MEMORANDUM

November 21, 2019

To:
Mr. Finlay Anderson
Kleinschmidt Group

From:
Brad R. Blood, PhD
Steve Norton
Psomas

Subject: Results of a Bat Roost Habitat Assessment Conducted for the Bishop Creek Hydroelectric Relicensing Project in Inyo County, California

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This memorandum presents the results of a bat roost habitat assessment (Order: *Chiroptera*) at the Bishop Creek Hydroelectric Project (Federal Energy Regulatory Commission [FERC] Project No. 1394-080; hereinafter referred to as the "Project"). The Project is located along Bishop Creek southwest of the City of Bishop, Inyo County, California (Attachment A). The habitat assessment was conducted to determine potential for bat day-roosts at project facilities. This habitat assessment did not include any species-specific focused surveys.

PROJECT BACKGROUND

Southern California Edison Company (SCE) is the licensee, owner, and operator of the existing hydroelectric facilities subject to the relicensing effort. The project is predominantly located on Bishop Creek and also includes facilities on Birch and McGee Creeks. SCE operates the project under a 30-year license issued by FERC on July 19, 1994. As the current license is due to expire on June 30, 2024, SCE has initiated the formal relicensing process utilizing the Integrated Licensing Process with FERC. No changes in project operations or existing facilities are anticipated if a new license were issued.

In advance of filing the Notice of Intent (NOI) and Pre-Application Document (PAD), SCE, Kleinschmidt, Psomas, and others have worked with stakeholders to identify necessary studies, with the goal of accelerating FERC's ability to issue a Study Plan Determination. Efforts began over one year prior to formal initiation of the process with FERC, through a series of Technical Working Group meetings that were held in Bishop, California.

During the Technical Working Group meetings, stakeholders identified the need to conduct a wildlife study to determine if special status wildlife species are utilizing project facilities for nesting, roosting, foraging, or sheltering, and if so, how project operations may affect these species. The literature review revealed records of the presence of special status bat species in the vicinity of the Project including Townsend's big-eared bat (*Corynorhinus townsendii*) a U.S. Forest Service Sensitive Species and a California Species of Special Concern, and spotted bat (*Euderma maculata*) a California Species of Special Concern. Therefore, special status bat species were identified as needing further study in support of Project relicensing.

ENVIRONMENTAL SETTING

The Project facilities are in the Owens Valley and along the eastern Sierra Nevada mountains. The Project facilities include powerhouses, dams, impoundments including South Lake and Lake Sabrina, diversions, weirs, outbuildings, valve houses, access roads, and the flowline. The Project's facilities are sited along Bishop Creek and its tributaries including South Fork, Middle Fork, Green Creek, Birch Creek, and McGee Creek. Bishop Creek is tributary to the Owens River. Project facilities occur across privately and federally held properties (federal lands include those held and managed by the US Forest Service [USFS] and US Bureau of Land Management [BLM]). Subsequently, land uses adjacent to the Project also varies including residential, grazing, public recreation, federally-designated Wilderness land, etc.

The Project area is one of moderate to steep ridge and valley topography. Elevations within the drainages range from approximately 4,000 feet above mean sea level (msl) to over 13,000 feet above msl. Bishop Creek is a major stream with a total drainage area of approximately 70-square-miles, flowing northeastward approximately 28 miles from its headwaters in the Sierra Nevada to its confluence with the Owens River at the City of Bishop. The North, Middle and South forks of Bishop Creek originate in nearby glacial basins separated by ridges. South Lake and Lake Sabrina are the major storage reservoirs in the watershed.

