APPENDIX O

SUPPLEMENTAL BIOLOGICAL RESOURCES INFORMATION

Supplemental Biological Resources Information
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The impacts of noise and vibration on wildlife is an emerging field of study. Studies reveal that the effects of noise and vibrations on wildlife species may vary by species; species location; how surrounding vegetation and topography alters noise; the nature, direction, and extent of the noise being produced; noise frequency; the species life cycle stage when noise and/or vibration is being produced (e.g., nesting, foraging, breeding, roosting); whether or not the animal can control the direction from which it hears noise (e.g., owls); and other factors.

Studies also have found that noise effects on wildlife may be negative or positive. For example, man-made noise may decrease the hunting efficiency of some bat species which, in turn, increases the population of that bat's prey base (an indirect positive impact on the prey).[1] Similarly, some rodents prefer road rights-of-way due to decreased predation while some raptors are attracted to noisy roads because of the presence of small mammals.[2]

Given the broad range of studies on noise and vibration on wildlife, and the lack of a consensus on the significance of those potential impacts on individual species, whether the impacts may be negative or positive, and how to address those impacts; this analysis focuses on noise and/or vibration studies conducted on those species (or closely related species) with the potential to occur on or surrounding the project site as established by the California Department of Fish and Wildlife Natural Diversity Database and the United States Fish and Wildlife Service species list.

More specifically, a potentially significant impact due to noise and/or vibration shall be considered one that, pursuant to a published scientific study, may adversely impact a special status wildlife species determined to be present or potentially present on the project site or surrounding the project site as established in the Project's Biological Assessment. Special-status species, as defined in the Biological Assessment, are the focus of this analysis rather than common wildlife species because special status species have limited population numbers and/or ranges and may reasonably be considered more susceptible to disturbances (e.g., noise and/or vibration) due to pre-existing low population levels and therefore, more likely to suffer a potentially significant adverse impact from the disturbance.

For the proposed project, as identified in the project's Biological Assessment (see Appendix D of the Draft EIR), those special-status species with potential to occur on or with the project's biological study area (Biological Assessment, Figure 4) are:

1. Crotch bumble bee (*Bombus crotchii)*
2. Olive-sided flycatcher (*Contopus cooperi*)
3. American peregrine falcon (*Falco peregrinus anatum)*
4. California spotted owl (S*trix occidentalis*)
5. Bats: Spotted bat (*Euderma maculatum),* Western mastiff bat (*Eumops perotis californicus),* Silver-haired bat (*Lasionycteris noctivagans),* Hoary bat (*Lasiurus cinereus),* Long eared myotis *(Myotis evotis)*
6. Fisher (*Pekania pennanti*)

[1] Kunc HP, Schmidt R. 2019. The effects of anthropogenic noise on animals: a meta-analysis. Biol. Lett. 15: 20190649, http://dx.doi.org/10.1098/rsbl.2019.0649.

[2] Ferris, C.R. 1974. Effects of highways on red-tailed hawks and sparrow hawks. M.S. Thesis, West Virginia University, Morgantown, WV.

Crotch bumble bee

Published studies specific to potential impacts of noise on the Crotch bumble bee were not found. One study indicated that honeybees stop moving for up to twenty minutes when exposed to sounds at intensities between 107 and 120 dB,[3] suggesting a response to noise. Several studies have been conducted on the potential effects of noise on insects, generally.[4] These studies focused on how noise may interfere with communications between insects during mating. In many cases, results suggest that regular exposure to man-made noise may decrease an insect's sensitivity and behavioral responses to noise decreasing their ability to maintain effective communication. The effects of vibrations (and/or noise) on Africanized honeybee colonies has been observed multiple times.

> "Almost all cases of Africanized honey bee attacks can be traced back to some provocation, such as a kid tossing a stone at the hive, or some noise or vibration, such as that of a lawn mower, weed eater or tractor."

Based on the preceding and as described in the Biological Assessment, it can reasonably be deduced that the ground-nesting Crotch bumble bee would:

> If present prior to commencing construction, the species nest/colony could be in response to construction noise and/or ground vibrations -- a potentially significant adverse impact to the species.

