam

BAT SPECIES SURVEY FORM

Observers: JK DH Page 1 of 2

Area/Job Name: UAIP Site Name/Number Junction Inlet/Main Date: 7/18/02

TIME	SPECIES	SEX (M/F)	AGE (J/A)	REPROD. STATUS	FORE-ARM (mm)	WEIGHT (g)	NET #	COMMENTS - SPECIES CONDITION
2223	Myotis thysanodes (fringed)	M	A	NOT REPRODUC	40	7.5	D	Vocals
2239	Yuma	M	A	ND	36	6g	D	slightly aggressive

Reproductive Status: P - Pregnant, L - Lactating, PL - Post-Lactating, NR - Non-Reproductive

BAT SURVEY FORM

Observers: JW & FG Date: 7/18/02 Page: 1 of 1

Area/Job Name: UVRP BATS Site Name/Number Union Valley Dam

Survey Location: T._____ N or S, R._____ E or W, S._____, QQ (1/16)_____ of Q (1/4)_____

UTM zone: 10S Coordinates: E(x) 0722220, N(y) 4304860, Source: GPS

Survey Location *(Create Diagram of Survey Site and Net Placement on back side of page)*

Aerial Photo: Yes No Nearest Water: Pond (Lake) River Creek Estuary Marine Elevation: Union Valley Res

Distance to Water: Over (Adjacent) Other - _____ m Pool Size (LxW) See Map

Overall Site Canopy Cover: 17 % # of Canopy Layers: 2 Define Shrubs & Trees

Potential Roost Sites: Cliffs Forest (Conifer) Deciduous) Snags Buildings Bridges Other: Decade Outcrops

Roost Observed? Yes (No) Nets: 2 6m, 1 9m, 1 18m, Harp Trap(s) (size) —

Roost Description: —

Habitat Type Description: mixed conifer fir & Manzanita community

Nearest Project Facility: Union Valley Lake Distance: @ ~~Miles~~

Environmental Conditions Official Sunset: 2030 Source: Rw

Begin Survey 2030 End Survey 2315 Temp. at start 70 Temp. at end 62°

Time	Visibility			Audio to 100m	Precipitation			Wind Speed and Direction (from)	Comments
	Cloud Height	Cloud Cover	Visible Distance		Rain	Fog	Other/Notes		
2015	5000'	10%	10mile	Y	n	n	—	0-5 mph Variable	
2315	VL	5%	VL	Y	n	n	—	Variable 0-3	—

For Rain and Fog: N - None, L - Light, M - Moderate, H - Heavy

Wind: 0= <1mph (<1.6Kmph) [Calm]

1=1-3 (1.6-4.8) [Light Air: smoke drifts]

2=4-7 (6.4-11.3) [Light Breeze: Leaves rustle, can feel wind on your face]

3=8-12 (12.9-19.3) [Gentle Breeze: Leaves and twigs move around. Light weight flags extend]

4=13-18 (20.9-29.0) [Moderate Breeze: Moves thin branches, raises dust and paper]

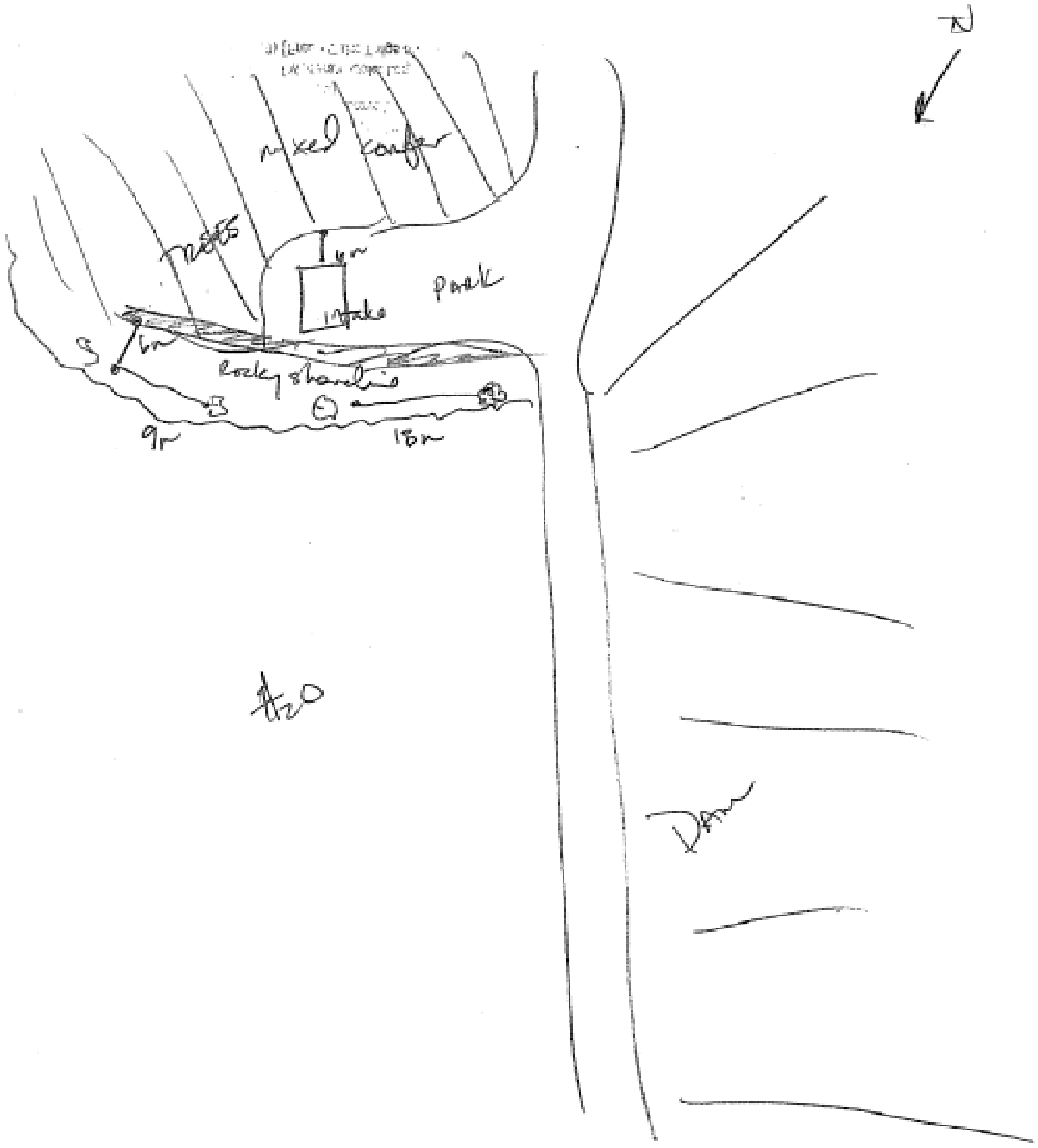
5=19-24 (30.6-38.6) [Fresh Breeze: Moves branches, trees sway]

6=25-31 (40.2-50.0) [Strong Breeze: Large tree branches move, open wires (such as telegraph wires) begin to "whistle", umbrellas are difficult to keep under control]

7=32-38 (51.5-61.2) [Moderate Gale: Large trees begin to sway, noticeably difficult to walk]

8=39-46 (62.9-74.0) [Fresh Gale: Twigs and small branches are broken from trees, walking into the wind is very difficult]

NO Captures


N
mixed conifer
park
Intake
Rocky shoreline
9m
15m
Dam

BAT SURVEY FORM

Observers: Waddell, Green Date: 7-9-02 Page: 1 of 2

Area/Job Name: SMUD Upper American River Proj Site Name/Number: Brush Creek Dam

Survey Location: T._____ N or S, R._____ E or W, S_____, QQ (1/16)_____ of Q (1/4)_____

UTM zone: 10S Coordinates: E(x) 0706550, N(y) 4298516, Source: Garmin GPS

Survey Location *(Create Diagram of Survey Site and Net Placement on back side of page)*

Aerial Photo: Yes No Nearest Water: Pond Lake River Creek Estuary Marine Elevation:_____

Distance to Water: Over Adjacent Other - _____m Pool Size (LxW)_____

Overall Site Canopy Cover: 10 % # of Canopy Layers: 2 Define Trees + shrubs

Potential Roost Sites: Cliffs Forest (Conifer) Deciduous Snags Buildings Bridges Other:_____

Roost Observed? Yes No Nets: 3 6m, 1 9m, 1 18m, Harp Trap(s) (size)_____

Roost Description: _____

Habitat Type Description: Mixed coniferous forest (pine/fir) w/ Manzanita understory, Deciduous along shoreline of reservoir

Nearest Project Facility: Brush Creek Dam Distance: 500 Miles Yards

Environmental Conditions Official Sunset:_____ Source:_____

Begin Survey 8:45pm End Survey 2345 Temp. at start 71° Temp. at end 59°

Time	Visibility			Audio to 100m	Precipitation			Wind Speed and Direction (from)	Comments
	Cloud Height	Cloud Cover	Visible Distance		Rain	Fog	Other/Notes		
8:45pm	NA	None	UL	Y	N	N	←	3 East	—
2345		No change							

For Rain and Fog: N - None, L - Light, M - Moderate, H - Heavy

Wind: 0= <1mph (<1.6Kmph) [Calm]

1=1-3 (1.6-4.8) [Light Air: smoke drifts]

2=4-7 (6.4-11.3) [Light Breeze: Leaves rustle, can feel wind on your face]

3=8-12 (12.9-19.3) [Gentle Breeze: Leaves and twigs move around. Light weight flags extend]

4=13-18 (20.9-29.0) [Moderate Breeze: Moves thin branches, raises dust and paper]