The Project area consists upland vegetation communities in higher terraces areas and a mixture of floodplains, wetlands, riparian and littoral communities within and adjacent to Bishop Creek. Plant community types consist of alpine grasses and forbs, alpine mixed scrub, barren, bitterbrush, saltbush, curl-leaf mountain mahogany, Great Basin mixed scrub, rabbitbrush, basin sagebrush, Great Basin – desert mixed scrub, blackbush, eastside pine, annual grasses and forbs, perennial grasses and forbs, lodgepole pine, high desert mixed scrub, singleleaf pinyon pine, limber pine, canyon live oak, subalpine conifers, whitebark pine, wet meadows, riparian mixed hardwood, willow, quaking aspen, perennial lake or pond, water, and willow (shrub).

The study area identified for the bat roost habitat assessment associated with the project primarily focus on a 500-foot buffer area surrounding the project facilities at 14 discrete locations along Bishop Creek, Birch Creek, and McGee Creek (Attachment A). These facilities specifically include:

- Powerhouse No. 6;
- Powerhouse No. 5 (including Intake No. 6 Dam);
- Powerhouse No. 4 (including Intake No. 5 Dam);
- Powerhouse No. 3 (including Intake No. 4 Dam);
- Powerhouse No. 2 (including Intake No. 3 Dam);
- Intake No. 2 Dam;
- Longley Dam (Longley and McGee Lakes);
- McGee Creek Diversion;
- Birch Creek Diversion;
- Sabrina Dam (Lake Sabrina);
- South Fork Diversion;
- Weir Lake Diversion;
- Green Creek Diversion; and
- Hillside Dam and South Lake Dam (Hillside and South Lakes).

These Project facilities extend from approximately 10,700 feet above mean sea level (AMSL) at Longley Lake to approximately 4,500 feet AMSL at Powerhouse No 6. There is perennial above-ground water (Bishop Creek or its tributaries) at each of the facilities. Vegetation types in the study area vary greatly

and include tree, shrub, and herb-dominated vegetation types in addition to barren (i.e. fully-developed) areas. Some of the facilities, specifically the powerhouses, are open, multi-story buildings adjacent to these open waters and associated vegetation. Representative site photographs are shown in Attachment B.

The facilities on Birch Creek and McGee Creek (Longley Dam, McGee Creek Diversion, and Birch Creek Diversion) were not accessible during the habitat assessment due to poor road conditions resulting from higher-than-normal snow levels.

METHODS

A review of the existing literature was conducted to determine the potential for special status bat species to occur in the vicinity of the Project. This review included previous biological reports prepared for individual projects and the Environmental Assessment for the Bishop Creek Project (FERC 1991). To obtain information on known special status bat species reported to occur in the Project vicinity, the CDFW's California Natural Diversity Database (CNDDB) (CDFW 2019) was queried for special status wildlife species for the following U.S. Geological Survey (USGS) 7.5-minute topographic quadrangles: Coyote Flat, North Palisade, Tungsten Hills, Mt. Darwin, Mount Tom, Bishop, and Mt. Goddard. Other sources in the literature review included: Morrison (2018), Anderson et. al. 2018, Pierson and Rainey (2018).

On June 10, 2019, bat expert Dr. Michael Morrison and Psomas bat specialist Steve Norton conducted a habitat assessment at Project facilities along Bishop Creek. As noted above, facilities on Birch Creek and McGee Creek were not accessible and were excluded from the survey effort. The habitat assessment was conducted to determine potential for significant bat roosts at Project facilities, i.e. Project buildings and associated structures. Significant roosts consist of potential maternity roosts or winter hibernacula. Large mature trees were present at many of the project facilities and those trees also have potential to support roosting bats. Trees were not surveyed for past or present bat roosts because there are not currently any non-invasive survey techniques available to identify tree roosts. Dr. Morrison and Mr. Norton inspected project structures with the potential to support roosting bats for signs of past and present bat use (e.g., urine staining, guano deposits, vocalizations, etc.). All evidence of roosting was recorded in field notes and marked on maps. Active roost sites were also photographed.