To minimize this impact, the Draft EIR recommends Mitigation Measures BIO-1.1a and BIO-1.1b require preconstruction surveys for the species during the species' potential nesting period with nest avoidance required if present and maintained until the nest is no longer occupied. Pre-construction environmental awareness training also is required to assure mitigation compliance.

Proper implementation of the preceding is expected to reduce potential impacts associated with noise and/or vibration for the Crotch bumble bee to a level of less-than-significant.

The species would not be expected to inhabit the developed portion of the site post-construction because the ground-nester would be unlikely to establish a ground nest in paved or built environments susceptible to adverse impacts associated with noise or vibrations. The species could locate in retained open spaces post-construction—especially if landscaping incorporates the species' preferred food sources (e.g., *Antirrhinum*, *Phacelia*, *Clarkia*, *Dendromecon*, *Eschscholzia*, and *Eriogonum*). However, some humans consider bees to be a pest (e.g., out of fear, allergies to bee stings) therefore encouraging bees in proximity to the site post-development is not encouraged. Because ample suitable habitat exists in close proximity off-site, impacts to the species are not anticipated.

Olive-sided flycatcher (*Contopus cooperi*) and other songbirds

Most published studies addressing the potential impacts of man-made noise involve birds; however, studies specific to the olive-sided flycatcher were not found. Most bird studies focus on the impact of road traffic noise on birds.

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[3] Frings, H. and F. Little. 1957. *Reactions of honeybees in the hive to simple sounds*. Science 125:122.

[4] Gallego-Abenza, Mario, Nicolas Mathevon, and David Wheatcroft. Behavioral Ecology (2020), 31(1), 90–96. *Experience modulates an insect's response to anthropogenic noise*. Core Facility for Behaviour and Cognition, University of Vienna.

Several studies evaluated positive versus negative effects of noise based on bird density near the noise source. One study found that 13 of 22 species responded negatively (fewer birds were present near a noisy road), 8 species appeared unaffected (no population change) and one species responded positively (i.e., was attracted by) road noise (Cassin's finch).[5]

Two issues are identified with many of these studies:

1) There is no control that can isolate man-made noise or vibration as the sole cause of a particular behavioral change and eliminate other potential factors as the cause for behavioral responses (e.g., increased lighting, presence of humans, temperature changes associated with pavement, vegetation changes, etc.);[6] and

2) Whether or not noise affects long-term population viability has not been determined.

Despite these shortcomings, some studies do provide data on bird responses to noise. Some birds appear to adapt to noise and remain in place while some species simply move to another location to avoid noise and associated vibration. For example, there is evidence that the European robin is more likely to sing at night in response to daytime noise in urban areas.[7] In another study, some bird species were found to relocate higher within the tree canopy to compensate for communication where noise is a factor at ground level.[8] In another study, song frequency shifted in response to noise.[9] In other studies, birds simply re-located further from the noise source with distance of relocation dependent upon the species.[10]

The general conclusion of the Federal Highway Administration is that some, but not all, bird species are sensitive to noise at least during breeding. The distances over which the potential effects of noise are observed varies considerably – "from a few meters to more than 3 km" (27± feet to 1.9± miles).[11]

Based on the preceding, it is reasonable to take a conservative approach and assume a potential impact to the flycatcher (and other songbirds) resulting from noise and vibration associated with the project. Anticipated responses may range from changes in song to bird self-relocation for distances of 27± feet

[5] McClure CJW, Ware HE, Carlisle J, Kaltenecker G, Barber JR. 2013. An experimental investigation into the effects of traffic noise on distributions of birds: avoiding the phantom road. Proc R Soc B 280: 20132290, http://dx.doi.org/10.1098/rspb.2013.2290.

[6] Radford, Andrew, Erica Morley and Gareth Jones. 2012. School of Biological Sciences, University of Bristol, Woodland Road, Bristol, UK. The Effects of Noise on Biodiversity (NO0235) Final Report for Defra (Department for Environment, Food and Rural Affairs).