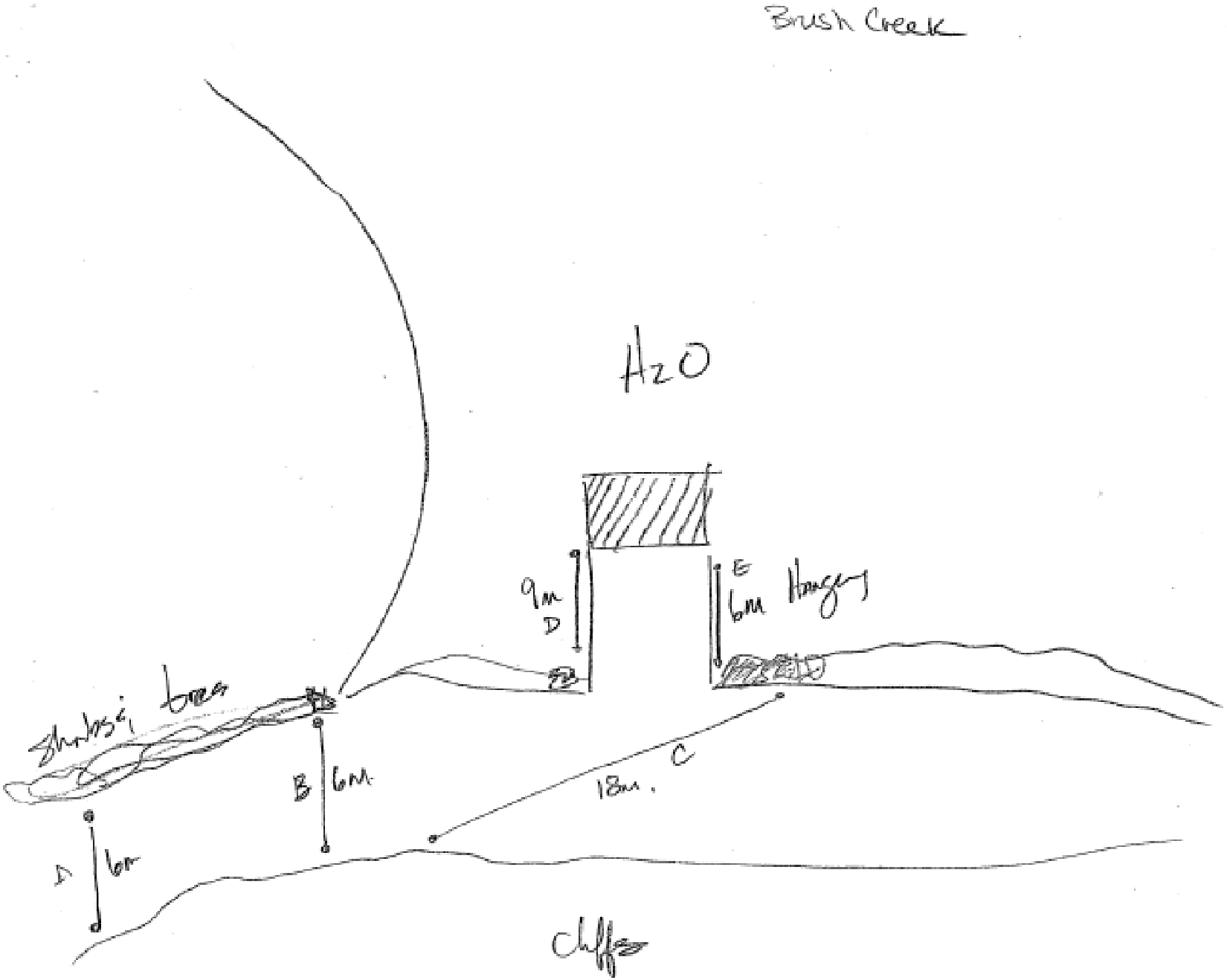
5=19-24 (30.6-38.6) [Fresh Breeze: Moves branches, trees sway]

6=25-31 (40.2-50.0) [Strong Breeze: Large tree branches move, open wires (such as telegraph wires) begin to "whistle", umbrellas are difficult to keep under control]

7=32-38 (51.5-61.2) [Moderate Gale: Large trees begin to sway, noticeably difficult to walk]

8=39-46 (62.8-74.0) [Fresh Gale: Twigs and small branches are broken from trees, walking into the wind is very difficult]

USE PENCIL


Brush Creek
H2O
9m
D
E
6m
Hanging
B
6m.
18m.
C
A
6m
Cliff

BAT SPECIES SURVEY FORM Observers: Waddell, Green Page 2 of 2

Area/Job Name: SMUD Upper American Riv Site Name/Number: Brush Creek Dam Date: 7-19-02

TIME	SPECIES	SEX (M/F)	AGE (J/A)	REPROD. STATUS	FORE-ARM (mm)	WEIGHT (g)	NET #	COMMENTS - SPECIES CONDITION
2225	Myotis yumanensis	M	A	NR	35 mm	7.0 g	E	Captured in 6m net hanging above water (from bridge to intake structure)
2245	Myotis yumanensis	M	A	NR	35 mm	6.0 g	E	Captured in 6 m net hanging above water - from bridge to intake structure

Reproductive Status: **P** - Pregnant, **L** - Lactating, **PL** - Post-Lactating, **NR** - Non-Reproductive

Roll #2 (cont) Photos 13-7

BAT SURVEY FORM Observers: JK, DM Date: 7/19/02 Page: 1 of 1

Area/Job Name: SMUD, UARP Site Name/Number: Camino PH

Survey Location: T.____ N or S, R.____ E or W, S____, QQ (1/16)____ of Q (1/4)____

UTM zone:____ Coordinates: E(x) W 120° 37.365', N(y) 38° 47.711', Source: GPS

Survey Location *(Create Diagram of Survey Site and Net Placement on back side of page)*

Aerial Photo: Yes No Nearest Water: Pond Lake (River) Creek Estuary Marine Elevation: ~1,840'

Distance to Water: Over (Adjacent) Other - 12 m Pool Size (LxW) —

Overall Site Canopy Cover: 40 % # of Canopy Layers: 3 Define Trees/shrubs along cliffs & other side of River, but closest tree to net is 20m

Potential Roost Sites: (Cliffs) Forest (Conifer / Deciduous) (Snags) (Buildings) (Bridges) Other: ← about 0.25 mi away

Roost Observed? Yes No Nets: 2 6m, 1 9m, 1 18m, Harp Trap(s) (size)

Roost Description: Potential roosting around PH, @ bridge 0.25 mi away (less likely), cliffs and trees and snags

Habitat Type Description: PH all other info

Nearest Project Facility: Camino PH Distance: 0 Miles - @ PH

Environmental Conditions Official Sunset: 2035 Source: GPS

Begin Survey 2045 End Survey 2335 Temp. at start 77°F Temp. at end 72°

Time	Visibility			Audio to 100m	Precipitation			Wind Speed and Direction (from)	Comments
	Cloud Height	Cloud Cover	Visible Distance		Rain	Fog	Other/Notes		
2035	N/A	0	1 mi	car	N	N	N	0	PH is fairly loud, in canyon

For Rain and Fog: N - None, L - Light, M - Moderate, H - Heavy

Wind: 0= <1mph (<1.6Kmph) [Calm]

1=1-3 (1.6-4.8) [Light Air: smoke drifts]

2=4-7 (6.4-11.3) [Light Breeze: Leaves rustle, can feel wind on your face]

3=8-12 (12.9-19.3) [Gentle Breeze: Leaves and twigs move around. Light weight flags extend]

4=13-18 (20.9-29.0) [Moderate Breeze: Moves thin branches, raises dust and paper]

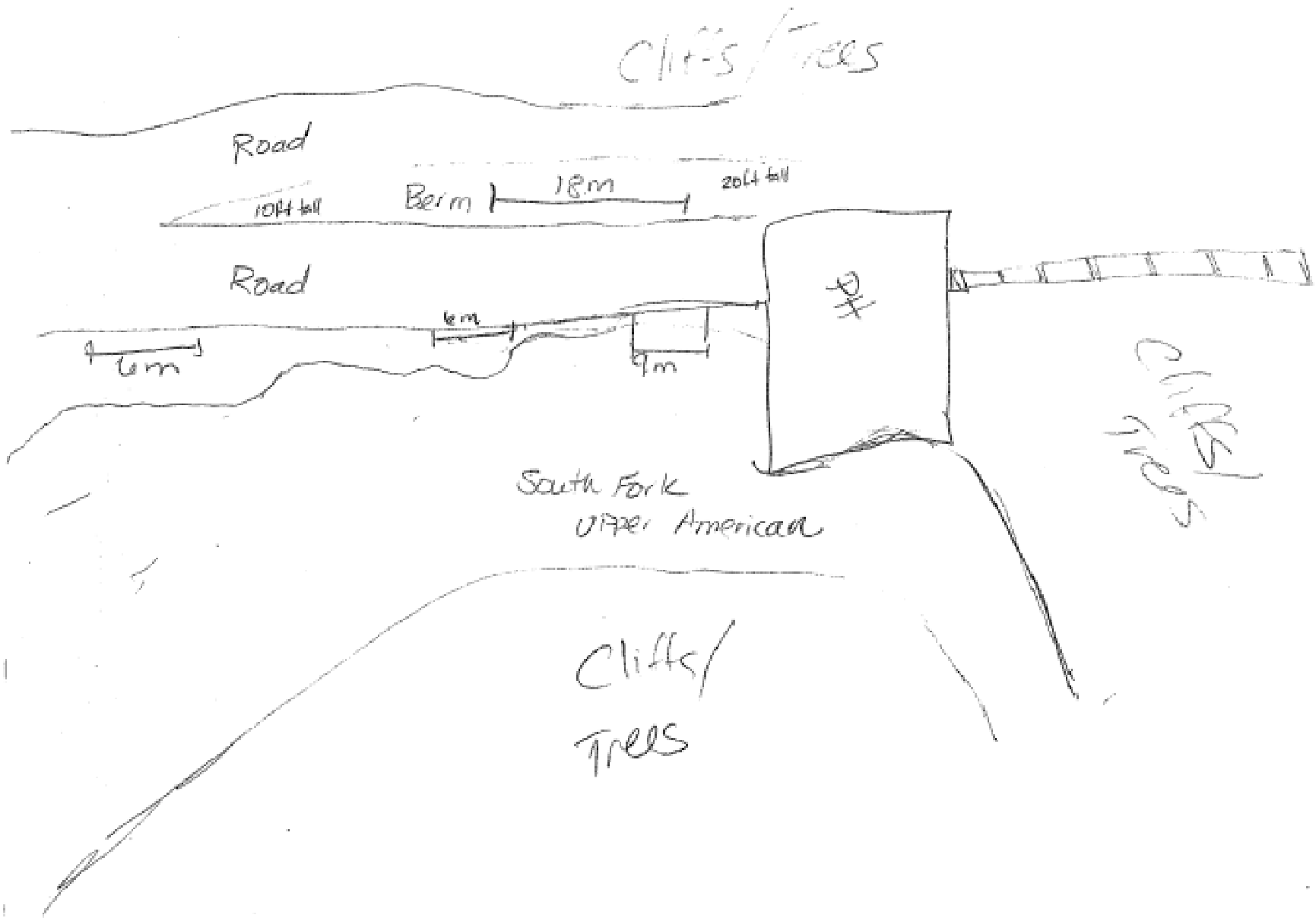
5=19-24 (30.6-38.6) [Fresh Breeze: Moves branches, trees sway]

6=25-31 (40.2-50.0) [Strong Breeze: Large tree branches move, open wires (such as telegraph wires) begin to "whistle", umbrellas are difficult to keep under control]

7=32-38 (51.5-61.2) [Moderate Gale: Large trees begin to sway, noticeably difficult to walk]

8=39-46 (62.8-74.0) [Fresh Gale: Twigs and small branches are broken from trees, walking into the wind is very difficult]

No Captures


Cliffs/Trees
Road
10ft tall
Berm
18m
20ft tall
Road
6m
6m
9m
South Fork
Upper American
Cliffs/
Trees

BAT SURVEY FORM

Observers: DM & JW Date: 7/20/02 Page: 1 of 3

Area/Job Name: YARD BATS Site Name/Number Slab Creek Powerhouse

Survey Location: T._____ N or S, R._____ E or W, S_____, QQ (1/16)_____ of Q (1/4)_____

UTM zone: 10S Coordinates: E(x) 0699954, N(y) 4294071, Source: Garmin GPS

Survey Location *(Create Diagram of Survey Site and Net Placement on back side of page)* Reservoir Dam.