RESULTS

Of all the project facilities inspected, the powerhouses were determined to be the most suitable for bat day roosting. Appurtenant structures, such as sheds and warehouses, were also inspected; however, no evidence of day-roosting was observed, and the other structures did not provide environmental conditions equivalent to the powerhouses, such as accessibility, thermal insulation, heat sources, etc. Table 1 shows the project buildings inspected and the presence of any roosting sign.

TABLE 1
ROOSTING SIGN OBSERVED

Project Building	Sign Present	Potential Maternity Roost
Powerhouse No. 6	None	No
Powerhouse No. 5	Current	Yes
Powerhouse No. 4	None	No
Powerhouse No. 3	Previous	No
Powerhouse No. 2*	Current	Yes

* Powerhouse No. 2 showed evidence of previous, non-maternity day-roosting. The active maternity roost is located in the transformer shed located at this facility (immediately adjacent to the powerhouse).

No sign of roosting was observed in Powerhouse No. 6 or Powerhouse No. 4 and no bat day roosting is anticipated at either facility. Powerhouse No. 3 contained limited bat guano likely resulting from bat night-roosting activity within the Powerhouse; no significant bat roosts occur in Powerhouse 3. Powerhouse 6 and Powerhouse 5 were both supporting active bat day roosting during the survey. The species present could not be determined, but more than five bats were observed roosting in crevices at both powerhouses. Both roosts have potential to support maternity roosting.

Tailraces are channels that convey water away from project turbines. The tailraces associated with the project vary in size and diameter at the different powerhouses, but all are concrete and all experience high levels of water flow at intermittent times. The flushing events that occur intermittently in the tailraces are likely to deter any roosting. Regardless, the tailraces at Powerhouses No. 6, No. 5, and No. 2 are substantially taller and wider than the others and have some limited potential to support bat roosting. The underground extent of those tailraces is not accessible for a daytime visual survey.

CONCLUSIONS

Potential maternity roosts occur at Powerhouses No. 5 and No. 2. The remaining powerhouses are not likely to support maternity roosting. No maternity roosting is anticipated at project facilities without powerhouses, including the facilities not surveyed on Birch Creek and McGee Creek. These locations do not likely contain structures with features necessary to support maternity roosts, including heat sources and insulation. None of the facilities were inspected for sign of hibernacula. Surveys to determine hibernacula can only occur during the winter months. A winter roost survey has been scheduled to take place during the winter of 2019-2020.

The tailraces at Powerhouses No. 6, No. 5, and No. 2 have limited potential to support roosting bats; however, they are not accessible for daytime visual surveys.

Based on these results, a study plan for an acoustic bat survey will be prepared and will take place during the 2020 field season.

If you have any questions regarding the content of this memorandum, please contact Brad Blood or Steve Norton at (714) 751-7373.

Attachments: A – Vicinity Map
B – Site Photographs

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REFERENCES

Anderson, A.P., J.E. Light, O.M. Takano, and M.L. Morrison. 2018. Population Structure of Townsend's Big-Eared Bat (*Corynorhinus townsendii*) in California. Journal of Mammalogy, 99 93): 646-658.

California Department of Fish and Wildlife (CDFW). 2019. California Natural Diversity Database (CNDDB) Records of Occurrence for: Coyote Flat, North Palisade, Tungsten Hills, Mt. Darwin, Mount Tom, Bishop, and Mt. Goddard, California. Sacramento, CA: CDFW, Natural Heritage Division.

Federal Energy Regulatory Commission (FERC). 1991. Environmental Assessment, Bishop Creek Project (FERC Project No. 1394-004).

Morrison, M.L. (2018). Townsend's Big-Eared Bat Surveys. Spring Through Fall 2018. Survey Report prepared for California Department of Fish and Wildlife.

Pierson, E.D., and W.E. Rainey. 2018. Distribution, Status, and Management of Townsend's Big-Eared Bat (*Corynorhinus townsendii*) in California. Bird and Mammal Conservation Program Technical Report No. 96-7.