[7] Fuller, R., Warren, P. & Gaston K. (2007). Biology Letters 3, 368-370. Daytime noise predicts nocturnal singing in urban robins.

[8] Marten, K. and P. Marler. 1977. Sound transmission and its significance for animal vocalization. Behavioral Ecology and Sociobiology 2:271-290.

[9] Patricelli, J. & Blickley, G. (2006). Avian communication in urban noise: causes and consequences of vocal adjustment. *The Auk* 123**,** 639-649.

[10] Reijnen, R., R. Foppen, C. Ter Braak and J. Thissen. 1995. The effects of car traffic on breeding bird populations in woodland. III. Reduction in the density in relation to the proximity of main roads. Journal of Applied Ecology 32: 187-202.

[11] Federal Highway Administration. Noise Effect on Wildlife.

to 1.9± miles. Because self-relocation would not be possible during nesting, noise and/or vibration produced during the nesting season may be considered a potentially significant and adverse. Mitigation included in the Draft EIR addresses avoidance of nesting flycatchers and other songbirds during nesting and until the young have fledged (allowing them to relocate) per Mitigation Measures BIO-1.8 and BIO-1.11. Proper implementation of these measures is expected to reduce potential impacts associated with noise and/or vibration for the flycatcher and other songbird species to a level of less-than-significant.

As with many other species, the flycatcher would not be expected to inhabit the site post-construction because fire-resistant plantings do not encourage the re-planting of mixed conifer, montane hardwood-conifer habitats in a non-modified state that the species finds suitable for nesting. Therefore, the species would be unlikely to establish a nest susceptible to adverse impacts associated with noise or vibrations post-construction and would, instead, establish a nest at a suitable distance (27± feet to 1.9± miles) from the project site where it may tolerate existing noise and/or vibrations. Given the similar vegetation patches found on adjacent public lands, ample habitat exists to support special status bird species that may self-relocate off the project site. Therefore, no potentially significant adverse impact would occur post-construction.

<u>American peregrine falcon (*Falco peregrinus anatum)*</u>

A 1995 Study focused on the potential impacts of noise on the peregrine falcon (*Falco peregrinus*). The three-year study investigated the potential impacts of jet aircraft noise on peregrine falcons during nesting season. The study found that 2 percent of jet overflights elicited a strong response (flight). The response came primarily from male peregrines more so than females. Study data suggested that:[12]

- "...peregrines were more sensitive to humans and other raptors than to helicopters, jets, and boats".
- Variation in intensity of response suggested that differences in sensitivity among individual peregrines, possibly related to experience, are more important in predicting response than level of exposure to noise.
- "Nest productivity did not differ between nests that were overflown and those that were not; however, average response of peregrines was negatively correlated with productivity. This indicates that intensity of response is a better indicator of productivity than noise exposure."

Another study found no apparent adverse effect on breeding goshawk (*Accipter gentiles*) females or juveniles located 1,640± feet from logging trucks with peak noise levels reaching approximately 50 dB(A).[13]

Numerous other studies[14] address impacts of human activities involving noise on raptors (i.e., noise levels were not measured, however evaluating the impacts of noise generating activities on raptors was

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[12] Roby, Danel D., Stephen Murphy, Angela Palmer and Elizabeth Pruitt et al. 1995. United States Airforce Research Laboratory with Oregon State University Oregon Cooperative Fish and Wildlife Research Unit, Alaska Biological Research, Inc., University of Alaska Fairbanks, and Geo-Marine, Inc. *The effects of Noise on Birds of Prey: A Study of Peregrine Falcons (Falco peregrinus) in Alaska*.

[13] Grubb, T.G., L.L. Pater and D.K. Delaney. 1998. Logging truck noise near nesting northern goshawks. USDA Forest Research Service Note RMRS-RN-3.

[14] Stalmaster, M.V. and J.R. Newman 1978. Behavioral responses of bald eagles to human activity. Journal of Wildlife Management 42:506-513.

the study's goal). One study found human pedestrian activity was more disturbing to bald eagles than aircraft overflights.[15] Another found that various hawks and golden eagles increased home range (territory) size during military activities involving vehicle use, camping, and helicopter overflights.[16] Similarly, red-tailed hawks shifted their activity away from military activities and returned when training ceased.[17]

Based on the preceding studies, high noise levels do not necessarily correspond to decreased nesting success in those raptor species studied, the noise source rather than its measured level may play a role in the behavior of some raptors, and non-nesting raptors may relocate in response to noise and return to their territories once the noise (or activity) has ceased.

