6.15 Noise

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This section describes the noise setting in the vicinity of the Upper North Fork Feather River Hydroelectric Project (UNFFR Project) and analyzes the potential impacts of the operation of the UNFFR Project under a new Federal Energy Regulatory Commission (FERC) license on the noise environment. The following topic is not discussed in this section for the reason noted:

- **Airport Noise:** None of the UNFFR Project activities would expose sensitive receptors to airport noise.

6.15.1 Environmental Setting

Noise Overview

Noise is generally defined as excessive and unwanted sound. Noise levels are measured by the extent of pressure exerted by a sound using an A-weighted decibel scale (dBA). The dBA scale correlates to the range of sounds audible to the human ear (where 10 dBA is at the low threshold of hearing and 120–140 dBA is the threshold of pain). Table 6.15-1 identifies typical noise levels for common activities. Human responses to noise are subjective and may include:

- annoyance and dissatisfaction;
- interference with activities such as speech, sleep, and learning; and
- physiological effects such as hearing loss or sudden startling.

The subjective effects of noise are difficult to measure as are the corresponding reactions of annoyance and dissatisfaction. Individual tolerance thresholds vary widely based on an individual's past experiences with noise and the environment. The intensity, duration, frequency, and time pattern of noise and any existing background noises can influence individual responses to noise.

Table 6.15-1. Noise Levels for Common Sources

Noise Source at a Given Distance	A-Weighted Sound Level in Decibels	Noise Environments	Subjective Impression
Civil defense siren (100 feet)	130-140		Pain threshold
Jet takeoff (200 feet)	120		
	110	Rock music concert	Very loud
Pile driver (50 feet)	100		
Ambulance siren (100 feet)	90	Boiler room	
Normal boat (50 feet)	80	Printer	Loud
Pneumatic drill (50 feet)		Garbage disposal	
Freeway (100 feet)	70		Moderately loud
Vacuum cleaner (100 feet)	60	Department store/office	

Table 6.15-1. Noise Levels for Common Sources

Noise Source at a Given Distance	A-Weighted Sound Level in Decibels	Noise Environments	Subjective Impression
Light traffic (100 feet)	50	Private business office	Quiet
Large transformer (200 feet)	40		
Soft whisper (5 feet)	30	Quiet bedroom	
	20	Recording studio	
	0-10		Hearing threshold

Note: The A-weighted sound level de-emphasizes very low and very high frequency components of sound similar to the response of the human ear.

Noise Sources

Major sources of noise in Plumas County include highway traffic, trains, airport operations, and local industrial uses (i.e., sawmills and mining activities). The community noise equivalent level (CNEL) of these noise sources can exceed 65 decibels (dB), which is the normally acceptable maximum noise level for residential uses in the county (Plumas County 2004). Primary sources of noise in the vicinity of the UNFFR Project include vehicle traffic, trains, hydroelectric facility operations, and recreation activities. The Lassen National Forest maintains an air base on the north shore of Lake Almanor on the outskirts of Chester, California, with planes and helicopters for fire suppression. Noise associated with air traffic and flat water recreation activities is more typical during the summer; during the off-season, limited recreational use and ongoing hydroelectric activities generate noise along with local traffic. The UNFFR Project vicinity is fairly quiet and comparable to a wilderness-like area, with sounds of nature dominating the environment.

The Union Pacific railroad follows the North Fork Feather River downstream of the Belden reach, and trains can be heard from several places along this reach. Operation and maintenance of UNFFR Project facilities (e.g., powerhouses and transmission lines) generate ongoing noise associated with electricity generation and transmission. Periodic changes in powerhouse operations at Butt Valley reservoir, Caribou powerhouses, and Belden powerhouse result in large increases in noise levels that can be heard by various receptors (i.e., workers, visitors, and wildlife). In addition to the noise of the powerhouses, audible alarms (e.g., civil defense siren) are used to warn of periodic changes in water elevation downstream of the powerhouses. Transmission lines are fairly quiet but a humming noise may be heard by people in the immediate area.

Recreation uses at Lake Almanor, Butt Valley reservoir, Belden forebay, and along the Seneca and Belden reaches of the North Fork Feather River also generate noise from voices, watercraft, vehicles, and common recreation activities. Noise tends to travel further and is typically more noticeable at Lake Almanor as the sound travels across the open water. The topography and vegetation surrounding the North Fork Feather River, Lake Almanor, and Butt Valley reservoir tend to prevent noise associated with the UNFFR Project facilities and recreation activities from traveling long distances.