ATTACHMENT A

VICINITY MAP

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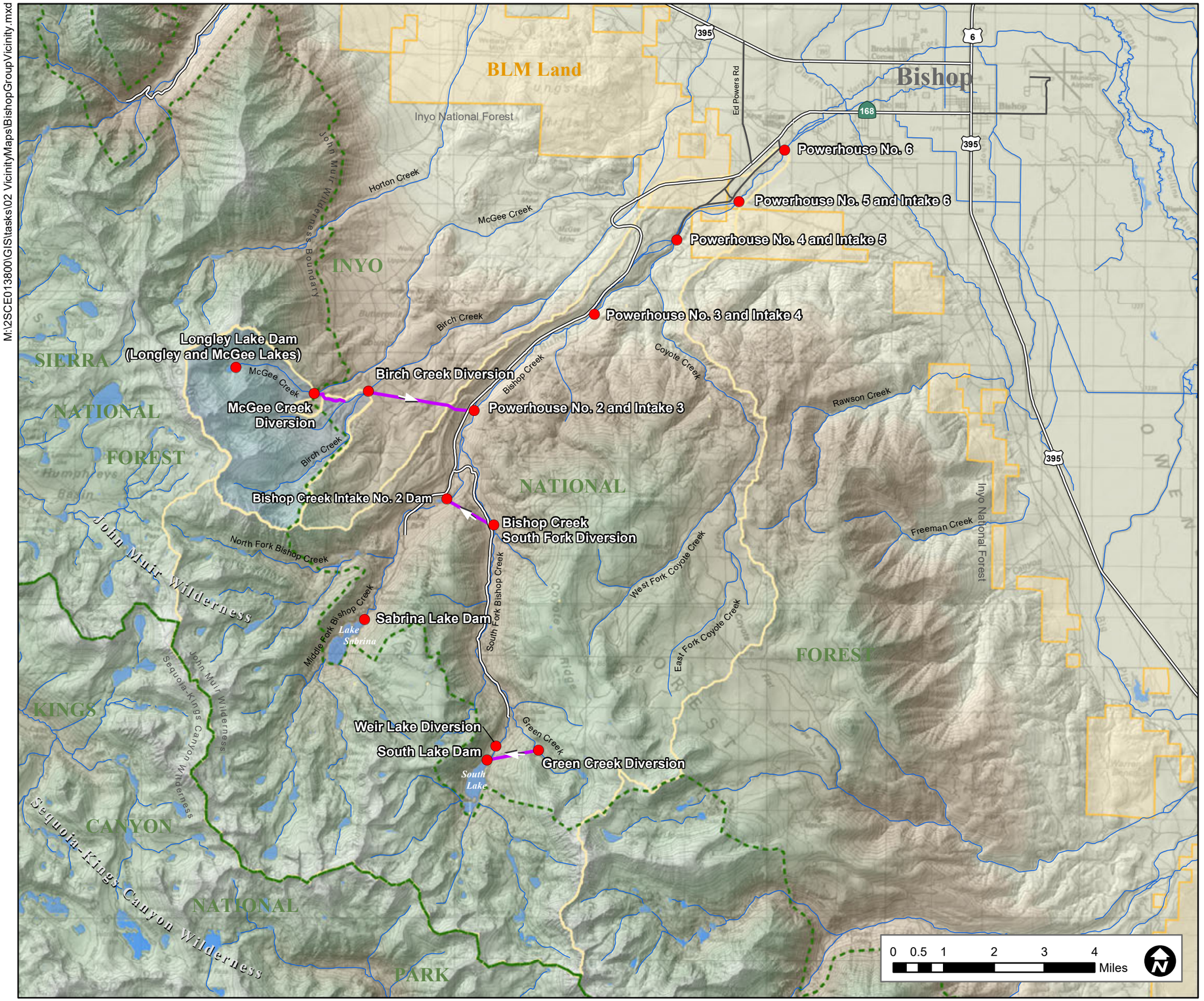