As noted in the Biological Assessment, the nearest CNDDB record for the peregrine falcon occurs approximately two miles from the project site in association with rocky, north-facing cliffs in a Mixed Conifer-Hardwood Forest in a steep canyon. Using the 1998 Grubb study of noise effects on breeding goshawks as a guide, noise levels equivalent to logging trucks would be unlikely to disturb the species if located more than 1,640± feet from the project site. The nearest suitable nesting habitat for the peregrine falcon is on the rocky cliffs of Sawmill Mountain located 3,000± feet from the project site—outside the potential range of disturbance from noise. Therefore, no potential impacts resulting from noise or vibration are likely to adversely impact this species while nesting.

Also as noted in the Biological Assessment, given the range of the species, it could occasionally roost temporarily on site (non-nesting). The introduction of noise levels associated with construction outside of the breeding season would cause the species to relocate itself to an alternative roost. While adequate suitable roosting habitat is available on adjacent lands to support the species' roosting activities, any potential disturbance to the species is being treated as potentially significant. Therefore, as already established in the Draft EIR, Mitigation Measure BIO-1.9 requires a preconstruction survey for the species and avoidance if the species is found on or adjacent to the site. Proper implementation of this measure will reduce the potential impact to a level of less-than-significant.

<u>California spotted owl (S*trix occidentalis*)</u>
Focused studies on noise and the California spotted owl were not found. However, one study investigated the potential effects of helicopter noise on a subspecies, the Mexican spotted owls (*Strix occidentalis lucida*).

The study found that nest sites did not differ in reproductive success or the number of young fledged in response to noise. As noise got closer, spotted owl flush (fly away) frequency increased. Spotted owls did not fly off when noise was more than 300 feet away. Spotted owls returned to pre-disturbance behavior within 10 to 15 min after a noise event. All adult flushes during the nesting season occurred after juveniles had left the nest. Spotted owl flush rates in response to helicopters did not differ between non-nesting and nesting seasons. Spotted owls did not flush when the noise level for helicopters was below 92 dBA and, for chain saws, was below 46 dBA. Chain saws were more disturbing to spotted owls than helicopter flights at comparable distances. The data indicates a 345±

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[15] Grubb, T.G. and R.M. King 1991. Assessing human disturbance of breeding bald eagles with classification tree models. Journal of Wildlife Management 55:500-511.
[16] Andersen, D.E., O.J. Rongstaf and W.R. Mytton. 1990. Home range changes of raptors exposed to increased human activity. Wildlife Society Bulletin 18:134-142.
[17] Andersen, D.E., O.J. Rongstad and W.R. Mytton. 1986. The behavioral response of red-tailed hawk to military training activity. Raptor research 20:65-68.

foot buffer zone for helicopter overflights would minimize spotted owl flush response and any potential effects on nesting activity.[18]

Based on the preceding, combined within the findings of the project's noise study which anticipates helicopter noise levels of 100 dB (i.e., similar to the SEL noise level of < 102dBO, or 92 dBA measured for military helicopters in the referenced study) a buffer of 345 feet between the project site and spotted owl nests during nesting season would minimize potential impacts to that species to a level of less-than-significant. As noted in the Biological Assessment, known spotted owl nesting locations occur within one mile of the project site. The precise location of these established nesting sites is more than 345 feet from the project site.[19]

To ensure that no nesting spotted owls have located within 345 feet of the project site prior to project construction, the following mitigation measure, already established in the Draft EIR is required: Mitigation Measure BIO-1.8 requires a preconstruction survey for spotted owls prior to initiating project construction and minimum buffers of 300 feet for raptors. Based on the preceding study findings, the following amendment to Mitigation Measure BIO-1.8 is recommended, as shown in Table 1-1 and Chapter 3, Revisions to the Draft EIR, of this Final EIR:

> Prior to issuance of grading permits for construction occurring between February 1st and August 30th (e.g., excavation, ground disturbance, or vegetation removal) a preconstruction survey for nesting birds will be conducted in accordance with the CDFW guidelines and a no-disturbance buffer will be established, if necessary.
>
> If equipment staging, site preparation, vegetation removal, grading, excavation or other project-related construction activities are scheduled during the avian nesting season (generally February 1 through August 30), a focused survey for active nests would be conducted by a qualified biologist within 15 days prior to the beginning of project-related activities.
>
> Following initial pre-construction surveys in year one of project construction, bird surveys shall be repeated annually so long as outside construction continues. Surveys should be repeated within 15 days prior to resuming outdoor construction activities for the first time between February 1st and August 30th whenever outdoor construction activities have ceased for more than one month (e.g., if outdoor construction shuts down for the season due to winter rains in late November, preconstruction bird surveys would occur again within 15 days prior to recommencing outdoor site work between February 1st and August 30th. If work recommences in January and continues without interruption through August 30th, then no additional preconstruction survey is required).
>
> Surveys shall be conducted in all suitable habitat in the BSA.
>
> If an active nest is found, the bird shall be identified to species and the approximate distance from the closest work site to the nest estimated. No additional measures need be implemented if active nests are more than the following distances from the nearest work site: (a) 300± feet for raptors

[18] Delaney, D.K., T.G. Grubb, P. Beiber, L.L. Pater and M.H. Reiser. 1999. Effects of helicopter noise on Mexican spotted owls. Journal of Wildlife Management 63:60-76.
[19] Delaney, D.K., T.G. Grubb, P. Beiber, L.L. Pater and M.H. Reiser. 1999. Effects of helicopter noise on Mexican spotted owls. Journal of Wildlife Management 63:60-76.

unless otherwise specified; (b) 345 feet for spotted owls; or (~~b~~c) 75± feet for other non-special-status bird species. Disturbance of active nests shall be avoided to the extent possible until it is determined that nesting is complete and the young have fledged. For species protected under the California Fish and Game Code (CFGC), if active nests are closer than those distances to the nearest work site and there is the potential for bird disturbance, CDFW will be contacted for approval to work within 300± feet of raptors, or 75± feet of other non-special-status bird species.

Proper implementation of the preceding measure will reduce the potential impacts of noise and vibration on the spotted owl to a level of less-than-significant.

Fisher

Without citing specific data, one study broadly identifies a class of potential behavioral effects on mammals, including the fisher, resulting from "adverse effects of roads and other linear features may also include displacement due to noise and human activity…"[20] Most studies involving the potential impacts of noise on mammals address roads as a barrier with noise being a contributing factor. Generally, avoidance behavior is the primary response of mammals to noise (and other man-made environmental factors) in most studies, although some small mammals were found to be attracted to noisy rights-of-way due to a decrease in predators.

Based on the preceding, the fisher would be expected to avoid the project site in response to noise without adverse impact to individuals. As noted in the Biological Assessment, the fisher is not expected to use the site for breeding, denning, or feeding; but is more likely to inhabit more mature forest stands and dense riparian habitat. During the day, it would likely to remain in a burrow off-site before emerging to become active at night, when noise levels are at their lowest. Therefore, given the ability of the species to self-relocate, that its habitat is off-site, and that it is active primarily at night; potential impacts of noise and associated vibration are not anticipated to result in a significant adverse impact.

Mitigation Measures addressing non-noise related aspects of construction that could impact this species is addressed in the Draft EIR including confining trash, avoiding trapping and work hours confined to daytime rather than nighttime.