Aerial Photo: Yes No Nearest Water: Pond (Lake) River (Creek) Estuary Marine Elevation:_____

Distance to Water: Over (Adjacent) Other - 30 m Pool Size (LxW) See Map

Overall Site Canopy Cover: 2 % # of Canopy Layers: 2 Define 1 tree & 1 shrub

Potential Roost Sites: (Cliffs) Forest (Conifer) (Deciduous) (Snags) (Buildings) Bridges Other:_____

Roost Observed? Yes (No) Nets: 3 6m, 1 9m, 1 18m, Harp Trap(s) (size)_____

Roost Description: Dominant Oak / Hardwood / Manzanita Community on Powerhouse side within site is primarily conifer forest and Manzanita w/

Habitat Type Description: abundant grasses.

Nearest Project Facility: Slabcreek Dam/Powerhouse Distance: 2 Miles

Environmental Conditions Official Sunset: 2030 Source:_____

Begin Survey 2030 End Survey 2000-0030 Temp. at start 78° Temp. at end 62°

Time	Visibility			Audio to 100m	Precipitation			Wind Speed and Direction (from)	Comments
	Cloud Height	Cloud Cover	Visible Distance		Rain	Fog	Other/Notes		
2030	UL	1%	UL	Y	N	N	N	Variable 0-5	—
0000	UL	—	UL	Y	N	N	N	Variable 0-2	—

For Rain and Fog: N - None, L - Light, M - Moderate, H - Heavy

Wind: 0= <1mph (<1.6Kmph) [Calm]

1=1-3 (1.6-4.8) [Light Air: smoke drifts]

2=4-7 (6.4-11.3) [Light Breeze: Leaves rustle, can feel wind on your face]

3=8-12 (12.9-19.3) [Gentle Breeze: Leaves and twigs move around. Light weight flags extend]

4=13-18 (20.9-29.0) [Moderate Breeze: Moves thin branches, raises dust and paper]

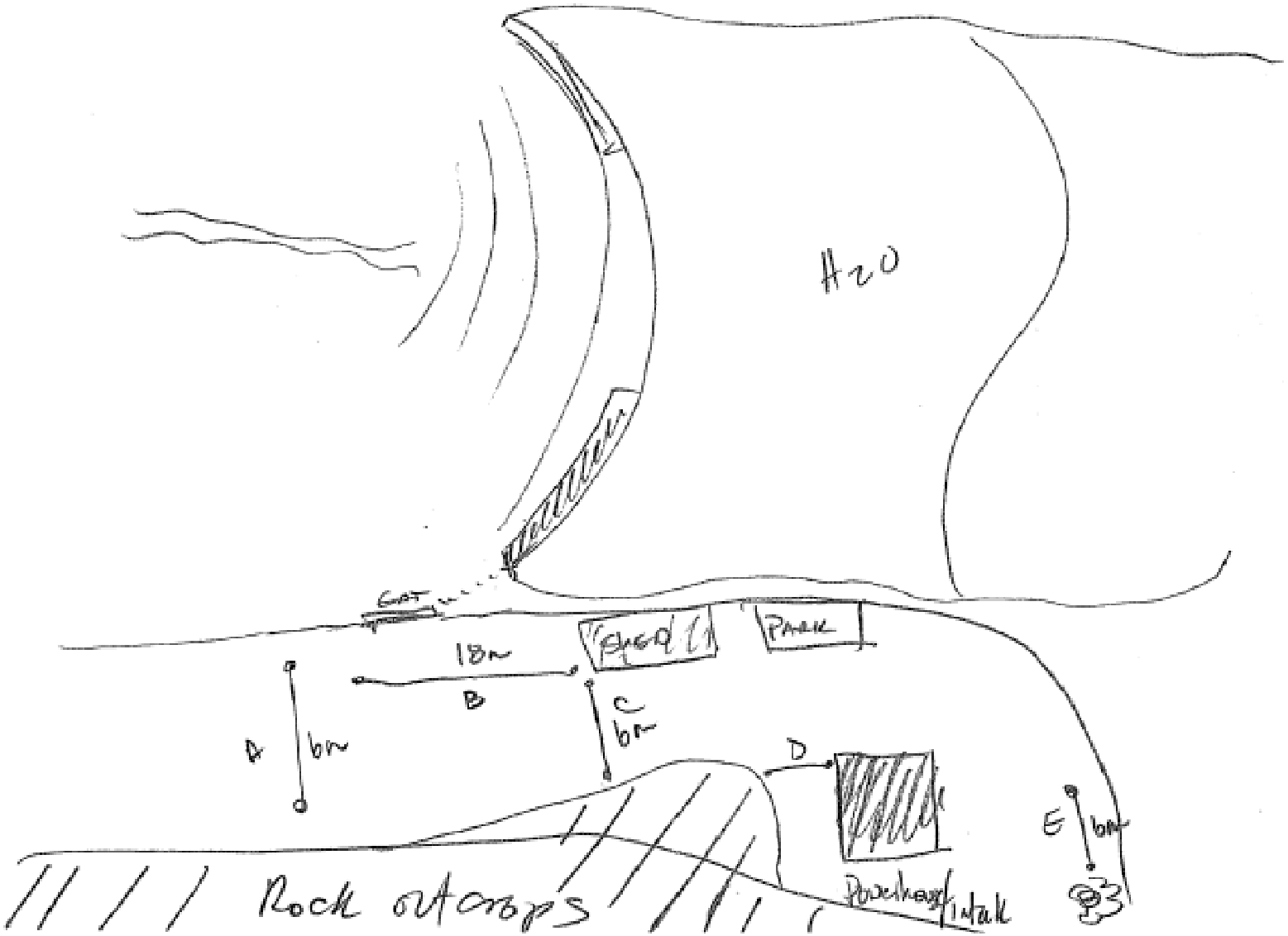
5=19-24 (30.6-38.6) [Fresh Breeze: Moves branches, trees sway]

6=25-31 (40.2-50.0) [Strong Breeze: Large tree branches move, open wires (such as telegraph wires) begin to "whistle", umbrellas are difficult to keep under control]

7=32-38 (51.5-61.2) [Moderate Gale: Large trees begin to sway, noticeably difficult to walk]

8=39-46 (62.8-74.0) [Fresh Gale: Twigs and small branches are broken from trees, walking into the wind is very difficult]

Skb Creek Dam



BAT SPECIES SURVEY FORM

Observers: JW

Area/Job Name: SNWD, JARP

Site Name/Number: Slab Creek Dam

Date: 7/20/2002

TIME	SPECIES	SEX (M/F)	AGE (J/A)	REPROD. STATUS	FORE-ARM (mm)	WEIGHT (g)	NET #	COMMENTS - SPECIES CONDITION
2030-2100	Myotis yumanensis	F	J	NR	36.0	5.04	D	Voucher call
↓	MYYU	F	A	PL	35.0	5.75	D	" "
	MYYU	F	A	PL	34	5.0	E	
	MYYU	F	J		34	4.25	E	
	MYYU	M	J		33	4.75	E	
	MYYU	M	J	NR	35	4.0	E	
	MYYU	F	A	PL	35.0	5.0	E	
	MYYU	M	J		34.0	4.5	E	
	MYYU	F	A	PL	35	5.5	E	
	MYYU	F	A	PL	36	5.5	E	
	MYYU	M	J		34	4.5	E	
	MYYU	M	A		35	5.25	E	
	MYYU	F	A	PL	36	5.75	E	
	MYYU	M	J		34	4.5	E	
	MYYU	M	J		34	4.75	E	
	MYYU	F	J		35	5.0	E	
	MYYU	F	A	PL	33	5.0	E	
	MYYU	F	A	PL	34	5.0	E	
	MYYU	M	J		34	4.75	E	
	MYYU	M	J		34	4.25	E	
	MYYU	M	J		34	4.50	E	

Reproductive Status: P - Pregnant, L - Lactating, PL - Post-Lactating, NR - Non-Reproductive

BAT SPECIES SURVEY FORM

Observers: DWK JLD Page 3

Area/Job Name: SMUD URAD Site Name/Number Slab Creek Dam Date 7/20/2002

TIME	SPECIES	SEX (M/F)	AGE (J/A)	REPROD. STATUS	FORE-ARM (mm)	WEIGHT (g)	NET #	COMMENTS - SPECIES CONDITION
2030-2102	MYYU	M	J		32	4.75	D	
	MYYU	M	J		36	4.25	E	
	MYYU	F	A	PL	35	5.75	E	
	MYYU	F	A	L	35	5.5	E	
	MYYU	F	A	PL	35	5.75	E	
	MYYU	F	A	NR	34	4.75	E	
	MYYU	F	A	L	36	5.25	E	
2240	MYYU	F	A	P	34	6.5	E	Abdomen very Tought/ Distended
2325	MYYU	F	A	P	33	6.25	E 1	" " "
	MYYU	F	A	P	34	6.0	E	Very Fat; Tight Abdomen
2345	MYYU	F	J	NR	33	5.0	C	
2400	MYYU	M	J		33	5.5	E	
2415	MYYU	M	A		34	5.0	C	

Reproductive Status: P - Pregnant, L - Lactating, PL - Post-Lactating, NR - Non-Reproductive

Photos 20-15

BAT SURVEY FORM

Observers: DM, JW Date: 7/21/02 Page: 191

Area/Job Name: UAREP BATS Site Name/Number Gaylord Canyon Adit

Survey Location: T._____ N or S, R._____ E or W, S_____, QQ (1/16)_____ of Q (1/4)_____

UTM zone: 10S Coordinates: E(x) 0717300, N(y) 4501679, Source: GPS Garmin

Survey Location *(Create Diagram of Survey Site and Net Placement on back side of page)*

Aerial Photo: Yes No Nearest Water: Pond Lake River (Creek) Estuary Marine small pool out of Adit Elevation:_____

Distance to Water: Over (Adjacent) Other - _____m Pool Size (LxW) 3mx4m

Overall Site Canopy Cover: 35 % # of Canopy Layers: 1 Define Tree

Potential Roost Sites: Cliffs Forest (Conifer) Deciduous) (Snags) (Buildings) Bridges Other: small utility bldg at Adit

Roost Observed? Yes (No) Nets: 3 6m, _____9m, 1 18m, Harp Trap(s) (size)_____

Roost Description: _____

Habitat Type Description: Adit in conifer forest w/brush; small creek coming from Adit entrance very open at Adit entrance & 30m to N on road.