Sensitive Noise Receptors

Sensitive noise receptors are specific geographic points, such as schools, hospitals, convalescent homes, residences, or parks, where people could be exposed to unacceptable levels of noise that affect daily activities or that result in health effects, like hearing loss or reduced sleep. Noise-sensitive receptors in the general vicinity of the UNFFR Project include residents adjacent to Lake Almanor, recreationists (e.g., hikers, picnickers, anglers, boaters, and rafters), and wildlife. Public and private recreation facilities have been developed along Lake Almanor and State Route 89. Noise tolerance levels for these groups are subjective, varying widely between individuals. Typical ambient outside noise levels in residential (single-family homes) and recreational areas range from 40 to 60 dBA, and community noise exposure levels are considered compatible up to 65–70 dB for residential areas and up to 75 dB for water recreation areas (Plumas County 2004). Topography, vegetation, and increased distance from the source often serve as noise buffers and help reduce noise levels by the time the noise reaches sensitive receptors.

The primary sensitive receptors in the vicinity of the Canyon dam and Prattville activity areas include recreationists at the campgrounds, boat launch, and viewing areas near Canyon dam; recreationists at day use areas, boat launches, and other recreation sites near the Prattville intake; recreationists (boaters and fishermen) on the water at Lake Almanor near Canyon dam and the Prattville intake; residents and workers at the PG&E camp downstream of Canyon dam; residents in the communities near the Prattville intake; and various wildlife. The Prattville community is approximately 0.3 mile southeast of the Prattville intake, and the Almanor community is approximately 0.5 mile northeast of the Prattville intake. The Canyon dam community is approximately 0.8 mile east of Canyon dam. The primary sensitive receptors in the vicinity of the Caribou intakes activity area at Butt Valley reservoir include campers, boaters (fishing and sailing), other recreationists on the east shore, and wildlife. No residential uses occur in the vicinity of the Butt Valley dam.

6.15.2 Environmental Impacts and Mitigation Measures

Methodology

The noise impact analysis is based on general information about noise and the noise environment in the vicinity of the UNFFR Project and a primarily qualitative discussion of noise impacts, focused on construction-related noise at activity areas. Information on the environmental setting is derived from common sources of noise levels, Plumas County noise information, and a site visit to observe noise levels in the area. The impact analysis considers the quantitative noise levels associated with typical construction equipment and the qualitative effects of construction-related noise on sensitive receptors in the area.

Thresholds of Significance

Impacts associated with noise would be significant if the Proposed UNFFR Project, Alternative 1, or Alternative 2 would:

- cause a substantial temporary or permanent increase in ambient noise levels in the vicinity above existing levels without the Proposed UNFFR Project or each alternative;
- expose people to, or generate, noise levels in excess of standards established in the Plumas County General Plan or applicable standards of other agencies; or

- expose people to, or generate, excessive ground-borne vibration or ground borne-noise levels.

Impacts and Mitigation Measures

This section discusses the anticipated noise impacts of the Proposed UNFFR Project and each alternative and identifies mitigation measures for significant impacts. Table 6.15-2 compares the final level of significance for each impact, with incorporation of mitigation measures if appropriate.

Table 6.15-2. Summary of Noise (NO) Impacts

IMPACT	PROPOSED UNFFR PROJECT	ALTERNATIVE 1	ALTERNATIVE 2
Impact NO-1: Construction activities associated with the UNFFR Project could increase noise levels above acceptable standards and may expose sensitive receptors to excessive noise or groundborne vibrations.	Less than significant with mitigation	Less than significant with mitigation	Less than significant with mitigation
Impact NO-2: Implementation of the UNFFR Project could increase ambient noise levels around Lake Almanor and Butt Valley reservoir or along the North Fork Feather River.	Less than significant	Less than significant	Less than significant

Impact NO-1: Construction activities associated with the UNFFR Project could increase noise levels above acceptable standards and may expose sensitive receptors to excessive noise or groundborne vibrations.

Proposed UNFFR Project and Alternatives 1 and 2

Construction activities would generate temporary noise and could generate occasional groundborne vibrations. Construction locations on Lake Almanor are near recreational uses, and a number of residences and commercial buildings occur in the immediate vicinity of the activity areas. In addition to residents, workers, and recreationists along the shore of Lake Almanor, boaters and wildlife would be subjected to noise from construction activities in the activity areas. Noise at either location may travel across the lake and be noticeable to boaters, residents, commercial establishments, or other receptors around the lake. Some receptors (e.g., boaters, campers, wildlife) are inherently mobile and may leave or avoid the activity areas during construction periods. Groundborne vibrations would be minimal and would occur only at the Prattville intake if equipment that generates vibrations is used to stabilize the shore during installation of a thermal curtain (Alternatives 1 and 2). The vibrations would not travel far enough to affect residential or recreation-related structures, which occur more than 500 feet from the activity area.