Wintering Mule Deer (*Odocoileus hemionus*)

Most studies addressing the potential effects of noise on hoofed mammals, like the mule deer, focus on the effects of roads on these species measuring levels of avoidance to evaluate potential effects.[21] However, one study focused on potential impacts of human activities on wintering mule deer in Colorado by exposing them to humans on foot and humans on snowmobiles. The study found that wintering mule deer activities were interrupted more by pedestrians than by snowmobiles. Responses by deer to people were longer in duration, "involved running more frequently," and expended more energy. Deer response depended upon distance between animals and people or snowmobiles. The study notes that preventing movements resulting in higher energy-consuming responses by deer would

[20] Naney, R.N., L.L. Finley, E.C. Lofroth, P.J. Happe, A.L Krause, C.R. Raley, R.L. Truex, L.J. Hale, J.M. Higley, A.D. Kosic, J.C. Lewis, S.A. Livingston, D.C. MacFarlane, A.M. Myers, and J.S. Yaeger. 2012. Conservation of Fishers (*Martes pennanti*) in South- Central British Columbia, Western Washington, Western Oregon, and California – Volume III: Threats Assessment. USDI Bureau of Land Management, Denver, Colorado, USA. U.S. Fish and Wildlife Service. March 2016. Final Species Report Fisher (*Pekania pennanti*), West Coast Population.

[21] Rost, G.R. and J.A. Bailey. 1979. Distribution of mule deer and elk in relation to roads. Journal of Wildlife Management 43:634-641.

require pedestrians to remain 625± feet from wintering deer.[22] More particularly, if pedestrians are restricted to trails, "deer might perceive the activities as predictable and more acceptable."[23] The Freddy study did not find impacts resulting in death or reduced ability to produce young in adult female deer as a result of the study, although the limited duration of the study may have been a factor.

In studies involving non-wintering deer:

One study found no evidence of road avoidance up to distances of 300 yards for elk along interstate 80 in Wyoming where traffic noise averaged 54-62 dB(A) for cars and 58-70 dB(A) for trucks.[24] Another study found that elk generally avoided roads while deer showed less sensitivity with little difference in distribution around interstate highways at distances up to 1312± feet from roads.[25]

The Federal Highway Administration concludes, that, taken together, studies provide little evidence suggesting that large hoofed mammals avoid roads due to noise. In fact, as noted previously, the presence of people was found to cause avoidance in mule deer (*Odocoileus hemionus*), although noise levels were not measured.[26]

Based on the preceding, potentially significant adverse impacts associated with noise on wintering and non-wintering mule deer are not anticipated. Impacts associated with pedestrians is recognized and addressed in the Biological Assessment.

<u>Bats</u>

Several studies have been made on the effects of noise on bats.[27] Generally, the potential noise impacts related to how the species locates prey. Some bats listen for prey-generated sounds (gleaning bats) and capture their food from the ground. These bats will cease or reduce foraging in response to noise. In contrast to gleaning bats, "echolocating bats appear to be at relatively low risk of direct impacts" of man-made noise.[28] Some bats both glean and use echolocation in hunting.

Another study using compressor stations associated with natural gas wells, found that activity levels for the Brazilian free-tailed bat (*Tadarida brasiliensis*) were lower at loud compressor sites, whereas the activity levels of four other species (*Myotis californicus*, *M. cillolabrum*, *M. lucifugus*, *Parastrellus hesperus*) were not affected by noise. Further, bat species emitting low frequency (<35 kHz) echolocation calls showed a 70 percent reduction in activity levels versus bats emitting higher

[22] Freddy, D.J., W.M. Brenough and Fowler. 1986. Responses of mule deer to disturbances by persons afoot and snowmobiles. Wildlife Society Bulletin 14:63-68.
[23] Macarthur, R. A., V. Geist, and R. H. Johnston. 1982. Cardiac and behavioral responses of mountain sheep to human disturbance. J. Wildl. Man- age. 46:351-358.
[24] Ward, A.L., J.J. Cupal, A.L. Lea et al. 1973. Elk behavior in relation to cattle grazing, forest recreation and traffic. North American Wildlife National Research Conference Transactions 38:327-337.
[25] Adams, L.W. and A.D. Geis. 1981. Effects of highways on wildlife. Federal Highway Administration Technical Report No. FHWA/RD-81/067.
[26] Freddy, D.J., W.M. Brenough and Fowler. 1986. Responses of mule deer to disturbances by persons afoot and snowmobiles. Wildlife Society Bulletin 14:63-68.
[27] The California Department of Transportation. 2016. Technical Guidance for the Assessment and Mitigation of the Effects of Traffic Noise and Road Construction Noise on Bats. July. (Contract 43A0306.) Sacramento, CA. Prepared by ICF International, Sacramento, CA, and West Ecosystems Analysis, Inc., Davis, CA.
[28] Tressler, J. & Smotherman, M. S. (2009). Context-dependent effects of noise on echolocation pulse characteristics in free-tailed bats. Journal of Comparative Physiology A 195, 923–934.