Nearest Project Facility: Adit Distance: 0 Miles

Environmental Conditions Official Sunset: 2030 Source:_____

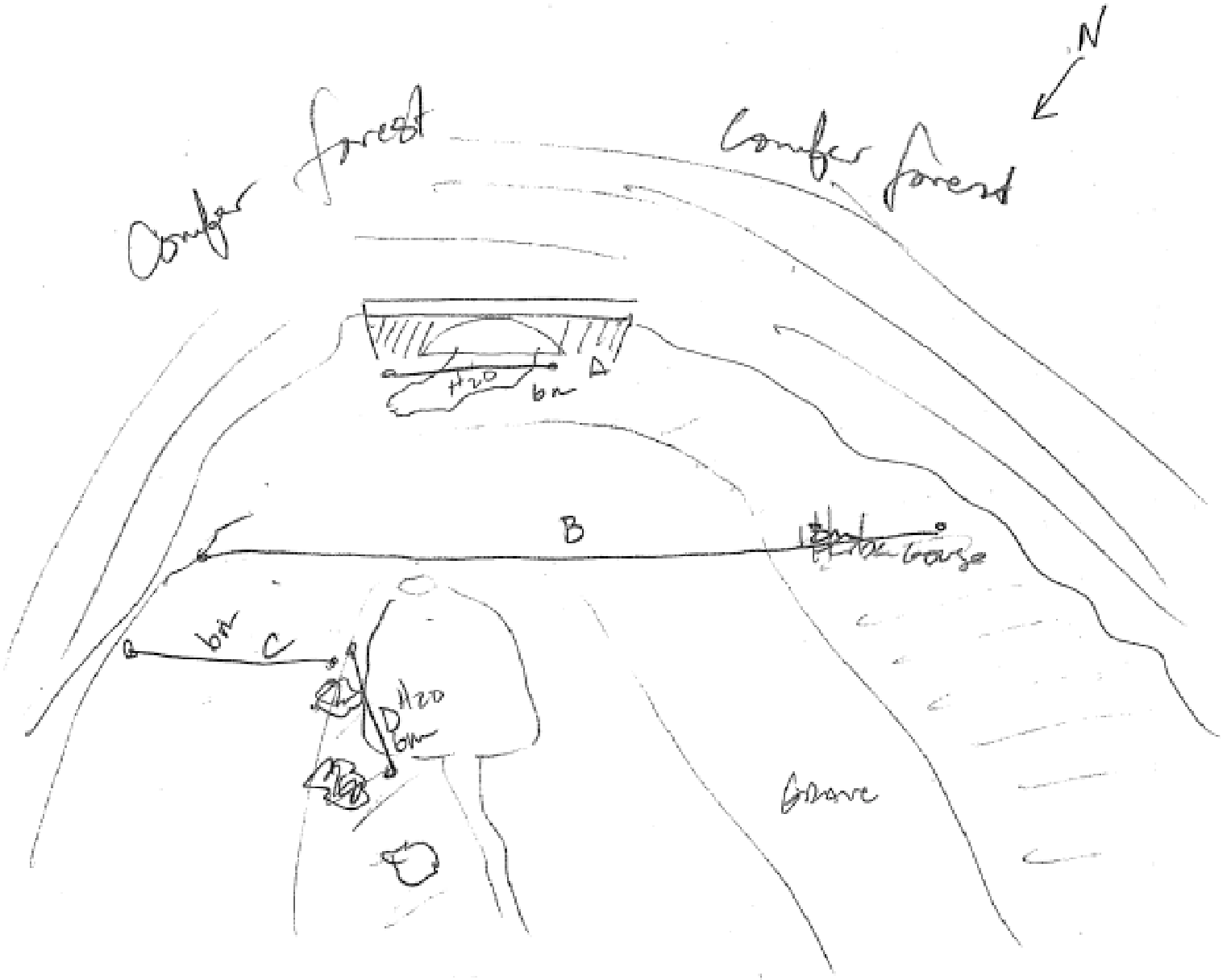
Begin Survey 2030 End Survey 2300(?) Temp. at start 71 Temp. at end_____

Time	Visibility			Audio to 100m	Precipitation			Wind Speed and Direction (from)	Comments
	Cloud Height	Cloud Cover	Visible Distance		Rain	Fog	Other/Notes		
2030	5000	25%	3mi	—	N	N	—	Variable 0-2	Some noise from creek.
2140	"	55%	"	no change besides clouds					

For Rain and Fog: N - None, L - Light, M - Moderate, H - Heavy

Wind: 0= <1mph (<1.6Kmph) [Calm]
1=1-3 (1.6-4.8) [Light Air: smoke drifts]
2=4-7 (6.4-11.3) [Light Breeze: Leaves rustle, can feel wind on your face]
3=8-12 (12.9-19.3) [Gentle Breeze: Leaves and twigs move around. Light weight flags extend]
4=13-18 (20.9-29.0) [Moderate Breeze: Moves thin branches, raises dust and paper]
5=19-24 (30.6-38.6) [Fresh Breeze: Moves branches, trees sway]
6=25-31 (40.2-50.0) [Strong Breeze: Large tree branches move, open wires (such as telegraph wires) begin to "whistle", umbrellas are difficult to keep under control]
7=32-38 (51.5-61.2) [Moderate Gale: Large trees begin to sway, noticeably difficult to walk]
8=39-46 (62.8-74.0) [Fresh Gale: Twigs and small branches are broken from trees, walking into the wind is very difficult]

NO CAPTURES


N
Conifer forest
Conifer forest
H2O
bm
A
B
bm
C
H2O
bm
Grave

BAT SURVEY FORM

Observers: DM & TW Date: 7/22/02 Page: 1 of 1

Area/Job Name: VARP BATS Site Name/Number Loon Lake PWHs.

Survey Location: T._____ N or S, R._____ E or W, S_____, QQ (1/16)_____ of Q (1/4)_____

UTM zone: 10S Coordinates: E(x) 0731430, N(y) 4319505 Source:_____

Survey Location *(Create Diagram of Survey Site and Net Placement on back side of page)*

Aerial Photo: Yes No Nearest Water: Pond (Lake) River Creek Estuary Marine Elevation:_____

Distance to Water: Over (Adjacent) Other - 70 m Pool Size (LxW) See Map

Overall Site Canopy Cover: 3 % # of Canopy Layers: 2 Define Shrub & tree

Potential Roost Sites: Cliffs Forest (Conifer / Deciduous) Snags (Buildings) Bridges Other: Rock outcrops

Roost Observed (Yes) No Nets: 4 6m, 1 9m, _____ 18m, Harp Trap(s) (size)_____

Roost Description: Very small right roost @ the entrance of the powerhouse

Habitat Type Description: Conifer forest w/ granite rock outcrops, both large and small tree present.

Nearest Project Facility: Powerhouse @ Loon Lake Distance: 0 Miles

Environmental Conditions Official Sunset: 2030 Source:_____

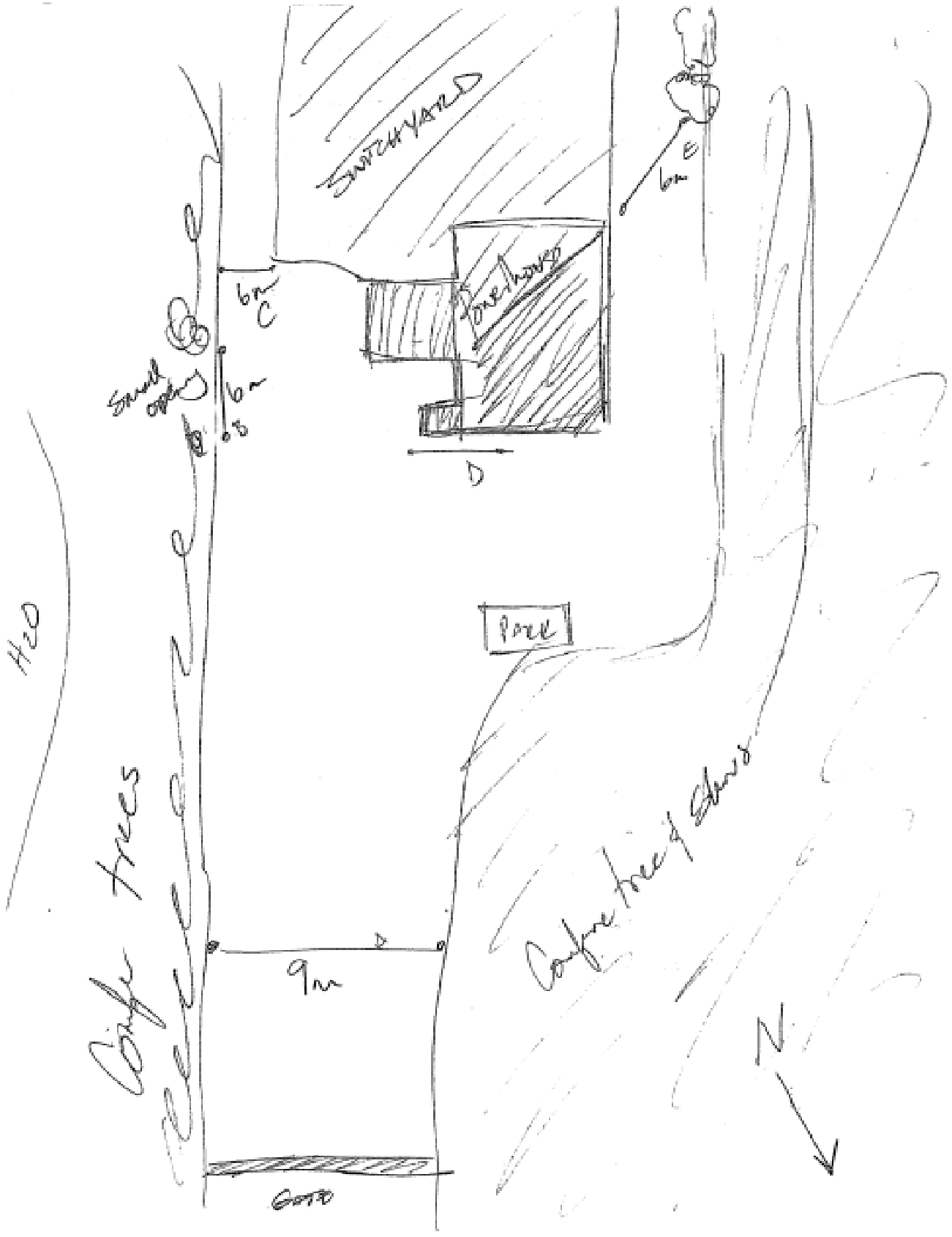
Begin Survey 2045 End Survey 2300 Temp. at start 71° Temp. at end 68°

Time	Visibility			Audio to 100m	Precipitation			Wind Speed and Direction (from)	Comments
	Cloud Height	Cloud Cover	Visible Distance		Rain	Fog	Other/Notes		
2020	UL	0	UL	Y	N	N	—	South 1-3	some noise from powerhouse