Typical noise levels of construction equipment range from about 75 dBA to 90 dBA (loud to very loud) at 50 feet from the source (U.S. Department of Transportation 2006). These noise levels exceed acceptable levels for recreational uses and could adversely affect recreationists at the recreational sites adjacent to activity areas. Because of the distance and intervening

topography and vegetation between the activity areas and nearby homes, the noise levels would be expected to attenuate (decrease in intensity) to acceptable levels before reaching the nearest residents. Recreational uses further from the construction areas would also experience lower noise levels.

Construction activities at Butt Valley reservoir would generate similar types of noise impacts, but fewer sensitive receptors would be affected. No residences occur near the dam, and recreational sites are limited to the eastern shore of the reservoir. Some construction noise may affect recreationists on the reservoir or at sites adjacent to the reservoir and wildlife in the vicinity. Recreational activities, such as boating, fishing, and birding, would be influenced by construction-related noise to varying degrees, depending on the distance of the receptor. Wildlife subjected to construction noise may avoid the activity area or leave the area.

The addition of a new source of noise (construction equipment and activities) in a relatively quiet area could degrade visitor experience by introducing an unwanted source of noise. Construction noise would be more noticeable at Butt Valley reservoir due to the relatively quiet existing noise environment. Some recreationists may avoid the area during the construction period, while others who continue to use nearby recreation facilities could experience various health or emotional impacts from the construction noise. Construction noise, although temporary, would exceed acceptable standards and could adversely affect visitor experience. Therefore, construction noise impacts would be **significant without mitigation**.

Mitigation Measure

Mitigation Measure NO-1: Implement Noise Reduction Measures

During construction activities, PG&E will implement measures to reduce construction-related noise. Noise reduction measures include, but are not limited to, the following:

- Equip construction equipment with manufacturer's specified noise-muffling devices or use newer construction equipment manufactured to reduce noise;
- Place stationary noise-generating equipment as far away as feasible from sensitive noise receptors or in an orientation that minimizes noise impacts (e.g., behind existing barriers, storage piles, unused equipment);
- Turn off all engines when not in use;
- Maintain low vehicle speeds in and around the construction areas (less than 15 miles per hour)

Significance after Mitigation

This mitigation measure falls outside the purview of the State Water Board. However, PG&E has agreed to implement Mitigation Measure NO-1, as proposed, in an email dated March 3, 2014. Implementation of Mitigation Measure NO-1 would reduce construction noise at nearby recreational sites to a **less than significant** level.

Impact NO-2: Implementation of the UNFFR Project could increase ambient noise levels around Lake Almanor and Butt Valley reservoir or along the North Fork Feather River.

Proposed UNFFR Project and Alternatives 1 and 2

Operation of the UNFFR Project would be modified to varying degrees under the Proposed UNFFR Project and the alternatives. However, the overall change in noise levels would be minimal under Alternatives 1 and 2. Increases in operational noise would be primarily associated with increased flow from Canyon dam under the Proposed UNFFR Project and Alternatives 1 and 2 and waves hitting the new buoys around the thermal curtains under Alternative 1 and 2. Modifications to the Canyon dam outlet[1] would allow increased flow into the Seneca Reach of the North Fork Feather River. In addition, minimum flows in the Belden reach would also be modified, with increases during some months. Ongoing sounds would be generated by the flow released through the dams and as the flow travels downstream along the river. The sound of flowing water is not generally considered an unwanted noise and may positively contribute to the outdoor experience.

Localized noise from waves hitting the buoys could be noticeable in the immediate vicinity of the thermal curtains at Prattville intake and Caribou intakes. The noise would be more noticeable at the Prattville intake because of the proximity of recreational uses to the proposed thermal curtain location and the presence of sensitive receptors nearby. Although wave noise could be noticeable, it would not likely detract from the visitor experience or dominate the noise environment, which already consists of recreational noise and waves hitting the shore and existing buoys around the intakes.

Overall, noise related to the Proposed UNFFR Project and both alternatives' operations and facilities would increase slightly over existing levels, but the new and modified noise sources would blend in with the existing noise environment and would not substantially degrade the quality of the environment. Operation-related noise impacts would be **less than significant**.

[1] Canyon dam "intake" and Canyon dam "outlet" are synonymous.