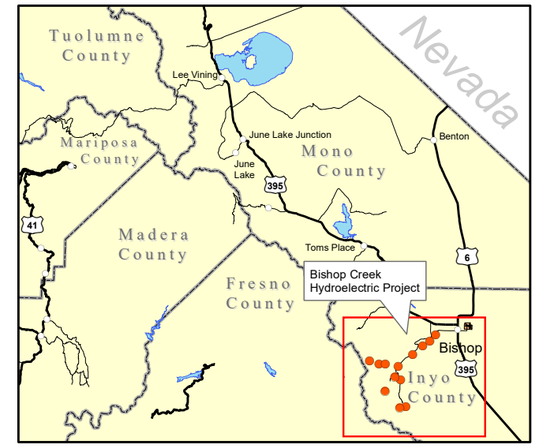

Regional Location

Legend

- Project Facility Site Locations
- Diversion Channels, Pipelines, & Penstocks
- National Forest/National Park Boundary
- Wilderness Area Boundary
- Bureau of Land Management (BLM) Boundary

Bishop Creek Hydroelectric Project Vicinity Map

PSOMAS

Attachment A

ATTACHMENT B

SITE PHOTOGRAPHS

Powerhouse No. 2: Exterior view of the transformer shed facing southeast. The transformer shed is presumed to be supporting an active maternity roost.

Powerhouse No. 2: Interior view of the transformer shed facing north. Bats were roosting inside the crest of the ceiling between the rafter beams.

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Site Photographs

Attachment B-1

Bishop Creek Hydroelectric Project

PSOMAS

Powerhouse No. 2: Interior view of the floor of the transformer shed facing west. Substantial guano had accumulated below the equipment since it was last cleaned (likely within the last month).

Powerhouse No. 2: View of the tailrace facing southwest. The volume of water expelled during facility flushing events does not completely inundate this tailrace leaving marginal suitable bat roosting habitat.

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Site Photographs

Attachment B-2

Bishop Creek Hydroelectric Project

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Powerhouse No. 3: Interior view of the powerhouse facing west. The roof and ceiling design are similar to Powerhouse 2 transformer shed, however, no evidence of day-roosting was observed.

Powerhouse No. 3: Interior view of the powerhouse facing east. The circular vent present at many of the facilities is a good entrance/emergence feature for bats. Evidence of night roosting (urine staining) is visible on right side of photograph.

Powerhouse No. 3: View of the tailrace facing northwest. This smaller tailrace is completely inundated during facility flushing events and has no potentially suitable bat roosting habitat.

Powerhouse No. 4: Exterior view of the powerhouse facing south. No sign of bat roosting was observed at this facility.

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Site Photographs

Attachment B-4

Bishop Creek Hydroelectric Project

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Powerhouse No. 4: Interior view of the powerhouse facing northwest. No sign of bat roosting was observed at this facility.

Powerhouse No. 4: View of the tailrace facing west. This larger tailrace does not completely inundate during facility flushing events leaving potentially suitable bat roosting habitat.

Powerhouse No. 5: Exterior view of the powerhouse facing southeast. The powerhouse is presumed to be supporting an active maternity roost.

Powerhouse No. 5: Interior view of the powerhouse facing west. The active roost is located in the steel gusset at the peak of the roof highlighted by the flashlight beam in the photograph.

Powerhouse No. 5: Interior view of the powerhouse facing west. Guano accumulation is visible on the white beams below the roost in the dark gusset. Dark urine staining is also visible below the gusset.

Powerhouse No. 5: View of the tailrace facing west. This larger tailrace does not completely inundate during facility flushing events leaving potentially suitable bat roosting habitat.

Powerhouse No. 6: Interior view of the powerhouse facing northwest. No sign of bat roosting was observed at this facility.

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Site Photographs

Attachment B-8

Bishop Creek Hydroelectric Project

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