For Rain and Fog: N - None, L - Light, M - Moderate, H - Heavy

Wind: 0= <1mph (<1.6Kmph) [Calm]
1=1-3 (1.6-4.8) [Light Air: smoke drifts]
2=4-7 (6.4-11.3) [Light Breeze: Leaves rustle, can feel wind on your face]
3=8-12 (12.9-19.3) [Gentle Breeze: Leaves and twigs move around. Light weight flags extend]
4=13-18 (20.9-29.0) [Moderate Breeze: Moves thin branches, raises dust and paper]
5=19-24 (30.6-38.6) [Fresh Breeze: Moves branches, trees sway]
6=25-31 (40.2-50.0) [Strong Breeze: Large tree branches move, open wires (such as telegraph wires) begin to "whistle", umbrellas are difficult to keep under control]
7=32-38 (51.5-61.2) [Moderate Gale: Large trees begin to sway, noticeably difficult to walk]
8=39-46 (62.8-74.0) [Fresh Gale: Twigs and small branches are broken from trees, walking into the wind is very difficult]

No Captures


SWITCHYARD
6m
E
6m
C
OVERHANG
SMALL OPEN
6m
B
D
POLE
H2O
Coffee trees
9m
Coffee trees
GATE
N

BAT SURVEY FORM

Observers: JK & JW Date: 7/23/02 Page: 18 1

Area/Job Name: USFS Bats Site Name/Number: Icehouse Dam/outflow

Survey Location: T._____ N or S, R._____ E or W, S._____, QQ (1/16)_____ of Q (1/4)_____

UTM zone: 10S Coordinates: E(x) 0729 900, N(y) 4300917, Source: _____

Survey Location *(Create Diagram of Survey Site and Net Placement on back side of page)*

Aerial Photo: Yes No Nearest Water: Pond Lake River (Creek) Estuary Marine Elevation: 3/8000'

Distance to Water: (Over) (Adjacent) Other - _____m Pool Size (LxW) 20m x 40m

Overall Site Canopy Cover: 15 % # of Canopy Layers: 3 Define understory, shrub & tree

Potential Roost Sites: Cliffs Forest (Conifer / Deciduous) (Snags) (Buildings) Bridges Other: _____

Roost Observed? Yes (No) Nets: 3 6m, 1 9m, _____18m, Harp Trap(s) (size)_____

Roost Description: Sparse conifer w/ prominent rock outcrops w/ shallow bedrock; small seep nearby

Habitat Type Description: _____

Nearest Project Facility: Icehouse Dam / outflow Distance: 0 Miles

Environmental Conditions Official Sunset: 2030 Source: _____

Begin Survey 2030 End Survey 2300 (?) Temp. at start 64° Temp. at end _____

Time	Visibility			Audio to 100m	Precipitation			Wind Speed and Direction (from)	Comments
	Cloud Height	Cloud Cover	Visible Distance		Rain	Fog	Other/Notes		
2030	UL	0	UL	Y	N	N	N	0	—

For Rain and Fog: N - None, L - Light, M - Moderate, H - Heavy

Wind: 0= <1mph (<1.6Kmph) [Calm]

1=1-3 (1.6-4.8) [Light Air: smoke drifts]

2=4-7 (6.4-11.3) [Light Breeze: Leaves rustle, can feel wind on your face]

3=8-12 (12.9-19.3) [Gentle Breeze: Leaves and twigs move around. Light weight flags extend]

4=13-18 (20.9-29.0) [Moderate Breeze: Moves thin branches, raises dust and paper]

5=19-24 (30.6-38.6) [Fresh Breeze: Moves branches, trees sway]

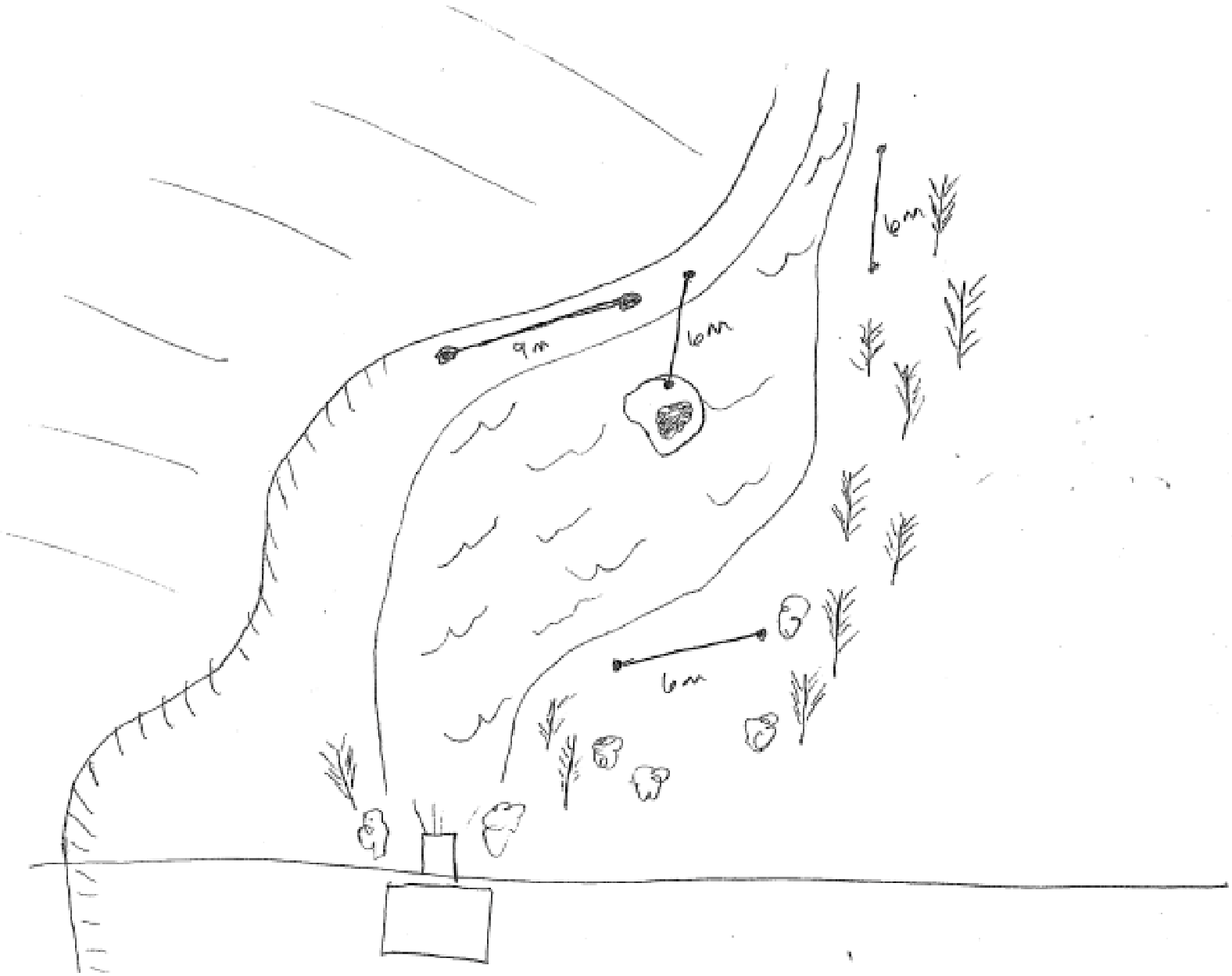
6=25-31 (40.2-50.0) [Strong Breeze: Large tree branches move, open wires (such as telegraph wires) begin to "whistle", umbrellas are difficult to keep under control]

7=32-38 (51.5-61.2) [Moderate Gale: Large trees begin to sway, noticeably difficult to walk]

8=39-46 (62.8-74.0) [Fresh Gale: Twigs and small branches are broken from trees, walking into the wind is very difficult]

No Captures

Last Revised 2/8/02


9m
6m
6m
6m

BAT SURVEY FORM

Observers: Munzer, Green Date: 7-23-02 Page: 182

Area/Job Name: SMUD Upper American River Project Site Name/Number Jones Fork PH

Survey Location: T._____ N or S, R._____ E or W, S_____, QQ (1/16)_____ of Q (1/4)_____

UTM zone:____ Coordinates: E(x)_____, N(y)_____, Source:_____

Survey Location *(Create Diagram of Survey Site and Net Placement on back side of page)*

Aerial Photo: Yes No Nearest Water: Pond (Lake) River Creek Estuary Marine Elevation:_____

Distance to Water: (Over) (Adjacent) Other - _____m Pool Size (LxW)_____

Overall Site Canopy Cover: 20 % # of Canopy Layers: 3 Define Mature conifers, saplings

Potential Roost Sites: Cliffs (Forest (Conifer) Deciduous) (Snags) (Buildings) Bridges Other:_____

Roost Observed? Yes (No) Nets: 2 6m, 1 9m, 1 18m, Harp Trap(s) (size)_____

Roost Description: _____

Habitat Type Description: Coniferous forest surrounding lake, stream flowing into reservoir

Nearest Project Facility: Jones Fork PH Distance: _____Miles

Environmental Conditions Official Sunset: 2035 Source:_____

Begin Survey 8:45pm End Survey 12:15pm Temp. at start ~70° Temp. at end ~50°

Time	Visibility			Audio to 100m	Precipitation			Wind Speed and Direction (from)	Comments
	Cloud Height	Cloud Cover	Visible Distance		Rain	Fog	Other/Notes		
2045	N/A	N/A	UL	yes	N/A	N/A	N/A	0	

For Rain and Fog: N - None, L - Light, M - Moderate, H - Heavy

Wind: 0= <1mph (<1.6Kmph) [Calm]

1=1-3 (1.6-4.8) [Light Air: smoke drifts]

2=4-7 (6.4-11.3) [Light Breeze: Leaves rustle, can feel wind on your face]

3=8-12 (12.9-19.3) [Gentle Breeze: Leaves and twigs move around. Light weight flags extend]

4=13-18 (20.9-29.0) [Moderate Breeze: Moves thin branches, raises dust and paper]

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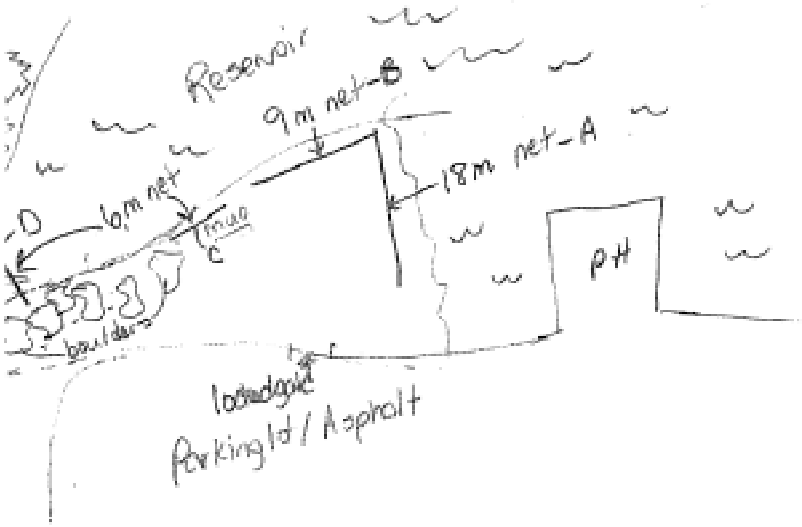
6=25-31 (40.2-50.0) [Strong Breeze: Large tree branches move, open wires (such as telegraph wires) begin to "whistle", umbrellas are difficult to keep under control]