frequency (>35kHz) did not exhibit changes in activity levels in response to noise. The study also found that echolocation search calls for prey in the Brazilian free-tailed bats were modified based on the presence or absence of compressor noise.[29]

All the special status bat species with potential to occupy the project site rely at least partially on echolocation for feeding. The Long-eared myotis (*Myotis evotis*) both gleans moths from substrate and aerial-hawks flying moths (echolocation). The duration and frequency of their echolocation calls change depending on the mode of attack.[30] In addition, the spotted bat,[31] silver-haired bat and hoary bat (Animal Diversity Web, University of Michigan) use average frequencies of less than 30 kHz indicating that loud noise could interfere with feeding success for these species at the site.

Based on the preceding, sustained loud noise at the project site would interfere with the ability of these bats to forage at the project site. However, loud noise at the project site during foraging (night-time hours) would be rare or infrequent and confined to emergency helipad use. Given the temporary and infrequent occurrence of helipad use, impacts are expected to be less than significant. Mitigation Measures BIO-1.3, BIO-1.4, BIO-1.5b, BIO-1.6, and BIO-1.7 established in the Draft EIR limit construction hours to day-time hours only. Therefore, noise would not interfere with these special status bat species in conjunction with construction. Similarly, the only sustained above-normal noise generating facility that could reach levels at night like those studied in evaluating noise impacts to bats, is the project maintenance yard. Mitigation Measure NOI-1.1 includes provisions to reduce noise generation at this facility to conform with Tuolumne County General Plan standards. Those standards are generally compatible with night-time residential noise levels. Night-time residential noise levels are not identified as incompatible with bat foraging activities; therefore, no significant adverse impacts are anticipated.

The potential impacts of the project relative to bat nurseries and colonial roosts was identified in the Biological Assessment for the silver-haired, hoary, and long-eared bat. While studies specific to noise impacts on bat nurseries or colonial roosts are not identified, it is assumed that, because noise can interfere with feeding patterns, it could reasonably be assumed to disrupt nurseries or colonial roosts. Project construction noise could, therefore, disrupt colonial roosts or nurseries, a potentially significant adverse impact. Mitigation Measures BIO-1.5a, BIO-1.6, and BIO-1.7 address preconstruction surveys and avoidance of colonial roosts or nurseries. Proper implementation of these measures will reduce the potential impact of construction noise on special status bats.

As with other species, special status bat species would not be expected to inhabit the site post-construction because suitable vegetation and habitat would no longer exist. Similarly, the species would be unlikely to establish a nursery or colonial roost where pre-nursery or pre-roosting noise levels are disturbing to the species. Given the similar vegetation patches found on adjacent public lands, ample

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[29] Bunkley, Jessie P., Christopher J.W. McClure, Nathan J. Kleist, Clinton D. Francis, Jesse R. Barber. 2014. Anthropogenic noise alters bat activity levels and echolocation calls. Global Ecology and Conservation (3) 2015 (62-71).

[30] Faure, P. A. and Barclay, R. M. R. 1994. Substrate-gleaning versus aerial-hawking: plasticity in the foraging and echolocation behaviour of the long-eared bat, Myotis evotis. J. Comp. Physiol. A 174, 651-660.

[31] Fullard J.H, Dawson J.W. 1997. The echolocation calls of the spotted bat *Euderma maculatum* are relatively inaudible to moths. J. Exp. Biol. 1997;200:129–137. [PubMed]

habitat exists to support special status bat species that may self-relocate off the project site. Therefore, no potentially significant adverse impact would occur post-construction.