7=32-38 (51.5-61.2) [Moderate Gale: Large trees begin to sway, noticeably difficult to walk]

8=39-46 (62.8-74.0) [Fresh Gale: Twigs and small branches are broken from trees, walking into the wind is very difficult]

Saw first bat at 8:30pm



BAT SPECIES SURVEY FORM

Observers: Murrier, Green

Area/Job Name: UARP

Site Name/Number: Jones Fork PH

Date: 7-23-02

TIME	SPECIES	SEX (M/F)	AGE (J/A)	REPROD. STATUS	FORE-ARM (mm)	WEIGHT (g)	NET #	COMMENTS - SPECIES CONDITION
9:10 pm	Myotis californicus	F	J	NR	31 mm	4g	D	After measuring and identifying she did not immediately fly away- location near PH colder than net D location- moved her to that location-

Reproductive Status: P - Pregnant, L - Lactating, PL - Post-Lactating, NR - Non-Reproductive

BAT SURVEY FORM

Observers: Waddell, Green Date: 7-24-02 Page: 14

Area/Job Name: SMUD Upper American River Project Site Name/Number Camino Dam

Survey Location: T._____ N or S, R._____ E or W, S_____, QQ (1/16)_____ of Q (1/4)_____

UTM zone: 10S Coordinates: E(x) 0713779, N(y) 4300635, Source:_____

Survey Location *(Create Diagram of Survey Site and Net Placement on back side of page)*

Aerial Photo: Yes No Nearest Water: Pond (Lake) River Creek Estuary Marine Elevation:_____

Distance to Water: (Over) (Adjacent) Other - _____m Pool Size (LxW)_____

Overall Site Canopy Cover: 5 % # of Canopy Layers: 2 Define herbaceous, trees

Potential Roost Sites: (Cliffs) (Forest (Conifer/ Deciduous)) Snags (Buildings) Bridges Other:_____

Roost Observed? Yes (No) Nets: 2 6m, 1 9m, 1 18m, Harp Trap(s) (size)_____

Roost Description: _____

Habitat Type Description: Camino Reservoir + Dam (w road on it), Roads on either side, bluffs above the road.

Nearest Project Facility: Camino Dam Distance: 0 Miles Conifers are on top of the bluffs

Environmental Conditions Official Sunset: 2030 Source:_____

Begin Survey 2045 End Survey 1145 Temp. at start 80 Temp. at end 70

Time	Visibility			Audio to 100m	Precipitation			Wind Speed and Direction (from)	Comments
	Cloud Height	Cloud Cover	Visible Distance		Rain	Fog	Other/Notes		
2030	N	N	UL		N	N	N	1	

For Rain and Fog: N - None, L - Light, M - Moderate, H - Heavy

Wind: 0= <1mph (<1.6Kmph) [Calm]
1=1-3 (1.6-4.8) [Light Air: smoke drifts]
2=4-7 (6.4-11.3) [Light Breeze: Leaves rustle, can feel wind on your face]
3=8-12 (12.9-19.3) [Gentle Breeze: Leaves and twigs move around. Light weight flags extend]
4=13-18 (20.9-29.0) [Moderate Breeze: Moves thin branches, raises dust and paper]
5=19-24 (30.5-38.6) [Fresh Breeze: Moves branches, trees sway]
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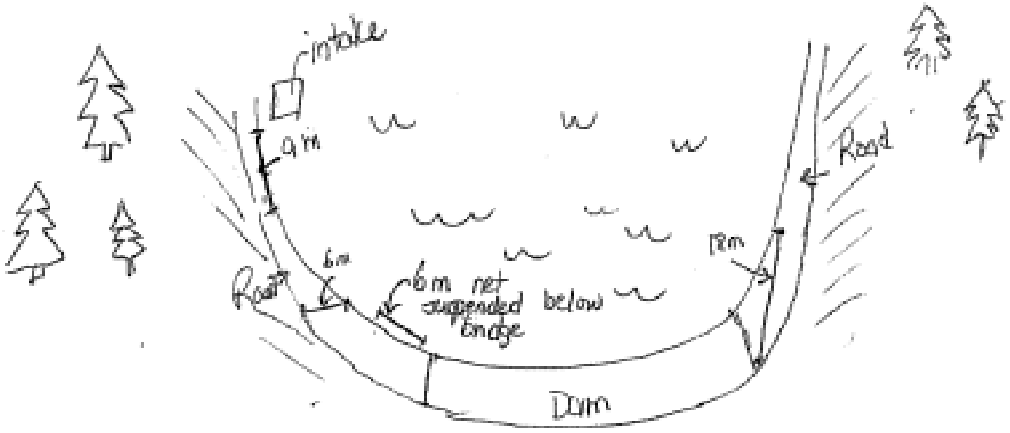
7=32-38 (51.5-61.2) [Moderate Gale: Large trees begin to sway, noticeably difficult to walk]
8=39-46 (62.8-74.0) [Fresh Gale: Twigs and small branches are broken from trees, walking into the wind is very difficult]

No Captures


intake
9m
Road
6m
6m net suspended below bridge
12m
Road
Dam

Photos Roll #603

BAT SURVEY FORM

Observers: JK, DM Date: 7/24/07 Page: 1 of 1

Area/Job Name: SNWS SMRP Site Name/Number: Jay Bird PH

Survey Location: T.____ N or S, R.____ E or W, S____, QQ (1/16)____ of Q (1/4)____

UTM zone:____ Coordinates: E(x)____, N(y)____, Source:____

Survey Location *(Create Diagram of Survey Site and Net Placement on back side of page)*

Aerial Photo: Yes No Nearest Water: Pond Lake (River) Creek Estuary Marine Elevation: 2915'

Distance to Water: Over (Adjacent) (Other) 25 m (Pool Size (LxW)____

Overall Site Canopy Cover: 35 % # of Canopy Layers: 3 Define coniferous trees of various sizes, mostly md - tall canopy layer

Potential Roost Sites: (Cliffs) Forest (Conifer) Deciduous) (Snags) (Buildings) Bridges Other:____

Roost Observed? Yes (No) Nets: 2 6m, 1 9m, 1 18m, Harp Trap(s) (size)____

Roost Description:____

Habitat Type Description: River in canyon w/ coniferous (primarily) trees, cliffs surrounding PH

Nearest Project Facility: Jay Bird PH Distance: 0 Miles @ PH

Environmental Conditions Official Sunset: 2035 Source:____

Begin Survey 2050 End Survey 2230 Temp. at start 72° Temp. at end____

Time	Visibility			Audio to 100m	Precipitation			Wind Speed and Direction (from)	Comments
	Cloud Height	Cloud Cover	Visible Distance		Rain	Fog	Other/Notes		
2115	N/A	N/A	UL	Yes see comments	N	N	N	0	Near main activity from PH
2155	N/A	N/A	UL	"	N	N	N	2,100'	Full moon

For Rain and Fog: N - None, L - Light, M - Moderate, H - Heavy

Wind: 0= <1mph. (<=1.6Kmph) [Calm]

1=1-3 (1.6-4.8) [Light Air: smoke drifts]

2=4-7 (6.4-11.3) [Light Breeze: Leaves rustle, can feel wind on your face]

3=8-12 (12.9-19.3) [Gentle Breeze: Leaves and twigs move around. Light weight flags extend]

4=13-18 (20.9-29.0) [Moderate Breeze: Moves thin branches, raises dust and paper]

5=19-24 (30.6-38.6) [Fresh Breeze: Moves branches, trees sway]

6=25-31 (40.2-50.0) [Strong Breeze: Large tree branches move, open wires (such as telegraph wires) begin to "whistle", umbrellas are difficult to keep under control]

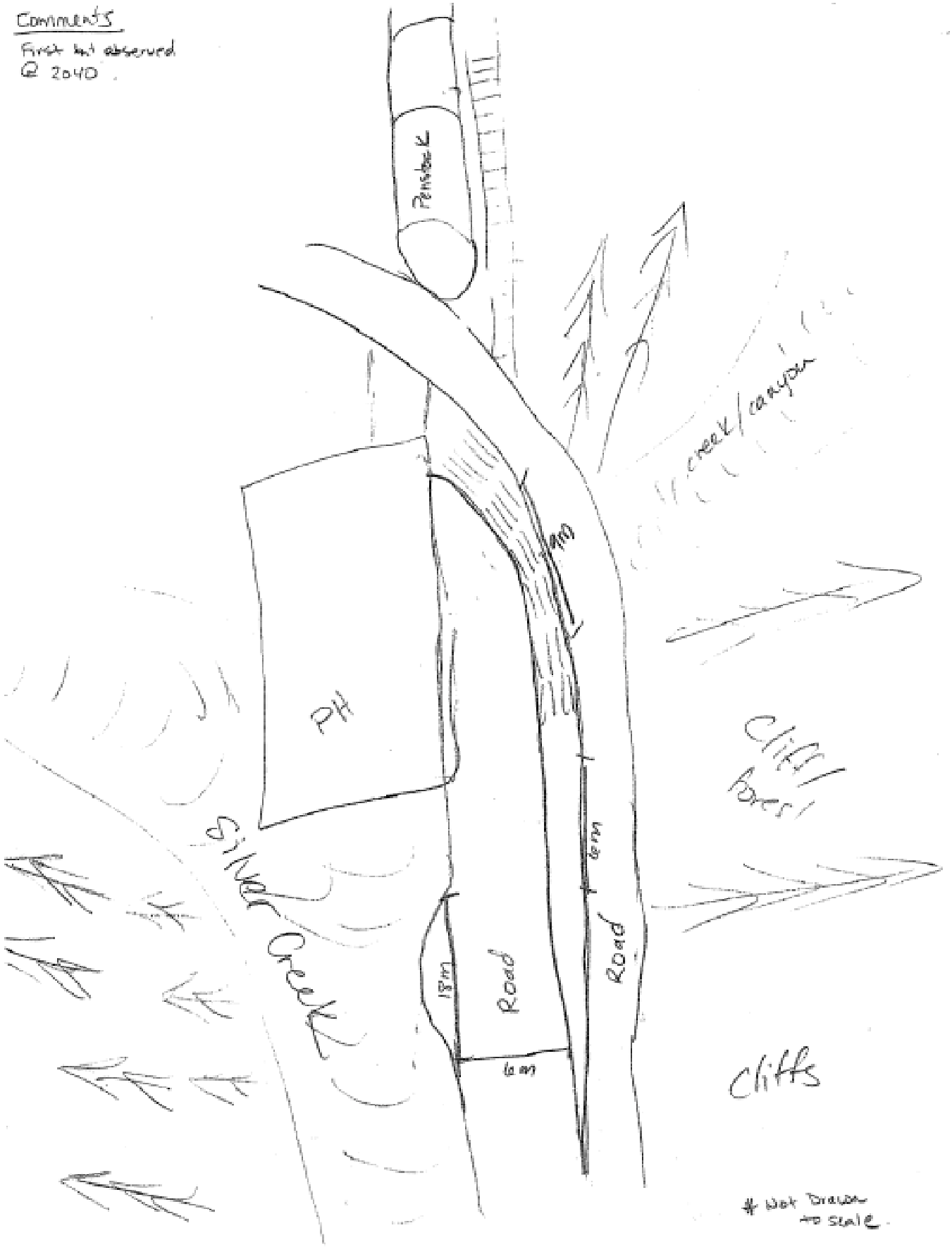
7=32-38 (51.5-61.2) [Moderate Gale: Large trees begin to sway, noticeably difficult to walk]

8=39-46 (62.8-74.0) [Fresh Gale: Twigs and small branches are broken from trees, walking into the wind is very difficult]

No Captures

Comments

First bat observed @ 2040.



BAT SURVEY FORM

Observers: JK, JW, DM, RD Date: 7/25/02 Page: 193

Area/Job Name: SNWD WARP Site Name/Number White Rock PH

Survey Location: T.____ N or S, R.____ E or W, S.____, QQ (1/16)____ of Q (1/4)____

UTM zone:____ Coordinates: E(x) 120° 47.290, N(y) 38° 45.872, Source:____

Survey Location *(Create Diagram of Survey Site and Net Placement on back side of page)*

Aerial Photo: Yes No Nearest Water: Pond Lake (River) South Fork AR Creek Estuary Marine Elevation: 993'

Distance to Water: Over (Adjacent) (Other) 10 m Pool Size (LxW) N/A

Overall Site Canopy Cover: 20 % # of Canopy Layers: 3 Define deciduous shrubs, dw trees and scattered dec./conif. trees & the are 3rd lay

Potential Roost Sites: (Cliffs) Forest (Conifer) (Deciduous) (Snags) (Buildings) Bridges Other: Switchyard crane

Roost Observed? Yes (No) Nets: 2 6m, 2 9m, 2 18m, Harp Trap(s) (size)____

Roost Description: Potential Large piles of mound under Switchyard Deck - Potential Roost Site, but none observed when we arrived

Habitat Type Description: PA in small canyon w/ primarily deciduous trees; River runs w/ canyon; Some cliff habitat - oak/Buckeye chaparral

Nearest Project Facility: White Rock PH Distance: 0 Miles @ PH + on bridge from PH

Environmental Conditions Official Sunset: 20:21 Source: GPS

Begin Survey 2030 End Survey 2255 Temp. at start 77°F Temp. at end____

Time	Visibility			Audio to 100m	Precipitation			Wind Speed and Direction (from)	Comments
	Cloud Height	Cloud Cover	Visible Distance		Rain	Fog	Other/Notes		
1800	N/A	N/A	VG	WNL	N	N	N	0	PH noise

For Rain and Fog: N - None, L - Light, M - Moderate, H - Heavy

Wind: 0= <1mph (<1.6Kmph) [Calm]
1=1-3 (1.6-4.8) [Light Air: smoke drifts]
2=4-7 (6.4-11.3) [Light Breeze: Leaves rustle, can feel wind on your face]
3=8-12 (12.9-19.3) [Gentle Breeze: Leaves and twigs move around. Light weight flags extend]
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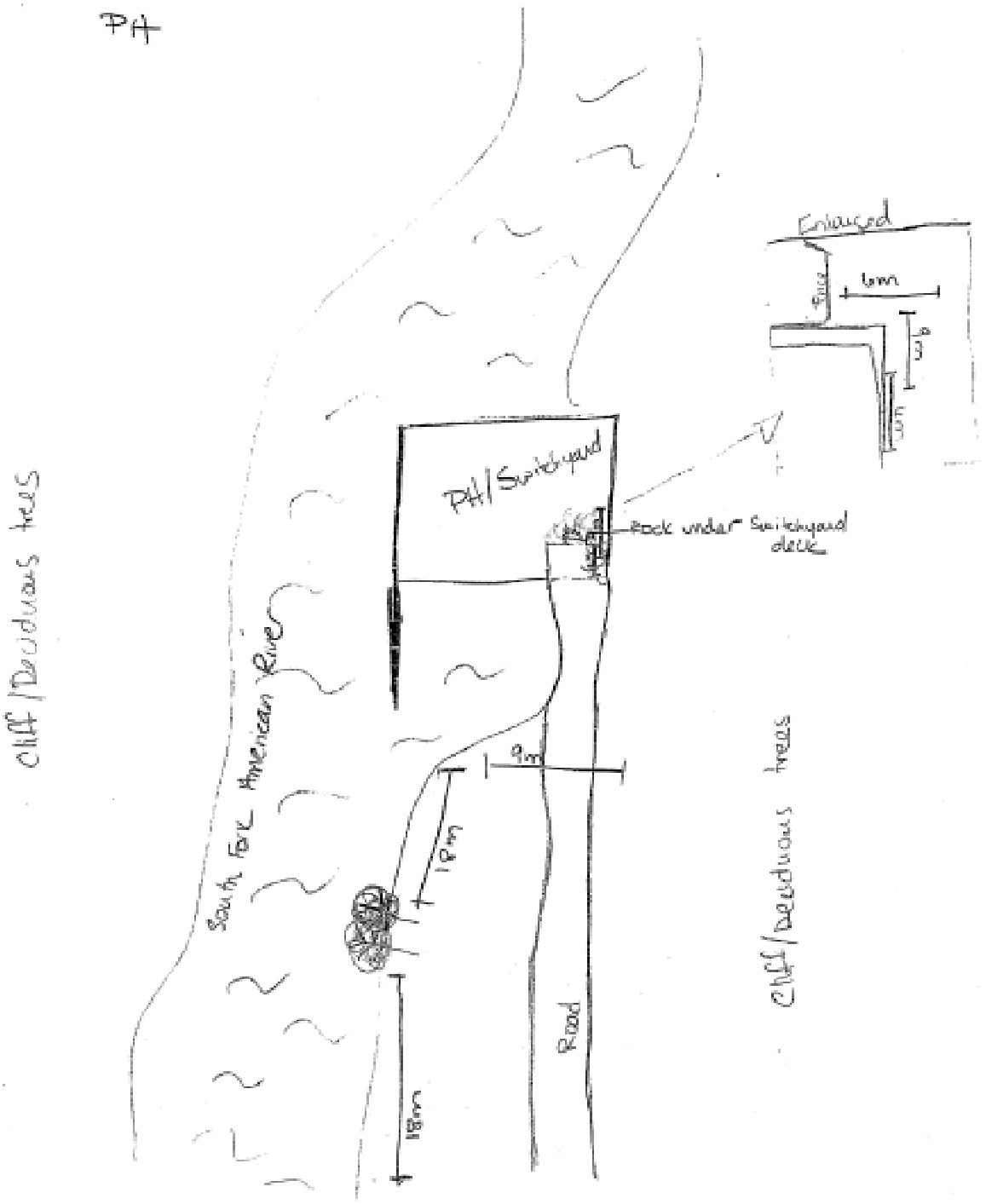
7=32-38 (51.5-61.2) [Moderate Gale: Large trees begin to sway, noticeably difficult to walk]
8=39-46 (62.8-74.0) [Fresh Gale: Twigs and small branches are broken from trees, walking into the wind is very difficult]

First bat observed
@ 2040

White Rock
PH



TABR NIGHT ROOST UNDER POWERHOUSE - SIGNIFICANT GUANO BUILDUP

BAT SPECIES SURVEY FORM

Observers: JJ, SE, DM, RW

Area/Job Name: SMUD, UARP

Site Name/Number: White Rock PH

Date: July 25, 2002

TIME	SPECIES	SEX (M/F)	AGE (J/A)	REPROD. STATUS	FORE-ARM (mm)	WEIGHT (g)	NET #	COMMENTS - SPECIES CONDITION
2050	M. yumanensis	F	A	Post lactating	34	5.5	1	Fur growing back on Nipples hard & crusty. Voucher
2100	MYYU	M	J	—	34	4.5	5	Dk hair white tip
2100	MYYU							Possible YUMA; premature release
2135	MYYU	M	J	—	32	6.0	5	
2151	TABR	M	A	—	40	12.0	5	
2155	"	M	A	—	42	12.5	5	
2204	TABR	M	A		43	14.25	5	
2155	TABR	M	J		43	16.0	6	
2153	TABR	M	A		—	—	6	Premature Released
2207	TABR	M	J		41	13.0	4	
2210	MYYU	F	A	NR	33	6.5	5	
2220	TABR	F	A	NR	43	13.0	12	
2260	MYYU	F	A	PL	34	6.75	2	
2223	MYYU	F	A	PL	33	6.0	5	
2224	TABR	M	A	—	43	12.75	4	
2230	MYYU	F	J	—	35	6.75	4	
2233	TABR	F	A	L	43	12.25	4	
2235	TABR	M	J		40	11.75	4	
2235	TABR	M	J		42	13.0	4/5	
2235	TABR	M	J		43	14.0	1	
2235	TABR	M	A		42	12.5	1	

Reproductive Status: P - Pregnant, L - Lactating, PL - Post-Lactating, NR - Non-Reproductive

BAT SPECIES SURVEY FORM

Observers: JW, JK, OM, RW — Page 383

Area/Job Name: SMUD WARP — Site Name/Number WHITE Rock PH — Date: July 25, 2002

TIME	SPECIES	SEX (M/F)	AGE (J/A)	REPROD. STATUS	FORE-ARM (mm)	WEIGHT (g)	NET #	COMMENTS - SPECIES CONDITION
2235	MYYU	F	A		32	5.0	4.6	
	MYYU	F	J	Non-Rep	35	5.5		
	MYYU							ESCAPED FROM BAG
	MYYU	M	J		33	5.0		

Reproductive Status: P - Pregnant, L - Lactating, PL - Post-Lactating, NR - Non-Reproductive

APPENDIX C

CALIFORNIA DEPARTMENT OF FISH AND GAME MEMORANDUM OF UNDERSTANDING ON TRAPPING AND HANDLING OF SPECIAL STATUS BATS

State of California - The Resources Agency
DEPARTMENT OF FISH AND GAME
http://www.dfg.ca.gov
1416 Ninth Street
Sacramento, CA 95814
(916) 653-4875

GRAY DAVIS, Governor

July 8, 2002

Mr. Richard D. Williams
Senior Wildlife Biologist
Duke Engineering and Services
2150 River Plaza Drive, Suite 140
Sacramento, California 95833

Dear Mr. Williams:

You and Mr. Dean Rofkar recently requested a renewal of and changes to your Memorandum of Understanding (MOU) that authorizes field studies of bats. Per your request, a revised List of Authorized Individuals is enclosed, the geographic scope of your MOU is hereby expanded from the counties of Calaveras, Stanislaus, and Tuolumne to Statewide, and the new expiration date of your MOU is December 31, 2004. All other provisions of your original MOU remain in full effect.

Thank you for your summary report and California Native Species Field Survey Forms for the work authorized by your previous MOU. We look forward to receiving additional reports and forms from your continuing field work.

Please remember to contact the regional Fish and Game office prior to initiating field work. A map and list of regional office telephone numbers is enclosed.

If you have any questions, please contact Ms. Betsy C. Bolster at the letterhead address, by e-mail at bbolster@dfg.ca.gov or by telephone at (916) 654-3806.

Sincerely,

Betsy C. Bolster

for Dale T. Steele, Supervising Biologist
Habitat Conservation Planning Branch

Enclosures

cc: See page two.

cc: Mr. Dean Rofkar
Duke Engineering and Services
1111 North Forest Street
Bellingham, Washington 98225-5119

Department of Fish and Game

Ms. Betsy Bolster
Sacramento, California

Mr. Don Koch
Northern California – North Coast Region
Redding, California

Mr. Banky Curtis
Sacramento Valley – Central Sierra Region
Rancho Cordova, California

Mr. Rob Floerke
Central Coast Region
Yountville, California

Mr. Bill Loudermilk
San Joaquin Valley – Southern Sierra Region
Fresno, California

Mr. Chuck Raysbrook
South Coast Region
San Diego, California

Mr. Curt Taucher
Eastern Sierra – Inland Deserts Region
Chino Hills, California

State of California - The Resources Agency
DEPARTMENT OF FISH AND GAME
http://www.dfg.ca.gov
1416 Ninth Street
Sacramento, CA 95814

GRAY DAVIS, Governor

LIST OF AUTHORIZED INDIVIDUALS FOR DUKE ENGINEERING BAT MOU

(effective 7/8/02; expires 12/31/04)

1. **Individuals authorized to conduct activities pursuant to this MOU:**

   Principal Investigator: **Mr. Dean Rofkar.**

   Field assistants: **Mr. Rick Williams, Mr. Jeromy Waddell.**

2. **Mr. Williams must be present on site to directly supervise Mr. Waddell until Mr. Williams is confident that Mr. Waddell is competent to accurately identify California bat species.**

7/8/02
Date

Betsy C. Bolster
Staff Environmental Scientist
Habitat Conservation Planning Branch
California Department of Fish and Game

This list is valid only if dated on or after the MOU effective date. This list, the MOU, and a valid California Scientific Collecting Permit must be possession of at least one individual on site while conducting permitted activities.

State of California - The Resources Agency
DEPARTMENT OF FISH AND GAME
http://www.dfg.ca.gov
1416 Ninth Street
Sacramento, CA 95814
(916) 653-4875

GRAY DAVIS, *Governor*

April 16, 2001

Mr. Richard D. Williams
Senior Wildlife Biologist
Duke Engineering and Services
2150 River Plaza Drive, Suite 140
Sacramento, California 95833

Dear Mr. Williams:

Enclosed is a copy of a Memorandum of Understanding (MOU) that will authorize Mr. Dean Rofkar, a biologist in your Bellingham, Washington office, to conduct field studies involving live-capture, handling, and collection of bats. Signatures from both you and Mr. Rofkar are required on the MOU to indicate your agreement with the conditions stipulated. Please sign and date your copy, retain a photocopy, and return the original to Ms. Betsy Bolster, Habitat Conservation Planning Branch, at the letterhead address.

Note that the MOU requires the completion and submission of the enclosed California Native Species Field Survey Form. Field survey forms are also available for download at http://www.dfg.ca.gov/whdab/html/cnddb.html.

Please note that the MOU requires notification of the local Department office prior to commencing field work. A map and list of telephone numbers for Department offices is enclosed.

We are pleased to work with you to obtain more information about bats. We look forward to receiving your netting summaries, preliminary results, field survey forms and annual report. If you have any further questions, please contact Ms. Betsy Bolster by e-mail at bbolster@dfg.ca.gov, or by telephone at (916) 654-3806.

Sincerely,

Sandra C. Morey, Chief
Habitat Conservation Planning Branch

Enclosures

cc: Department of Fish and Game

Regional Manager
Rancho Cordova, California

Regional Manager
Fresno, California

Conserving California's Wildlife Since 1870

State of California - The Resources Agency
DEPARTMENT OF FISH AND GAME
http://www.dfg.ca.gov
1416 Ninth Street
Sacramento, CA 95814

GRAY DAVIS, *Governor*

LIST OF AUTHORIZED INDIVIDUALS
FOR
DUKE ENGINEERING AND SERVICES
BAT MOU
(effective 4/16/01, expires 12/31/01)

1. Individuals authorized to conduct activities pursuant to this MOU:

   Principal Investigator: Mr. Dean A. Rofkar

   Field assistants: Ms. Olivia Munzer
   Mr. Chris Vera
   Mr. Jeromy Waddell

2. Field assistants must be directly supervised by Mr. Rofkar during any capture and handling of bats.

16 April 2001
Date

Betsy C. Bolster
Senior Biologist Specialist
Habitat Conservation Planning Branch
California Department of Fish and Game

This list is valid only if dated on or after the MOU effective date. This list and the MOU must be possession of all individuals while conducting permitted activities.

Expiration Date: December 31, 2001

MEMORANDUM OF UNDERSTANDING BY AND BETWEEN DUKE ENGINEERING SERVICES AND CALIFORNIA DEPARTMENT OF FISH AND GAME REGARDING BATS

This Memorandum of Understanding (MOU) is made and entered into on 16 April, 2001, by and between Duke Engineering and Services, Sacramento, California (Consultant), and the California Department of Fish and Game, Sacramento, California (Department).

Whereas, the Consultant has expressed an interest in conducting field surveys for bats, which are considered standard exceptions to State of California Scientific Collecting Permits and many of which are considered mammal species of special concern by the Department, and

Whereas, the Department encourages field research by competent investigators to expand the scientific knowledge of the geographic range, population density, habitat requirements, ecology, and taxonomic status of these species, and

Whereas, the Consultant and the Department wish to cooperate in field studies of bats by means of this MOU,

Therefore, it is mutually agreed and understood as follows:

PERMIT

1. The Department grants the Consultant permission to salvage dead bats and live-capture, identify, and immediately release all species of bats. Authorized capture methods are mist nets and harp traps. All handling activities shall be conducted using standard restraint procedures for bats. Special care must be taken to avoid injury to individuals during capturing and handling activities. Any inadvertent casualties or salvaged specimens must be donated to a public scientific institution in California where access to collection materials and information is provided willingly and free of charge.

2. All mist nets in operation shall be continuously attended and located a sufficient distance away from any known bat roost to minimize disturbance and avoid capturing an unmanageable number of individuals. No mist nets shall be operated near a known maternity roost from April through August, inclusive. Any pregnant or lactating females inadvertently captured shall be immediately released.

3. Potential cave or mine roost sites may be entered to initially determine presence or absence of bats. No roosting bats shall be disturbed. No bat roosts or hibernacula, natural or human-made, shall be entered or otherwise disturbed when bats are known to be present. If a maternity roost is located during a survey, the all field investigators shall immediately leave the site.

4. The Investigator may not purposefully sacrifice any individuals.

5. Permanent marking, including the use of wing-notches, wing bands, or radiotransmitter, is not authorized.

6. Authorized geographic area of capture is Calaveras, Stanislaus, and Tuolumne counties.

PERMITTEE

7. Mr. Dean Rofkar is designated as the principal investigator for this study. The only additional individuals authorized to conduct activities pursuant to this MOU are on the enclosed "List of Authorized Individuals". This list may be amended under the Authorized Individuals provision of Attachment 1.

STANDARD PROVISIONS

8. Standard provisions are enumerated in Attachment 1, incorporated into this MOU by this reference.

SPECIAL CONDITIONS

9. The Consultant may not hold any bats in captivity.

10. The Department strongly encourages the Consultant to ensure that all persons involved in bat handling activities have received appropriate preexposure rabies vaccinations and boosters, and/or have maintained a rabies antibody titer of greater than 1:5 during the past two years, as recommended by the U.S. Department of Health and Human Services Centers for Disease Control, and the California Department of Health Services.

COORDINATION

11. The Department contact on matters relating to this MOU is Ms. Betsy C. Bolster, Species Conservation and Recovery Program, Habitat Conservation Planning Branch, 1416 Ninth Street, Sacramento, California, 95814, e-mail bbolster@dfg.ca.gov, telephone (916) 654-3806.

12. The principal investigator is responsible for notifying the Department's regional office prior to commencing field activities. A map of Department regions and telephone numbers is enclosed.

REPORTING

13. The Consultant shall provide to the Department's contact a written annual report of activities and preliminary results including, but not limited to, 1) a summary of all trapping effort whether the target species was found or not, 2) Universal Tranverse Mercator (UTM) coordinates of all trapping localities, descriptions of habitat types, and a list of all individuals captured and their disposition. In addition to the capture summary and preliminary results, any captures or sightings of *Macrotus, Choeronycteris, Euderma, Lasiurus blossevillii, Corynorhinus (=Plecotus), Antrozous, Nyctinomops, Eumops, Myotis occultus, M. thysanodes, M. volans,* or *M.*

velifer must be reported, either on the enclosed California Native Species Field Survey Form, which may be photocopied as necessary, or in a format containing equivalent information.

14. Annual reports shall be provided on or before December 31, each year this MOU is in effect, to Ms. Bolster at the above address. In addition, final copies of any manuscripts, publications, or other reports resulting from these studies shall be provided.

PERMIT TERM

15. This MOU is effective on April 16, 2001 and shall expire on December 31, 2001, unless terminated sooner by either party. This MOU may be renewed under the Permit Renewal provision in Attachment 1.

16. This MOU is not valid until signed the Consultant, whose signature signifies understanding of and agreement to abide by the conditions and authorizations of this permit.

This MOU has been executed by and on behalf of Duke Engineering and Services and the Department as of the dates shown below.

Mr. Richard D. Williams, Senior
Wildlife Biologist
Duke Engineering and Services
2150 River Plaza Drive, Suite 140
Sacramento, California 95833
(916) 564-4214

Date: 4/26/01

Ms. Sandra C. Morey, Chief
Habitat Conservation Planning Branch
Department of Fish and Game
1416 Ninth Street
Sacramento, California 95814-5560

Date: April 14, 2001

Mr. Dean A. Rofkar, Principal Investigator
Duke Engineering and Services
1111 North Forest Street
Bellingham, Washington 98225-5119
(360) 671-1150

Date: