RA-04 PROJECT SOUND ASSESSMENT REPORT

SKAGIT RIVER HYDROELECTRIC PROJECT
FERC NO. 553

Seattle City Light

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Updated Study Report

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Attachment A Noise Measurement Site Photos
Attachment B Hourly Noise Measurement Summaries
Attachment C Base Noise Modeling Contour Mapbook

List of Acronyms and Abbreviations

°C .....degrees Celsius
AEDT .....Aviation Environmental Design Tool
altitude MSL .....altitude above mean sea level
ASA.....Acoustical Society of America
BPA.....Bonneville Power Administration
City Light.....Seattle City Light
cfs.....cubic feet per second
CFI8X .....Corona and Fields Interactive 1989 Experimental Model
dB.....decibel
dB re: 1 pW.....decibel with reference value 1 picowatt (10^{-12} watts)
dBA.....A-weighted decibel
FAA.....Federal Aviation Administration
FERC.....Federal Energy Regulatory Commission
FHWA.....Federal Highway Administration
ft .....feet
GIS .....Geographic Information System
HP .....horsepower
Hz.....hertz
ISO .....International Standards Organization
ISR .....Initial Study Report
L_{eq}.....equivalent sound level over a stated period of time, also a mean noise level
L_{min}.....minimum instantaneous noise level
L_{max} .....maximum instantaneous noise level
L_{nat}.....natural ambient noise level
L_{10} .....noise level exceeded 10 percent of an hour
L_{33} .....noise level exceeded 33 percent of an hour
L_{50} .....noise level exceeded 50 percent of an hour, also a median noise level
L_{90} .....noise level exceeded 90 percent of an hour
$L_{w,A}$.....sound power level in dBA
LD 831C.....Larson Davis Model 831C
lin .....linear weighting

LP .....licensing participant
mph .....miles per hour
nmi .....nautical miles
NPS .....National Park Service
P_H .....percentage basis
Project .....Skagit River Hydroelectric Project
pW.....picowatt (10^{-12} watts)
Q_{cfs}.....flow rate in cubic feet per second (cfs)
RCNM.....Roadway Construction Noise Model
REMEL .....Reference Energy Mean Emission Levels
RLNRA .....Ross Lake National Recreation Area
ROW .....right-of-way
RSP .....Revised Study Plan
SNOTEL .....Natural Resources Conservation Service Snow Telemetry
SPL.....sound pressure level
SWL .....sound power level
TNM.....traffic noise model
USGS .....U.S. Geological Survey
USR.....Updated Study Report

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1.0 INTRODUCTION

The RA-04 Project Sound Assessment is being conducted in support of the relicensing of the Skagit River Hydroelectric Project (Project), Federal Energy Regulatory Commission (FERC) No. 553, as identified in the Revised Study Plan (RSP) submitted by Seattle City Light (City Light) on April 7, 2021 (City Light 2021). On June 9, 2021, City Light filed a "Notice of Certain Agreements on Study Plans for the Skagit Relicensing" (June 9, 2021 Notice)[1] that detailed additional modifications to the RSP agreed to between City Light and supporting licensing participants (LP) (which include the Swinomish Indian Tribal Community, Upper Skagit Indian Tribe, National Marine Fisheries Service, National Park Service [NPS], U.S. Fish and Wildlife Service, Washington State Department of Ecology, and Washington Department of Fish and Wildlife). The June 9, 2021 Notice proposed no changes to the Project Sound Assessment as described in the RSP.

In its July 16, 2021 Study Plan Determination, FERC approved the Project Sound Assessment with modifications. Specifically, FERC recommended that City Light consult with NPS and other interested LPs about the exact monitoring sites and recommended including natural ambient noise (L_{nat}) values for each study site. On March 8, 2022, City Light filed its Initial Study Report (ISR). No requests for modifications to the Project Sound Assessment were filed. FERC's August 8, 2022 Determination on Requests for Study Modifications required no modifications to the Project Sound Assessment.

This study is complete, and a report of the study efforts is being filed with FERC as part of City Light's Updated Study Report (USR).

1.1 Noise Terminology

This section defines and provides additional background on noise terminology used in this report.

Sound is made of small fluctuations in air pressure, which propagate as longitudinal pressure waves. Sound may be characterized by its amplitude (how loud it is) and frequency (how high or low it sounds). Noise is sometimes defined as unwanted sound, but in this report the terms "sound" and "noise" are used interchangeably.

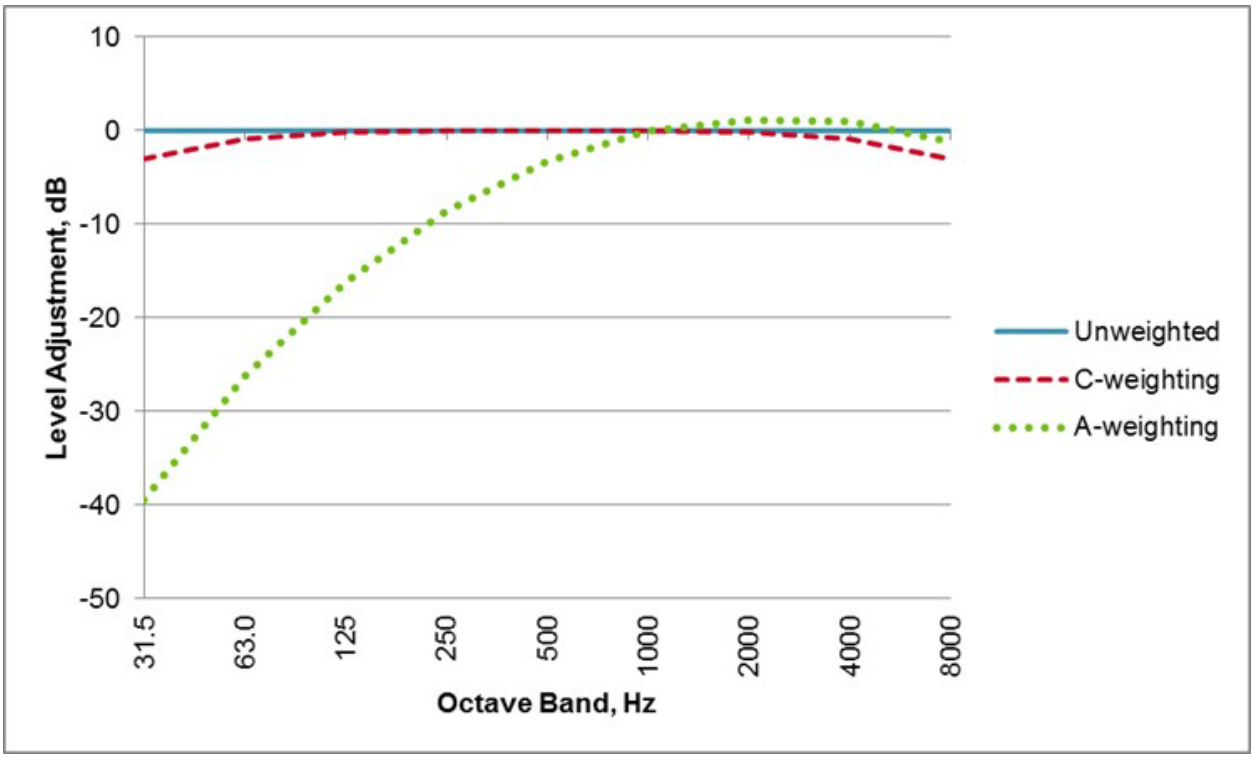
Within the range of human hearing, sound pressure may vary in amplitude by a factor of over one million. To make this scale more manageable, a logarithmic scale known as the decibel (dB) scale is used. When expressed in dB, sound pressure amplitude is known as the sound pressure level (SPL). This logarithmic scale means that decibel levels cannot be simply added and subtracted. If the amplitude of a sound is doubled, for example by adding an identical sound source, the SPL will increase by only 3 dB. A doubling of amplitude does not correlate to a doubling of perceived loudness: a change of 3 dB is considered a just-noticeable difference, a 5 dB change is considered readily perceptible, and a 10 dB change is considered a doubling or halving of loudness.

Frequency is described by hertz (Hz), which is equivalent to the number of sound wave cycles per second. A given sound may include components at many different frequencies, so octave bands are used to describe the frequency content of a sound. An octave is defined by a doubling or halving

[1] Referred to by FERC in its July 16, 2021 Study Plan Determination as the "updated RSP."

of frequency, so an octave band includes sound within a given frequency range and is identified by the frequency at the logarithmic center of the band. For example, the octave band with a center frequency of 1000 Hz includes all sound between 710 Hz and 1420 Hz. When a quantity is reported in octave bands, it is referred to as spectral (for example, spectral sound power level). Broadband sound, such as waterfall noise, includes components across a wide range of frequencies, while tonal sound, such as a siren, is concentrated at specific frequencies.

Since the human ear does not hear all frequencies equally well, the A-weighted decibel (dBA) is used to reflect this sensitivity by giving less weight to less audible components of sound (such as low frequencies), while giving slightly higher weight to components of sound in more sensitive frequencies. Unweighted dB may be specified as using linear weighting (lin). Differences between two sound levels are given in dB regardless of the weighting scheme of the original levels. Figure 1.1-1 shows the weightings given in each octave band for unweighted dB and dBA (and C-weighted decibels, which are not used in this report). Table 1.1-1 gives examples of some common noise sources and their typical dBA levels.



Source: Acoustical Society of America (ASA) 2001.

Figure 1.1-1. Frequency weightings.

Table 1.1-1. Typical SPL of common noise sources.

Noise source	SPL
Auto horn at 3 ft	120 dBA
Heavy truck at 50 ft	90 dBA
Loud human voice at 3 ft	70 dBA
Air conditioning unit at 20 ft	60 dBA
Light auto traffic at 100 ft	50 dBA
Soft whisper at 15 ft	30 dBA

Source: Environmental Protection Agency (1981).

SPL typically varies over time, so different metrics may be used to concisely report sound measurement results. The equivalent level (L_{eq}) is the mean noise level over a given period of time, representing a constant sound level that contains the same overall energy as the actual, time-varying sound level. Statistical levels (L_n) are used to describe the sound level that is exceeded n percent of the time in a given time period. Thus, the L_{10}, L_{33}, L_{50}, and L_{90} respectively represent the sound levels exceeded for 10, 33, 50, and 90 percent of the time period. L_n descriptors help explain how much sound levels vary (or how consistent they are) during each hour. The L_{50} descriptor is the median noise level, and a comparison of the mean (L_{eq}) and median (L_{50}) is another way to evaluate the amount of variation in sound levels during an hour. If the L_{eq} is much greater than the L_{50}, short and loud noise events were likely raising the L_{eq}, whereas if the L_{eq} and L_{50} are similar, sound levels were likely consistent through the hour. The L_{90} is often used to represent background noise; since it represents the noise level exceeded 90 percent of a time period, it represents the quietest moments when transient sound sources such as wind gusts or passing vehicles are not present. L_{nat} is a special case of statistical level, which is described in detail in Section 4.3.1.2. L_{max} and L_{min} are maximum and minimum instantaneous SPL, respectively.

Sound power level (SWL or L_W) is distinct from SPL. SPL describes the amplitude of sound pressure at a given location or distance from a noise source. SWL describes the total amount of sound energy emitted by a noise source and is not location dependent. Although both are reported in dB, the basis of the dB scale is different for each. For SPL, the dB are referenced to a pressure amplitude that represents the threshold of human hearing. However, for SWL, the dB are referenced to 1 picowatt (pW, 10^{-12} watts) since SWL is a measure of energy, not pressure. SWL (specifically spectral SWL) is frequently used as input data for noise models.

Refer to Section 5.3.2 for discussion of how sound propagation is affected by meteorology and terrain.

2.0 STUDY GOALS AND OBJECTIVES

The goal of this study is to develop estimates of Project-related noise to facilitate analysis of how Project-related noise may affect other resources (e.g., wildlife, cultural resources, recreation resources, etc.). The objectives of the study include:

- Inventory and assess the Project facilities, equipment, and activities that emit noise throughout the Project Boundary, and measure or otherwise identify the spectral noise emissions characteristics of those Project features;
- Identify when those Project-related features, maintenance, and operations produce noise (i.e., day/night, what seasons, etc.);
- Identify and delineate noise-sensitive land uses that are also representative of other noise-sensitive land uses in the study area. Delineate those areas in Geographic Information System (GIS) for later use in the noise assessment;
- Perform unattended noise measurements for a continuous 7-day period during two seasons (i.e., spring and summer) to describe and document existing noise levels at those noise-sensitive locations (measured noise levels are assumed to be representative of comparable land uses); and
- Model Project-related noise and develop noise contour maps that show how Project-related noise propagates and attenuates throughout the noise study area.

3.0 STUDY AREA

The study area includes an area covering 0.6 mile from noise-generating facilities, activities, and ongoing/known maintenance and construction projects within the Project Boundary, and a 500 foot buffer on either side of Project transmission lines for corona noise assessment. The noise propagation equations in the international acoustical standard used in the noise modeling task (International Standards Organization [ISO] 9613-2:1996, Acoustics – Attenuation of sound during propagation outdoors – Part 2: General method of calculation) are considered accurate to distances of 0.6 mile over flat terrain and conditions favorable to sound propagation. Beyond that distance, calculated noise levels are considered less accurate, particularly in areas where the terrain in the propagation path is not flat. See Section 5.3 for further discussion on the effect of terrain and meteorological conditions on the prediction of sound propagation.

In response to requests from LPs during consultation in 2021 related to ambient sound study site locations, City Light agreed to extend the noise modeling study area within the Ross Lake National Recreation Area (RLNRA) and North Cascades National Park to the point at which modeled noise levels attenuate to the L_{90} value measured at the nearest long-term unattended noise measurement location. To accommodate this request, the terrain extent of the model was increased from 0.6 mile to 1.6 miles around powerhouses and dams and 1 mile around the Project Boundary elsewhere. The Project-wide average measured L_{90} of 35 dBA was used as the extent of each model, since most models covered areas that included several noise measurement locations.[2] Modeling Project-related noise to the measured L_{90} is limited to portions of the noise study area within the RLNRA and North Cascades National Park. Figure 3.0-1 shows the Project Sound Assessment study area.

[2] City Light recognizes that the point at which Project-related noise attenuates to the measured L_{90} may be beyond 0.6 mile, or even 1.6 miles in some cases; however, modeling beyond the updated terrain extent of the model is not feasible given software limitations and accuracy concerns.

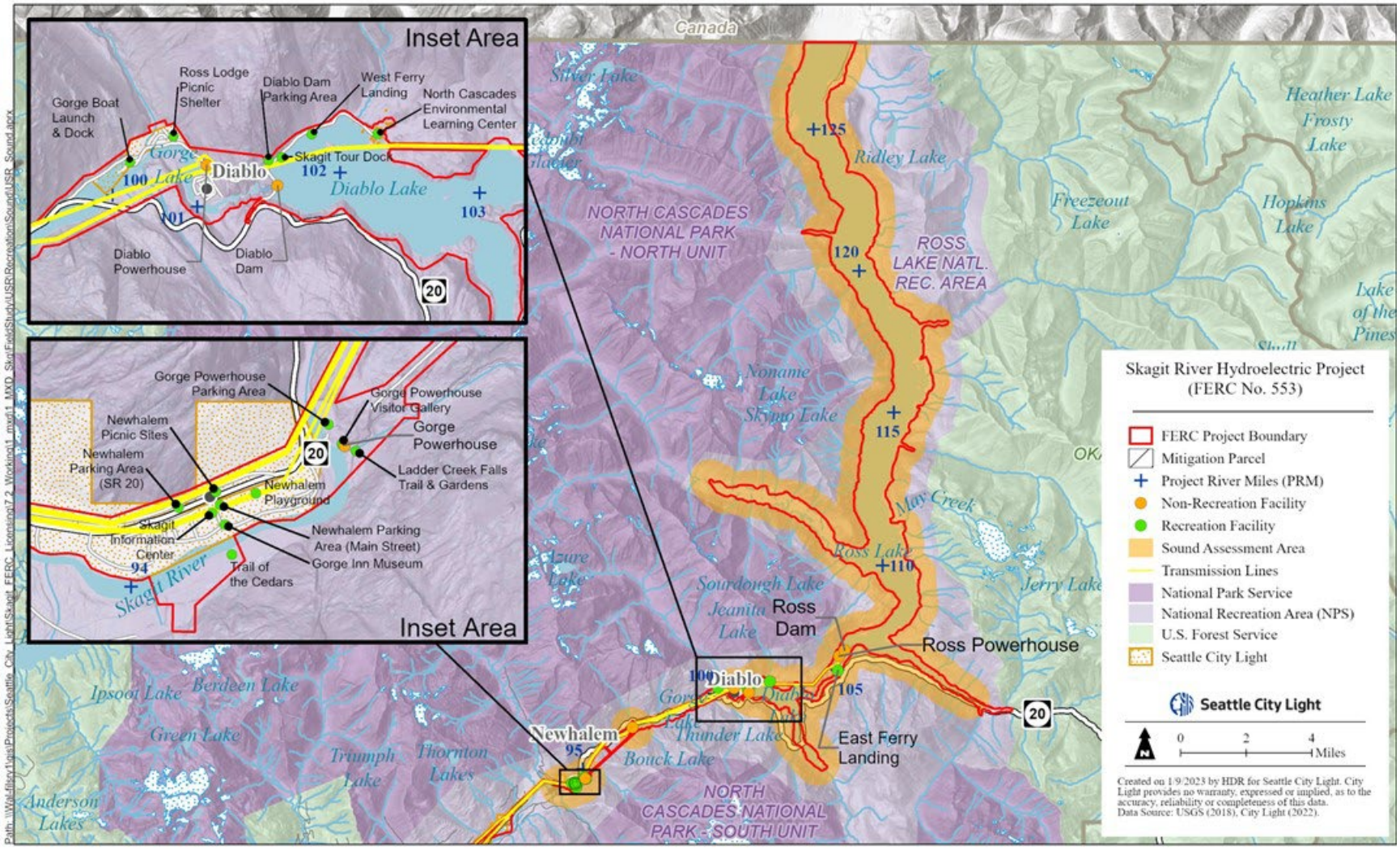


Figure 3.0-1. Project Sound Assessment study area.

4.0 METHODS

This section provides a broad overview of the Project Sound Assessment methods consisting of an inventory task, two measurement tasks, and a modeling task.

The study team developed an inventory of Project-related noise sources. Noise emissions data for those noise sources were either measured in the field, calculated based on available information about the noise sources, or obtained from publicly available and reasonably obtainable literature. The inventory also included where and when Project-related noise sources operate throughout the RLNRA.

The first noise measurement task—measuring ambient noise—showed existing noise levels and how they vary in certain portions of the study area. Those measurement locations were selected at the conclusion of a land use assessment task, in consultation with NPS and based on the extent to which they are representative of other noise-sensitive areas. In this manner, a limited number of existing noise measurement results were used to quantify existing noise levels in a wider area. These measurements had a continuous 7-day duration period, were unattended, and occurred during a summer season and a spring season, which correlate to the peak and off-peak recreation seasons, respectively.

The second noise measurement task, measuring Project-related noise, produced detailed measurements of noise emissions from stationary noise sources that are unique to the Project and continuously emit noise into the outdoor environment. Those measurement results were processed for use in the noise modeling task.

The noise modeling task estimated how Project-related noise travels and attenuates throughout the study area. This was achieved by modeling Project-related noise and creating multi-colored noise contours that were overlaid upon topographic maps or digital aerial photographs. Modeling results provided information about Project-related noise to assess potential effects on noise-sensitive land uses and locations. Those noise contour images also allow resource-specific assessments of the effects of Project-related noise on certain areas or other Project resources. Those resource-specific assessments will be presented in the final license application.

The Project Sound Assessment methods included the following steps.

4.1 Inventory and Assess Noise-Emitting Project Facilities and Activities

The study team performed an inventory of activities, buildings, and equipment that emit noise into the outdoor environment. For this task, information gathered was evaluated to determine what Project-related activities and equipment were best suited to be included in noise models. Through measurements and/or literature searches, the sound power level and spectrums of select activities and equipment were quantified for use in the modeling task. For noise sources that were not suited for modeling, the A-weighted SPL was determined at reference distances including 50, 100, and 200 feet (ft) from the noise source. Section 5.1 presents the results of the noise source inventory, the corresponding noise emissions data, and explains why some activities and equipment were suitable for modeling and others were not.

4.2 Assess Land Use

Information gathered in this task was used to select locations where long-term noise measurements would be performed. The study team reviewed land uses (areas or specific locations) within 0.6 mile of each Project dam and powerhouse, the townsite of Newhalem, one additional site on Diablo Lake, and within 500 ft of the transmission line. City Light categorized these areas and locations based on several characteristics including terrain, ground cover/vegetation, noise-sensitivity, and the overall noise environment (e.g., within 100-200 ft of a road corridor; areas surrounding campgrounds; trails away from development; etc.). Using those categories, the study team subdivided the Project Sound Assessment study area into areas with similar soundscapes and noise sensitivities. The study team then selected six locations whose characteristics were representative of other areas within the Project Sound Assessment study area and therefore were suitable candidate locations for long-term unattended noise measurements. The soundscapes at these locations were expected to be similar to soundscapes at other locations in the study area. The study team also selected six alternate locations for use if the original six locations were inaccessible; however, the alternate locations were not needed/used. The final six primary and six alternate measurement locations were reviewed and approved by NPS and City Light's cultural resources team.

4.3 Noise Measurements

The study team performed long-term (7 day) unattended noise measurements of the outdoor ambient soundscape during a summer season and a spring season, which correlate respectively to the peak and off-peak recreation seasons. The study team also measured noise emissions from selected stationary noise sources as described below.

4.3.1 Ambient Noise Measurements (Long-term)

Using the outcome of the land use assessment, the study team conducted measurements at the following six locations that were representative of other locations in the study area. These six noise monitoring locations are shown in Figure 4.3-1.

(1) Near Ross Dam and Ross Lake Resort;

(2) On Diablo Lake Trail on the north side of Diablo Lake;

(3) In the Newhalem area at Newhalem Creek Campground;

(4) In the Gorge bypass reach area;

(5) On Pyramid Lake Trail on the southwest side of Diablo Lake; and

(6) In the transmission line right-of-way near Caskey Lake.

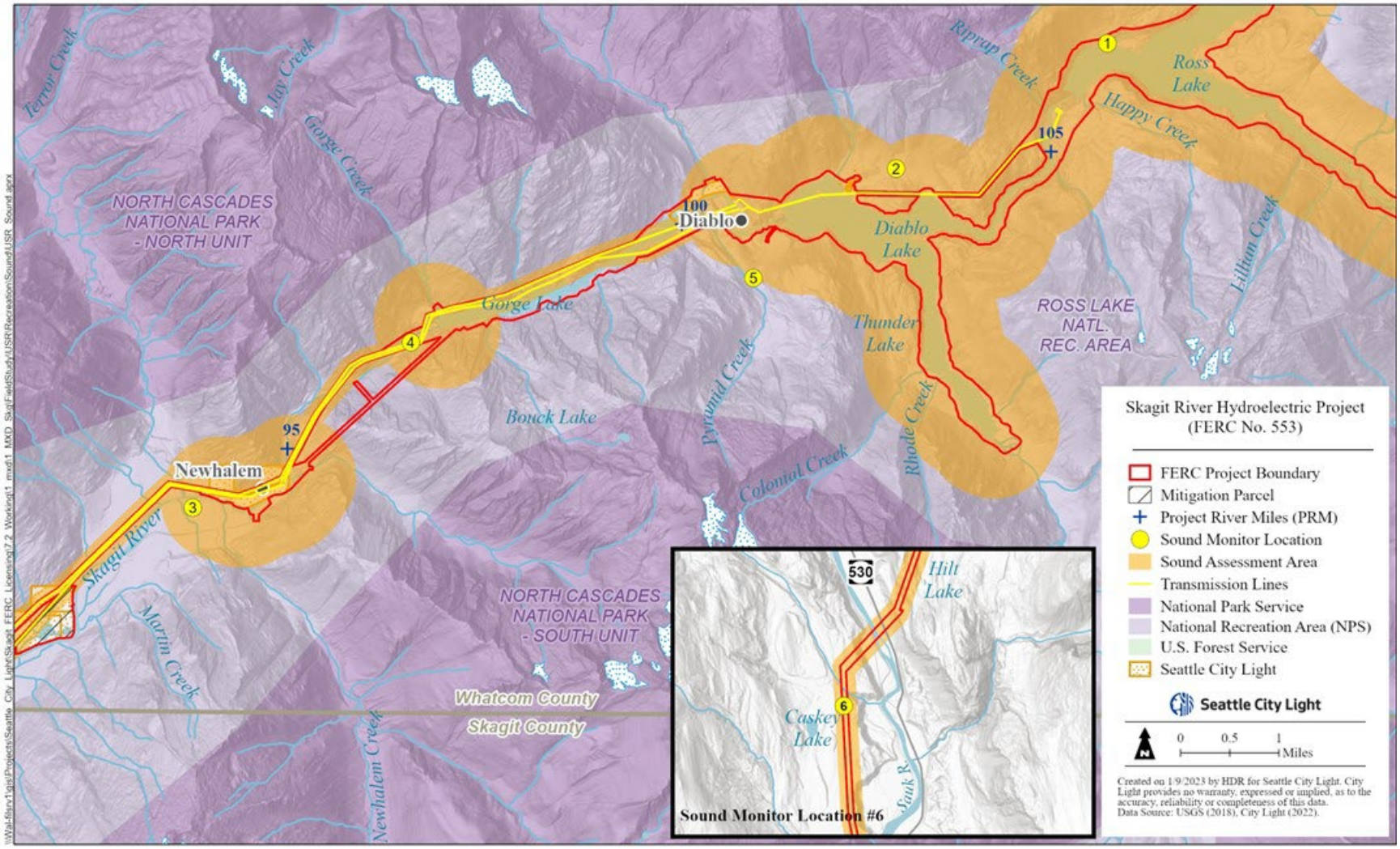


Figure 4.3-1. Ambient noise measurement monitoring locations.

The study team performed continuous 7 day, simultaneous, unattended outdoor noise measurements at these locations. The summer measurements began on August 24 and 25, 2021, and ended on September 1, 2021, to coincide with the summer recreation season. The spring measurements began on April 26, 2022, and ended on May 4, 2022, to represent off-peak use while still occurring at a time when all sites were safely accessible.

At each location, the study team used a Larson Davis Model 831C (LD 831C) real-time sound level analyzer to measure and store the noise measurement results. The LD 831C also continuously recorded a digital audio file on an external USB drive for the duration of the 7-day measurement.[3] The study team measured wind speed, wind direction, and temperature at each location using a Vaisala digital weather station. Weather station measurement data were also stored in the LD 831C. The analyzer and recorder systems were stored in weather-resistant Pelican cases during deployment. The microphone was situated at a height of approximately 5 ft. A windscreen covered the microphone, and the windscreen had a single spike on it to discourage birds from sitting on the windscreen. The power supply consisted of external batteries stored in Pelican cases. Photos of the setup at each location are included in Attachment A.

4.3.1.1 Process and Analyze 7-day Ambient Noise Measurement Results

The study team processed each hour of the 7-day noise measurement results to produce the following characterizations of hourly outdoor noise levels:

- L_{min};
- L_{max};
- L_{eq}; and
- L_{10}, L_{33}, L_{50}, and L_{90}.

Selective audio review was performed on the digital audio files to identify anthropogenic noises that occurred during the measurement periods. For each day, the study team listened to the hour-long audio file containing the L_{max} for that day and identified the source of the L_{max}. Further audio review was performed in service of determining the L_{nat}, as described in the following section.

The study team processed the 7-day noise measurement data to remove, when appropriate, certain instances, periods of time, or events from the dataset. These included:

- When the onsite weather station recorded precipitation or wind speeds greater than 11 miles per hour (mph). Per Lynch et. al. (2011), wind speeds over 11 mph contaminate the measurement result, making it unreliable;
- When the sound level meters reported overloads, which happens when measured sound levels exceed the upper level of the overall range of sound levels the meter is capable of processing. Part of the sound level meter configuration file is establishing the overall range of sound levels the meter can measure. LD 831C's have a standard range from 20 to 140 dB that can be adjusted up or down while still retaining the overall dynamic range of 120 dB;

[3] Because the LD 831C sound level analyzer was used instead of the LD 831, an Edirol R-09 digital audio recorder (as described in the RSP) was not necessary to record and store audio data.

- When Project staff were onsite setting up, inspecting, and retrieving the equipment; and
- When passers-by interacted with the sound level meters, as determined by audio review.

In these instances, the study team excluded data in increments of seconds (not minutes or hours). However, if any hour had more than 25 percent of its seconds excluded, results from that hour were excluded (NPS 2013).

4.3.1.2 Audio Review and L_{nat}

The L_{nat} is intended to represent noise levels at a site in the absence of human-made (anthropogenic) sounds. For a given hour, the hourly L_{nat} is the sound level exceeded x percent of the time, where

$$x = \frac{100 - P_H}{2} + P_H$$

P_H is the percentage of samples containing human-made sounds for a given hour. In order to determine this percentage, the audio recordings from each site were reviewed following field work. The study team reviewed the audio recordings on a basis of 10 seconds for every 2 minutes recorded. For each sample, the source or sources of any noise audible were identified to the best of the reviewer's ability. If any of those sources were anthropogenic in origin, that sample was marked as containing anthropogenic noise. Each individual hour, therefore, has its own percentage basis (P_H) for calculating that hour's L_{nat}. The first and last day of each measurement (i.e., days in which the measurement duration was less than 24 hours) were not included in the audio review, in order to focus on seven 24 hour days.

Based on the audio review, the noise-free interval was also calculated. The noise-free interval is the longest period in a given measurement in which no anthropogenic noise is heard.

4.3.2 Project-related Noise Measurements (Short-term)

As part of the noise inventory task, the study team identified several noise sources that, being unique to the Project, would be best characterized by performing short-term handheld noise measurements. These sources include the Project powerhouses, transformers, and switchyards, as well as the sirens, telephone alerts at Gorge Dam, and the locomotive bell in Newhalem.

The study team conducted noise measurements at several locations surrounding all three powerhouses, several locations near the transformers at each powerhouse, and several locations surrounding the Diablo and Newhalem switchyards. Each of these measurements lasted at least 30 seconds. For fixed point sources including the sirens, telephone alert, and locomotive bell, measurements were made at one point a fixed distance away while the noise source was sounding.

Results of the short-term noise measurements were used to characterize the noise sources for the inventory and for noise modeling. For other Project-related noise sources, the study team obtained or estimated noise emissions data from publicly available and reasonably obtainable literature, or performed modeling to establish noise emissions levels as described in the next section.

4.4 Noise Modeling

The study team performed noise modeling using the Cadna-A environmental noise modeling software to show how sound propagates (travels) away from Project-related noise sources, how features in the propagation path (terrain and ground cover type) affect propagation, and how sound attenuates (decays as it moves farther from the source) throughout the study area. The study team used the Bonneville Power Administration (BPA) CFI8X (Corona and Fields Interactive 1989 Experimental Model) spreadsheet model (BPA 1989) to estimate sound levels due to transmission line corona noise, and used a relationship developed by Lilly (2007) to estimate sound levels due to dam spills. The study team also estimated helicopter noise using the Federal Aviation Administration (FAA) Aviation Environmental Design Tool (AEDT) (FAA 2022).

4.4.1 Cadna-A Noise Modeling

The study team used Cadna-A environmental noise modeling software to model noise from Project-related noise sources located on the ground or on water. Cadna-A incorporates calculations from ISO 9613-2—the international acoustical standard for outdoor sound propagation (ISO 1996). The study team created different versions of the model to represent different Project-related noise sources and activities, but all models share the same terrain, ground surface cover, and meteorological settings.

The study team's first step in developing the noise model was importing a digital terrain map into Cadna-A that extended 2 miles beyond the powerhouses and dams, and 500 ft on either side of the transmission line centerline.[4] This digital terrain map, which depicts terrain in the study area, was overlaid with a Cartesian coordinate grid, and the model was configured to calculate noise levels at every point on the Cartesian coordinate grid at a height of 5 ft above ground. The complexity of the terrain and the areal extent (size) of the coordinate grid exceeded Cadna-A's computational capacity. To reduce the complexity of the noise model, the study team reduced the resolution of the terrain map to 40 foot contour increments.

The ground surface cover types vary throughout the Cartesian coordinate grid; therefore, the study team delineated ground cover type zones using GIS, assigned each zone a value that represented the extent to which each cover type absorbs or reflects sound, and then entered the zones into the noise model. These cover types included the acoustically reflective lake surfaces, acoustically absorptive tree and vegetated zones, reflective pavements, etc. The various ground surfaces in the Project vicinity absorb sound differently. To account for this, the study team entered ground absorption factors for each surface into Cadna-A, as shown in Table 4.4-1. Ground absorption factors range from 0 for fully reflective surfaces to 1 for fully absorptive surfaces.

[4] The terrain map was extended from 0.6 mile (the original plan) to 2 miles in response to an NPS request that modeling should propagate Project-related noise to the point where it is equivalent to the measured L_{90}. This was established as the Project-wide average L_{90} of 35 dBA.

Table 4.4-1. Ground absorption factors.

Ground Type	Ground Absorption Factor
Pavement	0.00
Water	0.00
Hard Soil	0.26
Loose Soil	0.59
Lawn	1.00
Forested Areas	1.00

Source: Federal Highway Administration (FHWA) 2004; Datakustik GmbH 2021.

The study team configured the meteorological settings in Cadna-A based on annual averages of the Project vicinity, which resulted in an ambient temperature of 10 degrees Celsius (°C) and a humidity of 90 percent being used in Cadna-A.[5] Incorporating the complex terrain, the acoustically absorptive or reflective characteristics of the ground cover, and local weather conditions allowed the model to produce realistic depictions of sound propagating from Project-related noise sources under favorable conditions for sound propagation.

Sound power level inputs for each model variant were developed from handheld measurements or estimated based on comparable manufacturer data and/or accepted engineering methods and can be found in Section 5.1. This section also describes how each noise source was represented in the Cadna-A model.

4.4.2 Corona Noise Modeling

Corona noise is generated when high voltage power lines discharge energy into the surrounding air. This noise is typically heard as a crackling or hissing, and a hum component at the frequency of the alternating current in the lines can sometimes be heard as well. The noise is strongly affected by atmospheric conditions such as humidity and precipitation. During dry conditions the noise may be nearly nonexistent, while during foggy or rainy conditions, it may be clearly audible.

The study team calculated sound levels due to corona noise from the Project transmission lines using the BPA CFI8X model (BPA 1989). The model assumes rainy conditions in order to represent corona noise levels at their loudest. Table 4.4-2 shows Project-specific inputs to the CFI8X model.

[5] Sound pressure waves travel more efficiently (there is less atmospheric absorption) in higher humidity than in lower humidity. The average humidity in the Project vicinity is near 90 percent during winter months, but 90 percent humidity conditions may occur at any time of year. Therefore, 90 percent humidity was used in the models to add realistic conservatism.

Table 4.4-2. CFI8X Corona Noise Model inputs.

Input Variable	Value
Number of lines	6
Conductors per line	1
Conductor diameter	1.14 inches
Horizontal distance between lines	30 ft
Vertical distance between lines	20 ft
Vertical distance between lowest line and ground	Varies from 30 ft to 117 ft
Line-line voltage	230 kilovolts
Phase spacing	120 degrees
Phase arrangement	1 2 3 3 2 1

Source: City Light.

The CFI8X model gives results in terms of A-weighted L_{50} levels at specified points relative to the individual lines. Comparison with geometric spreading calculations from line sources showed that at the line heights typical for this project, the model results could be represented to a good degree of accuracy (+/- 1 dB) by a single line source on the centerline of the transmission line with a height above ground equal to that of the lowest conductor. It was also determined that interaction between parallel sets of transmission lines (e.g., between the B and D lines) did not affect results enough to require the parallel sets to be modeled concurrently; therefore, each set of six individual lines (i.e., one transmission line) was modeled in Cadna-A as one line source. For a source such as corona noise that does not vary over time (assuming static conditions), the L_{50} is equivalent to the L_{eq}; therefore, results are represented as L_{eq} in Cadna-A.

4.4.3 Dam Spill Noise Modeling

When the dams are spilling, noise is created by the falling water. An empirical relationship between the flow rate of a free-falling waterfall and its sound power level is given by Lilly (2007) and shown in the equation below, where $L_{w,A}$ is the sound power level in dBA, and Q_{cfs} is the flow rate in cubic feet per second (cfs). This relationship is independent of the waterfall height, which was found to not have an effect on the sound level for waterfalls higher than 3 ft.

$$L_{w,\mathrm{A}} = 10\log(Q_{\mathrm{cfs}}) + 85$$

Overall sound power levels for each dam spill were calculated using the above equation based on flow rates for each dam as described in Section 5.1.3.1. A spectral shape (frequency distribution) was applied to the calculated sound power levels for each dam based on handheld noise measurements of the dam spill at Gorge Dam. Dam spills are represented as point sources in Cadna-A.

4.4.4 Helicopter Noise Modeling

The study team modeled Project-related helicopter noise using the FAA's AEDT (Version 3e) (FAA 2022). AEDT has several settings that affect aircraft performance profiles and sound

propagation based on meteorological data. Meteorological settings include average annual temperature, barometric pressure, and relative humidity. AEDT used the following default values for annual average weather conditions at the Newhalem Office for the noise modeling:

- Temperature: 11.5 °C;
- Air Pressure at Sea-level: 1016.89 millibars;
- Relative Humidity: 70.98 percent;
- Dew Point: 6.4 °C; and
- Wind Speed: 3.66 Knots.

AEDT uses terrain elevation data to adjust the ground level under the flight paths. The terrain data does not change the helicopter's performance or noise levels but alters the vertical distance between the helicopter and a "receiver" on the ground. The terrain also does not provide shielding effects, resulting in conservative modeling results that do not account for obstacles in the propagation path. The study team used terrain data from the U.S. Geological Survey (USGS) National Elevation Dataset with one-third arc second (approximately 33 ft) resolution in conjunction with the terrain feature of the AEDT to generate the noise contours.

AEDT requires the use of specific noise and performance data for each helicopter type commonly used. Noise data is in the form of sound exposure level at a range of distances (from 200 ft to 25,000 ft) from a particular helicopter with engines at a range of thrust levels. Performance data include thrust, speed, and altitude profiles for takeoff and landing operations.

Aside from identifying the aircraft type in the database, AEDT has standard aircraft flight profiles for takeoff and landing operations. As none of these profiles match the helicopter flight operations required for the Natural Resources Conservation Service Snow Telemetry (SNOTEL) surveys, the study team developed custom profiles for each flight route. The altitude and speed profiles for each flight route are shown in Section 5.1.4.

5.0 RESULTS

5.1 Noise Inventory

In pursuit of the Project Sound Assessment study goals, the study team performed an inventory of Project facilities, equipment, and activities that create noise. The study team performed an extensive review of the items in the inventory to understand where the items are used, durations of use, how many noise sources can reasonably be expected to be in use concurrently, and how their noise emissions data could be evaluated in order to fulfill the goal of the noise study (i.e., develop estimates of Project-related noise). The study team organized the noise source inventory results into the following categories:

- Continuous noise sources;
- Mobile terrestrial noise sources;
- Stationary noise sources;
- Helicopters;
- Boats; and
- Variable noise sources.

This section lists each of the Project-related noise sources in each category, along with their noise characteristics and how those noise characteristics were determined.

5.1.1 Continuous Noise Sources

Noise sources that emit noise continuously from a fixed position are categorized as continuous noise sources. Project-related noise sources in this category include the Ross, Diablo, and Gorge powerhouses, transformers associated with each powerhouse, the Diablo and Gorge switchyards, and corona noise from the transmission lines (which varies based on precipitation and humidity). Noise models are an effective way to show how sound propagates away from this type of source, so these sources are all represented in Cadna-A in the Continuous Noise Source model. Noise contour results from this model are discussed in Section 5.4.1 and shown in Attachment C.

5.1.1.1 Powerhouses

The turbines, generators, and other equipment inside each powerhouse emit noise when operating, which is transmitted through the exterior walls and roof of the powerhouse. This noise was quantified by measuring noise emissions at multiple points outside of each building. For the purposes of noise modeling, the building surfaces are characterized as horizontal area noise sources (roof) and vertical area noise sources (walls). To calculate the spectral sound power level of these sources for use as model inputs, the noise measurements were combined with the powerhouse dimensions.

Table 5.1-1 shows the physical dimensions of each powerhouse as represented in the noise model. Table 5.1-2 shows the resulting spectral sound power levels for each area noise source (wall or roof) at each powerhouse.

Table 5.1-1. Powerhouse dimensions.

Powerhouse	Length (ft)	Width (ft)	Height (ft)
Ross	280	130	60
Diablo	94.67	230.67	60
Gorge	280	120	60

Source: Johnson 2010.

Table 5.1-2. Spectral sound power levels for powerhouse facades.

Building Façade Name	Sound Power Level (dB re: 1 pW)										
	Octave Band Center Frequency (Hz)										
	31.5	63	125	250	500	1,000	2,000	4,000	8,000	dBA	Linear Weighting (Lin)
Ross West	92.3	92.7	95.9	101.9	96.4	89.5	85.2	76.9	69.1	97.6	104.6
Ross East	92.3	92.7	95.9	101.9	96.4	89.5	85.2	76.9	69.1	97.6	104.6
Ross North	85.5	87.4	89.3	83.7	79.9	75.2	69.3	58.7	52.8	81.7	93.3
Ross South	97.0	98.2	99.4	96.1	90.5	88.5	82.0	72.0	60.7	93.6	104.2
Ross Roof	91.7	93.6	95.5	89.9	86.1	81.4	75.5	64.9	59.0	87.9	99.5
Diablo West	102.4	97.1	93.2	89.6	82.6	78.3	74.1	69.6	68.1	86.0	104.1
Diablo East	104.1	98.1	92.0	86.7	83.0	79.6	77.1	71.1	66.7	86.0	105.4
Diablo North	107.1	102.6	98.2	95.4	90.5	87.3	83.4	78.8	75.8	93.4	109.1
Diablo South	107.1	102.6	98.2	95.4	90.5	87.3	83.4	78.8	75.8	93.4	109.1
Diablo Roof	109.6	105.1	100.7	97.9	92.9	89.8	85.9	81.3	78.3	95.9	111.6
Gorge West	96.4	96.2	94.3	86.5	83.8	78.3	74.3	67.8	58.9	85.6	100.8
Gorge East	100.8	105.9	105.1	100.4	96.8	94.1	91.4	87.3	80.1	99.9	110.2
Gorge South	102.6	106.8	105.9	101.0	97.4	94.6	91.9	87.7	80.5	100.5	111.1
Gorge North	103.3	106.8	99.3	96.0	96.9	91.5	87.1	80.5	72.4	97.4	109.5
Gorge Roof	102.6	107.4	98.2	94.8	96.6	86.2	79.6	73.6	66.2	95.4	109.4

5.1.1.2 Powerhouse Transformers

Each powerhouse also has a set of transformers abutting the building façade. These transformers are modeled as point noise sources. The study team measured noise emissions from the transformers and used those results to develop sound power levels for use in the noise model. Table 5.1-3 shows sound power levels for the transformers.

Table 5.1-3. Spectral sound power levels for powerhouse transformers.

	Sound Power Level (dB re: 1 pW)										
	Octave Band Center Frequency (Hz)										
Transformer Name	31.5	63	125	250	500	1,000	2,000	4,000	8,000	dBA	Lin
Ross Transformers (Main)	83.7	89.7	91.7	86.7	86.7	80.7	75.7	70.7	63.7	87.1	95.7
Ross Transformers (Auxiliary)	86.4	87.4	87.2	81.5	80.3	76.8	72.4	66.5	58.2	82.1	92.6
Diablo Transformers	103.4	99.3	94.7	92.3	91.8	90.2	86.6	83.2	78.1	94.8	105.8
Gorge Transformers	84.5	85.6	94.7	84.9	75.7	72	63.3	55.5	50.9	81.8	96

Table 5.1-3 has two entries for the transformers at Ross Powerhouse. Ross Powerhouse has eight transformers, six of which are located on the bank of Diablo Lake (the main transformers). Due to the location, the study team was unable to safely measure noise from these six transformers. Instead, sound power levels for the main transformers at Ross Powerhouse were calculated based on transformer specifications. The remaining two auxiliary transformers at the Ross Powerhouse are located along the south façade of the Ross Powerhouse, and the study team measured noise emissions from those transformers for use in developing the sound power level estimates shown in Table 5.1-3. The other powerhouses also have auxiliary transformers, but due to their limited accessibility, the noise contribution from these transformers had to be included with the powerhouse façade sound power levels shown in Table 5.1-2.

5.1.1.3 Switchyards

Switchyards are located near the Diablo Powerhouse and in Newhalem across the Skagit River from the Gorge Powerhouse. There are numerous components distributed throughout each switchyard that emit noise; therefore, the switchyards are modeled as area sources. The study team measured noise around the perimeter of each switchyard and used that data to develop sound power levels for use in the noise model. Table 5.1-4 shows the spectral sound power levels for each switchyard.

Table 5.1-4. Spectral sound power levels for switchyards.

	Sound Power Level (dB re: 1 pW)										
	Octave Band Center Frequency (Hz)										
Switchyard Name	31.5	63	125	250	500	1,000	2,000	4,000	8,000	dBA	Lin
Diablo Switchyard	-	93.1	89.7	86.4	87.5	87.9	54.7	79.8	79.6	91.9	97.1
Newhalem Switchyard	-	102.2	97.9	90.4	85.8	83.0	80.2	78.7	80.8	90.2	103.9

Dash (-) denotes negligible sound power present in this octave band.

5.1.1.4 Transmission Lines

Transmission lines run from Ross Powerhouse to the Diablo and Newhalem switchyards, and then to City Light's Bothell substation. Overall noise emissions for the transmission lines were calculated using the CFI8X model (BPA 1989) as described in Section 4.4.2, and the frequency distribution was determined through analysis of peak periods of corona noise measured at the Caskey Lake ambient noise measurement location (Sound Monitoring Location No. 6). The spectral sound power level per meter of transmission line is shown in Table 5.1-5 below.

Table 5.1-5. Spectral sound power level for transmission line.

	Sound Power Level (dB / m, re: 1 pW)										
	Octave Band Center Frequency (Hz)										
Name	31.5	63	125	250	500	1,000	2,000	4,000	8,000	dBA	Lin
Transmission Line	-	-	60.0	52.4	51.3	54.5	58.4	59.6	59.7	65.0	66.3

Dash (-) denotes negligible sound energy present in this octave band.

Line heights above ground vary throughout the transmission line corridor, with local minimums occurring approximately at the midpoint between transmission line towers (line sag). To avoid unnecessary detail while retaining conservatism, the corridor was broken into segments with different average minimum heights for each segment, and each segment was modeled as a line source with that height in Cadna-A. These heights are shown in Table 5.1-6.

Table 5.1-6. Transmission line average minimum heights by segment.[1]

Location	Line B		Avg Min Height (ft)	Line D		Avg Min Height (ft)
	Start Tower	End Tower		Start Tower	End Tower	
Bothell to Darrington	Bothell	B20/30N	30[1]	Bothell	D20/30N	30
	B20/30N	B21/43N	45	D20/30N	D21/36N	42
	B21/43N	B23/10N	74	D21/36N	D25/31N	58
	B23/10N	B25/33N	54			
	B25/33N	B27/32N	52	D25/31N	D29/19N	49
	B27/32N	B29/39N	55			
	B29/39N	B31/50N	62	D29/19N	D31/50N	55
	B31/50N	B34/11N	43	D31/50N	D34/11N	50
	B34/11N	B37/32N	56	D34/11N	D37/32N	57
	B37/32N	B39/21N	48			
	B39/21N	B39/49N	65			
	B39/49N	B46/42N	43	D37/32N	D46/42N	44
Darrington to Marblemount	B46/42N	B49/07N	41	D46/42N	D49/27N	39
	B49/07N	B50/24N	44	D49/27N	D50/02N	40
	B50/24N	B52/16N	49	D50/02N	D50/31N	43
	B52/16N	B53/18N	42	D50/31N	D54/38N	51
	B53/18N	B54/38N	62			

Location	Line B		Avg Min Height (ft)	Line D		Avg Min Height (ft)
	Start Tower	End Tower		Start Tower	End Tower	
	B54/38N	B56/26N	42	D54/38N	D57/10N	68
	B56/26N	B58/04N	102			
	B58/04N	B62/18N	52	D57/10N	D62/33N	82
	B62/18N	B63/50N	43	D62/33N	D64/24N	49
	B63/50N	B65/02N	57	D64/24N	D64/45N	78
Marblemount to Newhalem	B65/02N	B69/48N	41	D64/45N	D70/17N	41
	B69/48N	B79/19N	83	D70/17N	D77/21N	62
	B79/19N	B80/29N	81	D77/21N	D81/30N	61
	B80/29N	B81/23N	50			
Newhalem to Diablo	B81/24N	B85/38N	98	D81/30N	Diablo Switchyard (end of Line D)	117
Diablo to Ross	B85/38N	B87/19N	71	N/A		
	B87/29N	B87/46N	96			
	B87/46N	B88/39N	110			
	B88/39N	B89/09N	97			
	B89/09N	B90/14N	117			
	B90/14N	Ross (end of Line B)	107			

Source: City Light.

1 Line C runs from the Bothell substation approximately 0.7 mi northeast to tower 0/32N and was modeled at 30 ft average minimum height for its entire length.

5.1.2 Mobile Terrestrial Noise Sources

Noise sources that primarily emit noise when travelling on land from one location to another are categorized as mobile terrestrial noise sources. Project-related noise sources in this category include passenger and vehicles with features that serve specific, specialized functions, owned and operated by City Light. Non-terrestrial mobile sources, such as helicopters and boats, are covered in their own respective categories in Sections 5.1.4 and 5.1.5.

City Light estimated noise emissions for these vehicles using the FHWA's Reference Energy Mean Emission Levels (REMELs). REMELs are the vehicle spectral noise emission levels used in FHWA's traffic noise model (TNM), which is used by all states to analyze traffic noise impacts and abatement measures. In TNM, all roadway vehicles are classified into one of five categories: cars, medium trucks, heavy trucks, buses, and motorcycles. All of City Light's vehicles can be categorized as either cars, medium trucks, or heavy trucks. Cars are all vehicles with two axles and four tires. Medium trucks are cargo vehicles with two axles and six tires. Heavy trucks are cargo vehicles with three or more axles. A list of vehicles operated by City Light at the Project as of July 13, 2021 is given in Table 5.1-7 below, including the make and model of the vehicle, a brief description, the quantity of vehicles of that type, and the TNM category of the vehicle.

Table 5.1-7. Mobile terrestrial noise source inventory.

Make and Model	Description	Quantity	TNM Category
Passenger Vehicles			
Ford F350	Pickup truck	10	Car
Ford F250	Pickup truck	14	Car
Ford F150	Pickup truck	8	Car
Ford Transit-350	High roof cargo van	1	Car
Ford Transit Connect	Cargo minivan	2	Car
Ford E150	Cargo van	3	Car
Ford E250	Cargo van	1	Car
Ford Escape	Compact hybrid SUV 4x4	8	Car
Chevy Express	Cargo/passenger van	2	Car
Chevy Silverado	Pickup truck	1	Car
Mercedes Sprinter	Cargo van	1	Car
Non-Passenger Vehicles			
Ford F450	Truck with service body	3	Medium Truck
Ford F550	Truck with 40 ft aerial Versalift SVC Body	1	Medium Truck
Ford F550	Wildfire unit	1	Medium Truck
Peterbilt 367	Truck tractor	1	Heavy Truck
Peterbilt 365	Dump truck	1	Heavy Truck
Peterbilt 335	Dump truck	3	Heavy Truck
Peterbilt 335	Truck (hook lift, multibody)	1	Heavy Truck
Peterbilt 335	Truck cab chassis	1	Heavy Truck
Freightliner FL80	Dump/sander/plow truck	1	Heavy Truck

Source: City Light; FHWA 2019.

For Project-related activities, City Light operates a total of 20 vehicle types, with a total of 64 individual vehicles (11 passenger vehicle types with 51 individual vehicles, including vans and pickup trucks; and 9 non-passenger truck types of varying sizes and purposes, with 13 individual vehicles). While the fleet of vehicles exists in the study area, the vehicles are never all operated simultaneously, their use is neither constant nor continuous, and they are not operated in predictable locations (other than travelling between locations on State Route [SR] 20) or regular patterns of activity. As a result, it is difficult to depict their use in a noise model and therefore these vehicles were not included in a Cadna-A noise model. Instead, the study team developed representative sound levels at fixed distances for each vehicle type. For each of the five vehicle categories, FHWA has REMEL data for different pavement types and speeds. The pavements in the study area are primarily asphalt, and noise levels generally increase as speed increases. Table 5.1-8 shows examples of SPL at reference distances based on the FHWA REMELs.

Table 5.1-8. Maximum pass-by SPL in dBA for vehicles on asphalt by speed.

Speed	Location on SR 20	TNM Category	SPL at 50 ft	SPL at 100 ft	SPL at 200 ft
30 mph	Within Newhalem	Car	68	65	62
		Medium Truck	75	72	69
		Heavy Truck	81	78	75
45 mph	East of Newhalem	Car	71	68	65
		Medium Truck	78	75	72
		Heavy Truck	83	80	77
50 mph	West of Newhalem and near Diablo Lake	Car	72	69	66
		Medium Truck	79	76	73
		Heavy Truck	84	81	78
60 mph	Ross Lake and eastward	Car	75	72	69
		Medium Truck	81	78	75
		Heavy Truck	86	82	79

Source: FHWA 2019.

The 20 City Light vehicle types (SUVs, vans, pickup trucks, and heavy trucks) are similar to non-City Light vehicles that travel through the study area. The number of vehicles driving in the study area reaches a peak in summer during the height of the recreational season. Traffic volumes decrease in fall, winter, and spring. As a safety precaution, the Washington Department of Transportation closes a section of SR 20 in mid-November when weather and avalanche danger threaten the safety of drivers and maintenance crews. The road may close earlier depending on winter weather conditions. The closure points are typically milepost 134/Ross Dam Trailhead and milepost 171/Silver Star Gate, and the roadway is generally re-opened by the following May (WSDOT 2021). NPS performs traffic counts at different locations throughout RLNRA. Table 5.1-9 shows NPS average daily traffic counts at three locations along SR 20 in the study area, for the last six years (2017 through 2022, excluding November and December 2022).

Table 5.1-9. Average daily traffic counts from 2017-2022.

Location	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
East Boundary SR 20 Entering the Park (milepost 139)	0	0	0	54	489	782	905	813	867	673	84	19
West Boundary SR 20 Entering the Park (milepost 111)	88	105	119	175	828	1,197	1,693	1,417	1,262	946	198	101
Diablo Lake Overlook (milepost 132)	14	12	19	50	280	499	842	597	497	296	47	16

Source: NPS 2022.

Of the above locations, the West Boundary is most representative of where City Light vehicles travel due to proximity to Project facilities. During summertime, when tourist season peaks, the 64 City Light vehicles represent at most up to 8 percent of the overall average daily traffic volume at that location (this is a conservative over-estimate, as all 64 vehicles do not operate simultaneously). During non-peak seasons (fall, winter, and early spring), City Light vehicles comprise a larger fraction of the total volume of vehicles in the study area because there are fewer non-City Light vehicles in the study area. In particular, during January, February, March, and December, the average daily traffic volume at the West Boundary is comparable to the total number of City Light vehicles, with the 64 total City Light vehicles representing a maximum of 73 percent of the overall traffic (with the caveat again that all 64 vehicles are never operated simultaneously). Therefore, City Light-owned vehicles may be more noticeable during non-peak recreational seasons even though the fleet is the same size as it is during other times of the year.

5.1.3 Stationary Noise Sources

Noise sources that are in a fixed location but do not emit noise continuously are categorized as stationary noise sources. Project-related noise sources in this category include water spills from the dams, sirens, telephone alerts, the locomotive bell in Newhalem, and emergency generators. Each of these are discussed below.

5.1.3.1 Dam spill

Each of the three dams periodically discharges water through the spillways. The resulting waterfall generates noise. Section 4.4.3 explains how the study team determined the sound power level of the waterfall. Table 5.1-10 shows the modeled flow rates and corresponding sound power levels for each dam. City Light provided dam spill flow rates from 1997 through 2022. At each dam, the study team modeled the overall maximum spill rate, and the average annual maximum spill rate for years where the annual maximum was at least 1,000 cfs. Note that annual maximum spill rates cover a wide range of cfs, with only 4, 7, and 5 years (at Ross, Diablo, and Gorge dams, respectively) in that 26-year range having maximum rates in excess of 10,000 cfs. Additionally, the annual maximum flow was occasionally below 1,000 cfs at each dam, particularly at Ross Dam.

Table 5.1-10. Sound power level and modeled flow rate for dam spills.

Dam Name	Avg. and Annual Max. Flow Rate (cfs)	Sound Power Level (dB re: 1 pW)										
		Octave Band Center Frequency (Hz)										
		31.5	63	125	250	500	1,000	2,000	4,000	8,000	dBA	Lin
Ross	8,692	128	123	119	119	119	119	118	116	107	124	131
	18,595	132	126	123	122	123	123	121	119	110	128	134
Diablo	9,333	129	123	120	119	120	120	118	116	107	125	131
	25,946	133	127	124	123	124	124	123	120	112	129	136
Gorge	9,550	129	123	120	119	120	120	119	116	108	125	131
	24,072	133	127	124	123	124	124	123	120	112	129	136

Source: City Light.

The study team modeled dam spill events as point sources located at the base of each spillway and at the base of each waterfall. One set of contours was created for the average annual maximum spill rate at each dam, and another set for the overall maximum spill rate at each dam. Modeled noise contour results for the dam spill events as described above are shown in Attachment C and discussed in Section 5.4.2.

5.1.3.2 Sirens

There are seven sirens located throughout the study area, each mounted to an approximately 50 ft tall pole. There are three sirens in Newhalem, three in Diablo, and one at the Environmental Learning Center (this siren is not currently in use). These sirens operate in several different modes, and always sound simultaneously:

- Noon siren: The sirens are sounded at noon every day for approximately 8 seconds.
- Dam failure siren: The sirens are sounded in a "whoop"/pause pattern for approximately 3 minutes. This occurs as an annual test, as well as after any work on the siren system is performed, both of which would occur during working hours. As an emergency warning, it could occur any time of the day or night.
- Emergency 911 siren: The sirens are sounded continuously for 1 minute to summon emergency response. This could occur at any time of the day or night.

Each of these events uses the same tone and volume of siren; the only difference between them is the duration of siren operation. Thus, all siren operation can be depicted in a noise model showing the L_{max} during a siren event. The maximum spectral sound power level of the sirens was determined from noise measurements of the siren near the City Light administration building in Newhalem and the siren near the tennis courts in Diablo and is shown in Table 5.1-11 below. Each of the seven sirens is assumed to have the same sound power level. Modeled noise contour results for the sirens are shown in Attachment C and discussed in Section 5.4.4.

Table 5.1-11. Maximum spectral sound power level for siren.

	Maximum Sound Power Level (dB re: 1 pW)										
	Octave Band Center Frequency (Hz)										
Noise Source	31.5	63	125	250	500	1,000	2,000	4,000	8,000	dBA	Lin
Each Siren	-	-	-	103.2	151.99	123.5	131.4	127.6	107.7	148.9	152.0

Dash (-) denotes negligible sound energy present in this octave band.

5.1.3.3 Telephone Alerts

Each dam has telephone horns or speakers that sound to alert staff onsite to answer an exterior telephone. These are used primarily between 6:30 am and 4:30 pm, most often from Monday through Thursday. They can also be used Friday through Sunday if City Light staff are working outside of routine hours. The duration of each telephone alert varies, sometimes sounding for as long as 12-15 rings.

The nature of the alert sound and the speaker or horn varies at each dam. At Gorge Dam, the spectral sound power level of the telephone alerts was calculated from handheld measurements. At Ross and Diablo dams, the spectral sound power levels of the telephone alerts were calculated based on manufacturer data for comparable speakers and videos of the alert sounds. Spectral sound power level for each alert is shown in Table 5.1-12 below. The telephone horns and speakers were modeled in Cadna-A as point sources with directivity applied. Directivity affects the way sound propagates out from a point source at different angles; for example, a speaker typically sounds louder directly in front of it than behind it. Directivity for each of the speakers or horns was determined from manufacturer data for comparable equipment and applied in the Cadna-A model based on the orientation of the speaker or horn at each location. Similar to the sirens, although the duration of the telephone rings may vary, the maximum sound level when they are ringing remains the same. Therefore, the telephone alerts were modeled in Cadna-A on an L_{max} basis. Modeled noise contour results for the telephone alerts are shown in Attachment C and discussed in Section 5.4.4.

Table 5.1-12. Maximum spectral sound power level for telephone alerts.

Noise Source (at dam)	Maximum Sound Power Level (dB re: 1 pW)										
	Octave Band Center Frequency (Hz)										
	31.5	63	125	250	500	1,000	2,000	4,000	8,000	dBA	Lin
Ross Telephone	-	-	-	-	90.1	121.1	95.1	90.1	70.1	121.1	124.1
Diablo Telephone	-	-	-	-	-	-	92.3	102.3	-	103.7	102.7
Gorge Telephone	-	-	-	97.1	108.6	110.0	114.8	111.3	108.6	118.8	118.4

Dash (-) denotes negligible sound energy present in this octave band.

5.1.3.4 Number 6 Locomotive Bell

A historic steam locomotive owned by City Light is located in Newhalem near the visitor center. The locomotive has a bell which may be manually rung by visitors. This may occur at any time, and typically occurs during the daytime hours. As a result, it is difficult to depict the use in a noise model and therefore the locomotive bell was not included in a Cadna-A noise model. Instead, handheld noise measurements of the bell were used to calculate the expected SPL of the bell at various distances from the bell assuming unimpeded noise propagation over flat, reflective ground, as shown in Table 5.1-13 below.

Table 5.1-13. Locomotive bell noise.

Distance from Bell (ft)	SPL (dBA)
50	82
100	76
200	70

5.1.3.5 Emergency generators

City Light owns and operates eight backup emergency generators throughout the Project vicinity as shown in Table 5.1-14. Each generator is tested at regular intervals to ensure operational status during the year. Other than this testing, generators are only operated in the event that primary power to a location is lost, which is unpredictable but infrequent.

Table 5.1-14. Emergency generators.

Generator Location	Enclosure Structure	HP[1] rating	Testing Schedule
Ross Dam	Concrete room beneath dam roadway	277	6 minutes, monthly
Ross Powerhouse	Accessory building on northeast corner of powerhouse	750	6 minutes, monthly
Diablo Dam	Headgate building on dam	166	15 minutes, weekly
Diablo Powerhouse[2]	Outside entrance to powerhouse	59	15 minutes, monthly
Gorge Dam[3]	Roadway on top of dam	134	15 minutes, weekly in winter and monthly in summer
Gorge Powerhouse	Inside powerhouse, in the "high room"	590	Has not run since 2015, will be repaired or replaced
Newhalem Admin Office	Outside admin office	99	60 minutes, quarterly
Newhalem Sewage Treatment Plant	Outside treatment plant	99	60 minutes, weekly

Source: City Light.
1 HP = Horsepower.
2 Temporary emergency generator.
3 Temporary emergency generator (will be replaced by 173 HP enclosed emergency generator).

With the exception of the two temporary emergency generators, all of the emergency generators are inside buildings or enclosures, and their noise emissions are attenuated by the buildings or enclosures they reside in. Therefore, their noise emissions are not characterized in detail and were not modeled. The temporary emergency generators will be removed when the permanent generators are repaired or replaced, and therefore its noise emissions also were not characterized or modeled.

5.1.4 Helicopters

Project-related helicopter use is infrequent; the only routine helicopter flights are those associated with SNOTEL maintenance checks conducted in early April. On occasion City Light may also deploy helicopters to transport staff to Project locations when they become inaccessible by land or water, such as between Newhalem and Diablo, Ross Powerhouse, Ross Dam, or Hozomeen, or to conduct reservoir rim patrols.

City Light contracts for helicopter support with Northwest Helicopters LLC. They fly the Bell 206B Jetranger helicopter, usually at around 80 knots. Altitude generally ranges from 500 to

1,000 ft above the terrain unless low clouds prevent flying at that altitude. They typically do not hover or idle; rather, they fly to the destination, and if a crew needs to land, the helicopter either drops them off and returns later, or the helicopter lands, shuts off, and waits for the crew to finish. The standard route flown by helicopter pilots is to follow lower terrain along SR 20 or waterbodies, including Project reservoirs and rivers and creeks. Helicopter pilots minimize flight time and fly direct routes until flight paths approach mountains where higher elevations are required.

Two helicopter routes were selected for modeling using the AEDT software. The first route proceeds from the helipad in Newhalem, up the Gorge bypass reach, along Gorge and Diablo Lakes, and up Ross Lake to Hozomeen. The second route follows the same path but splits off over Ross Lake to proceed up the Big Beaver Creek valley to the Big Beaver Creek Trail and Big Beaver Creek Pass SNOTEL stations. The Big Beaver Creek route was selected because it passes near an area of concern for wildlife. For both routes, the modeled flight path was located near the centerline of waterbodies. Figure 5.1-1 shows the flight altitude above mean sea level (altitude MSL) compared to the ground elevation for the Hozomeen route along the route distance in nautical miles (nmi); Figure 5.1-2 shows the speed profile along the route distance. The helicopter routes are depicted in the noise contour figures in Attachment C.



Figure 5.1-1. Flight altitude and ground elevation for helicopter route from Newhalem to Hozomeen Camp.

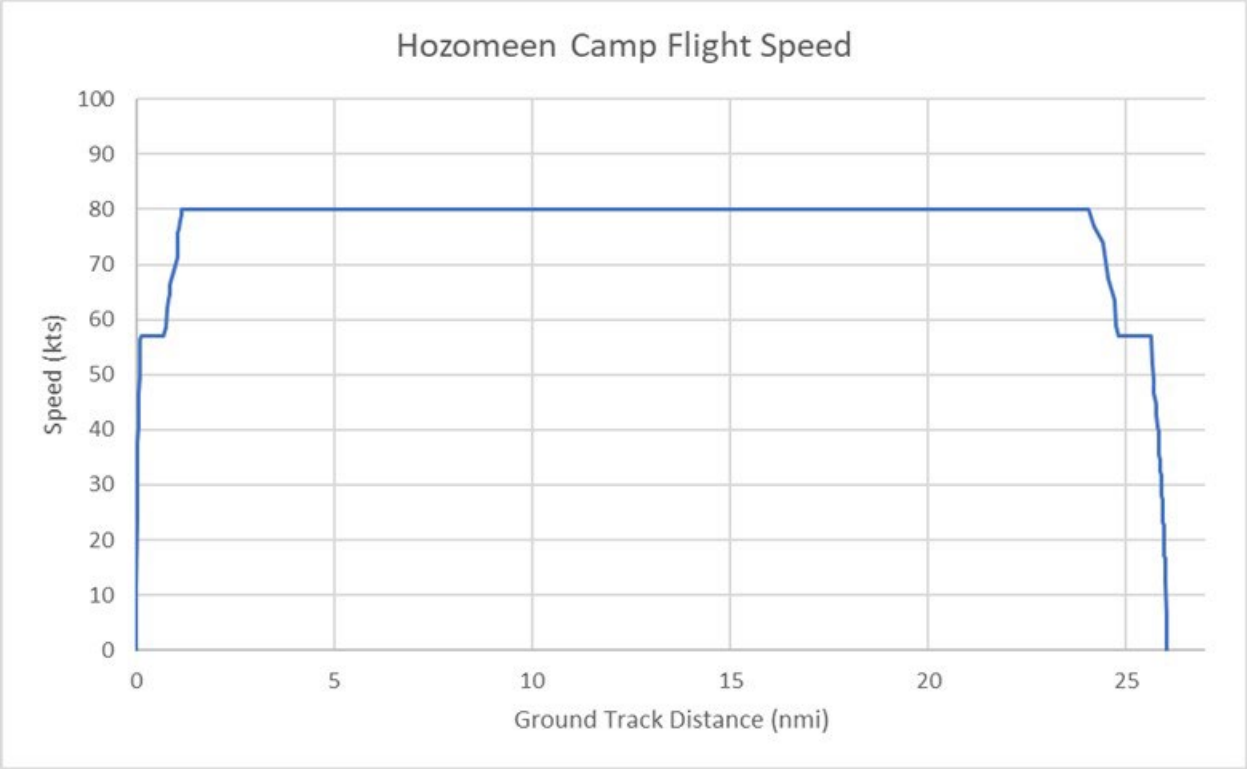


Figure 5.1-2. Flight speed profile for helicopter route from Newhalem to Hozomeen Camp.

The flat elevation for the latter part of this route corresponds to the portion of the route over Ross Lake. The speed profile is constant at 80 knots for most of the flight, with brief periods at 57 knots just after takeoff and just before landing.

Figure 5.1-3 shows the flight altitude compared to the ground elevation for the Big Beaver Creek route; Figure 5.1-4 shows the speed profile.

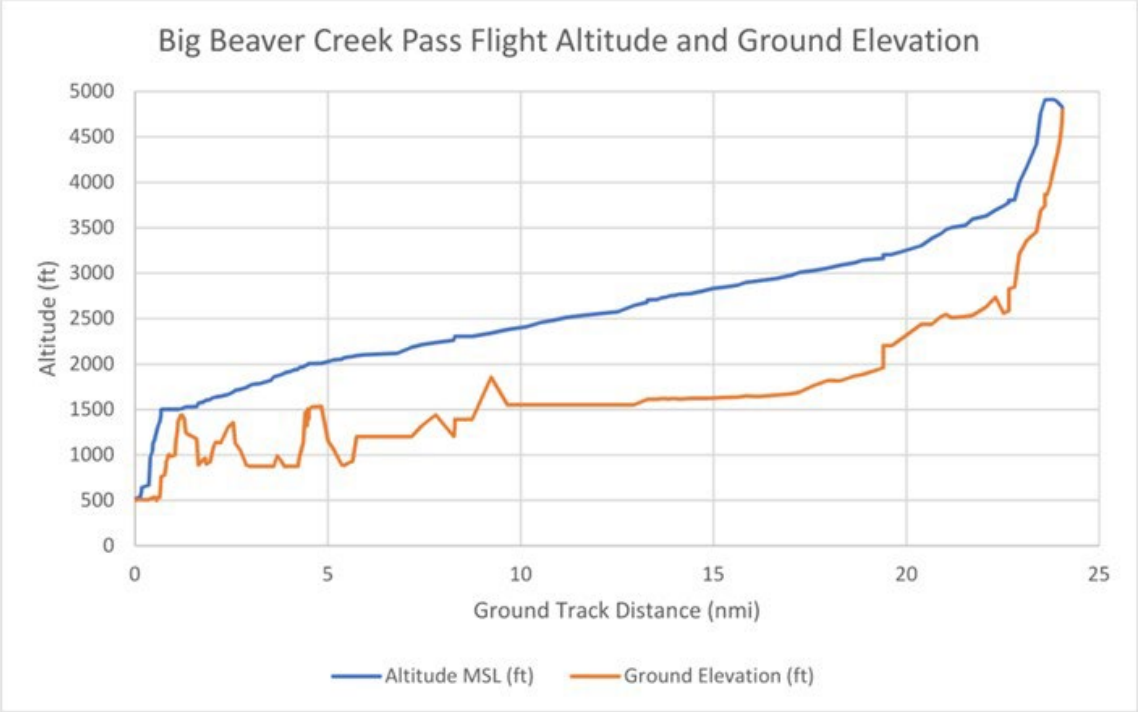


Figure 5.1-3. Flight altitude and ground elevation for helicopter route from Newhalem to Big Beaver Creek Pass SNOTEL site.

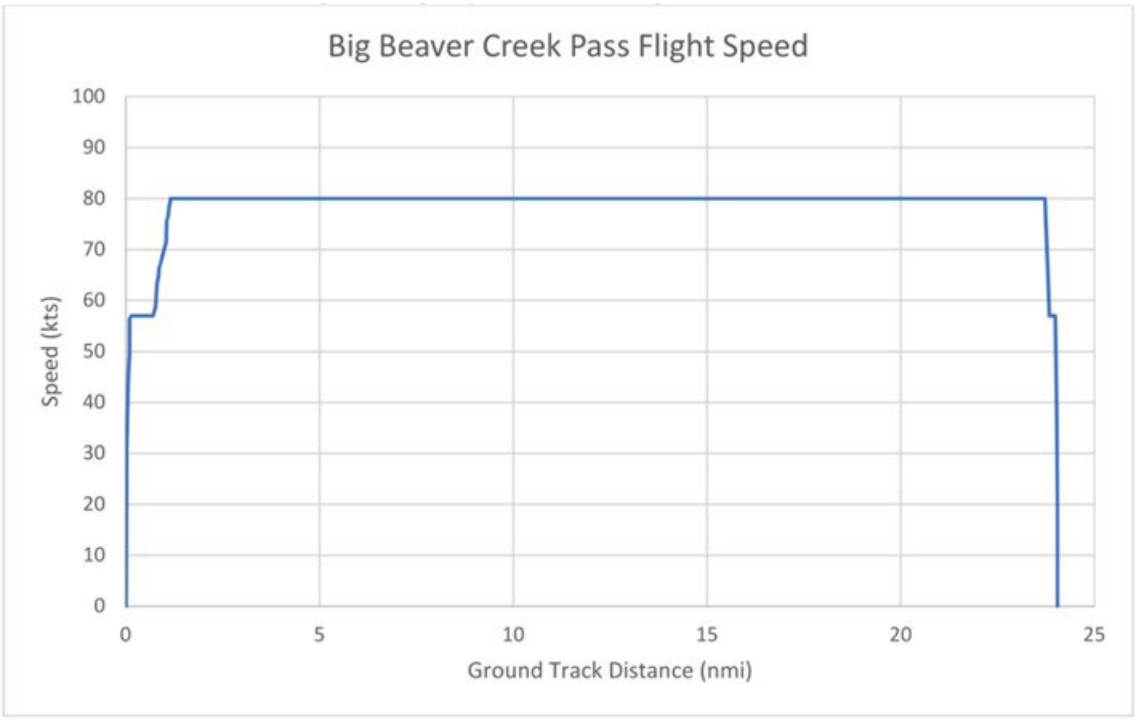


Figure 5.1-4. Flight speed profile for helicopter route from Newhalem to Big Beaver Creek Pass SNOTEL site.

The first half of the Big Beaver Creek route is identical to the Hozomeen Route. Partway up Ross Lake, the flight path diverges up the Big Beaver Creek valley, ending at the Big Beaver Creek Pass SNOTEL site on the mountainside, as reflected in the elevation profile. The speed profiles for both routes are similar.

Since helicopter flights are infrequent and involve only one helicopter at a time, the L_{max} during a single helicopter pass-by was modeled. Noise contour results for each of the two routes are shown in Attachment C and discussed in Section 5.4.5.

5.1.5 Boats

City Light owns and operates numerous boats that are used for a variety of different activities, with different frequencies and areas of use. These boats are listed in Table 5.1-15, which gives a summary of the typical use for each boat, and an estimate of the maximum SPL at reference distances during a boat pass-by, based on the HP rating, engine type (inboard vs. outboard), and expected water noise based on hull size and typical operating speed. Detailed information on acoustic treatment for each boat such as mufflers, hull construction, and other factors that may affect noise was not available for every boat, so the SPL values reported in the table represent an estimate based on available data. Note that while SPL values among different boats may appear similar, this does not necessarily mean they sound the same, as boat engine noise includes low-frequency components that may not be reflected in overall dBA levels.

Table 5.1-15. Boat inventory.

Boat Description	Typical Use	Engine Type	HP Rating	Pass-by SPL (dBA)		
				50 ft	100 ft	200 ft
Diablo Lake						
Alice Ross IV, Rozema Boatworks tour boat	Tour boat traveling around Diablo Lake and up to Ross Powerhouse, used Thursday-Monday from early July until Labor Day weekend, then weekends only until end of September. Two tours run per day, during daytime hours.	Inboard	1,000	67	61	55
Duckworth, 26 ft work boat	Ferries hydro operators on Diablo Lake between boathouse and Ross Powerhouse; can be used seven days per week at any hour.	Inboard	315	72	66	60
Blue Bentz, 27 ft Bentz fast boat	Backup to the Duckworth; used when Duckworth is out for repairs.	Inboard	760	72	66	60
Skagit Queen, 36 ft Bentz crew boat	Primary crew boat; travels on Diablo Lake between City Light boathouse and Ross Powerhouse; used daily Monday-Thursday during working hours.	Inboard	880	72	66	60
Red Bentz, 31 ft Bentz work boat	Supplemental crew boat to Skagit Queen; runs 1-2 times per week during working hours.	Inboard	760	72	66	60
Cascadian, RONR 42 ft tour boat	Travels on Diablo Lake between ferry docks; runs 7 days per week from mid-June to end of October, one AM and one PM round trip.	Inboard	205	67	61	55
Thunder, Kvichak 26 ft tug boat	Primary tug boat; travels on Diablo Lake between barge landings during business hours.	Inboard	660	69	63	57
Lightning, Kvichak 26 ft tug boat	Secondary tug to Thunder.	Inboard	330	68	62	56
Diablo II, custom 40 ft tug boat	Old tug used 2-3 times per month for maintenance activities on Diablo Lake during business hours.	Inboard	265	68	62	56
Logging boat	Used about 60% of days throughout the year during business hours.	Inboard	225	68	62	56
Work boat	Small boat primarily used one week per quarter for getting from Reflector Bar up to the toe of Diablo Dam, used during business hours.	Outboard	9.9	71	65	59
Ross Lake						
Thunder Jet Luxor, 26 ft work boat	May be used anywhere on Ross Lake.	Outboard	125	77	71	65

Boat Description	Typical Use	Engine Type	HP Rating	Pass-by SPL (dBA)		
				50 ft	100 ft	200 ft
Logging boat	Used approximately 70% of days between June and October.	Inboard	225	68	62	56
Other Locations						
Woolridge, Woolridge Xtraplus work boat	Dry docked in Newhalem, can be used as needed on Diablo, Ross, Gorge, or Skagit River.	Outboard	200	78	72	66
Woolridge 20 ft work boat	Used 90% of the time on Skagit River between Sauk confluence and Alma Creek; Used once a week fall-spring with occasional summer trips, primarily daytime with rare nighttime trips.	Outboard	200	78	72	66

Source: City Light.

The number of boat captains is limited, so a typical maximum use scenario on Diablo Lake would be four boats operating at once, likely operating with different purposes such as the Alice Ross IV tour boat, the Blue Bentz crew boat, the Cascadian ferry boat, and the Thunder tug boat. The Duckworth and the logging boat could conceivably also be operating at the same time since they can be operated by staff other than boat captains, but a scenario where six boats are operating simultaneously is exceedingly unlikely. On Ross Lake, the ThunderJet and logging boat may be operating at the same time.

Some boats travel regularly enough on relatively fixed routes that they can be incorporated into a noise model. Three boats and routes were selected for modeling:

- The Skagit Queen: Many boats travel from the City Light boathouse to Ross Powerhouse on Diablo Lake, but the Skagit Queen was selected for modeling as the loudest and therefore most conservative of these. Such trips occur year-round.
- The Alice Ross IV: This tour boat generally runs 1-2 tours per day Thursday-Monday from early July until Labor Day weekend, then one tour per day on weekends through September. The tour boat runs at a slower speed than the crew boats.
- The ThunderJet: This crew boat may travel anywhere on Ross Lake, but a route from the Ross Lake boathouse to Hozomeen Camp was selected for modeling due to the amount of area it covers. Note however that due to annual lowering of lake elevations of Ross Lake, a significant portion of the lake approaching Hozomeen is usually inaccessible by water from approximately November to June. Depending on water levels, the farthest accessible point may be anywhere between Jack Point and Little Beaver Creek. During this time, City Light boat traffic is infrequent and slow.

Table 5.1-16 shows sound power levels for these boats that were estimated based on HP rating, engine type, and typical operating speed.

Table 5.1-16. Spectral sound power level for boats.

	Maximum Sound Power Level (dB re: 1 pW)										
	Octave Band Center Frequency (Hz)										
Boat	31.5	63	125	250	500	1,000	2,000	4,000	8,000	dBA	Lin
Skagit Queen	117	119	103	99	97	97	97	97	97	104	121
Alice Ross IV	99	101	93	92	92	92	92	92	92	99	105
ThunderJet Luxor	96	100	104	103	103	103	103	98	96	108	111

The study team modeled these boats as point sources traveling along line paths in Cadna-A. For each position along the line, Cadna-A calculates the SPL throughout the cartesian grid, then takes the maximum SPL calculated at each point to create the noise contour. Noise contour figures for each route are shown in Attachment C and discussed in Section 5.4.

5.1.6 Variable Noise Sources

Noise sources whose location and duration of use varies are categorized as variable noise sources. Project-related noise sources in this category primarily include specialized utility equipment used for maintenance activities.

Including these sources in a noise model could potentially be misleading because the variable noise sources would have to be represented in a single fixed location, which would represent a very limited subset of their potential use; or be represented in all possible areas of use, which would inaccurately represent cumulative effects. In Table 5.1-17, the study team summarized variable noise sources and the locations they are typically used. For certain items, noise levels were available via FHWA's Roadway Construction Noise Model, version 2.0 (RCNM). For all other equipment with internal combustion engines, the study team estimated SPLs at reference distances based on the HP rating of the engine. These estimates based on HP typically give conservative or worst-case results, without regard for high-performance mufflers or other special noise attenuation that may be present. Noise levels were not developed for equipment that has electric motors, because they are generally much quieter than internal combustion engines.

Table 5.1-17. Variable noise source inventory.

Make, Model, Description	Location of Use	HP	Max SPL (dBA) at distance (ft.)		
			50	100	200
Chain saw[1]	Varies within Project Boundary	8.6	84	78	72
Limbing saw	Varies within Project Boundary	2.15	69	63	57
Chipper, Bandit model 250 XP	Varies within Project Boundary	174	88	82	76
Honda FG110 mini-tiller/cultivator	Varies within Project Boundary	1.0	66	60	54
Stihl BR 800X backpack blower	Varies within Project Boundary	4.4	73	66	60
Honda HS928 snow blower	Varies within Project Boundary	8.5	75	69	63
Honda GX390 push blower	Varies within Project Boundary	11.7	77	71	65
Stihl SH 86C handheld blower	Varies within Project Boundary	1.07	66	60	54
Stihl MM56C garden cultivator	Varies within Project Boundary	1.14	67	61	55
Stihl FS 56 RC trimmer	Varies within Project Boundary	1.07	66	60	54
Honda GX100 vibratory plate compactor	Varies within Project Boundary	2.8	71	65	59
Honda GXV160 sod cutter	Varies within Project Boundary	4.3	72	66	60

Make, Model, Description	Location of Use	HP	Max SPL (dBA) at distance (ft.)		
			50	100	200
Stihl FS 350 brush cutter	Varies within Project Boundary	2.2	70	63	57
Dust collector trailer, Safesystems Model DC 30000D	Varies within Project Boundary	75	82	76	70
MEC 2033 Aerial Work Platform (scissor lift)[1]	Varies within Project Boundary	2.0	75	69	63
Toyota 7FGU45 Forklift - 10,000 LB	Newhalem compound	90	86	80	74
Toyota 8FGU25 Forklift (Propane)	Newhalem compound	118	87	81	75
Toyota 8FGU25 Forklift (Propane)	Varies within Project Boundary	118	87	81	75
John Deere ZTRAK995 72" Riding Mower	Newhalem lawns	24.7	80	74	68
John Deere ZTRAK997 Riding Mower	Diablo	37.4	82	76	70
Toro 4800 Riding Lawn Sweeper	Diablo	18	79	73	67
Toro 4800 Riding Lawn Sweeper	Newhalem lawns	18	79	73	67
John Deere GATORXUV865M 4WD Utility Vehicle	Varies within Project Boundary	22.8	80	74	68
John Deere GATORXUV865M 4WD Utility Vehicle	Varies within Project Boundary	22.8	80	74	68
Grove RT540E Rough Terrain 40 ton 4x4 Crane[1]	Varies within Project Boundary	164	79	73	67
Caterpillar 259D Track Loader[1]	Varies within Project Boundary	73.2	81	75	69
Caterpillar D6N Tractor Crawler (dozer)[1]	Varies within Project Boundary	145	86	80	74
Caterpillar 514D 11,000 lb. Lift (telehandler)[1]	Newhalem	100	89	83	77
Caterpillar 514D 11,000 lb. Lift (telehandler)[1]	Varies within Project Boundary	100	89	83	77
Caterpillar 140M2 AWCB Motor grader with snow plow[1]	Roads in winter	250	77	71	65

Make, Model, Description	Location of Use	HP	Max SPL (dBA) at distance (ft.)		
			50	100	200
Caterpillar 140M2AWCB Motor grader with snow plow[1]	Varies within Project Boundary	250	77	71	65
Caterpillar 320D 22 ton Excavator[1]	Varies within Project Boundary	172	87	81	75
Caterpillar M313D Wheeled Excavator[1]	Varies within Project Boundary	128	87	81	75

Source: City Light.
1 Noise levels obtained from RCNM.
2 Manufacturer HP data unavailable, HP based on comparable equipment.

Variable noise sources in the table above can be used for a variety of activities, as discussed in the following text.

5.1.6.1 Vegetation Management

Vegetation management activities may include removing trees; cutting trees and brush; trimming branches; controlling invasive weeds; mowing grass and other herbaceous plants; and landscaping/gardening. Noise-generating equipment for vegetation removal may include chainsaws, chippers, various mowers, and brush cutters. In some cases, Genie® lifts are used to provide access to tall branches on trees. Branches and small trees may be chipped onsite, and the chips may be used throughout the Project Boundary for landscaping, erosion control, or habitat restoration. Weed control involves hand pulling, cutting with hand tools (loppers, weed wrenches), or the use of herbicides, all of which generate negligible amounts of noise.

Vegetation management may include the following activities:

- Hazard tree management – Cutting, trimming, or removing trees and shrubs that that could fall and damage power lines, hydroelectric facilities, ancillary infrastructure, residences, or other structures.
- Road maintenance – Brush-cutting or trimming vegetation along transmission line roads or other roads leading to ancillary infrastructure in order to maintain access.
- Invasive species management – Treating or removing invasive species within the transmission line right-of-way (ROW), along roads, or elsewhere within the Project Boundary to prevent spread or introduction.
- General landscaping and/or gardening – Mowing lawns, weeding, planting, and maintaining vegetation within the towns of Diablo and Newhalem for beautification, erosion, or invasive weed prevention purposes.
- Signage visibility – Removing or trimming vegetation within the Project Boundary that reduce visibility for signs that are important for informing the public of hazards, providing dam security, or guiding visitors. This may also include navigational aids (e.g., lights, reflectors) along the reservoirs.

- Facility protection – Removing or trimming vegetation that is causing, or could cause, damage to hydroelectric infrastructure, ancillary facilities, or other infrastructure within the Project Boundary.
- Rockfall protection – Removing or trimming vegetation growing through rock-fall fences or in other types of catchments that serve to protect people and infrastructure in rockfall-prone areas. This activity is required when trees and shrubs grow large enough to diminish the integrity of the fence or other protective structure.
- Dam safety – Vegetation management in order to maintain a clear view for daily visual inspections and monitoring of the dam foundation and project works. This clear view is a FERC requirement. A 15 foot zone that is free of vegetation around the dams must be maintained. Inspections and monitoring may be conducted on foot or by continuous monitoring with video cameras. Also, visibility of survey markers on the dam and around the dam must be maintained in order to detect structural changes.
- Firewise program – Vegetation control as part of wildfire management for Newhalem and Diablo.

Transmission Line ROW Maintenance

The transmission line ROW is 100 miles long, averaging 300 ft in width, and passes primarily through rural and forested areas, although there has been a dramatic increase in suburban development adjacent to the transmission line ROW in Snohomish County in recent years. City Light ROW crews work the transmission line ROW daily. Transmission line crew chiefs constantly monitor vegetation growth, clearances, access roads, culverts, bridges, transmission line ROW uses, encroachments, and vandalism to identify areas and prioritize actions.

Work is performed at lowest elevations first and moves to the higher elevations as snow recedes and access improves. The following procedures are used to maintain vegetation in the transmission line ROW:

- Selective removal – Cutting down individual trees. This method is the most common approach used by City Light. Trees are generally cut down before they grow within 20 ft of a line. Depending on wire height and topography, tree heights can range from less than 5 ft to greater than 100 ft tall.
- Topping – Removing tops of individual trees. This practice is used minimally as it is difficult, can be more dangerous, and kills the tree in the long run. However, it can be useful when screening or some shading from the remaining tree is desired.
- Girdling – Removing a band of cambium from the entire circumference of the tree trunk to kill the tree. This method is only used on conifers when a snag is desired for either aesthetics or habitat value.
- Side trimming – Pruning tree limbs growing in from areas adjacent to the transmission line ROW.
- Brush cutting – Using a mower to mow down woody vegetation. This approach was greatly increased after adoption of the pesticide reduction program to decrease herbicide use. However, based on independent research and City Light field work, City Light has concluded

that annual brush cutting generally facilitates the spread of invasive plant species (e.g., common tansy [*Tanacetum vulgare*]) and is now limiting use to immediately along patrol roads/trails (within 3 ft of roadway) and 20 ft around transmission towers. Use of a reticulated arm allows vegetation to be cut at different heights. City Light plans to test the efficacy and effects of mowing Scot's broom and some tree species over lower-growing native species (e.g., salal [*Gaultheria shallon*]).

- Mowing – Using a tractor-mounted rotary cutter (i.e., field deck) to mow herbaceous and small-diameter woody vegetation. There are several stream crossings (e.g., Montague Creek) where this method was commonly used. This method was used in relatively flat riparian areas below the Sauk crossing; however, this method has resulted in increased reed canarygrass (*Phalaris arundinacea*) and has been largely discontinued to allow appropriate native woody species to grow.

Roads and Trails

City Light uses some transmission line ROW trails to access transmission towers and conduct vegetation management in those areas where vehicle access is not possible, mostly in steep areas within the Ross Lake National Recreation Area. These trails are intentionally kept obscure to the general public to prevent conflicts with NPS management objectives. As such, maintenance is extremely minimal. No trail tread surface work is performed for these transmission line ROW access trails.

The following procedures are used to maintain roads in the transmission line ROW:

- Grading – using graders to smooth out ruts, rills, and potholes in the road surface.
- Gravel – applying a layer of crushed rock to the road surface with a dump truck.
- Ditch cleaning - removing dirt and debris from roadside ditches with an excavator.

Slash Management

The following procedures are used to maintain slash in the ROW:

- Lop and scatter – cutting slash wood into smaller segments and scattering pieces such that they are spread relatively homogenously and most wood is in contact with the ground. This technique generally promotes faster decomposition of woody debris but can also result in buildup of wildfire fuels.
- Brush pile – piling slash into small piles to provide habitat for wildlife and reduce contiguity of wildfire fuels.

5.1.6.2 Woody Debris Management

While not an explicit condition in the current FERC operating license, City Light manages woody debris at various locations in each of the Project reservoirs (Ross Lake, Diablo Lake, and Gorge Lake). Every year, woody debris accumulates in the lakes and requires removal to maintain dam and recreational safety. Woody debris management activities are neither constant nor continuous, and they occur in variable locations and therefore these activities were not included in a Cadna-A noise model.

Ross Lake

Wood in Ross Lake is currently transported to and stored in various locations around the lake, including Hozomeen Debris Pen, Dry Creek, Roland Bay, and Green Point. Collection of woody debris on Ross Lake and transporting into pens typically occurs in July and August. This effort requires two logging boats and occasional use of a chain saw to cut logs that are 12 ft or longer so they can later fit into a dump truck for transport to the Skagit River below Gorge Dam.

Extraction of woody debris from the southern end of Ross Lake (i.e., from the Green Point debris pen) typically occurs in November-December (so as not to interfere with Ross Lake Resort operations). After the woody debris is transported by water to the Ross Lake Resort dock, an excavator transports the wood from the water into a 30-yard dump truck, which then transports the wood to a staging area on the Haul Road. The wood is then transferred by excavator to a 10-yard dump truck, barged across Diablo Lake, and driven to the Agg Ponds (it is transferred from a 30-yard dump truck to 10-yard dump truck because the 30-yard truck is not approved for highway use).

Diablo Lake

Similar to woody debris removed from the south end of Ross Lake, City Light extracts woody debris from Diablo Lake for transport to the Agg Ponds and eventual placement into the Skagit River. Wood may be collected throughout the year and stored in a pen at Buster Brown cove until it is extracted. When there is enough wood to make it worthwhile, the wood is towed by boat to a designated area by the mouth of Sourdough Creek. A chainsaw may be used to cut long logs. An excavator extracts the wood out of the water and places it in a 10-yard dump truck. The wood is then driven to the Agg Ponds.

Gorge Lake

Woody debris removal from Gorge Lake is conducted on an as-needed basis, most likely to occur following significant storm events or if debris has passed through upstream dam spill releases. To extract wood from Gorge Lake, transmission line ROW crews tow wood using either of the two logging boats or the Woolridge Work Boat to the upstream face of Gorge Dam. The wood is passed through a log chute which allows wood to be passed through the dam and then into the bypass reach/Skagit River.

5.1.7 Lawn Mowing

Lawn mowing is an activity that uses equipment from the variable noise source category in a well-defined area on a regularly recurring basis; therefore, it lends itself to representation in a noise model. Lawn mowing activities occur in lawn areas in Newhalem and Diablo, delineations of which are shown in the noise contour figures in Attachment C. These activities typically start in spring, occurring once or twice per week depending on weather and growth, and last through about early October. A typical lawnmowing activity might involve two mowers and one sweeper operating simultaneously. Different lawnmower models are stationed in Newhalem and Diablo, but the lawn sweeper model is the same for each. Spectral sound power levels for this equipment were estimated based on HP rating and are shown in Table 5.1-17 below.

Table 5.1-17. Spectral sound power level for lawnmowing equipment.

Noise Source	Sound Power Level (dB re: 1 pW)										
	Octave Band Center Frequency (Hz)										
	31.5	63	125	250	500	1,000	2,000	4,000	8,000	dBA	Lin
Newhalem mowers (John Deere ZTRAK 995, 24.7 HP)	129	115	116	114	108	106	103	95	88	112	129
Diablo mowers (John Deere ZTRAK 997, 37.4 HP)	130	116	117	116	110	108	104	97	90	113	131
Lawn sweepers (Toro 4800, 18 HP)	127	113	114	112	107	105	101	94	87	110	128

Since lawnmowing activities occur over periods of at least an hour, the 1 hour L_{eq} was selected for modeling in Cadna-A. The lawn sweeper is assumed to cover the same area as the mowers, so the amount of area two mowers could cover in one hour was estimated by assuming a mowing speed of 6 mph, 72-inch mower decks, and overlap of 20 percent. The total sound power level for two mowers and a sweeper was divided by this area to determine a sound power per unit area, which was applied to the mowing areas in Cadna-A. This gives somewhat conservative results, as the entire mowing area is modeled as simultaneously emitting noise. Noise contour figures for lawnmowing activities are shown in Attachment C and discussed in Section 5.4.

5.2 Ambient Noise Measurement Results

Table 5.2-1 summarizes the metrics calculated for each location by presenting averages of the hourly values across the entire noise measurement duration at each location, with exclusions applied as described in the Section 4.3.1.1. Metrics are summarized by three periods, including overall (all valid hours), daytime (all valid hours from 7:00 am through 9:00 pm), and nighttime (all valid hours from 10:00 pm through 6:00 am). Note that the daily L_{max} sources presented in Table 5.2-1 reflect only the loudest source of noise on a particular day, and do not reflect the frequency with which that noise source occurred at a location. Individual hourly values for each site can be found in Attachment B, and discussion of each site can be found in Section 5.2.1.

Table 5.2-2 summarizes the results of the audio review for each location by presenting the percentage of time that each source is audible. The LP request to identify individual sources in the audio review came after the audio review to determine the anthropogenic noise percentage was already underway, so the summer measurement at certain locations had the source review performed for a smaller subset of days. Specifically, the first full day at all locations, the second full day at Ross Lake, all days at Diablo Lake Trail, and the first five full days at Newhalem Creek Campground did not have the source review performed for the summer measurements. Results presented are for the remaining days.

Table 5.2-1. Ambient noise measurement result summary (dBA).

Measurement Location	Season	Subset[1]	Avg. Hourly L_{eq}	Overall L_{min}	Avg. Hourly L_{min}	Overall L_{max}	Avg. Hourly L_{max}	Daily L_{max} Sources	Avg. Hourly L_{10}	Avg. Hourly L_{33}	Avg. Hourly L_{50}	Avg. Hourly L_{90}	Avg. Hourly L_{nat}	% Anthro. Noise[2]	Noise-Free Interval (hh:mm)
Ross Lake	Summer 2021[3]	Overall	39	20	28	75	56	Dogs, bird, helicopter, aircraft	42	37	36	31	29	85%	0:28
		Daytime	42	21	30	75	62		45	40	38	33	31	84%	
		Nighttime	34	20	25	63	47		36	33	32	28	26	87%	
	Spring 2022	Overall	41	32	36	75	55	Bird, helicopter, wind	42	40	40	38	39	4%	9:08
		Daytime	44	32	36	75	59		45	43	42	39	41	6%	
		Nighttime	37	32	35	72	48		38	37	37	36	36	1%	
Diablo Lake Trail	Summer 2021	Overall	33	17	24	70	50	Helicopter, foliage, aircraft	35	32	30	27	30	28%	5:20
		Daytime	36	18	26	70	53		38	34	33	29	32	37%	
		Nighttime	28	17	20	58	44		30	27	26	22	26	13%	
	Spring 2022	Overall	34	24	28	70	51	Aircraft, helicopter, rain, hikers	35	33	32	30	31	5%	7:40
		Daytime	37	24	29	70	56		38	35	34	32	34	8%	
		Nighttime	30	24	26	62	43		30	29	28	27	28	1%	
Newhalem Creek Campground	Summer 2021	Overall	39	32	35	84	56	Noon siren, car horn	39	38	37	36	36	55%	1:34
		Daytime	40	33	35	84	62		41	39	38	37	36	75%	
		Nighttime	36	32	34	66	47		37	36	36	35	36	22%	
	Spring 2022	Overall	40	35	37	80	53	Noon siren, helicopter, airplane	40	39	39	38	39	16%	7:38
		Daytime	41	35	37	80	58		41	40	39	38	38	25%	
		Nighttime	39	36	37	59	46		39	39	39	38	39	2%	
Gorge Bypass Reach	Summer 2021[4]	Overall	39	26	30	78	56	Helicopter, traffic, hiker	41	37	36	33	34	44%	2:04
		Daytime	42	27	31	78	59		44	40	39	34	35	54%	
		Nighttime	34	26	29	63	50		36	33	32	30	32	28%	
	Spring 2022	Overall	51	43	50	80	58	Vehicle, helicopter, airplane, bird	52	51	51	50	51	10%	8:38
		Daytime	52	43	50	80	62		53	52	52	51	52	14%	
		Nighttime	50	44	49	68	54		50	50	50	49	50	2%	

Measurement Location	Season	Subset[1]	Avg. Hourly L_{eq}	Overall L_{min}	Avg. Hourly L_{min}	Overall L_{max}	Avg. Hourly L_{max}	Daily L_{max} Sources	Avg. Hourly L_{10}	Avg. Hourly L_{33}	Avg. Hourly L_{50}	Avg. Hourly L_{90}	Avg. Hourly L_{nat}	% Anthro. Noise[2]	Noise-Free Interval (hh:mm)
Pyramid Lake Trail	Summer 2021	Overall	43	40	41	71	53	Noon siren, bird, hikers, helicopter	43	42	42	42	42	14%	5:34
		Daytime	43	40	41	71	56		44	43	42	42	42	20%	
		Nighttime	42	40	41	67	48		43	42	42	41	42	3%	
	Spring 2022	Overall	47	43	45	73	55	Noon siren, Helicopter, Hikers	47	46	46	46	46	2%	10:34
		Daytime	47	43	45	73	58		48	47	46	46	46	3%	
		Nighttime	46	44	45	66	51		46	46	46	46	46	1%	
Caskey Lake	Summer 2021	Overall	33	22	26	79	53	Helicopter, logging truck, bird	33	31	30	28	26	83%	1:42
		Daytime	35	22	26	79	56		35	32	31	28	26	86%	
		Nighttime	30	23	25	76	48		31	29	28	27	26	78%	
	Spring 2022	Overall	34	26	29	87	51	Airplane, gunshot, logging truck	34	32	32	30	31	44%	3:08
		Daytime	35	26	29	87	54		35	32	31	30	30	48%	
		Nighttime	33	27	30	64	47		34	33	32	31	31	37%	

1 Overall includes all hours; daytime includes the hours from 7:00 am through 9:00 pm on all days; nighttime includes the hours from 10:00 pm through 6:00 am.
2 Anthro. = anthropogenic.
3 The weather station at Ross Lake was not functioning properly during the summer 2021 measurements, so weather-based exclusions were made using weather data from the nearest measurement location (Diablo Lake Trail).
4 The summer 2021 measurement in the Gorge bypass reach downstream of Gorge Dam started on August 25, 2021.

Table 5.2-2. Audio review results.

Measurement Location	Season	Subset[1]	% Of Time Audible																	
			Human-made (Anthropogenic) Sounds											Natural Sounds						
			Helicopter	Airplane	Vehicles	Boats	Humans	Corona Noise	Heavy Equipment	Tree cutting	Gunshots	Generators	Transformer	UnIDed Hum	Rain	Wind	Birds	Insects	Water	No Audible Sound
Ross Lake	Summer 2021[2]	Overall	0%	1%	<1%	22%	23%	*	1%	*	*	*	92%	*	5%	25%	8%	35%	2%	1%
		Daytime	0%	1%	<1%	33%	35%	*	2%	*	*	*	88%	*	<1%	36%	8%	11%	2%	1%
		Nighttime	0%	1%	1%	2%	4%	*	0%	*	*	*	98%	*	12%	7%	8%	75%	2%	1%
	Spring 2022	Overall	<1%	1%	1%	2%	1%	*	0%	*	*	*	0%	<1%	1%	20%	15%	0%	0%	61%
		Daytime	<1%	1%	1%	3%	1%	*	0%	*	*	*	0%	<1%	2%	31%	16%	0%	0%	48%
		Nighttime	0%	<1%	<1%	<1%	0%	*	0%	*	*	*	0%	<1%	0%	1%	13%	0%	0%	84%
Diablo Lake Trail	Summer 2021[2]	Overall	†	†	†	†	†	†	†	†	†	†	†	†	†	†	†	†	†	†
		Daytime	†	†	†	†	†	†	†	†	†	†	†	†	†	†	†	†	†	†
		Nighttime	†	†	†	†	†	†	†	†	†	†	†	†	†	†	†	†	†	†
	Spring 2022	Overall	<1%	2%	2%	1%	1%	*	*	*	*	*	*	*	2%	9%	30%	0%	*	54%
		Daytime	<1%	3%	3%	1%	1%	*	*	*	*	*	*	*	3%	14%	36%	0%	*	41%
		Nighttime	0%	1%	<1%	<1%	0%	*	*	*	*	*	*	*	0%	<1%	19%	0%	*	77%
Newhalem Creek Campground	Summer 2021[2]	Overall	<1%	3%	17%	1%	33%	*	*	*	*	23%	*	*	6%	1%	14%	<1%	100%	0%
		Daytime	<1%	3%	24%	1%	50%	*	*	*	*	36%	*	*	6%	1%	19%	<1%	100%	0%
		Nighttime	0%	2%	5%	1%	3%	*	*	*	*	0%	*	*	5%	0%	4%	<1%	100%	0%
	Spring 2022	Overall	<1%	3%	7%	*	<1%	*	*	8%	*	*	*	*	3%	1%	22%	<1%	100%	0%
		Daytime	<1%	4%	10%	*	<1%	*	*	13%	*	*	*	*	5%	1%	25%	<1%	100%	0%
		Nighttime	0%	1%	1%	*	0%	*	*	0%	*	*	*	*	1%	0%	16%	0%	100%	0%
Gorge Bypass Reach	Summer 2021[2]	Overall	<1%	2%	37%	0%	<1%	5%	*	*	*	*	*	11%	10%	3%	10%	22%	0%	26%
		Daytime	<1%	2%	53%	0%	<1%	4%	*	*	*	*	*	3%	12%	4%	13%	6%	0%	22%
		Nighttime	0%	1%	11%	0%	<1%	6%	*	*	*	*	*	25%	7%	1%	5%	49%	0%	34%
	Spring 2022	Overall	<1%	2%	6%	*	<1%	3%	*	*	*	*	*	*	<1%	<1%	26%	<1%	100%	0%
		Daytime	<1%	2%	9%	*	<1%	4%	*	*	*	*	*	*	1%	<1%	32%	<1%	100%	0%

Measurement Location	Season	Subset[1]	% Of Time Audible																	
			Human-made (Anthropogenic) Sounds											Natural Sounds						
			Helicopter	Airplane	Vehicles	Boats	Humans	Corona Noise	Heavy Equipment	Tree cutting	Gunshots	Generators	Transformer	UnIDed Hum	Rain	Wind	Birds	Insects	Water	No Audible Sound
		Nighttime	0%	<1%	1%	*	0%	1%	*	*	*	*	*	*	<1%	<1%	16%	0%	100%	0%
Pyramid Lake Trail	Summer 2021[2]	Overall	<1%	2%	12%	*	1%	*	*	*	*	*	*	*	5%	5%	9%	0%	100%	0%
		Daytime	<1%	3%	18%	*	2%	*	*	*	*	*	*	*	5%	7%	11%	0%	100%	0%
		Nighttime	0%	1%	3%	*	0%	*	*	*	*	*	*	*	5%	1%	5%	1%	100%	0%
	Spring 2022	Overall	<1%	1%	1%	*	<1%	*	*	*	*	*	*	*	2%	4%	12%	0%	100%	0%
		Daytime	<1%	2%	1%	*	1%	*	*	*	*	*	*	*	3%	6%	12%	0%	100%	0%
		Nighttime	0%	1%	<1%	*	<1%	*	*	*	*	*	*	*	<1%	<1%	13%	0%	100%	0%
Caskey Lake	Summer 2021[2]	Overall	1%	4%	30%	0%	<1%	89%	*	*	1%	*	*	*	10%	0%	24%	2%	*	6%
		Daytime	1%	5%	37%	0%	1%	92%	*	*	1%	*	*	*	5%	0%	27%	3%	*	4%
		Nighttime	0%	2%	19%	0%	<1%	83%	*	*	0%	*	*	*	17%	<1%	17%	<1%	*	10%
	Spring 2022	Overall	<1%	6%	5%	*	<1%	44%	*	*	<1%	*	*	*	17%	3%	16%	1%	*	36%
		Daytime	<1%	6%	5%	*	<1%	44%	*	*	<1%	*	*	*	17%	3%	16%	1%	*	36%
		Nighttime	0%	2%	4%	*	<1%	39%	*	*	0%	*	*	*	20%	<1%	14%	<1%	*	46%

* Source not present at this location.

† Audio review of the summer 2021 measurement at Diablo Lake Trail was complete prior to the LP request to identify sources was received. The percentage of anthropogenic noise for this location across all days can be found in Table 5.2-1.

1 Overall includes all hours; Daytime includes the hours from 7:00 am through 9:00 pm on all days; Nighttime includes the hours from 10:00 pm through 6:00 am.

2 Audio review of summer 2021 measurements was partially complete when the LP request to identify sources was received. Results presented for all summer 2021 measurements do not include the first full day. Results for Ross Lake do not include the first two full days, and results for Newhalem Creek Campground do not include the first five full days. The percentage of anthropogenic noise for each location across all days was analyzed and can be found in Table 5.2-1.

Birds are a common source of sound at all sites. Vehicles and aircraft could also be heard at all sites, although vehicle noise was less common at Ross Lake. Some site-specific noise sources, such as heavy equipment at Ross Lake during the summer measurements, and chainsaws at Newhalem Creek Campground during the spring measurements, were likely not regular occurrences at those sites, instead coincidentally occurring during the same week as the Project Sound Assessment measurements. Other site-specific sources such as the corona noise at Caskey Lake are a regular part of the soundscape at that location.

Helicopters were identified as one of the daily L_{max} sources during the measurement periods. There were no Project-related helicopter flights during the 7-day ambient noise measurement period for summer 2021. However, NPS documented 29.5 hours of NPS-approved helicopter flight time in the month of August, including 25.1 hours related to wildland fire operations, 2.7 hours of search and rescue, and 1.7 hours of other NPS work (Torres 2022). City Light assumes the daily L_{max} helicopter noise sources identified during the 7-day ambient noise measurement period are associated with the helicopter use authorized by NPS, with the exception of the Caskey Lake helicopter noise that is more likely associated with non-Project and non-NPS helicopter use at the nearby Darrington Municipal Airport.

During the spring 2022 noise measurements, there were two Project-related round-trip flights on April 28 and one on April 29, from Newhalem to and from the Hozomeen area at the north end of Ross Lake. These are reflected in daily L_{max} sources at all sites other than Caskey Lake.

5.2.1 Site-specific Ambient Noise Measurement Results

5.2.1.1 Ross Lake

The measurement site at Ross Lake was located along a trail behind Ross Lake Resort, in a partially forested area near the shore of Ross Lake. During the summer measurement, this site was near a transformer that generated a near-constant 120 Hz hum. During the spring measurement, the transformer was no longer present; a resort employee reported that it had failed over the winter. The level of Ross Lake was approximately 70 ft lower in the spring than it was in the summer, but the measurement equipment was placed at the same location on shore. The resort was operational during the summer measurement but had not yet opened for the season during the spring measurement. Typical sources of sound included boat traffic and resort operation during the summer, and distant vehicle and boat traffic during the spring. Ruffed grouse drumming could occasionally be heard during the spring. No sounds immediately identifiable with Project operation were audible during either of the measurements. City Light's noon siren was not audible at this location.

The graphs in Figures 5.2-1 and 5.2-2 respectively show calculated metrics during the summer 2021 and spring 2022 measurements at Ross Lake. Excluded hours are shown by colored vertical bars, with the color corresponding to the reason for exclusion as given in the legend. The green shaded area shows the range of A-weighted sound levels during each hour, with the top of the area representing the L_{max} and the bottom representing the L_{min}. The L_{eq} is shown by a solid blue line. Statistical levels L_{10}, L_{50}, and L_{90} are shown in black, with a dot showing the L_{50}, and lines showing the range from the L_{90} (bottom of the line) and L_{10} (top of the line). Metrics related to anthropogenic noise are shown in orange, with an orange dot showing the L_{nat}, and the orange line showing the percentage of time in each hour where anthropogenic noise is audible.

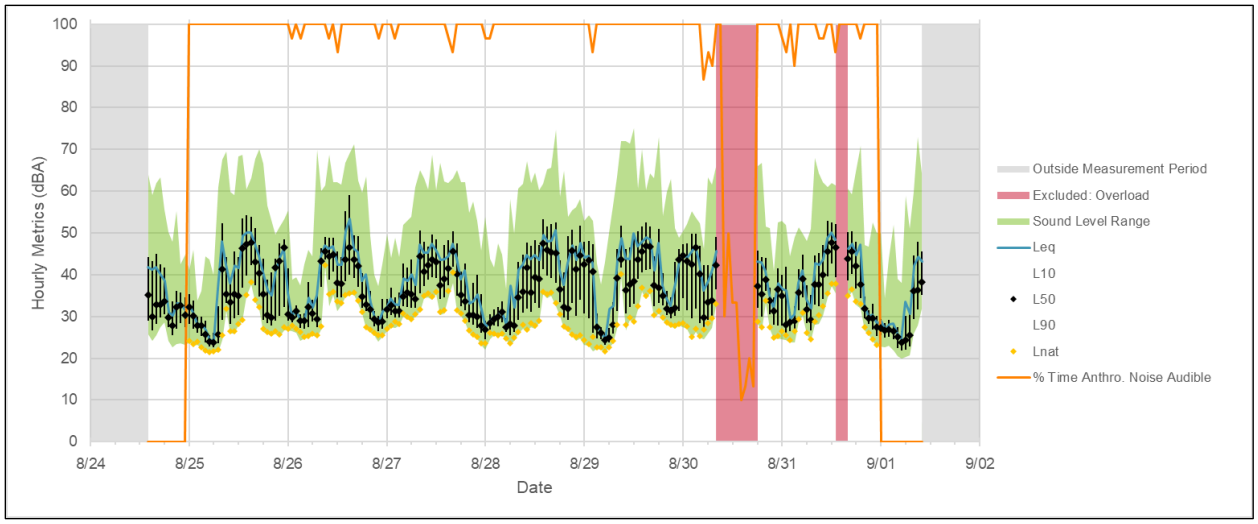


Figure 5.2-1. Ross Lake summer 2021 measurement.

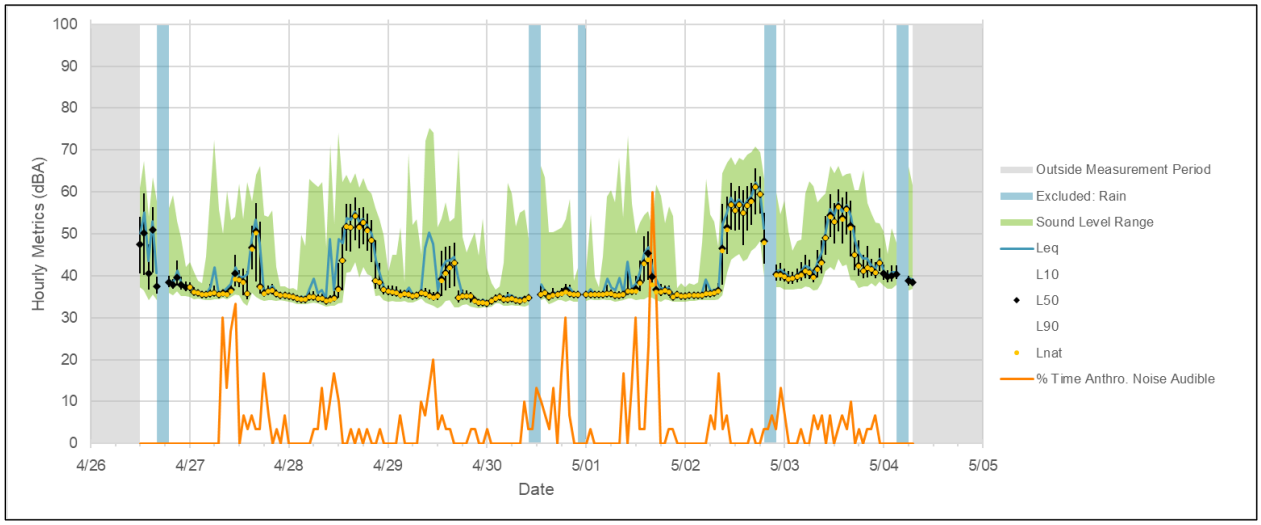


Figure 5.2-2. Ross Lake spring 2022 measurement.

During the summer measurement, anthropogenic noise was near constant, due to transformer hum and resort activities. There was large variability within hours, as shown by the L_{10}-L_{90} range. Overloads were related to wind noise, although the wind was not above 11 mph. There is a strong diurnal cycle, with higher noise levels during the day.

During the spring measurement, the resort was not operating and the transformer was no longer present, and anthropogenic noise was less frequent, less continuous, present at lower levels, and more variable. Although L_{max} levels are high, these represent isolated events as shown by the comparatively low L_{10} levels. The diurnal cycle is still present in the proportion of audible anthropogenic noise, but certain days show little to no increase in L_{eq} or statistical levels during the day. An unidentified 50-60 Hz hum was heard for part of the time during the spring measurement.

5.2.1.2 Diablo Lake Trail

The measurement site at Diablo Lake was located off the Diablo Lake Trail, about 0.75 mile from the Environmental Learning Center parking lot trailhead. The surroundings were heavily forested. Audio review of the summer measurements at this site was completed before the request to include a breakdown of sources was submitted, so a detailed source summary for the summer measurements is not available, however, the anthropogenic noise determination was made for all full days. Typical sounds included birdsong, passing hikers, and distant vehicle and boat traffic. Project-related noise sources audible at this site included boat traffic and the noon siren. The graphs in Figures 5.2-3 and 5.2-4 respectively show calculated metrics during the summer 2021 and spring 2022 measurements at the Diablo Lake Trail site. Refer to Section 5.2.1.1 for a description of the graph format.

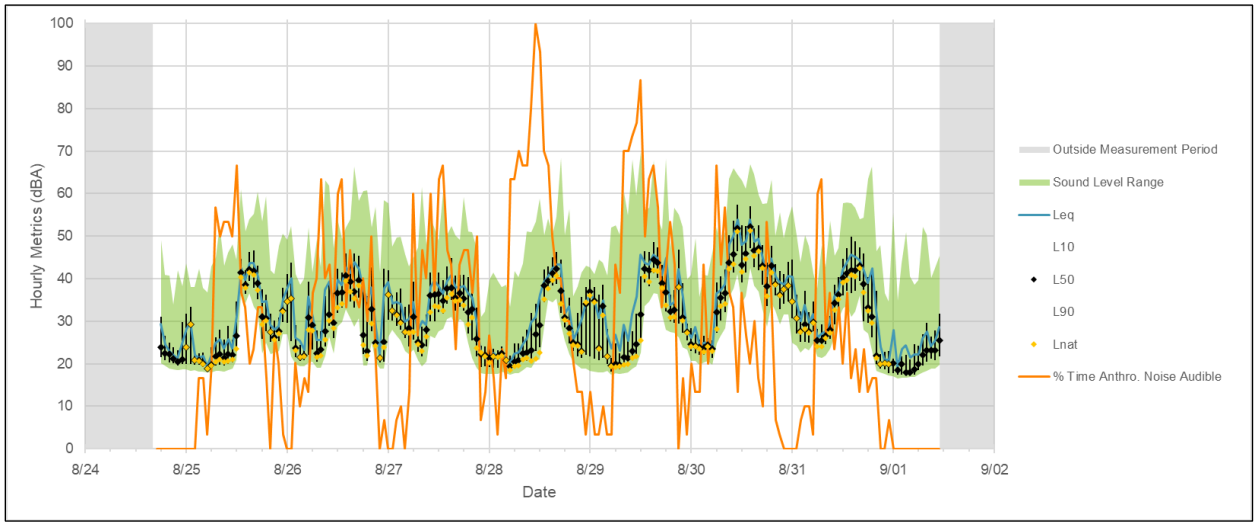


Figure 5.2-3. Diablo Lake Trail summer 2021 measurement.

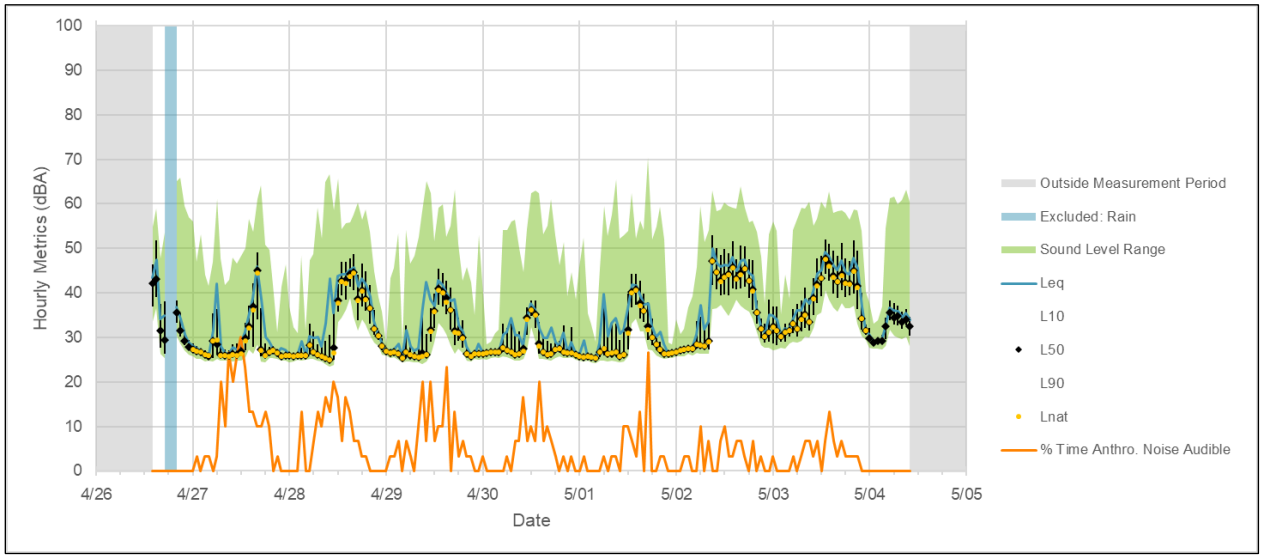


Figure 5.2-4. Diablo Lake Trail spring 2022 measurement.

During the summer measurement, anthropogenic noise was variable, with frequent noise from boat traffic on the lake and passing hikers. A strong diurnal cycle with higher noise levels during the day was present.

During the spring measurement, anthropogenic noise was much less frequent, less variable, and present at lower levels. There was still a pronounced diurnal cycle, although variability was much greater during the summer measurement. There were long periods of steady low levels during most nights.

5.2.1.3 Newhalem Creek Campground

The measurement site at the Newhalem Creek Campground was located in Campsite 26, which was unoccupied for the duration of the measurements. The campground was open during the summer measurements but was still closed for the season during the spring measurements. The campground is in a forested area.

Typical sounds in the summer included birds and noise from campers. In the spring, chainsaws could be heard during working hours on weekdays. Water noise from the Skagit River could be heard throughout both measurements. No sounds immediately identifiable with Project operation were audible, other than City Light's noon siren.

The graphs in Figure 5.2-5 and 5.2-6 respectively show calculated metrics during the summer 2021 and spring 2022 measurements at the Newhalem Creek Campground site. Refer to the Section 5.2.1.1 for a description of the graph format.

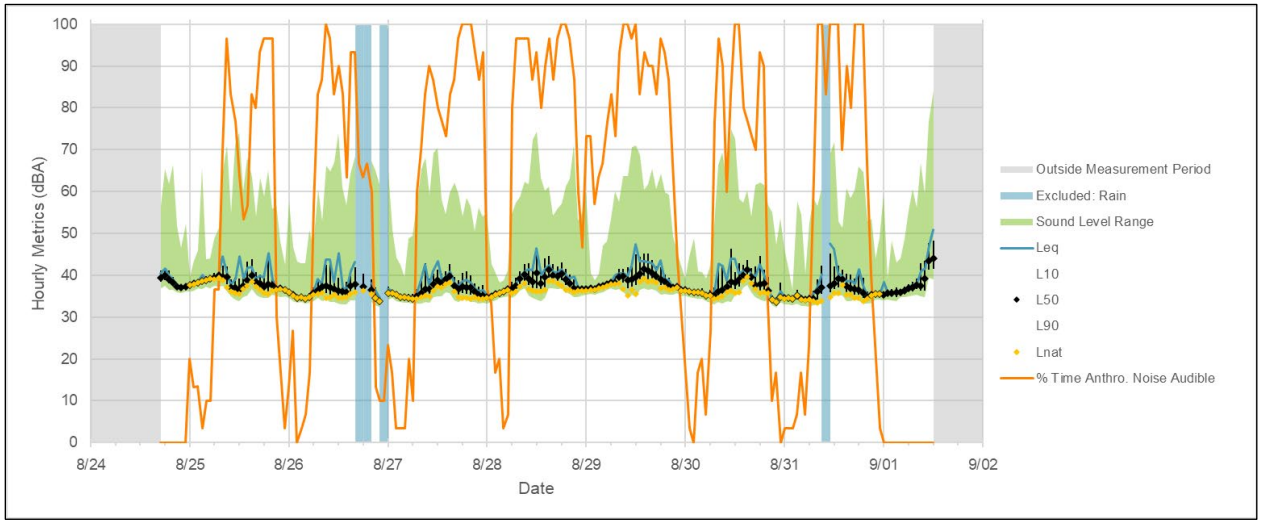


Figure 5.2-5. Newhalem Creek Campground summer 2021 measurement.

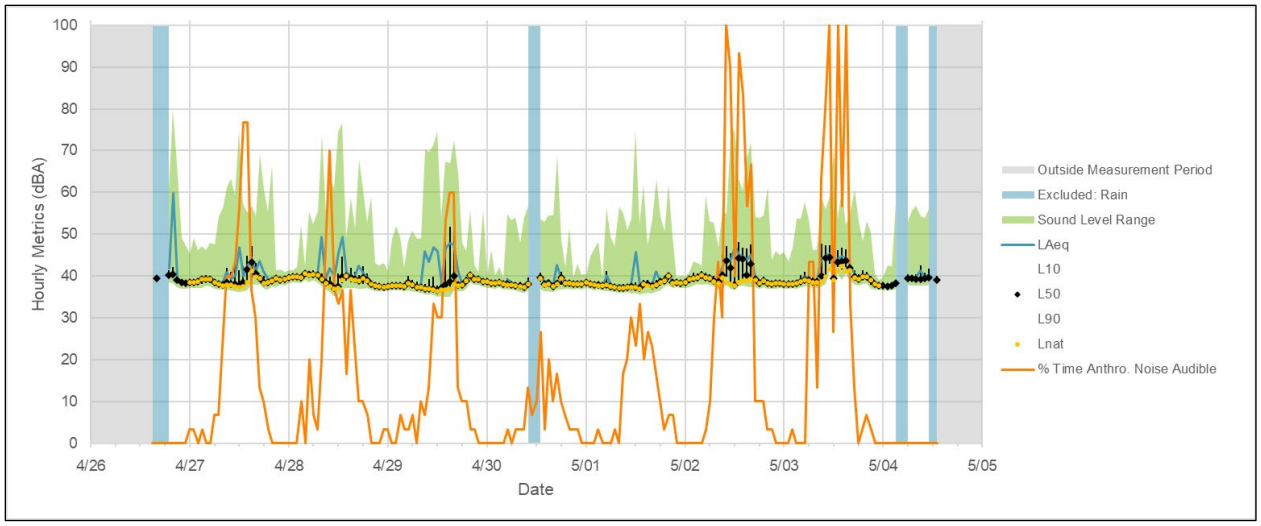


Figure 5.2-6. Newhalem Creek Campground spring 2021 measurement.

During the summer measurement, anthropogenic noise frequently lasted well into the night due to activity from campground guests, although overall noise levels are still markedly lower during the night. Variability increased during daytime hours with fairly high maximum levels, but L_{10} levels were rarely more than 10 dB above L_{90} levels, indicating that loud noises were usually not particularly frequent during an hour.

During the spring measurement, there was frequent anthropogenic noise during daytime hours on weekdays due to tree cutting activity, but this was reduced on the weekend. The baseline noise level remained similar to the summer measurements due to noise from the nearby Skagit River, but variability was less outside of the tree cutting periods due to less anthropogenic noise.

5.2.1.4 Gorge Bypass Reach

The measurement site in Gorge bypass reach was located along the access road on the south side of the Skagit River, south of the bridge below Gorge Dam. During the summer measurement the dam was not spilling, whereas during the spring measurements the dam was spilling between April 26 and April 29, 2022. Flows varied from approximately 430 to 4,930 cfs, with the higher flows occurring during daytime hours between 8 am and 6 pm.

Typical sounds during the summer included birds and traffic noise from SR 20, while water noise from the river dominated during the spring while the dam was spilling. Project-related sounds included occasional corona noise from the power lines overhead. The graphs in Figure 5.2-7 and 5.2-8 respectively show calculated metrics during the summer 2021 and spring 2022 measurements at the Gorge bypass reach site. Refer to Section 5.2.1.1 for a description of the graph format.

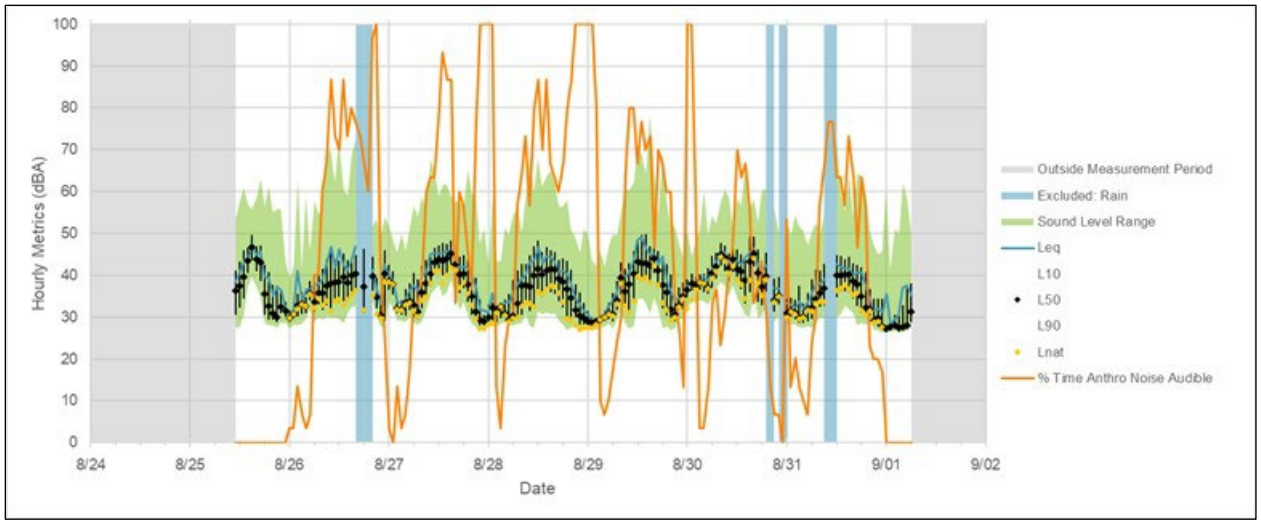


Figure 5.2-7. Gorge bypass reach summer 2021 measurement.

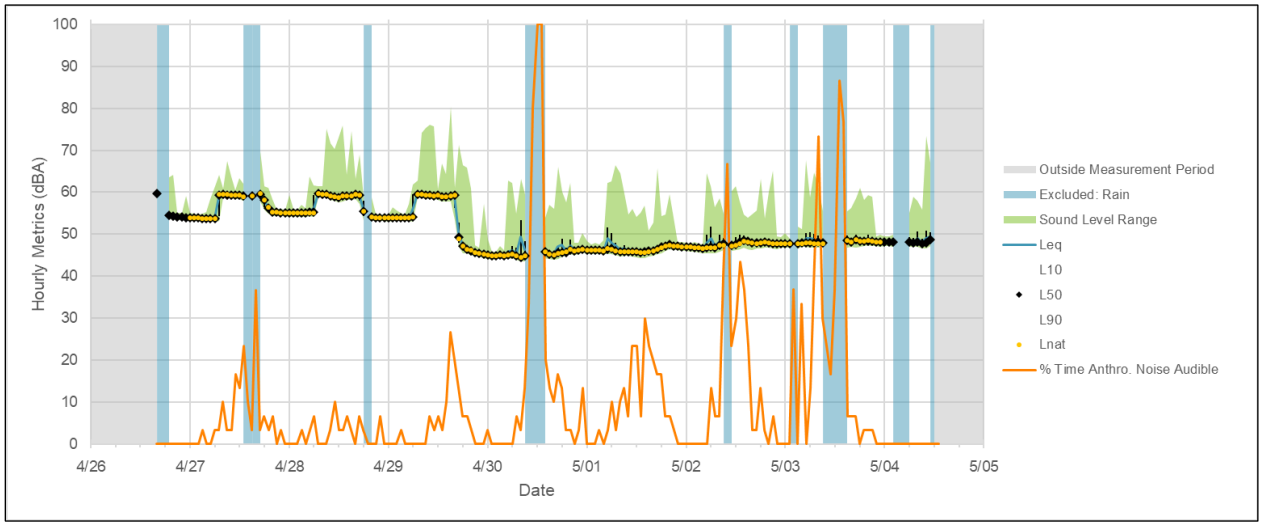


Figure 5.2-8. Gorge bypass reach spring 2022 measurement.

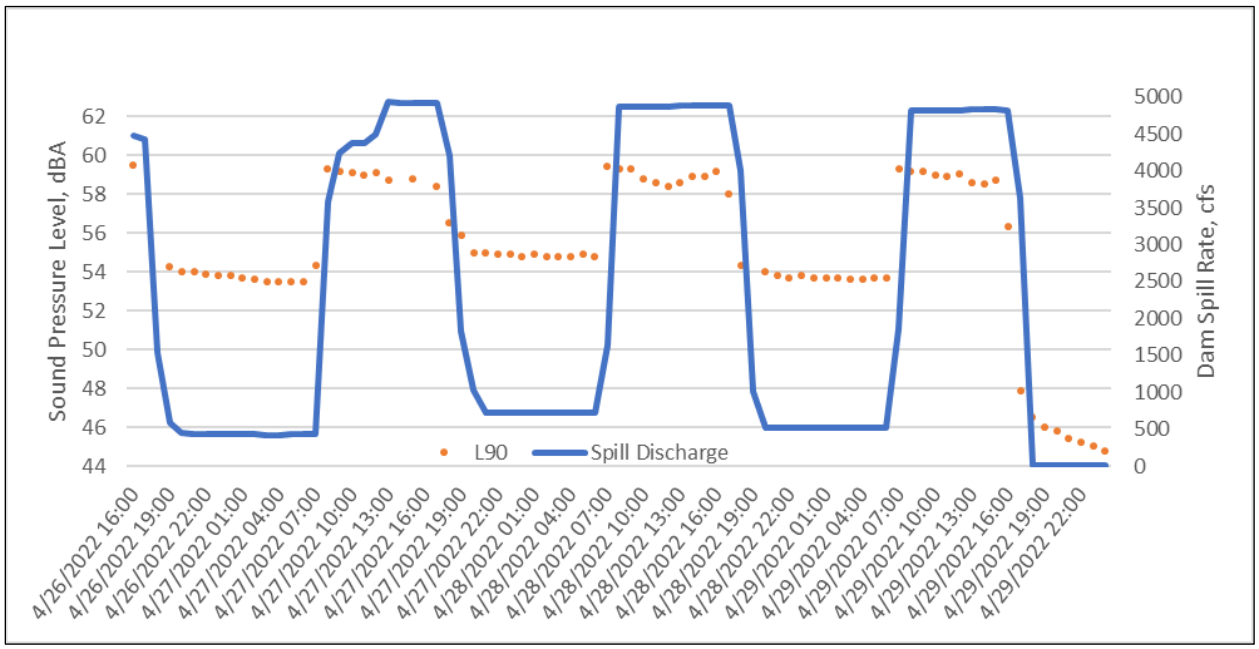
During the summer measurements, anthropogenic noise and overall levels follow a distinct diurnal cycle. Vehicle traffic was a primary driver of both of these metrics at this location. The variability between L_{10} and L_{90} reflects the impact of distinct but frequent passing vehicles.

The spring measurements show very little variability, reflecting the dominance of the relatively constant river noise. A diurnal cycle can be seen in the range of maximum noise levels, however, reflecting occasional traffic during the day. The dam was spilling during the first three days of the measurement, and changes in the spill volume are reflected in changes in noise levels. Table 5.2-1 and Figure 5.2-9 show the hourly L_{90} (i.e., the background noise level) for different flow rates during the period from April 26 through April 29, 2022, when the dam was spilling and shortly after the spill ended.

Table 5.2-1. Sound levels during dam spill, Gorge bypass reach (April 26-29, 2022).

Dam spill rate (cfs)	Average hourly L_{90} (dBA)
0	46
430-1,000	54
4,000-5,000	59

Source: City Light.



Source: City Light.

Figure 5.2-9. Gorge Dam spill rate vs hourly L_{90} at Gorge bypass reach, spring 2022.

There is a slight lag between the dam spill rate and noise levels in the graph, but this is because the hourly values plotted for the spill rate are the instantaneous rates at the top of each hour, whereas the hourly L_{90} is the baseline level across the entire hour. For this reason, sound levels for the transition volumes between 1,000 and 4,000 cfs are excluded from Table 5.2-1. The graph shows that even at a relatively low spill rate of 430 cfs, ambient noise levels are elevated by at least 8 dB. The difference between noise levels during the low and high spill rate is less, at about 5 dB.

5.2.1.5 Pyramid Lake Trail

The measurement site along Pyramid Lake Trail was located about 0.75 mile from the trailhead on SR 20. Typical sounds during both spring and summer measurements included water noise from a nearby stream, passing hikers, birdsong, and distant traffic. No sounds immediately identifiable with Project operation were audible, other than City Light's noon siren.

The graphs in Figure 5.2-10 and 5.2-11 respectively show calculated metrics during the summer 2021 and spring 2022 measurements at the Pyramid Lake Trail site. Refer to Section 5.2.1.1 for a description of the graph format.

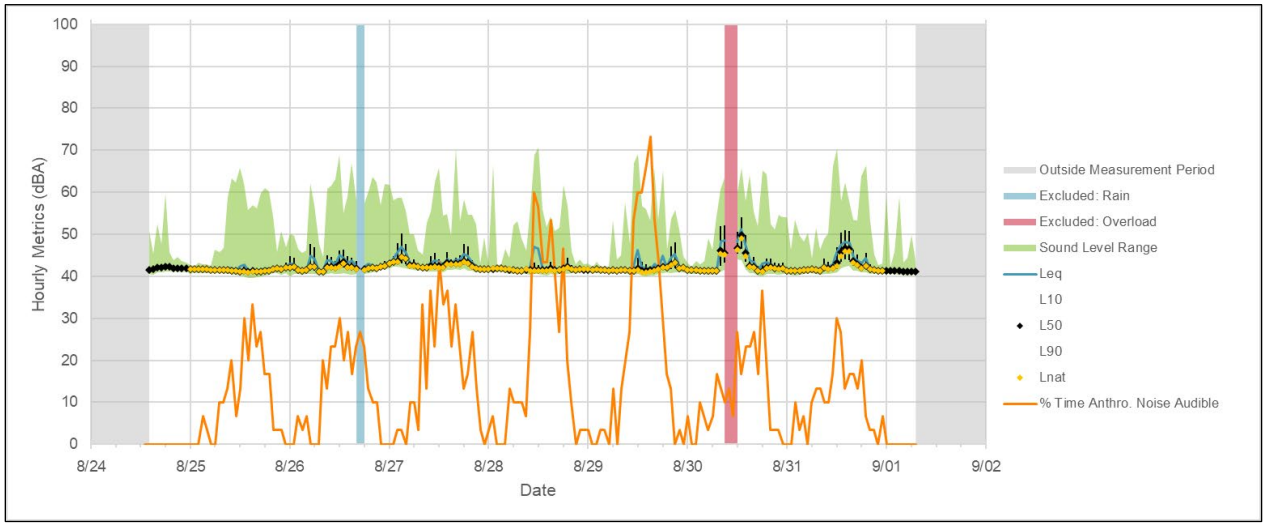


Figure 5.2-10. Pyramid Lake Trail summer 2021 measurement.

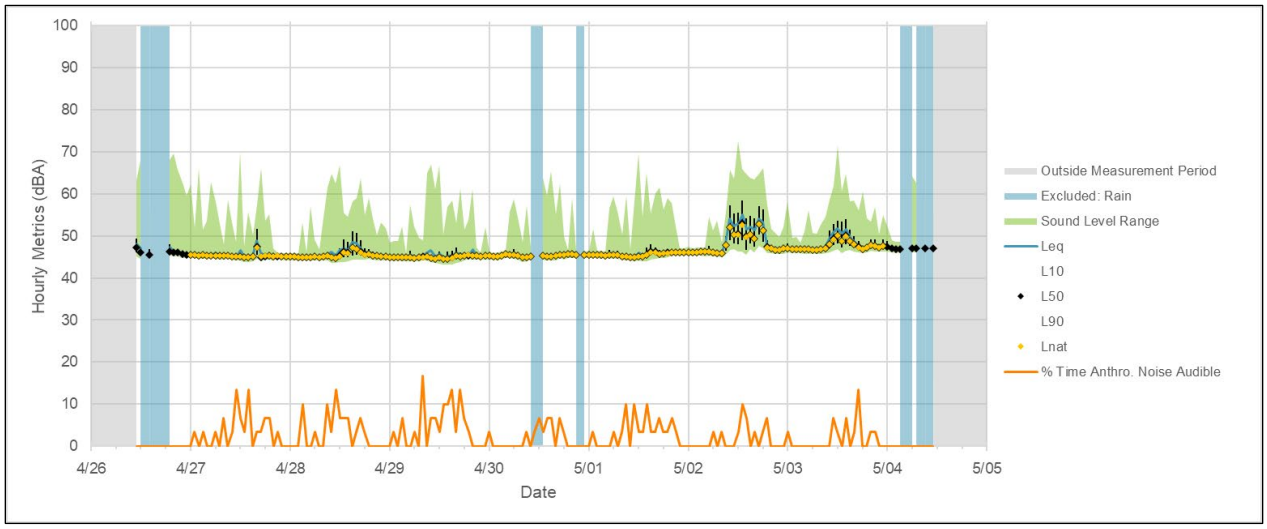


Figure 5.2-11. Pyramid Lake Trail spring 2022 measurement.

There was very little variability at this location during both the summer and spring measurements. This reflects the prevalence of stream noise at this location, providing a consistent noise floor and masking other transient noises. This lack of variability extends to overall noise levels over time, with a diurnal pattern reflected mainly in the anthropogenic noise percentage and the maxima. Occurrences of elevated noise levels are largely associated with periods of elevated wind.

5.2.1.6 Caskey Lake

The measurement site at Caskey Lake was located within the transmission line ROW, just off an access road. Typical sounds during the summer measurements included birds, distant traffic on SR 530, nearby logging traffic, and corona noise from the transmission lines. Distant gunshots could also occasionally be heard during both measurements. Project-related sounds at this location included corona noise. The noon siren was not audible at this location.

The graphs in Figure 5.2-12 and 5.2-13 respectively show calculated metrics during the summer 2021 and spring 2022 measurements at the Caskey Lake site. Refer to the Section 5.2.1.1 for a description of the graph format.

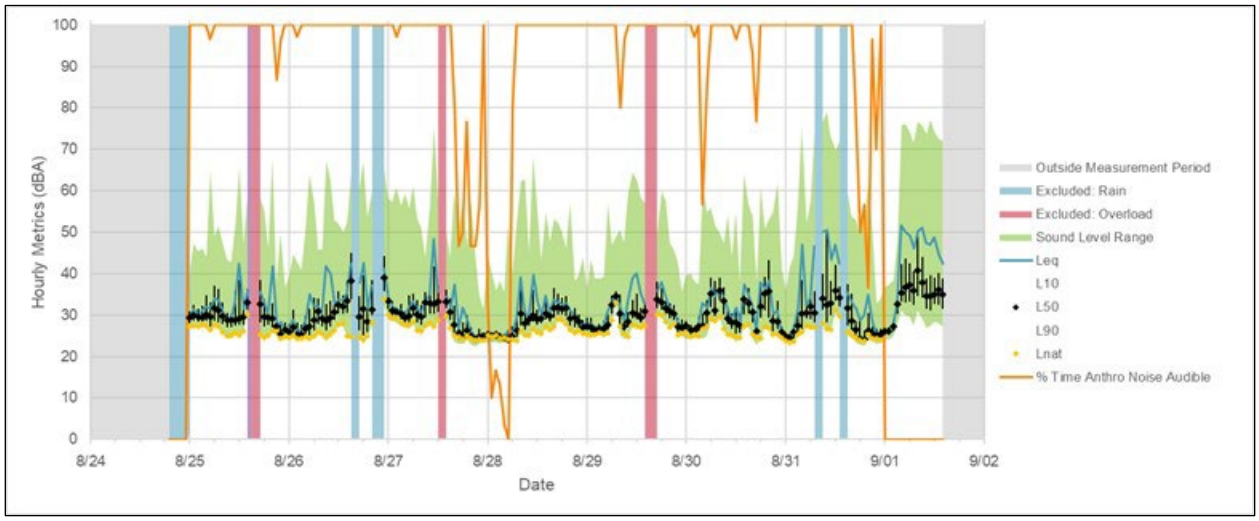


Figure 5.2-12. Caskey Lake summer 2021 measurement.

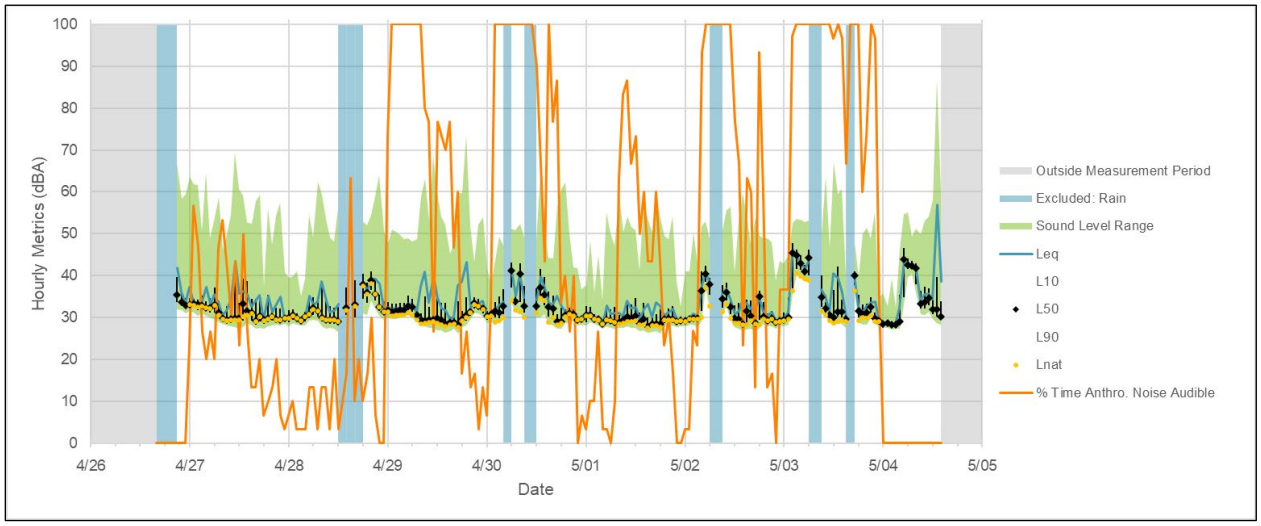


Figure 5.2-13. Caskey Lake spring 2022 measurement.

Corona noise was audible nearly constantly throughout the summer measurement, as reflected in the high percentage of audible anthropogenic noise. The diurnal cycle is discernable in maximum sound levels, frequently caused by truck traffic on the logging road, while traffic noise from SR 530 was regularly audible.

During the spring measurement, corona noise was still present although not as frequently, likely due to lower temperatures and lower absolute humidity. Though distant traffic on SR 530 was audible during the daytime, the primary factor driving up noise levels during the day on the last three days of the measurement was wind noise in the foliage.

5.3 Model Validation and Meteorological Effects on Sound Propagation

The Cadna-A noise modeling software incorporates sound propagation equations from ISO 9613-2, which simulate conditions that are favorable to sound propagation (i.e., downwind propagation under a mild temperature inversion). However, conditions may arise in the atmosphere that are more or less favorable to sound propagation, especially in conjunction with steep, complex terrain such as exists in the Project vicinity. This section includes a comparison of model results to measurement results and a more detailed discussion of potential meteorological effects.

5.3.1 Validation of Model with Measurement Data

During the long-term measurements, the noon sirens were audible at Diablo Lake Trail, Newhalem Creek Campground, and Pyramid Lake Trail. This provides an opportunity to compare model results against measured data, as most other models represent source conditions that may not have occurred during the measurements or are too quiet compared to background noise at the measurement locations to be clearly discerned. Table 5.3-1 below shows measurement and modeling results at each of the three locations where siren noise was audible.

Table 5.3-1. Siren model validation.

Measurement Location	Distance and Direction to Nearest Siren	SPL Range of Measured Siren Events	Average SPL of Siren Event	Modeled Level from Sirens
Diablo Lake Trail	1.7 mi WSW	34-51 dBA	42 dBA	41 dBA
Newhalem Creek Campground	0.3 mi ENE	68-73 dBA	70 dBA	71 dBA
Pyramid Lake Trail	0.6 mi NNW	63-69 dBA	66 dBA	70 dBA

The model shows good agreement with the measurements; average SPL from the model is within 1 dB of the measured average siren event at the Diablo Lake Trail and Newhalem Creek Campground sites. Although the model result was 4 dB above the measured average siren event at the Pyramid Lake Trail site, it was only 1 dB above the maximum siren event measured at that site. The Pyramid Lake Trail site was the highest in elevation of the three sites and was located on a north-facing slope, which may have made it especially prone to interference from atmospheric effects.

Cadna-A simulates noise propagation assuming a moderate atmospheric temperature inversion, and assuming that every noise receptor is downwind of every noise source, in accordance with

ISO 9613-2. While this does not represent absolute worst-case conditions for sound propagation, it does represent conservative conditions that may not be regularly experienced.

The measurements demonstrate how atmospheric and meteorological conditions can affect sound propagation. Although the sirens produce the same sound every day, the SPL received at different locations varied by ±5 dB to ±17 dB, with variation increasing as the distance from sirens increased. Since these measurements took place over only 14 days in two different seasons, it is conceivable that even wider variation may occur throughout the year. The Cadna-A results represent a somewhat conservative average condition, with the understanding that sound may sometimes propagate more or less effectively than represented in the noise contours, based on terrain and meteorology.

5.3.2 Meteorological Effects on Sound Propagation

Following is a brief discussion of how weather and terrain may interact and interfere with sound propagation in the study area. The term sound propagation refers to sound pressure waves moving away from the noise source. Sounds that we hear are longitudinal pressure waves that travel through the air. As they travel away from a noise source those pressure waves are affected by meteorological conditions including wind speed and direction, the amount of turbulence in the air, temperature inversions, the density of the air (a function of temperature and humidity), solar radiation, the interactions of microclimate and terrain, and more. The combination of tall, steep mountains with deep valleys and regional, local, and microclimate (highly localized) weather conditions disrupt sound pressure waves traveling through the study area, as discussed below.

Wind speed and direction affect sound propagation, and down-wind conditions enhance sound propagation by refracting sound waves down toward the ground, while upwind conditions inhibit sound propagation by refracting sound waves up into the atmosphere. Cadna-A and ISO 9613-2 assume downwind propagation in all directions simultaneously to produce conservatively high calculated noise levels.

Temperature inversions also affect sound propagation by refracting sound waves. A temperature inversion occurs when air is colder near the ground and warmer farther from the ground. These conditions frequently occur at night and early morning under clear skies. Under a temperature inversion, sound waves in the atmosphere refract back down toward the ground, increasing the distance a sound wave may travel. The opposite of a temperature inversion is called a temperature lapse, which occurs when air is warmer near the ground and cooler higher up – which is common on sunny days. Temperature lapses frequently occur during midday once the sun has warmed the ground. Under these conditions, sound is refracted upwards into the atmosphere without coming back down. This can create shadow zones where sound is reduced by 20 dB or more. Cadna-A and ISO 9613-2 model a mild temperature inversion by default.

Turbulence in the atmosphere occurs when winds encounter ridgetops and mountain tops. It also occurs when sunlight creates warm buoyant pockets of air that rise up and let cooler air take their place (creating winds). Turbulence in the atmosphere interferes with sound pressure waves moving through the atmosphere. In complex terrain regimes like the study area, there are many opportunities for winds to interact with terrain and create turbulence which interferes with sound propagation. Although Cadna-A evaluates the shielding or blocking effect of terrain on noise when terrain features are in a sound propagation path, the turbulence effects these features may cause

are not represented in Cadna-A. Further complexity due to terrain arises because the sun may warm one side of a valley much more than the other, resulting in microclimates that affect sound propagation differently in different areas of the valley.

In complex terrain regimes like this study area, sound propagation is attenuated by the atmosphere in ways Cadna-A cannot account for. As a result, modeling results are most accurate in areas closest to the noise sources, particularly when the terrain is flat like in Newhalem. Modeling results in areas farther from the noise source, or in complex terrain may be conservatively high or otherwise uncertain because the software cannot account for the complex turbulent wind regimes that occur on mountain tops and throughout the study area.

5.4 Noise Model Results

The Cadna-A noise modeling software calculates Project-related noise from the noise sources at each intersection throughout a Cartesian coordinate grid, accounting for some of the factors that affect sound propagation such as terrain and ground surface cover types. Using those results, Cadna-A creates noise contours which are overlaid upon base maps to create noise contour figures shown in Attachment C. The following sections describe the noise sources included in each iteration of the noise model, and the resulting contours.

5.4.1 Continuous Noise Source Model

The continuous noise source model includes noise sources that operate on a continuous basis in a fixed location.[6] The following noise sources are included in this model:

- Ross, Diablo and Gorge powerhouses;
- Transformers at each of the powerhouses;
- Diablo and Newhalem switchyards; and
- Transmission lines from Ross Powerhouse to Bothell substation.

Since these sources emit noise continuously at a relatively constant level, the L_{eq} is depicted in the noise contours. The contours show noise from the powerhouses is typically impeded by the steep terrain that surround each powerhouse, although it may spread farther over flat ground such as in Newhalem. However, river noise, traffic noise, and other anthropogenic noise may obscure the sound of the powerhouse and switchyard in Newhalem.

Noise from the transmission lines depends on the height of the transmission lines relative to the ground. At the lowest heights the 35 dBA contour might extend 750 ft from the transmission line, while at higher points it might extend 200 ft or less. Note however that the sound power level for the transmission lines was based on rainy conditions, which is when corona noise is loudest. Under dry conditions, corona noise from the transmission lines may not be audible at all.

5.4.2 Dam Spill Model

There are two dam spill noise models: one depicting the average annual maximum spill rate, and one depicting the overall maximum spill rate. These models included only dam spill noise,

[6] In the Project Sound Assessment Interim Report (City Light 2022) this model was referred to as the Base Model.

including spillway noise and water surface noise below each dam. In the maximum flow case at Diablo Dam, an additional spillway noise source was added on the river right side to represent the additional gates that would be open for maximum flow. Since the dam spills emit noise at a constant or slowly changing rate, the L_{eq} is depicted in the contours.

The noise contours from each dam may extend over a mile away from the dam depending on terrain, although the noise from each dam does not have a cumulative effect with noise from a different dam at any location within the contours. In the maximum flow model, the contours for Gorge Dam extend to the edge of the modeling area. The noise contours may be patchy or spotty at greater distances, which is an effect of shielding from terrain.

5.4.3 Siren Model

Each of the six operational sirens was included in the siren noise model: three in Newhalem and three in Diablo. The sirens were modeled as emitting the noise they would emit at the peak of a siren event, so the noise contours show the L_{max} during a siren event. Cumulative effects of all sirens are represented in the model, as all sirens typically sound simultaneously. However, the contribution of the Diablo sirens to noise levels in the Newhalem area is negligible, and vice versa.

The sirens are extremely loud; as a result the 35 dBA noise contour extends beyond the bounds of the model in most directions except for those in which heavy terrain shielding is encountered. The noise contours presented in this report have been clipped to the model extents. As shown by the comparison of the model results to the long-term measurements, great variability may be seen as distance from the siren and complexity of terrain increases, so these contours are best understood as representing a somewhat conservative average condition.

5.4.4 Telephone Alert Model

The telephone alerts at each of the three dams were included in the telephone alert noise model. The L_{max} of the telephone alerts was modeled. Although each of the alerts was modeled simultaneously, the contribution of the alert at one dam to noise levels near another dam was negligible, as shown by the extent of the contours.

Each of the telephones has a different alert sound and a different sound source type, which is reflected in the noise contours. The alert at Diablo is the quietest, due to its high-frequency alert sound and small speakers. The contour for Ross shows the shielding effects of the building to which the speakers are mounted. It is important to note that the periodic (i.e., repeating on/off pattern) and tonal nature of the telephone alert sounds may make them more noticeable in the field, even if their overall level is lower than background noise. Thus, they may be audible beyond the extent of the contours shown in the figures.

5.4.5 Helicopter Models

Two helicopter routes were modeled in the AEDT program: one route from the helipad in Newhalem to Hozomeen, and another from the helipad in Newhalem to the Big Beaver Creek Pass SNOTEL site. These routes are the same for the first part of the route and diverge where Big Beaver Creek joins Ross Lake. The noise contours depict the L_{max} during a helicopter pass-by over a period of time. Thus the noise levels shown in the contours would only be experienced for a matter of seconds as the helicopter makes its closest approach to a given point on the ground.

These noise contours are a static depiction of helicopter noise, but do not represent helicopter noise at all locations simultaneously. These contours have some additional conservatism built in, as the AEDT program does not account for shielding effects of terrain.

5.4.6 Boat Models

Three different boats on different routes were modeled in Cadna-A to represent boat activity on Diablo and Ross lakes. These include: the Skagit Queen crew boat running from the City Light boathouse on Diablo Lake to the boathouse at Ross Powerhouse; the Alice Ross IV tour boat running a typical tour route from the City Light boathouse on Diablo Lake near Diablo Dam, up Thunder Arm, to Ross Dam and back to the boathouse; and the ThunderJet crew boat running from the boathouse on Ross Lake up to Hozomeen. Each of these routes was modeled separately, so there is no cumulative noise from different boats. The noise contours depict the L_{max} as a boat passes by. Similarly to the helicopter contours, this only represents the noise levels during a brief pass-by event. These noise contours are a static depiction of boat noise, but do not represent boat noise at all locations simultaneously.

The extent of the boat noise contours varies by boat, though noise from each boat travels unimpeded to shore unless blocked by terrain in an inlet or bay. Noise from the louder ThunderJet and Skagit Queen travels farther inland compared to the quieter Alice Ross IV, although the tour path for the Alice Ross IV takes it closer to shore near Diablo Dam and Thunder Arm.

5.4.7 Lawnmower Model

The lawnmower noise model depicts the hourly L_{eq} that might be experienced while lawns are being mowed. Since all lawn areas are modeled simultaneously, and there is more lawnmowing area than may be covered in an hour, there might be some cumulative overrepresentation of noise in the vicinity of each lawnmowing area, depending on lawnmowing patterns on a given day. However, there is no cross-contribution between the Newhalem and Diablo areas.

The noise contours depict lawnmowing noise spreading throughout the entire populated Newhalem and Diablo areas and extending up the valley sides to distances of up to a mile in some cases.

6.0 DISCUSSION AND FINDINGS

This study is complete and has met the goals and objectives stated in Section 2.0. The goal of this study is to develop estimates of Project-related noise to facilitate analysis of how Project-related noise may affect other resources (e.g., wildlife, cultural resources, recreation resources, etc.). The study team performed 7-day unattended noise measurements at six locations in the study area in summer 2021 and spring 2022. Those locations were selected using a land use assessment that identified candidate measurement locations where soundscapes were representative of other portions of the study area. The study team processed the two sets of 7-day noise measurement results at each of the six measurement locations, and reported the following parameters:

- Overall mean average SPL measured over a 1 hour period;
- Overall and average minimum SPL measured over a 1 hour period;
- Overall and average maximum SPL measured over a 1 hour period; and
- Average 1 hour L_{10}, L_{33}, L_{50}, and L_{90} (noise levels exceeded 10 percent, 33 percent, 50 percent, and 90 percent of the hour).

Attachment B includes measurement results for each hour at each measurement location. The study team also performed a selective audio review and identified noises attributable to the overall L_{max} values measured at each location. Audio review also determined the percentage of time that anthropogenic noise was audible, which was used to determine the hourly L_{nat} and noise-free interval, and sound source determinations to characterize the soundscape at each location.

The study team prepared an inventory of major Project-related sources of noise in the study area and organized them into categories based on their characteristics. Certain noise sources and activities were selected for noise modeling, and the remainder were characterized by their SPL at reference distances.

The study team created a noise model using Cadna-A environmental noise modeling software, including terrain and information about ground surface types and their effects upon sound propagation. With feedback from NPS, the model was populated with noise sources to create a total of nine different sets of noise contours, each depicting a different category of noise source or condition. In addition, helicopter noise was modeled for two different routes using the AEDT software. Attachment C shows noise contours for each of these models.

Validation of the noise model results for the emergency sirens against siren events recorded during the long-term noise monitoring showed that the noise model gives somewhat conservative results for average conditions, affected by terrain and distance from noise sources. The measurements also showed that large variations in noise levels are possible from day to day because of atmospheric conditions, so conditions may sometimes arise that allow noise to propagate much more or less effectively than depicted by the Cadna-A results, especially as distance from noise sources increases.

7.0 VARIANCES FROM FERC-APPROVED STUDY PLAN AND PROPOSED MODIFICATIONS

7.1 Noise Model Extent Variance

As described in the Project Sound Assessment Interim Report (City Light 2022), City Light agreed in response to requests from LPs to extend the noise modeling study area within the RLNRA and North Cascades National Park to the point at which modeled noise levels attenuate to the L_{90} value measured at the nearest long-term unattended noise measurement location, which would approximate the distance at which Project noise sources may be audible against quiet background conditions. To accommodate this request, the terrain extent of the model was increased from 0.6 mile to 1.6 miles around powerhouses and dams and 1 mile around the Project Boundary elsewhere. The Project-wide average measured L_{90} of 35 dBA was used as the extent of each model, since most models covered areas that included several noise measurement locations. This distance was sufficient to model propagation out to 35 dBA for all noise sources except the sirens, which exceeded the model limits in certain directions. Calculating noise levels at locations beyond the updated terrain extent of the model was infeasible given software limitations and accuracy concerns; however, the study as it stands meets the intent of the goals and objectives of the FERC-approved study plan in that the contour maps show how Project-related noise propagates throughout the study area.

7.2 Noise Model Data Variance

A second variance from the methodology described in the study plan for the Project Sound Assessment was made to ensure the intent of the study objectives were met. An objective was to develop spectral noise emission characteristics for Project-related noise sources. Spectral noise emission characteristics were necessary for calculating Project-related sound propagation using Cadna-A software. That objective included the underlying but unwritten assumption that the spectral noise emission characteristics would only be developed for noise sources that were going to be included in a Cadna-A noise model.

Spectral noise emissions data for noise sources were included as part of the Project Sound Assessment as inputs into the Cadna-A noise model because sound propagation over extended distances is more accurately calculated using spectral noise emissions data. Sound energy in higher frequency ranges interacts with vegetation and particulate matter in the air and is attenuated by those interactions. Sound energy in lower frequency ranges does not interact with vegetation and particulate matter. The net effect is that when sound travels a large distance, receivers hear more of the lower frequencies than the higher frequencies from the original sound source.

This Project Sound Assessment provides estimates of noise emissions from noise sources that were not modeled; however, these are not expressed on a spectral basis. Noise emission estimates from those sources are provided on an overall A-weighted basis (dBA), which is easier to understand than spectral sound pressure or power levels that are used as inputs into the noise modeling software. Providing estimates of non-modeled noise emissions in a different and easier to understand format meets the intent of the goals and objectives of the FERC-approved study plan.

7.3 Noise Model and Contour Map Development Variance

A third variance from the methodology described in the study plan for the Project Sound Assessment was made to ensure the intent of the study objectives were met. One of the original study objectives was to model Project-related noise and develop noise contour maps that show how Project-related noise propagates and attenuates throughout the noise study area. In the course of work, the study team concluded that noise models were only effective at depicting sound propagation from Project-related noise sources that operated continuously, were stationary, or had consistent, predictable patterns and locations of use. Many Project-related noise sources did not meet those criteria, and, therefore, it was impossible to create a Cadna-A noise model that depicted their use. Inclusion of these noise sources in a Cadna-A noise model would produce results that could potentially be misleading. On that basis, those noise sources were excluded from modeling with Cadna-A. Instead, the study team identified those noise sources and developed estimates of SPLs at reference distances such as 50, 100, and 200 ft. City Light met the intent of the FERC-approved study plan by showing how Project-related noise from sources that were unsuitable for inclusion in the noise model propagates using estimates SPLs at reference distances.

Notwithstanding these variances, the goals and objectives of the FERC-approved study plan were achieved.

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PROJECT SOUND ASSESSMENT REPORT

ATTACHMENT A

NOISE MEASUREMENT SITE PHOTOS



Figure A-1. Photographs of the summer (left) and spring (right) unattended noise measurement location at Ross Lake.



Figure A-2. Photographs of the summer (left) and spring (right) unattended noise measurement location at Diablo Lake Trail.



Figure A-3. Photographs of the summer (left) and spring (right) unattended noise measurement location at Newhalem Creek Campground. ***Note: In the summer photo, the weather station is out of frame, near the photographer.***



Figure A-4. Photographs of the summer (left) and spring (right) unattended noise measurement location in the Gorge bypass reach.



Figure A-5. Photographs of the summer (left) and spring (right) unattended noise measurement location at Pyramid Lake Trail.



Figure A-6. Photographs of the summer (left) and spring (right) unattended noise measurement location at Caskey Lake.

PROJECT SOUND ASSESSMENT REPORT

ATTACHMENT B

HOURLY NOISE MEASUREMENT SUMMARIES

Table B-1. Hourly noise metrics, Ross Lake summer 2021 measurement (dBA).[1]

Date	Time	Percent Excluded	L_{eq}	L_{min}	L_{max}	L_{10}	L_{33}	L_{50}	L_{90}	L_{nat}	% Anth.[2] Noise
2021-08-24	14:00:00	0.0%	42	26	64	44	38	35	29	N/A[1]	N/A[1]
2021-08-24	15:00:00	0.0%	41	24	59	43	33	30	27	N/A[1]	N/A[1]
2021-08-24	16:00:00	0.0%	42	26	62	45	37	33	28	N/A[1]	N/A[1]
2021-08-24	17:00:00	0.0%	40	27	63	42	36	33	30	N/A[1]	N/A[1]
2021-08-24	18:00:00	0.0%	39	29	56	42	36	34	31	N/A[1]	N/A[1]
2021-08-24	19:00:00	0.0%	31	24	50	32	31	30	28	N/A[1]	N/A[1]
2021-08-24	20:00:00	0.0%	30	23	48	34	29	28	26	N/A[1]	N/A[1]
2021-08-24	21:00:00	0.0%	33	23	55	36	34	32	27	N/A[1]	N/A[1]
2021-08-24	22:00:00	0.0%	33	23	42	36	34	33	28	N/A[1]	N/A[1]
2021-08-24	23:00:00	0.0%	32	23	45	35	32	30	27	N/A[1]	N/A[1]
2021-08-25	00:00:00	0.0%	33	24	41	35	34	32	28	24	100.00%
2021-08-25	01:00:00	0.0%	31	23	46	34	31	30	27	23	100.00%
2021-08-25	02:00:00	0.1%	28	23	34	30	29	28	26	24	100.00%
2021-08-25	03:00:00	0.0%	28	22	36	30	29	28	25	23	100.00%
2021-08-25	04:00:00	0.0%	27	21	44	29	27	26	24	22	100.00%
2021-08-25	05:00:00	0.0%	24	21	44	26	25	24	23	21	100.00%
2021-08-25	06:00:00	0.0%	24	21	40	26	24	24	23	22	100.00%
2021-08-25	07:00:00	0.0%	37	22	61	32	27	26	24	22	100.00%
2021-08-25	08:00:00	0.0%	48	24	68	52	43	41	29	26	100.00%
2021-08-25	09:00:00	0.0%	42	31	69	44	38	35	33	32	100.00%
2021-08-25	10:00:00	0.0%	38	26	60	39	34	34	28	26	100.00%
2021-08-25	11:00:00	0.0%	42	26	59	46	39	35	30	26	100.00%
2021-08-25	12:00:00	0.0%	42	28	68	44	38	35	30	28	100.00%
2021-08-25	13:00:00	18.7%	49	29	69	53	49	46	37	29	100.00%
2021-08-25	14:00:00	22.1%	50	35	60	54	50	47	40	35	100.00%
2021-08-25	15:00:00	16.3%	50	38	63	54	50	48	42	38	100.00%
2021-08-25	16:00:00	11.1%	47	33	68	51	46	43	37	34	100.00%

Date	Time	Percent Excluded	L_{eq}	L_{min}	L_{max}	L_{10}	L_{33}	L_{50}	L_{90}	L_{nat}	% Anth.[2] Noise
2021-08-25	17:00:00	3.1%	45	32	70	47	42	40	35	32	100.00%
2021-08-25	18:00:00	0.8%	41	26	67	44	37	35	29	27	100.00%
2021-08-25	19:00:00	0.0%	36	26	56	39	32	30	28	26	100.00%
2021-08-25	20:00:00	0.0%	35	25	53	41	31	30	28	26	100.00%
2021-08-25	21:00:00	0.0%	41	26	50	44	43	42	29	26	100.00%
2021-08-25	22:00:00	0.0%	44	25	51	47	45	43	30	26	100.00%
2021-08-25	23:00:00	0.1%	46	27	53	49	48	46	32	27	100.00%
2021-08-26	00:00:00	0.0%	36	27	55	42	31	31	29	27	100.00%
2021-08-26	01:00:00	0.0%	30	26	39	31	30	30	29	28	96.67%
2021-08-26	02:00:00	0.1%	31	26	39	33	32	31	30	27	100.00%
2021-08-26	03:00:00	0.0%	29	24	37	31	30	29	27	26	96.67%
2021-08-26	04:00:00	0.0%	29	25	42	31	30	29	27	25	100.00%
2021-08-26	05:00:00	0.3%	35	25	46	38	34	32	28	25	100.00%
2021-08-26	06:00:00	0.0%	32	26	44	34	32	31	29	26	100.00%
2021-08-26	07:00:00	0.0%	35	25	70	35	30	29	27	25	100.00%
2021-08-26	08:00:00	0.0%	44	27	60	46	44	43	37	28	100.00%
2021-08-26	09:00:00	1.4%	47	42	61	49	47	46	44	42	100.00%
2021-08-26	10:00:00	0.9%	46	32	69	49	45	44	39	35	96.67%
2021-08-26	11:00:00	2.3%	47	35	62	49	46	45	41	36	100.00%
2021-08-26	12:00:00	0.5%	42	31	62	45	40	38	35	34	93.33%
2021-08-26	13:00:00	0.3%	42	33	62	44	40	38	35	33	100.00%
2021-08-26	14:00:00	1.1%	51	35	67	55	47	44	38	35	100.00%
2021-08-26	15:00:00	6.4%	53	35	69	59	50	46	40	36	100.00%
2021-08-26	16:00:00	4.3%	46	35	71	50	46	44	39	36	100.00%
2021-08-26	17:00:00	4.5%	45	33	63	49	45	42	37	34	100.00%
2021-08-26	18:00:00	0.0%	38	31	60	40	36	35	32	31	100.00%
2021-08-26	19:00:00	0.0%	40	27	63	40	34	33	31	27	100.00%
2021-08-26	20:00:00	0.0%	33	26	49	36	33	32	29	27	100.00%
2021-08-26	21:00:00	0.0%	30	25	40	31	30	29	28	26	100.00%

Date	Time	Percent Excluded	L_{eq}	L_{min}	L_{max}	L_{10}	L_{33}	L_{50}	L_{90}	L_{nat}	% Anth.[2] Noise
2021-08-26	22:00:00	0.0%	29	24	37	30	29	29	27	26	96.67%
2021-08-26	23:00:00	0.0%	31	25	42	34	30	29	27	26	100.00%
2021-08-27	00:00:00	1.7%	32	27	50	34	32	32	29	27	100.00%
2021-08-27	01:00:00	0.0%	34	27	44	37	34	33	30	28	100.00%
2021-08-27	02:00:00	0.1%	33	27	49	35	32	31	30	29	96.65%
2021-08-27	03:00:00	0.1%	33	28	44	36	32	31	30	28	100.00%
2021-08-27	04:00:00	1.8%	39	30	52	43	37	35	32	31	100.00%
2021-08-27	05:00:00	1.3%	39	29	53	42	37	36	32	30	100.00%
2021-08-27	06:00:00	2.3%	40	29	54	44	37	35	32	29	100.00%
2021-08-27	07:00:00	0.3%	38	30	61	39	35	34	32	30	100.00%
2021-08-27	08:00:00	0.8%	47	31	65	51	46	44	36	32	100.00%
2021-08-27	09:00:00	1.1%	45	34	63	48	43	41	37	35	100.00%
2021-08-27	10:00:00	2.5%	45	35	60	47	44	42	39	35	100.00%
2021-08-27	11:00:00	24.5%	47	34	69	50	46	44	39	35	100.00%
2021-08-27	12:00:00	2.6%	46	35	60	48	44	43	39	36	100.00%
2021-08-27	13:00:00	0.8%	44	30	67	44	40	37	34	31	100.00%
2021-08-27	14:00:00	0.6%	44	31	62	47	41	39	35	31	100.00%
2021-08-27	15:00:00	3.1%	44	34	62	48	44	41	38	36	96.67%
2021-08-27	16:00:00	10.6%	47	38	63	50	47	46	42	40	93.33%
2021-08-27	17:00:00	3.3%	44	31	65	47	44	40	35	31	100.00%
2021-08-27	18:00:00	0.0%	39	30	62	41	37	35	33	31	100.00%
2021-08-27	19:00:00	0.0%	41	29	62	43	35	34	31	29	100.00%
2021-08-27	20:00:00	0.0%	33	26	55	34	31	30	29	27	100.00%
2021-08-27	21:00:00	0.0%	34	25	57	38	32	30	28	26	100.00%
2021-08-27	22:00:00	0.0%	35	25	53	40	35	30	27	25	100.00%
2021-08-27	23:00:00	0.0%	32	23	46	35	29	28	26	24	100.00%
2021-08-28	00:00:00	0.0%	27	22	54	29	28	27	25	24	96.67%
2021-08-28	01:00:00	0.0%	29	24	44	31	29	28	27	26	96.67%
2021-08-28	02:00:00	0.1%	30	25	42	32	30	29	28	26	100.00%

Date	Time	Percent Excluded	L_{eq}	L_{min}	L_{max}	L_{10}	L_{33}	L_{50}	L_{90}	L_{nat}	% Anth.[2] Noise
2021-08-28	03:00:00	0.0%	30	25	48	32	31	30	28	26	100.00%
2021-08-28	04:00:00	0.0%	31	26	45	34	32	31	29	26	100.00%
2021-08-28	05:00:00	0.0%	28	24	36	30	28	28	26	25	100.00%
2021-08-28	06:00:00	0.0%	37	23	58	35	29	28	26	24	100.00%
2021-08-28	07:00:00	0.0%	32	24	50	32	29	28	26	25	100.00%
2021-08-28	08:00:00	0.0%	41	26	61	43	36	35	29	26	100.00%
2021-08-28	09:00:00	0.1%	42	27	62	45	39	36	31	28	100.00%
2021-08-28	10:00:00	0.1%	45	26	67	48	45	42	32	27	100.00%
2021-08-28	11:00:00	0.0%	44	27	62	47	39	36	31	28	100.00%
2021-08-28	12:00:00	0.1%	45	27	64	48	42	39	33	28	100.00%
2021-08-28	13:00:00	1.9%	43	28	60	47	42	39	32	29	100.00%
2021-08-28	14:00:00	16.9%	49	35	62	53	50	48	41	36	100.00%
2021-08-28	15:00:00	7.4%	48	34	65	52	48	46	40	35	100.00%
2021-08-28	16:00:00	5.9%	48	35	66	52	48	45	39	36	100.00%
2021-08-28	17:00:00	3.1%	51	32	75	53	47	45	38	33	100.00%
2021-08-28	18:00:00	0.9%	41	30	59	43	39	37	33	31	100.00%
2021-08-28	19:00:00	0.0%	38	27	65	41	34	32	30	28	100.00%
2021-08-28	20:00:00	0.0%	43	27	54	49	34	32	29	27	100.00%
2021-08-28	21:00:00	0.0%	47	26	55	51	48	46	33	26	100.00%
2021-08-28	22:00:00	0.0%	43	24	56	47	43	41	30	25	100.00%
2021-08-28	23:00:00	0.0%	47	25	58	52	48	45	34	25	100.00%
2021-08-29	00:00:00	0.0%	44	23	53	48	44	43	31	24	100.00%
2021-08-29	01:00:00	0.0%	44	23	54	48	45	44	30	23	100.00%
2021-08-29	02:00:00	0.1%	43	22	53	47	43	41	26	25	93.30%
2021-08-29	03:00:00	0.0%	28	22	43	31	29	27	25	23	100.00%
2021-08-29	04:00:00	0.0%	26	22	38	27	27	26	25	23	100.00%
2021-08-29	05:00:00	0.0%	25	21	43	26	25	24	23	22	100.00%
2021-08-29	06:00:00	0.0%	32	22	50	27	26	25	24	23	100.00%
2021-08-29	07:00:00	0.0%	33	24	57	34	29	28	26	24	100.00%

Date	Time	Percent Excluded	L_{eq}	L_{min}	L_{max}	L_{10}	L_{33}	L_{50}	L_{90}	L_{nat}	% Anth.[2] Noise
2021-08-29	08:00:00	0.0%	44	27	64	46	42	39	31	28	100.00%
2021-08-29	09:00:00	0.0%	49	40	72	52	45	44	42	40	100.00%
2021-08-29	10:00:00	0.0%	44	27	72	46	39	36	31	28	100.00%
2021-08-29	11:00:00	0.0%	44	29	71	47	40	38	32	30	100.00%
2021-08-29	12:00:00	0.0%	50	28	75	50	42	38	33	29	100.00%
2021-08-29	13:00:00	5.0%	47	32	61	50	46	44	39	32	100.00%
2021-08-29	14:00:00	9.3%	48	36	70	52	48	46	41	37	100.00%
2021-08-29	15:00:00	13.4%	49	34	60	53	49	47	41	35	100.00%
2021-08-29	16:00:00	9.6%	48	36	64	52	48	47	41	36	100.00%
2021-08-29	17:00:00	0.8%	41	30	63	44	40	37	32	30	100.00%
2021-08-29	18:00:00	0.8%	48	31	73	51	40	37	33	31	100.00%
2021-08-29	19:00:00	0.5%	37	29	54	40	36	35	33	30	100.00%
2021-08-29	20:00:00	0.6%	34	28	60	36	33	32	30	29	100.00%
2021-08-29	21:00:00	0.0%	33	28	63	35	32	31	30	28	100.00%
2021-08-29	22:00:00	0.0%	38	27	51	43	33	32	30	28	100.00%
2021-08-29	23:00:00	0.0%	43	28	49	46	44	44	31	28	100.00%
2021-08-30	00:00:01	0.0%	45	27	50	48	46	45	32	28	100.00%
2021-08-30	01:00:00	0.0%	44	27	52	48	45	43	31	28	100.00%
2021-08-30	02:00:00	0.1%	45	25	55	50	46	42	29	25	100.00%
2021-08-30	03:00:00	0.0%	47	26	54	50	48	47	32	27	100.00%
2021-08-30	04:00:00	0.0%	43	25	52	47	43	40	28	25	100.00%
2021-08-30	05:00:00	0.1%	36	25	46	42	32	30	27	27	86.67%
2021-08-30	06:00:00	0.6%	39	26	63	42	37	33	29	28	93.33%
2021-08-30	07:00:00	0.3%	41	27	62	41	35	34	30	30	90.00%
2021-08-30	08:00:00	2.8%	46	33	66	49	45	42	37	33	100.00%
2021-08-30	09:00:00	32.9%	Excluded – Overload (wind)								100.00%
2021-08-30	10:00:00	26.9%	Excluded – Overload (wind)								30.00%
2021-08-30	11:00:00	32.0%	Excluded – Overload (wind)								50.00%
2021-08-30	12:00:00	49.4%	Excluded – Overload (wind)								33.33%

Date	Time	Percent Excluded	L_{eq}	L_{min}	L_{max}	L_{10}	L_{33}	L_{50}	L_{90}	L_{nat}	% Anth.[2] Noise
2021-08-30	13:00:00	62.7%	Excluded – Overload (wind)								33.33%
2021-08-30	14:00:00	87.9%	Excluded – Overload (wind)								10.00%
2021-08-30	15:00:00	78.9%	Excluded – Overload (wind)								13.33%
2021-08-30	16:00:00	61.1%	Excluded – Overload (wind)								20.00%
2021-08-30	17:00:00	29.3%	Excluded – Overload (wind)								13.33%
2021-08-30	18:00:00	2.0%	43	28	66	46	40	37	32	29	100.00%
2021-08-30	19:00:00	2.0%	43	27	67	44	38	35	30	27	100.00%
2021-08-30	20:00:00	1.0%	41	33	51	44	41	39	36	34	100.00%
2021-08-30	21:00:00	0.6%	35	27	51	37	35	34	31	27	100.00%
2021-08-30	22:00:00	0.1%	32	25	41	35	33	31	28	25	100.00%
2021-08-30	23:00:00	0.1%	38	25	53	42	39	37	28	25	100.00%
2021-08-31	00:00:00	0.0%	37	25	53	40	38	35	28	26	96.67%
2021-08-31	01:00:00	0.0%	36	24	52	42	29	28	26	26	93.33%
2021-08-31	02:00:00	0.1%	30	24	44	31	29	29	26	24	100.00%
2021-08-31	03:00:00	0.1%	30	24	49	33	30	29	27	26	90.00%
2021-08-31	04:00:00	1.1%	38	29	51	41	37	36	32	29	100.00%
2021-08-31	05:00:00	3.7%	41	30	50	45	41	39	35	31	100.00%
2021-08-31	06:00:00	0.6%	34	26	48	37	33	32	28	26	100.00%
2021-08-31	07:00:00	0.2%	32	24	51	35	30	29	27	25	100.00%
2021-08-31	08:00:00	0.5%	43	28	68	45	40	38	33	29	100.00%
2021-08-31	09:00:00	2.1%	42	28	64	45	40	38	32	30	96.67%
2021-08-31	10:00:00	1.9%	44	30	62	47	42	40	34	32	96.67%
2021-08-31	11:00:00	21.0%	49	35	61	53	49	46	40	36	100.00%
2021-08-31	12:00:00	15.1%	50	37	62	53	49	48	43	38	100.00%
2021-08-31	13:00:00	14.7%	48	36	61	52	48	47	39	38	93.33%
2021-08-31	14:00:00	39.5%	Excluded – Overload (wind)								100.00%
2021-08-31	15:00:00	27.2%	Excluded – Overload (wind)								100.00%
2021-08-31	16:00:00	9.4%	46	34	61	50	46	44	39	35	100.00%
2021-08-31	17:00:00	12.1%	47	36	59	50	47	46	40	36	100.00%

Date	Time	Percent Excluded	L_{eq}	L_{min}	L_{max}	L_{10}	L_{33}	L_{50}	L_{90}	L_{nat}	% Anth.[2] Noise
2021-08-31	18:00:00	3.2%	45	33	65	48	44	42	37	34	100.00%
2021-08-31	19:00:00	1.1%	47	32	71	46	40	38	34	33	96.67%
2021-08-31	20:00:00	0.1%	33	27	47	35	33	32	30	27	100.00%
2021-08-31	21:00:00	0.0%	30	26	47	31	30	30	28	26	100.00%
2021-08-31	22:00:00	0.0%	30	24	52	33	31	30	27	25	100.00%
2021-08-31	23:00:00	0.0%	28	23	50	30	28	27	25	23	100.00%
2021-09-01	00:00:00	0.0%	29	23	50	29	28	27	25	N/A[1]	N/A[1]
2021-09-01	01:00:00	0.0%	27	23	34	28	27	27	25	N/A[1]	N/A[1]
2021-09-01	02:00:00	0.1%	28	23	44	29	28	27	25	N/A[1]	N/A[1]
2021-09-01	03:00:00	0.0%	28	22	52	28	27	27	25	N/A[1]	N/A[1]
2021-09-01	04:00:00	0.0%	26	20	39	28	26	25	22	N/A[1]	N/A[1]
2021-09-01	05:00:00	0.0%	25	20	38	26	25	24	22	N/A[1]	N/A[1]
2021-09-01	06:00:00	0.0%	33	20	59	30	26	24	22	N/A[1]	N/A[1]
2021-09-01	07:00:00	0.0%	31	21	51	31	27	26	23	N/A[1]	N/A[1]
2021-09-01	08:00:00	0.0%	42	26	60	45	40	36	29	N/A[1]	N/A[1]
2021-09-01	09:00:00	0.0%	44	28	73	48	39	36	32	N/A[1]	N/A[1]
2021-09-01	10:00:00	0.2%	43	32	64	46	40	38	35	N/A[1]	N/A[1]

1 Partial days were not analyzed for anthropogenic noise.
2 Anth. = anthropogenic

Table B-2. Hourly noise metrics, Ross Lake spring 2022 measurement (dBA).[1]

Date	Time	Percent Excluded	L_{eq}	L_{min}	L_{max}	L_{10}	L_{33}	L_{50}	L_{90}	L_{nat}	% Anth.[2] Noise
2022-04-26	12:00:00	0.0%	50	37	61	54	50	48	41	N/A[1]	N/A[1]
2022-04-26	13:00:00	4.8%	55	36	67	60	54	50	40	N/A[1]	N/A[1]
2022-04-26	14:00:00	0.0%	44	34	54	48	43	41	37	N/A[1]	N/A[1]
2022-04-26	15:00:00	13.2%	53	36	63	56	53	51	41	N/A[1]	N/A[1]
2022-04-26	16:00:00	19.0%	41	34	58	40	38	37	36	N/A[1]	N/A[1]
2022-04-26	17:00:00	29.5%	Excluded - Rain								N/A[1]
2022-04-26	18:00:00	80.1%	Excluded - Rain								N/A[1]
2022-04-26	19:00:00	19.2%	39	36	56	40	39	38	37	N/A[1]	N/A[1]
2022-04-26	20:00:00	0.0%	38	35	59	39	38	38	37	N/A[1]	N/A[1]
2022-04-26	21:00:00	0.0%	41	36	53	44	41	40	38	N/A[1]	N/A[1]
2022-04-26	22:00:00	0.0%	38	35	49	40	38	38	37	N/A[1]	N/A[1]
2022-04-26	23:00:00	0.0%	38	35	42	39	38	37	36	N/A[1]	N/A[1]
2022-04-27	00:00:00	0.0%	37	35	43	39	38	37	36	37	0.00%
2022-04-27	01:00:00	0.0%	36	34	41	37	36	36	36	36	0.00%
2022-04-27	02:00:00	0.0%	36	35	39	37	36	36	35	36	0.00%
2022-04-27	03:00:00	0.0%	36	34	38	36	36	36	35	36	0.00%
2022-04-27	04:00:00	0.0%	36	34	45	36	36	36	35	36	0.00%
2022-04-27	05:00:00	0.0%	37	34	59	38	36	36	35	36	0.00%
2022-04-27	06:00:00	0.0%	42	34	72	38	36	36	35	36	0.00%
2022-04-27	07:00:00	0.0%	36	34	56	36	36	36	35	36	0.00%
2022-04-27	08:00:00	0.0%	36	35	50	36	36	36	36	36	30.00%
2022-04-27	09:00:00	0.0%	37	34	60	36	36	36	35	36	13.33%
2022-04-27	10:00:00	0.0%	38	35	53	38	37	37	36	36	26.67%
2022-04-27	11:00:00	0.0%	42	36	54	45	42	41	38	39	33.33%
2022-04-27	12:00:00	0.0%	40	35	62	41	40	39	37	39	0.00%
2022-04-27	13:00:00	0.0%	40	34	53	42	40	39	35	39	6.67%
2022-04-27	14:00:00	0.0%	40	33	62	41	37	36	34	36	3.33%
2022-04-27	15:00:00	0.0%	48	36	58	52	49	47	42	46	6.67%

Date	Time	Percent Excluded	L_{eq}	L_{min}	L_{max}	L_{10}	L_{33}	L_{50}	L_{90}	L_{nat}	% Anth.[2] Noise
2022-04-27	16:00:00	0.0%	53	35	64	57	53	51	39	50	3.33%
2022-04-27	17:00:00	1.8%	48	34	66	53	39	37	36	37	3.33%
2022-04-27	18:00:00	0.0%	36	34	54	37	36	36	35	36	16.67%
2022-04-27	19:00:00	0.0%	37	34	54	38	37	36	36	36	6.67%
2022-04-27	20:00:00	0.0%	37	34	56	38	37	37	36	37	0.00%
2022-04-27	21:00:00	0.0%	36	34	42	37	36	36	35	36	3.33%
2022-04-27	22:00:00	0.0%	35	34	37	36	36	35	35	35	0.00%
2022-04-27	23:00:00	0.0%	35	34	37	36	36	35	35	35	6.67%
2022-04-28	00:00:00	0.0%	35	34	37	36	35	35	35	35	0.00%
2022-04-28	01:00:00	0.0%	35	34	37	36	35	35	35	35	0.00%
2022-04-28	02:00:00	0.0%	35	33	37	35	35	35	34	35	0.00%
2022-04-28	03:00:00	0.0%	35	33	50	35	35	34	34	34	0.00%
2022-04-28	04:00:00	0.0%	34	33	47	35	35	34	34	34	0.00%
2022-04-28	05:00:00	0.0%	37	33	63	37	35	35	34	35	0.00%
2022-04-28	06:00:00	0.0%	39	34	62	36	35	35	34	35	3.33%
2022-04-28	07:00:00	0.0%	36	33	61	36	35	35	34	34	3.33%
2022-04-28	08:00:00	0.0%	37	33	62	36	35	35	34	34	13.33%
2022-04-28	09:00:00	0.0%	35	33	47	35	34	34	34	34	3.33%
2022-04-28	10:00:00	0.0%	49	33	71	35	35	34	34	34	10.00%
2022-04-28	11:00:00	0.0%	37	33	52	38	36	35	34	35	16.67%
2022-04-28	12:00:00	0.0%	49	33	74	43	39	37	35	37	10.00%
2022-04-28	13:00:00	0.0%	48	34	62	52	47	44	37	44	0.00%
2022-04-28	14:00:00	0.0%	54	41	64	57	54	52	46	52	0.00%
2022-04-28	15:00:00	0.0%	53	41	62	57	54	52	46	51	3.33%
2022-04-28	16:00:00	0.0%	55	43	64	59	56	54	49	54	0.00%
2022-04-28	17:00:00	0.0%	53	40	61	56	54	52	47	52	3.33%
2022-04-28	18:00:00	0.0%	54	42	63	56	54	53	48	53	0.00%
2022-04-28	19:00:00	0.0%	52	40	61	55	52	51	46	51	3.33%
2022-04-28	20:00:00	1.7%	50	40	60	53	50	48	43	48	0.00%

Date	Time	Percent Excluded	L_{eq}	L_{min}	L_{max}	L_{10}	L_{33}	L_{50}	L_{90}	L_{nat}	% Anth.[2] Noise
2022-04-28	21:00:00	23.6%	44	35	56	48	41	39	37	39	0.00%
2022-04-28	22:00:00	0.0%	41	35	54	43	39	38	37	38	3.33%
2022-04-28	23:00:00	0.0%	37	34	50	38	37	37	36	37	0.00%
2022-04-29	00:00:00	0.0%	37	34	41	38	37	36	35	36	0.00%
2022-04-29	01:00:00	0.0%	37	34	45	38	37	36	35	36	0.00%
2022-04-29	02:00:00	0.0%	36	34	45	38	37	36	35	36	0.00%
2022-04-29	03:00:00	0.0%	36	34	52	37	36	36	35	35	6.67%
2022-04-29	04:00:00	0.0%	36	34	38	36	36	36	35	36	0.00%
2022-04-29	05:00:00	0.0%	37	34	69	37	36	36	35	36	0.00%
2022-04-29	06:00:00	0.0%	36	34	52	36	35	35	35	35	0.00%
2022-04-29	07:00:00	0.0%	36	34	53	36	36	35	35	35	0.00%
2022-04-29	08:00:00	0.0%	36	35	45	37	36	36	35	36	10.00%
2022-04-29	09:00:00	0.0%	47	34	72	37	36	36	35	36	6.67%
2022-04-29	10:00:00	8.3%	50	33	75	37	36	35	34	35	13.33%
2022-04-29	11:00:00	5.3%	48	33	74	36	35	35	34	35	20.00%
2022-04-29	12:00:00	0.0%	36	32	52	37	36	35	34	35	3.33%
2022-04-29	13:00:00	0.0%	42	33	54	46	41	39	35	39	6.67%
2022-04-29	14:00:00	0.0%	43	34	58	47	43	41	37	41	3.33%
2022-04-29	15:00:00	0.0%	44	34	53	47	44	42	37	42	3.33%
2022-04-29	16:00:00	0.0%	44	33	54	48	45	43	38	43	0.00%
2022-04-29	17:00:00	0.0%	40	32	70	37	35	35	34	35	0.00%
2022-04-29	18:00:00	0.0%	36	33	49	37	36	35	34	35	0.00%
2022-04-29	19:00:00	0.0%	35	33	46	37	36	35	34	35	0.00%
2022-04-29	20:00:00	0.0%	35	33	48	36	35	35	34	35	3.33%
2022-04-29	21:00:00	0.0%	34	32	50	35	34	34	33	34	3.33%
2022-04-29	22:00:00	0.0%	34	32	45	34	34	34	33	34	0.00%
2022-04-29	23:00:00	0.0%	34	32	54	34	34	34	33	34	0.00%
2022-04-30	00:00:00	0.0%	34	32	42	34	34	34	33	33	3.33%
2022-04-30	01:00:00	0.0%	34	33	38	35	34	34	34	34	0.00%

Date	Time	Percent Excluded	L_{eq}	L_{min}	L_{max}	L_{10}	L_{33}	L_{50}	L_{90}	L_{nat}	% Anth.[2] Noise
2022-04-30	02:00:00	0.0%	35	33	37	36	35	35	34	35	0.00%
2022-04-30	03:00:00	0.0%	35	34	38	36	35	35	34	35	0.00%
2022-04-30	04:00:00	0.0%	35	33	43	35	35	34	34	34	0.00%
2022-04-30	05:00:00	0.0%	36	33	62	36	35	34	34	34	0.00%
2022-04-30	06:00:00	0.0%	35	33	60	36	35	35	34	35	0.00%
2022-04-30	07:00:00	0.0%	35	33	52	35	34	34	34	34	0.00%
2022-04-30	08:00:00	0.0%	35	33	55	35	34	34	34	34	0.00%
2022-04-30	09:00:00	0.0%	35	33	56	35	35	34	34	34	10.00%
2022-04-30	10:00:00	21.3%	35	33	49	35	35	35	34	35	3.33%
2022-04-30	11:00:00	65.4%	Excluded - Rain								3.33%
2022-04-30	12:00:00	35.6%	Excluded - Rain								13.33%
2022-04-30	13:00:00	7.0%	38	34	66	38	36	36	35	36	10.00%
2022-04-30	14:00:00	0.0%	36	35	64	37	36	36	35	36	6.67%
2022-04-30	15:00:00	0.0%	35	33	50	36	35	35	34	35	3.33%
2022-04-30	16:00:00	0.0%	36	34	50	37	36	36	35	35	13.33%
2022-04-30	17:00:00	0.0%	36	34	51	36	36	36	35	36	0.00%
2022-04-30	18:00:00	0.0%	36	34	51	37	36	36	35	36	16.67%
2022-04-30	19:00:00	0.0%	37	34	54	38	37	37	36	36	30.00%
2022-04-30	20:00:00	0.0%	37	34	58	38	36	36	35	36	6.67%
2022-04-30	21:00:00	6.2%	36	34	39	36	36	36	35	36	0.00%
2022-04-30	22:00:00	8.1%	36	34	42	36	36	36	35	36	0.00%
2022-04-30	23:00:00	32.9%	Excluded - Rain								0.00%
2022-05-01	00:00:00	0.6%	36	34	41	36	36	35	35	35	0.00%
2022-05-01	01:00:00	0.0%	37	34	55	36	36	36	35	36	3.33%
2022-05-01	02:00:00	0.0%	36	34	40	36	36	36	35	36	0.00%
2022-05-01	03:00:00	0.0%	36	34	37	36	36	36	35	36	0.00%
2022-05-01	04:00:00	0.0%	36	34	45	36	36	36	35	36	0.00%
2022-05-01	05:00:00	0.0%	39	34	59	38	36	36	35	36	0.00%
2022-05-01	06:00:00	0.0%	37	34	60	37	36	36	35	36	0.00%

Date	Time	Percent Excluded	L_{eq}	L_{min}	L_{max}	L_{10}	L_{33}	L_{50}	L_{90}	L_{nat}	% Anth.[2] Noise
2022-05-01	07:00:00	0.0%	37	34	58	36	36	35	35	35	0.00%
2022-05-01	08:00:00	0.0%	40	34	68	36	36	35	35	35	0.00%
2022-05-01	09:00:00	0.0%	36	34	54	36	36	36	35	36	16.67%
2022-05-01	10:00:00	0.0%	43	35	73	41	37	36	36	36	0.00%
2022-05-01	11:00:00	0.0%	37	34	57	38	37	36	36	36	13.33%
2022-05-01	12:00:00	0.0%	38	34	50	40	38	37	36	36	30.00%
2022-05-01	13:00:00	0.0%	41	34	53	44	40	38	36	38	3.33%
2022-05-01	14:00:00	0.0%	45	34	54	49	45	43	39	43	3.33%
2022-05-01	15:00:00	0.0%	47	35	55	51	47	45	39	44	23.33%
2022-05-01	16:00:00	0.0%	41	35	52	44	41	40	37	38	60.00%
2022-05-01	17:00:00	0.0%	39	34	62	40	37	37	35	36	33.33%
2022-05-01	18:00:00	0.0%	37	34	59	38	37	36	35	36	0.00%
2022-05-01	19:00:00	0.0%	37	34	52	38	37	37	36	37	0.00%
2022-05-01	20:00:00	0.0%	37	34	56	38	37	36	35	36	3.33%
2022-05-01	21:00:00	0.0%	35	34	54	36	35	35	35	35	3.33%
2022-05-01	22:00:00	0.0%	36	34	37	36	36	36	35	36	0.00%
2022-05-01	23:00:00	0.0%	35	34	38	36	35	35	35	35	0.00%
2022-05-02	00:00:00	0.0%	35	34	37	36	35	35	35	35	0.00%
2022-05-02	01:00:00	0.0%	35	34	38	36	36	35	35	35	0.00%
2022-05-02	02:00:00	0.0%	35	34	38	36	36	35	35	35	0.00%
2022-05-02	03:00:00	0.0%	36	34	39	36	36	35	35	35	0.00%
2022-05-02	04:00:00	0.0%	36	34	48	36	36	35	35	35	0.00%
2022-05-02	05:00:00	0.0%	39	34	63	39	36	36	35	36	0.00%
2022-05-02	06:00:00	0.0%	36	34	55	37	36	36	35	36	6.67%
2022-05-02	07:00:00	0.0%	37	34	53	37	36	36	35	36	3.33%
2022-05-02	08:00:00	0.0%	37	34	47	38	37	37	36	36	16.67%
2022-05-02	09:00:00	0.0%	52	35	64	57	51	47	38	46	3.33%
2022-05-02	10:00:00	0.0%	55	41	67	59	54	52	45	51	6.67%
2022-05-02	11:00:00	0.0%	59	44	68	62	59	57	51	57	0.00%

Date	Time	Percent Excluded	L_{eq}	L_{min}	L_{max}	L_{10}	L_{33}	L_{50}	L_{90}	L_{nat}	% Anth.[2] Noise
2022-05-02	12:00:00	0.1%	57	45	66	60	57	56	51	56	0.00%
2022-05-02	13:00:00	0.1%	58	45	68	61	59	57	51	57	0.00%
2022-05-02	14:00:00	0.1%	57	43	68	60	57	55	47	55	0.00%
2022-05-02	15:00:00	0.2%	58	44	69	61	58	57	51	57	0.00%
2022-05-02	16:00:00	0.1%	59	46	70	62	59	58	52	58	3.33%
2022-05-02	17:00:00	0.3%	62	47	71	66	63	61	55	61	0.00%
2022-05-02	18:00:00	0.2%	61	48	69	64	61	59	55	59	0.00%
2022-05-02	19:00:00	0.0%	51	40	63	55	51	48	43	48	3.33%
2022-05-02	20:00:00	25.9%	Excluded - Rain								3.33%
2022-05-02	21:00:00	41.2%	Excluded - Rain								6.67%
2022-05-02	22:00:00	0.0%	41	37	60	43	41	40	39	40	3.33%
2022-05-02	23:00:00	0.0%	41	37	55	43	41	40	39	40	13.33%
2022-05-03	00:00:00	0.0%	41	37	58	42	40	40	39	40	6.67%
2022-05-03	01:00:00	0.0%	40	37	51	41	40	39	38	39	0.00%
2022-05-03	02:00:00	0.0%	40	37	46	41	40	39	38	39	0.00%
2022-05-03	03:00:00	0.0%	40	37	48	42	40	40	38	40	0.00%
2022-05-03	04:00:00	0.0%	41	37	49	43	41	40	39	40	3.33%
2022-05-03	05:00:00	0.0%	42	37	60	45	42	41	39	41	0.00%
2022-05-03	06:00:00	9.6%	42	37	63	44	42	41	39	41	0.00%
2022-05-03	07:00:00	0.0%	40	37	61	42	40	40	39	40	6.67%
2022-05-03	08:00:00	0.0%	43	37	57	46	43	42	40	42	3.33%
2022-05-03	09:00:00	0.0%	46	38	59	48	45	43	41	43	6.67%
2022-05-03	10:00:00	0.0%	51	41	60	54	51	49	45	49	0.00%
2022-05-03	11:00:00	0.0%	56	42	66	59	56	54	49	54	6.67%
2022-05-03	12:00:00	0.0%	54	41	65	57	55	53	48	53	0.00%
2022-05-03	13:00:00	0.0%	57	44	66	61	58	57	51	56	3.33%
2022-05-03	14:00:00	0.0%	55	42	64	59	56	54	48	53	6.67%
2022-05-03	15:00:00	0.0%	57	43	64	60	58	56	50	56	3.33%
2022-05-03	16:00:00	0.0%	54	39	65	58	54	52	45	51	10.00%

Date	Time	Percent Excluded	L_{eq}	L_{min}	L_{max}	L_{10}	L_{33}	L_{50}	L_{90}	L_{nat}	% Anth.[2] Noise
2022-05-03	17:00:00	0.0%	48	39	60	52	47	45	41	45	0.00%
2022-05-03	18:00:00	0.0%	45	37	60	49	44	42	40	42	3.33%
2022-05-03	19:00:00	0.0%	44	38	65	45	42	41	39	41	0.00%
2022-05-03	20:00:00	0.0%	44	38	57	47	43	42	40	42	3.33%
2022-05-03	21:00:00	0.0%	43	38	55	44	42	42	40	42	3.33%
2022-05-03	22:00:00	0.0%	42	38	53	43	41	41	39	41	6.67%
2022-05-03	23:00:00	0.0%	44	39	53	47	44	43	41	43	0.00%
2022-05-04	00:00:00	0.0%	41	38	51	43	41	41	39	N/A[1]	N/A[1]
2022-05-04	01:00:00	0.0%	40	37	45	41	40	40	39	N/A[1]	N/A[1]
2022-05-04	02:00:00	0.0%	41	37	51	43	41	40	39	N/A[1]	N/A[1]
2022-05-04	03:00:00	3.5%	41	38	48	42	41	40	39	N/A[1]	N/A[1]
2022-05-04	04:00:00	52.6%	Excluded - Rain								N/A[1]
2022-05-04	05:00:00	36.2%	Excluded - Rain								N/A[1]
2022-05-04	06:00:00	5.0%	40	37	66	40	39	39	38	N/A[1]	N/A[1]
2022-05-04	07:00:00	6.1%	39	37	62	39	39	39	38	N/A[1]	N/A[1]

1. Partial days were not analyzed for anthropogenic noise.

Table B-3. Hourly noise metrics, Diablo Lake Trail summer 2021 measurement (dBA).[1]

Date	Time	Percent Excluded	L_{eq}	L_{min}	L_{max}	L_{10}	L_{33}	L_{50}	L_{90}	L_{nat}	% Anth.[2] Noise
2021-08-24	18:00:00	0.0%	29	20	49	31	25	24	22	N/A[1]	N/A[1]
2021-08-24	19:00:00	0.0%	24	20	41	27	24	23	21	N/A[1]	N/A[1]
2021-08-24	20:00:00	0.0%	23	19	41	25	23	22	20	N/A[1]	N/A[1]
2021-08-24	21:00:00	0.0%	22	19	34	24	22	21	20	N/A[1]	N/A[1]
2021-08-24	22:00:00	0.0%	21	19	42	23	22	21	20	N/A[1]	N/A[1]
2021-08-24	23:00:00	0.0%	25	19	38	30	23	21	20	N/A[1]	N/A[1]
2021-08-25	00:00:00	0.0%	28	19	44	32	30	24	20	24	0.00%
2021-08-25	01:00:00	0.0%	30	18	38	33	31	29	20	29	0.00%
2021-08-25	02:00:00	0.1%	22	18	38	22	21	21	20	21	0.00%
2021-08-25	03:00:00	0.0%	21	18	42	23	21	21	20	21	16.67%
2021-08-25	04:00:00	0.0%	22	18	38	23	21	20	19	20	16.67%
2021-08-25	05:00:00	0.0%	19	18	37	20	19	19	19	19	3.33%
2021-08-25	06:00:00	0.0%	22	18	43	24	21	20	19	20	20.00%
2021-08-25	07:00:00	0.0%	25	18	45	26	23	22	20	20	56.67%
2021-08-25	08:00:00	0.0%	26	18	52	28	24	22	20	21	50.00%
2021-08-25	09:00:00	0.0%	24	18	43	26	22	21	20	20	53.33%
2021-08-25	10:00:00	0.0%	26	18	46	29	24	22	20	21	53.33%
2021-08-25	11:00:00	0.0%	24	19	48	26	23	22	20	21	50.00%
2021-08-25	12:00:00	0.0%	31	21	44	35	29	27	23	23	66.67%
2021-08-25	13:00:00	0.0%	42	36	61	45	42	41	39	40	36.67%
2021-08-25	14:00:00	0.0%	40	34	51	42	40	39	36	38	33.33%
2021-08-25	15:00:00	0.1%	44	37	54	46	43	42	39	41	20.00%
2021-08-25	16:00:00	0.0%	44	33	55	47	43	42	38	41	23.33%
2021-08-25	17:00:00	0.0%	40	32	60	43	40	39	35	37	33.33%
2021-08-25	18:00:00	0.0%	35	22	53	38	34	31	26	29	33.33%
2021-08-25	19:00:00	0.0%	35	25	59	36	32	31	28	30	16.67%
2021-08-25	20:00:00	0.0%	29	22	42	32	28	27	25	27	0.00%
2021-08-25	21:00:00	0.0%	28	23	41	30	27	26	25	26	26.67%

Date	Time	Percent Excluded	L_{eq}	L_{min}	L_{max}	L_{10}	L_{33}	L_{50}	L_{90}	L_{nat}	% Anth.[2] Noise
2021-08-25	22:00:00	0.0%	29	23	48	31	29	28	25	27	20.00%
2021-08-25	23:00:00	0.0%	35	27	51	38	34	32	30	32	3.33%
2021-08-26	00:00:00	0.0%	38	27	49	41	37	35	30	35	0.00%
2021-08-26	01:00:00	0.0%	40	22	52	44	39	35	25	35	0.00%
2021-08-26	02:00:00	0.1%	26	20	41	29	25	24	22	23	20.11%
2021-08-26	03:00:00	0.0%	25	19	39	24	22	22	21	22	10.00%
2021-08-26	04:00:00	0.0%	23	19	40	24	22	22	21	22	16.67%
2021-08-26	05:00:00	0.0%	36	20	52	39	35	31	22	28	13.33%
2021-08-26	06:00:00	0.0%	31	20	41	34	31	29	23	28	36.67%
2021-08-26	07:00:00	0.0%	26	19	49	28	24	23	20	22	40.00%
2021-08-26	08:00:00	0.0%	26	19	43	28	25	23	21	22	63.33%
2021-08-26	09:00:00	0.0%	37	22	63	36	31	28	24	26	40.00%
2021-08-26	10:00:00	0.0%	39	26	62	39	33	32	29	30	43.33%
2021-08-26	11:00:00	0.0%	33	22	47	37	32	30	26	28	30.00%
2021-08-26	12:00:00	0.0%	40	29	54	42	39	37	32	33	60.00%
2021-08-26	13:00:00	0.0%	38	30	49	41	38	37	33	34	63.33%
2021-08-26	14:00:00	0.0%	43	33	52	46	42	41	36	39	33.33%
2021-08-26	15:00:00	0.0%	41	31	54	45	41	39	35	37	46.67%
2021-08-26	16:00:00	0.1%	44	29	66	46	39	37	33	35	36.67%
2021-08-26	17:00:00	0.0%	42	31	58	45	41	40	36	38	33.33%
2021-08-26	18:00:00	0.0%	38	19	61	40	33	27	22	24	40.00%
2021-08-26	19:00:00	0.0%	35	20	61	36	26	23	21	22	30.00%
2021-08-26	20:00:00	0.0%	38	25	52	43	36	33	28	29	50.00%
2021-08-26	21:00:00	0.0%	28	20	57	30	26	25	22	24	20.00%
2021-08-26	22:00:00	0.0%	22	19	41	24	22	21	20	21	0.00%
2021-08-26	23:00:00	0.0%	38	19	58	42	36	25	21	24	6.67%
2021-08-27	00:00:00	1.7%	39	26	58	42	38	36	30	36	0.00%
2021-08-27	01:00:00	0.0%	34	28	48	36	33	32	30	32	0.00%
2021-08-27	02:00:00	0.1%	35	27	50	37	33	32	29	31	6.70%

Date	Time	Percent Excluded	L_{eq}	L_{min}	L_{max}	L_{10}	L_{33}	L_{50}	L_{90}	L_{nat}	% Anth.[2] Noise
2021-08-27	03:00:00	0.0%	34	25	50	38	31	30	28	30	10.00%
2021-08-27	04:00:00	0.0%	30	23	46	33	28	28	26	28	0.00%
2021-08-27	05:00:00	0.0%	31	22	43	34	31	28	24	27	13.33%
2021-08-27	06:00:00	0.0%	35	23	45	39	34	31	26	28	60.00%
2021-08-27	07:00:00	0.0%	28	21	47	30	26	25	23	25	26.67%
2021-08-27	08:00:00	0.0%	30	19	61	29	26	24	22	23	46.67%
2021-08-27	09:00:00	0.0%	29	20	48	32	29	28	24	26	40.00%
2021-08-27	10:00:00	0.0%	38	27	55	42	38	36	30	32	60.00%
2021-08-27	11:00:00	0.0%	40	26	52	44	39	36	30	34	36.67%
2021-08-27	12:00:00	0.0%	38	28	49	41	38	36	32	33	63.33%
2021-08-27	13:00:00	14.2%	36	28	60	40	36	35	32	32	66.67%
2021-08-27	14:00:00	0.0%	40	30	50	43	39	38	34	35	46.67%
2021-08-27	15:00:00	0.0%	41	31	52	45	40	38	35	36	43.33%
2021-08-27	16:00:00	0.0%	38	29	50	41	37	36	32	35	23.33%
2021-08-27	17:00:00	0.0%	38	30	49	41	38	37	33	35	43.33%
2021-08-27	18:00:00	0.0%	38	30	59	41	37	35	33	34	46.67%
2021-08-27	19:00:00	0.0%	37	25	51	40	35	32	27	29	46.67%
2021-08-27	20:00:00	0.0%	35	21	51	40	35	33	26	31	36.67%
2021-08-27	21:00:00	0.0%	29	19	47	33	30	26	22	24	50.00%
2021-08-27	22:00:00	0.0%	22	18	31	24	23	22	19	23	6.67%
2021-08-27	23:00:00	0.0%	22	18	32	24	23	22	19	22	13.33%
2021-08-28	00:00:00	0.0%	22	18	40	24	22	21	19	20	26.67%
2021-08-28	01:00:00	0.0%	22	18	41	24	23	22	19	22	16.67%
2021-08-28	02:00:00	0.1%	22	18	40	23	23	22	19	22	3.35%
2021-08-28	03:00:00	0.0%	22	18	38	24	23	22	20	22	23.33%
2021-08-28	04:00:00	0.0%	21	18	39	23	21	21	20	21	16.67%
2021-08-28	05:00:00	0.0%	20	17	33	22	20	19	18	18	63.33%
2021-08-28	06:00:00	0.0%	22	18	42	25	22	21	19	19	63.33%
2021-08-28	07:00:00	0.0%	23	18	40	25	22	21	19	20	70.00%

Date	Time	Percent Excluded	L_{eq}	L_{min}	L_{max}	L_{10}	L_{33}	L_{50}	L_{90}	L_{nat}	% Anth.[2] Noise
2021-08-28	08:00:00	0.0%	24	18	44	26	24	23	20	21	66.67%
2021-08-28	09:00:00	0.0%	26	19	51	28	24	23	21	21	66.67%
2021-08-28	10:00:00	0.0%	30	19	51	32	25	23	21	21	80.00%
2021-08-28	11:00:00	0.0%	31	21	53	34	29	27	23	21	100.00%
2021-08-28	12:00:00	0.0%	36	21	59	36	31	29	24	23	93.33%
2021-08-28	13:00:00	0.0%	39	29	50	42	40	38	34	35	70.00%
2021-08-28	14:00:00	0.0%	41	35	54	43	41	40	37	38	66.67%
2021-08-28	15:00:00	0.0%	42	35	50	45	42	41	38	40	50.00%
2021-08-28	16:00:00	0.0%	43	35	55	46	44	42	39	41	40.00%
2021-08-28	17:00:00	0.0%	43	29	68	44	39	37	32	34	40.00%
2021-08-28	18:00:00	0.0%	32	26	50	34	32	31	29	30	30.00%
2021-08-28	19:00:00	0.0%	33	22	56	36	30	28	25	27	30.00%
2021-08-28	20:00:00	0.0%	26	20	36	28	26	25	23	24	20.00%
2021-08-28	21:00:00	0.0%	28	19	38	32	27	25	22	24	13.33%
2021-08-28	22:00:00	0.0%	31	19	41	36	25	23	21	23	13.33%
2021-08-28	23:00:00	0.0%	34	19	43	38	36	34	22	34	3.33%
2021-08-29	00:00:00	0.0%	36	18	43	40	38	37	22	36	13.33%
2021-08-29	01:00:00	0.0%	35	18	41	38	37	35	21	34	3.33%
2021-08-29	02:00:00	0.1%	31	18	45	36	25	24	21	24	3.35%
2021-08-29	03:00:00	0.0%	35	18	44	39	37	34	21	31	10.00%
2021-08-29	04:00:00	0.0%	27	18	41	28	22	22	20	22	3.33%
2021-08-29	05:00:00	0.0%	24	17	52	21	20	20	18	19	3.33%
2021-08-29	06:00:00	0.0%	27	18	53	25	21	20	19	19	43.33%
2021-08-29	07:00:00	0.0%	23	18	50	23	20	20	19	19	36.67%
2021-08-29	08:00:00	0.0%	29	18	60	29	23	22	19	20	70.00%
2021-08-29	09:00:00	0.0%	25	18	55	26	22	21	20	20	70.00%
2021-08-29	10:00:00	0.0%	32	19	68	28	24	23	21	21	73.33%
2021-08-29	11:00:00	0.0%	36	19	60	32	26	25	22	22	76.67%
2021-08-29	12:00:00	0.0%	46	23	70	41	35	32	26	25	86.67%

Date	Time	Percent Excluded	L_{eq}	L_{min}	L_{max}	L_{10}	L_{33}	L_{50}	L_{90}	L_{nat}	% Anth.[2] Noise
2021-08-29	13:00:00	0.0%	44	34	56	47	44	42	39	41	50.00%
2021-08-29	14:00:00	0.0%	43	35	57	46	43	42	38	39	63.33%
2021-08-29	15:00:00	0.0%	46	37	68	49	46	44	41	42	66.67%
2021-08-29	16:00:00	0.0%	45	36	54	47	45	44	40	42	56.67%
2021-08-29	17:00:00	0.0%	41	32	51	43	40	39	36	38	33.33%
2021-08-29	18:00:00	0.0%	45	28	68	44	39	37	32	34	43.33%
2021-08-29	19:00:00	0.0%	34	27	47	36	33	32	30	31	53.33%
2021-08-29	20:00:00	0.0%	34	27	57	37	34	33	30	31	43.33%
2021-08-29	21:00:00	0.0%	42	26	55	47	41	38	30	38	0.00%
2021-08-29	22:00:00	0.0%	36	24	52	39	33	31	27	30	16.67%
2021-08-29	23:00:00	0.0%	28	23	40	30	28	27	25	27	3.33%
2021-08-30	00:00:00	0.0%	26	21	41	28	26	25	23	24	20.00%
2021-08-30	01:00:00	0.0%	29	21	50	27	25	24	22	24	13.33%
2021-08-30	02:00:00	0.1%	24	20	36	26	25	24	22	23	13.41%
2021-08-30	03:00:00	0.0%	25	20	41	27	25	24	22	23	43.33%
2021-08-30	04:00:00	0.0%	25	21	41	26	25	24	23	24	20.00%
2021-08-30	05:00:00	0.0%	24	20	46	25	24	24	21	23	33.33%
2021-08-30	06:00:00	0.0%	37	25	52	39	34	32	27	28	66.67%
2021-08-30	07:00:00	0.0%	37	27	48	41	37	36	30	34	43.33%
2021-08-30	08:00:00	0.0%	39	28	51	42	38	37	32	34	56.67%
2021-08-30	09:00:00	0.2%	48	36	64	50	45	44	40	42	36.67%
2021-08-30	10:00:00	0.8%	50	38	66	54	49	46	41	43	33.33%
2021-08-30	11:00:00	3.0%	54	41	65	57	54	52	46	51	13.33%
2021-08-30	12:00:00	1.5%	48	34	63	53	46	43	39	42	36.67%
2021-08-30	13:00:00	0.5%	49	36	61	52	48	46	41	45	26.67%
2021-08-30	14:00:00	2.1%	54	42	67	57	54	52	47	51	20.00%
2021-08-30	15:00:00	0.9%	49	38	65	52	48	47	43	45	30.00%
2021-08-30	16:00:00	1.0%	49	37	60	53	49	47	42	46	16.67%
2021-08-30	17:00:00	0.1%	45	33	58	48	45	43	39	43	10.00%

Date	Time	Percent Excluded	L_{eq}	L_{min}	L_{max}	L_{10}	L_{33}	L_{50}	L_{90}	L_{nat}	% Anth.[2] Noise
2021-08-30	18:00:00	0.0%	41	29	58	44	40	38	34	36	53.33%
2021-08-30	19:00:00	0.0%	45	34	63	48	45	43	39	41	36.67%
2021-08-30	20:00:00	0.0%	40	32	50	43	40	39	36	39	6.67%
2021-08-30	21:00:00	0.0%	39	29	56	42	38	36	33	36	3.33%
2021-08-30	22:00:00	0.0%	39	32	49	41	39	37	34	37	0.00%
2021-08-30	23:00:00	0.0%	41	31	54	44	40	38	35	38	0.00%
2021-08-31	00:00:00	0.0%	40	25	57	45	38	35	31	35	0.00%
2021-08-31	01:00:00	0.0%	35	24	50	36	32	31	27	31	0.00%
2021-08-31	02:00:00	0.1%	30	23	44	32	29	28	25	27	6.70%
2021-08-31	03:00:00	0.0%	34	24	50	37	32	29	25	28	10.00%
2021-08-31	04:00:00	0.0%	30	23	48	32	29	28	25	27	10.00%
2021-08-31	05:00:00	0.0%	32	25	41	35	31	30	28	30	3.33%
2021-08-31	06:00:00	0.0%	26	22	38	28	26	25	24	24	60.00%
2021-08-31	07:00:00	0.0%	27	21	48	29	26	25	24	24	63.33%
2021-08-31	08:00:00	0.0%	28	22	43	30	28	27	25	26	26.67%
2021-08-31	09:00:00	0.0%	29	24	54	31	29	28	26	27	36.67%
2021-08-31	10:00:00	0.0%	36	26	45	39	36	34	29	33	23.33%
2021-08-31	11:00:00	0.0%	37	30	47	40	37	36	33	35	33.33%
2021-08-31	12:00:00	0.0%	42	33	58	45	42	40	36	39	20.00%
2021-08-31	13:00:00	0.0%	44	34	58	47	43	41	37	40	36.67%
2021-08-31	14:00:00	0.0%	46	31	58	50	45	42	37	41	16.67%
2021-08-31	15:00:00	0.0%	45	32	57	49	44	42	37	41	23.33%
2021-08-31	16:00:00	0.0%	44	36	54	47	45	43	40	43	13.33%
2021-08-31	17:00:00	0.0%	42	28	54	46	42	39	30	37	23.33%
2021-08-31	18:00:00	0.0%	39	27	63	40	36	33	30	32	13.33%
2021-08-31	19:00:00	0.0%	42	23	66	42	36	31	26	30	16.67%
2021-08-31	20:00:00	0.0%	32	18	46	37	28	22	20	21	16.67%
2021-08-31	21:00:00	0.0%	24	18	48	22	20	20	19	20	0.00%
2021-08-31	22:00:00	0.0%	21	18	37	23	21	20	19	20	0.00%

Date	Time	Percent Excluded	L_{eq}	L_{min}	L_{max}	L_{10}	L_{33}	L_{50}	L_{90}	L_{nat}	% Anth.[2] Noise
2021-08-31	23:00:00	0.0%	21	17	35	23	21	20	18	20	6.67%
2021-09-01	00:00:01	0.0%	28	17	55	21	21	20	18	N/A[1]	N/A[1]
2021-09-01	01:00:00	0.0%	19	17	35	21	20	18	17	N/A[1]	N/A[1]
2021-09-01	02:00:00	0.1%	23	17	44	22	21	20	17	N/A[1]	N/A[1]
2021-09-01	03:00:00	0.0%	24	17	51	22	19	18	17	N/A[1]	N/A[1]
2021-09-01	04:00:00	0.0%	21	17	41	21	18	18	17	N/A[1]	N/A[1]
2021-09-01	05:00:00	0.0%	22	17	39	25	20	19	18	N/A[1]	N/A[1]
2021-09-01	06:00:00	0.0%	22	17	40	24	21	20	19	N/A[1]	N/A[1]
2021-09-01	07:00:00	0.0%	26	18	52	27	23	22	20	N/A[1]	N/A[1]
2021-09-01	08:00:00	0.0%	28	18	50	30	25	23	21	N/A[1]	N/A[1]
2021-09-01	09:00:00	0.0%	24	19	40	26	24	23	21	N/A[1]	N/A[1]
2021-09-01	10:00:00	0.0%	26	19	42	28	24	23	21	N/A[1]	N/A[1]

1 Partial days were not analyzed for anthropogenic noise.
2 Anth. = anthropogenic

Table B-4. Hourly noise metrics, Diablo Lake Trail spring 2022 measurement (dBA).[1]

Date	Time	Percent Excluded	L_{eq}	L_{min}	L_{max}	L_{10}	L_{33}	L_{50}	L_{90}	L_{nat}	% Anth.[2] Noise
2022-04-26	14:00:00	0.0%	43	34	55	46	44	42	37	N/A[1]	N/A[1]
2022-04-26	15:00:00	1.9%	47	37	59	52	47	43	39	N/A[1]	N/A[1]
2022-04-26	16:00:00	0.9%	34	26	48	38	34	31	28	N/A[1]	N/A[1]
2022-04-26	17:00:00	1.0%	35	25	54	38	33	29	26	N/A[1]	N/A[1]
2022-04-26	18:00:00	57.7%	Excluded - Rain								N/A[1]
2022-04-26	19:00:00	29.2%	Excluded - Rain								N/A[1]
2022-04-26	20:00:00	3.2%	37	30	65	38	36	36	33	N/A[1]	N/A[1]
2022-04-26	21:00:00	14.9%	34	29	66	35	33	31	30	N/A[1]	N/A[1]
2022-04-26	22:00:00	0.0%	31	27	59	32	30	29	28	N/A[1]	N/A[1]
2022-04-26	23:00:00	0.0%	29	26	57	29	28	28	27	N/A[1]	N/A[1]
2022-04-27	00:00:00	0.0%	28	26	56	29	28	27	27	27	0.00%
2022-04-27	01:00:00	0.0%	28	25	47	28	27	27	26	27	3.33%
2022-04-27	02:00:00	0.0%	27	25	53	27	27	27	26	27	0.00%
2022-04-27	03:00:00	0.0%	27	25	44	27	26	26	26	26	3.33%
2022-04-27	04:00:00	0.0%	26	25	42	26	26	26	26	26	3.33%
2022-04-27	05:00:00	0.0%	32	25	47	35	32	29	25	29	0.00%
2022-04-27	06:00:00	0.0%	42	25	61	36	31	29	26	29	3.33%
2022-04-27	07:00:00	0.0%	28	25	48	30	27	26	26	26	20.00%
2022-04-27	08:00:00	0.0%	26	25	42	27	26	26	26	26	10.00%
2022-04-27	09:00:00	0.0%	26	25	43	27	26	26	26	26	26.67%
2022-04-27	10:00:00	0.0%	28	25	48	29	27	26	26	26	20.00%
2022-04-27	11:00:00	0.0%	27	25	47	29	27	26	26	26	26.67%
2022-04-27	12:00:00	0.0%	28	25	48	30	28	27	26	26	30.00%
2022-04-27	13:00:00	0.0%	31	26	50	33	31	30	27	29	23.33%
2022-04-27	14:00:00	0.0%	36	27	57	37	34	32	30	32	13.33%
2022-04-27	15:00:00	0.0%	39	26	54	42	39	37	28	36	13.33%
2022-04-27	16:00:00	0.3%	46	28	61	49	46	45	34	45	10.00%
2022-04-27	17:00:00	0.0%	39	25	64	37	29	27	26	27	10.00%

Date	Time	Percent Excluded	L_{eq}	L_{min}	L_{max}	L_{10}	L_{33}	L_{50}	L_{90}	L_{nat}	% Anth.[2] Noise
2022-04-27	18:00:00	0.0%	30	24	51	29	27	26	25	26	13.33%
2022-04-27	19:00:00	0.0%	29	25	50	28	27	27	26	27	10.00%
2022-04-27	20:00:00	0.0%	27	25	42	28	27	27	26	27	0.00%
2022-04-27	21:00:00	0.0%	27	25	31	27	27	27	26	27	3.33%
2022-04-27	22:00:00	0.0%	27	25	41	26	26	26	26	26	0.00%
2022-04-27	23:00:00	0.0%	27	25	46	26	26	26	26	26	0.00%
2022-04-28	00:00:00	0.0%	26	24	37	26	26	26	25	26	0.00%
2022-04-28	01:00:00	0.0%	26	25	32	26	26	26	25	26	0.00%
2022-04-28	02:00:00	0.0%	26	25	31	26	26	26	26	26	0.00%
2022-04-28	03:00:00	0.0%	29	25	48	28	26	26	26	26	13.33%
2022-04-28	04:00:00	0.0%	26	25	31	26	26	26	26	26	0.00%
2022-04-28	05:00:00	0.0%	30	25	47	33	30	28	26	28	0.00%
2022-04-28	06:00:00	0.0%	30	25	49	31	28	27	26	27	6.67%
2022-04-28	07:00:00	0.0%	30	25	59	28	27	26	26	26	13.33%
2022-04-28	08:00:00	0.0%	28	25	52	29	26	26	25	26	10.00%
2022-04-28	09:00:00	0.0%	33	24	65	29	26	25	25	25	16.67%
2022-04-28	10:00:00	0.0%	43	24	67	31	26	25	25	25	13.33%
2022-04-28	11:00:00	0.0%	35	24	58	37	31	28	25	27	20.00%
2022-04-28	12:00:00	0.0%	44	34	66	42	39	38	36	38	16.67%
2022-04-28	13:00:00	0.0%	44	35	54	47	44	43	39	43	6.67%
2022-04-28	14:00:00	0.0%	44	36	56	47	44	43	39	42	16.67%
2022-04-28	15:00:00	0.0%	45	39	56	48	45	44	41	44	13.33%
2022-04-28	16:00:00	0.0%	46	35	58	49	46	45	41	44	6.67%
2022-04-28	17:00:00	0.0%	41	32	60	44	40	39	34	38	6.67%
2022-04-28	18:00:00	0.0%	43	34	56	47	42	41	37	40	3.33%
2022-04-28	19:00:00	0.0%	42	33	59	45	40	39	36	39	3.33%
2022-04-28	20:00:00	0.0%	39	30	54	42	38	37	33	37	0.00%
2022-04-28	21:00:00	0.0%	34	29	45	36	33	32	31	32	0.00%
2022-04-28	22:00:00	0.0%	31	28	39	32	31	30	29	30	0.00%

Date	Time	Percent Excluded	L_{eq}	L_{min}	L_{max}	L_{10}	L_{33}	L_{50}	L_{90}	L_{nat}	% Anth.[2] Noise
2022-04-28	23:00:00	0.0%	28	26	36	30	29	28	27	28	0.00%
2022-04-29	00:00:00	0.0%	27	26	28	27	27	27	27	27	0.00%
2022-04-29	01:00:00	0.0%	27	25	43	27	27	27	26	27	3.33%
2022-04-29	02:00:00	0.0%	27	26	46	27	27	27	26	27	3.35%
2022-04-29	03:00:00	0.0%	28	25	53	27	27	26	26	26	6.67%
2022-04-29	04:00:00	0.0%	25	24	28	26	26	25	25	25	0.00%
2022-04-29	05:00:00	0.0%	32	25	54	33	28	27	25	27	6.67%
2022-04-29	06:00:00	0.0%	28	25	47	29	26	26	25	26	3.33%
2022-04-29	07:00:00	0.0%	27	24	48	27	26	26	25	26	0.00%
2022-04-29	08:00:00	0.0%	28	24	52	28	26	26	25	25	10.00%
2022-04-29	09:00:00	15.2%	37	24	58	35	29	26	25	26	20.00%
2022-04-29	10:00:00	0.0%	42	24	65	31	27	26	25	26	6.67%
2022-04-29	11:00:00	0.0%	38	26	62	37	33	32	29	31	20.00%
2022-04-29	12:00:00	0.0%	37	29	52	40	37	36	32	36	6.67%
2022-04-29	13:00:00	0.0%	43	33	59	45	43	41	37	41	10.00%
2022-04-29	14:00:00	0.0%	42	32	60	45	42	40	37	40	10.00%
2022-04-29	15:00:00	0.0%	40	31	52	43	40	39	35	38	23.33%
2022-04-29	16:00:00	0.0%	38	28	55	41	38	36	32	36	0.00%
2022-04-29	17:00:00	0.0%	38	26	63	36	33	32	28	31	13.33%
2022-04-29	18:00:00	0.0%	33	28	51	34	32	31	29	31	3.33%
2022-04-29	19:00:00	0.0%	31	27	43	34	31	30	28	30	6.67%
2022-04-29	20:00:00	0.0%	28	25	46	28	27	26	26	26	3.33%
2022-04-29	21:00:00	0.0%	26	25	42	26	26	26	25	26	3.33%
2022-04-29	22:00:00	0.0%	26	25	35	27	27	26	26	26	0.00%
2022-04-29	23:00:00	0.0%	29	25	53	27	27	26	26	26	0.00%
2022-04-30	00:00:00	0.0%	27	25	40	27	27	26	26	26	3.33%
2022-04-30	01:00:00	0.0%	27	25	29	27	27	27	26	27	0.00%
2022-04-30	02:00:00	0.0%	27	25	29	27	27	27	26	27	0.00%
2022-04-30	03:00:00	0.0%	27	25	31	27	27	27	26	27	0.00%

Date	Time	Percent Excluded	L_{eq}	L_{min}	L_{max}	L_{10}	L_{33}	L_{50}	L_{90}	L_{nat}	% Anth.[2] Noise
2022-04-30	04:00:00	0.0%	27	25	32	27	27	27	26	27	0.00%
2022-04-30	05:00:00	0.0%	31	26	54	33	29	28	27	28	0.00%
2022-04-30	06:00:00	0.0%	31	26	54	32	28	27	27	27	3.33%
2022-04-30	07:00:00	0.0%	34	25	56	33	27	27	26	27	0.00%
2022-04-30	08:00:00	0.0%	31	25	56	30	27	26	26	26	6.67%
2022-04-30	09:00:00	0.0%	30	25	50	31	27	26	26	26	6.67%
2022-04-30	10:00:00	4.9%	28	25	45	30	28	27	26	27	16.67%
2022-04-30	11:00:00	1.7%	35	27	54	37	35	34	31	34	6.67%
2022-04-30	12:00:00	10.0%	38	32	62	38	37	36	35	36	10.00%
2022-04-30	13:00:00	15.2%	36	29	63	38	37	35	32	35	6.67%
2022-04-30	14:00:00	0.0%	32	25	62	33	30	29	26	28	20.00%
2022-04-30	15:00:00	0.0%	30	25	53	30	27	27	26	27	6.67%
2022-04-30	16:00:00	0.0%	30	25	55	29	27	26	26	26	10.00%
2022-04-30	17:00:00	0.0%	32	25	61	29	27	26	26	26	6.67%
2022-04-30	18:00:00	0.0%	29	25	53	29	28	27	27	27	3.33%
2022-04-30	19:00:00	0.0%	28	26	46	29	28	27	27	27	0.00%
2022-04-30	20:00:00	0.0%	31	25	51	33	27	27	26	27	3.33%
2022-04-30	21:00:00	0.0%	27	25	39	27	27	27	26	27	0.00%
2022-04-30	22:00:00	0.0%	29	25	45	32	27	27	26	27	3.33%
2022-04-30	23:00:00	0.0%	27	25	38	27	26	26	26	26	0.00%
2022-05-01	00:00:00	0.0%	26	25	46	26	26	26	25	26	0.00%
2022-05-01	01:00:00	0.0%	29	25	52	26	26	26	25	26	3.33%
2022-05-01	02:00:00	0.0%	26	25	35	26	26	26	26	26	0.00%
2022-05-01	03:00:00	0.0%	26	24	33	26	26	26	25	26	0.00%
2022-05-01	04:00:00	0.0%	25	24	29	26	26	25	25	25	0.00%
2022-05-01	05:00:00	0.0%	29	25	45	30	28	27	26	27	0.00%
2022-05-01	06:00:00	0.0%	40	25	60	37	29	27	26	27	0.00%
2022-05-01	07:00:00	0.0%	30	25	53	32	27	26	26	26	0.00%
2022-05-01	08:00:00	0.0%	33	25	58	34	27	26	26	26	0.00%

Date	Time	Percent Excluded	L_{eq}	L_{min}	L_{max}	L_{10}	L_{33}	L_{50}	L_{90}	L_{nat}	% Anth.[2] Noise
2022-05-01	09:00:00	0.0%	34	25	65	33	28	27	26	27	3.33%
2022-05-01	10:00:00	0.0%	31	24	52	30	26	26	25	26	16.67%
2022-05-01	11:00:00	0.0%	32	25	53	31	27	26	25	26	13.33%
2022-05-01	12:00:00	0.0%	36	26	54	40	35	32	27	31	10.00%
2022-05-01	13:00:00	0.0%	42	33	62	44	42	40	37	40	13.33%
2022-05-01	14:00:00	0.0%	42	34	52	44	42	41	37	40	10.00%
2022-05-01	15:00:00	0.0%	40	31	56	43	40	38	34	37	13.33%
2022-05-01	16:00:00	0.0%	37	31	54	40	37	36	34	36	6.67%
2022-05-01	17:00:00	0.0%	38	27	70	38	34	33	29	32	26.67%
2022-05-01	18:00:00	0.0%	33	27	52	34	31	30	28	30	3.33%
2022-05-01	19:00:00	0.0%	30	26	55	30	29	28	27	28	0.00%
2022-05-01	20:00:00	0.0%	31	26	59	29	28	27	26	27	10.00%
2022-05-01	21:00:00	0.0%	29	25	52	27	26	26	26	26	3.33%
2022-05-01	22:00:00	0.0%	26	25	29	27	27	26	26	26	0.00%
2022-05-01	23:00:00	0.0%	27	25	28	27	27	27	26	27	0.00%
2022-05-02	00:00:00	0.0%	27	26	34	27	27	27	27	27	0.00%
2022-05-02	01:00:00	0.0%	27	26	31	27	27	27	27	27	0.00%
2022-05-02	02:00:00	0.0%	27	26	32	28	28	27	27	27	3.35%
2022-05-02	03:00:00	0.0%	28	26	37	28	28	28	27	28	3.33%
2022-05-02	04:00:00	0.0%	28	26	39	28	28	27	27	27	0.00%
2022-05-02	05:00:00	0.0%	31	27	46	34	29	28	27	28	0.00%
2022-05-02	06:00:00	0.0%	37	26	59	35	29	28	27	28	10.00%
2022-05-02	07:00:00	0.0%	32	26	51	32	29	28	27	28	0.00%
2022-05-02	08:00:00	0.0%	33	26	54	37	31	29	27	29	6.67%
2022-05-02	09:00:00	0.0%	50	36	63	53	49	47	42	47	0.00%
2022-05-02	10:00:00	0.0%	47	37	58	50	46	45	41	45	0.00%
2022-05-02	11:00:00	0.0%	46	37	59	49	45	43	40	43	6.67%
2022-05-02	12:00:00	0.0%	46	36	60	50	45	44	40	43	10.00%
2022-05-02	13:00:00	0.0%	46	35	60	49	46	44	40	44	3.33%

Date	Time	Percent Excluded	L_{eq}	L_{min}	L_{max}	L_{10}	L_{33}	L_{50}	L_{90}	L_{nat}	% Anth.[2] Noise
2022-05-02	14:00:00	0.0%	48	37	59	52	48	46	41	46	3.33%
2022-05-02	15:00:00	0.0%	45	38	59	48	45	43	41	43	6.67%
2022-05-02	16:00:00	0.0%	47	37	64	51	47	45	41	44	6.67%
2022-05-02	17:00:00	0.0%	48	36	59	51	47	46	41	45	3.33%
2022-05-02	18:00:00	0.0%	44	36	56	48	45	43	39	43	0.00%
2022-05-02	19:00:00	0.0%	44	34	56	47	43	41	36	40	6.67%
2022-05-02	20:00:00	0.0%	37	31	54	38	37	36	33	36	0.00%
2022-05-02	21:00:00	0.0%	33	28	48	34	33	32	30	32	3.33%
2022-05-02	22:00:00	0.0%	31	28	37	33	31	30	29	30	0.00%
2022-05-02	23:00:00	0.0%	35	28	53	39	32	31	29	31	0.00%
2022-05-03	00:00:00	0.0%	35	27	56	37	33	33	29	32	3.33%
2022-05-03	01:00:00	0.0%	34	27	54	37	32	32	28	32	0.00%
2022-05-03	02:00:00	0.0%	30	28	35	31	31	30	29	30	0.00%
2022-05-03	03:00:00	0.0%	32	28	44	33	32	31	29	31	0.00%
2022-05-03	04:00:00	0.0%	32	29	39	33	32	32	30	32	0.00%
2022-05-03	05:00:00	0.0%	34	29	54	36	34	33	31	33	3.33%
2022-05-03	06:00:00	0.0%	36	29	57	38	33	32	30	32	0.00%
2022-05-03	07:00:00	0.0%	36	29	59	38	35	34	31	34	3.33%
2022-05-03	08:00:00	0.0%	39	30	59	41	37	35	32	35	6.67%
2022-05-03	09:00:00	0.0%	38	30	60	39	35	34	32	33	6.67%
2022-05-03	10:00:00	0.0%	40	32	55	43	40	39	35	39	3.33%
2022-05-03	11:00:00	0.0%	44	35	57	48	44	42	38	42	6.67%
2022-05-03	12:00:00	0.0%	45	36	61	48	45	43	39	43	0.00%
2022-05-03	13:00:00	0.0%	49	41	59	52	49	48	44	48	6.67%
2022-05-03	14:00:00	0.0%	48	38	63	51	48	47	43	46	13.33%
2022-05-03	15:00:00	0.0%	46	37	58	49	46	44	40	44	6.67%
2022-05-03	16:00:00	0.0%	45	36	58	48	44	43	39	42	3.33%
2022-05-03	17:00:00	0.0%	47	38	59	51	46	44	41	44	6.67%
2022-05-03	18:00:00	0.0%	45	37	58	48	44	42	39	42	3.33%

Date	Time	Percent Excluded	L_{eq}	L_{min}	L_{max}	L_{10}	L_{33}	L_{50}	L_{90}	L_{nat}	% Anth.[2] Noise
2022-05-03	19:00:00	0.0%	44	37	56	47	43	42	39	42	3.33%
2022-05-03	20:00:00	0.0%	48	37	59	52	48	45	40	45	3.33%
2022-05-03	21:00:00	0.0%	46	33	58	50	44	42	36	41	3.33%
2022-05-03	22:00:00	0.0%	37	30	54	40	36	34	32	34	0.00%
2022-05-03	23:00:00	0.0%	32	29	40	33	32	32	31	32	0.00%
2022-05-04	00:00:00	0.0%	30	28	38	32	30	30	29	N/A[1]	N/A[1]
2022-05-04	01:00:00	0.0%	29	27	33	30	29	29	28	N/A[1]	N/A[1]
2022-05-04	02:00:00	0.0%	29	28	34	30	30	29	29	N/A[1]	N/A[1]
2022-05-04	03:00:00	0.0%	30	27	37	31	30	29	29	N/A[1]	N/A[1]
2022-05-04	04:00:00	0.0%	33	28	54	35	33	32	30	N/A[1]	N/A[1]
2022-05-04	05:00:00	2.1%	37	32	61	38	36	36	34	N/A[1]	N/A[1]
2022-05-04	06:00:00	1.0%	36	30	62	38	35	34	33	N/A[1]	N/A[1]
2022-05-04	07:00:00	9.5%	36	30	60	37	36	35	33	N/A[1]	N/A[1]
2022-05-04	08:00:00	1.7%	35	30	61	36	34	34	32	N/A[1]	N/A[1]
2022-05-04	09:00:00	6.0%	36	30	63	36	35	34	33	N/A[1]	N/A[1]
2022-05-04	10:00:00	5.7%	34	28	61	35	33	33	30	N/A[1]	N/A[1]

1 Partial days were not analyzed for anthropogenic noise.
2 Anth. = anthropogenic

Table B-5. Hourly noise metrics, Newhalem Creek Campground summer 2021 measurement (dBA).[1]

Date	Time	Percent Excluded	L_{eq}	L_{min}	L_{max}	L_{10}	L_{33}	L_{50}	L_{90}	L_{nat}	% Anth.[2] Noise
2021-08-24	17:00:00	0.0%	41	37	57	41	40	39	38	N/A[1]	N/A[1]
2021-08-24	18:00:00	0.0%	42	38	65	42	40	40	39	N/A[1]	N/A[1]
2021-08-24	19:00:00	0.0%	40	36	62	41	39	39	38	N/A[1]	N/A[1]
2021-08-24	20:00:00	0.0%	39	36	66	40	39	38	38	N/A[1]	N/A[1]
2021-08-24	21:00:00	0.0%	37	36	52	38	38	37	37	N/A[1]	N/A[1]
2021-08-24	22:00:00	0.0%	37	36	46	38	37	37	37	N/A[1]	N/A[1]
2021-08-24	23:00:00	0.0%	37	36	52	38	37	37	37	N/A[1]	N/A[1]
2021-08-25	00:00:00	0.0%	38	36	40	38	38	38	37	38	20.00%
2021-08-25	01:00:00	0.0%	38	36	43	39	38	38	37	38	13.33%
2021-08-25	02:00:00	0.1%	38	37	46	39	38	38	38	38	13.41%
2021-08-25	03:00:00	0.0%	40	37	66	39	39	39	38	39	3.33%
2021-08-25	04:00:00	0.0%	39	37	44	40	39	39	38	39	10.00%
2021-08-25	05:00:00	0.0%	39	37	44	40	40	39	39	39	10.00%
2021-08-25	06:00:00	0.0%	40	38	49	41	40	39	39	39	36.67%
2021-08-25	07:00:00	0.0%	40	37	51	41	40	40	39	39	36.67%
2021-08-25	08:00:00	0.7%	44	37	65	42	40	40	39	39	70.00%
2021-08-25	09:00:00	0.0%	41	36	71	42	40	40	38	37	96.67%
2021-08-25	10:00:00	0.0%	38	35	55	39	38	37	36	36	83.33%
2021-08-25	11:00:00	0.0%	39	34	71	39	38	37	36	36	76.67%
2021-08-25	12:00:00	0.0%	45	34	74	39	37	37	35	36	63.33%
2021-08-25	13:00:00	0.0%	39	35	60	40	38	37	36	37	53.33%
2021-08-25	14:00:00	0.1%	42	35	68	43	40	39	37	37	56.67%
2021-08-25	15:00:00	0.0%	42	37	64	44	41	40	38	38	83.33%
2021-08-25	16:00:00	0.0%	39	35	54	41	39	39	37	37	80.00%
2021-08-25	17:00:00	0.0%	40	35	63	40	39	38	37	36	93.33%
2021-08-25	18:00:00	0.0%	39	35	59	41	38	37	36	36	96.67%
2021-08-25	19:00:00	0.1%	45	35	65	45	39	38	36	35	96.67%
2021-08-25	20:00:00	0.0%	39	35	56	40	38	38	37	36	96.67%

Date	Time	Percent Excluded	L_{eq}	L_{min}	L_{max}	L_{10}	L_{33}	L_{50}	L_{90}	L_{nat}	% Anth.[2] Noise
2021-08-25	21:00:00	0.0%	37	35	57	38	37	37	36	37	30.00%
2021-08-25	22:00:00	0.0%	37	35	48	38	37	37	36	37	16.67%
2021-08-25	23:00:00	0.0%	37	35	42	37	37	37	36	37	3.33%
2021-08-26	00:00:00	0.0%	36	35	58	37	36	36	36	36	13.33%
2021-08-26	01:00:00	0.0%	36	34	47	36	36	35	35	35	26.67%
2021-08-26	02:00:00	0.1%	35	33	43	35	35	35	34	35	0.00%
2021-08-26	03:00:00	0.0%	35	34	43	35	35	35	34	35	3.33%
2021-08-26	04:00:00	0.0%	35	33	43	35	35	34	34	34	6.67%
2021-08-26	05:00:00	0.0%	35	33	51	36	35	35	34	35	16.67%
2021-08-26	06:00:00	0.0%	36	34	47	37	36	36	35	35	56.67%
2021-08-26	07:00:00	0.0%	39	35	61	39	37	37	36	36	83.33%
2021-08-26	08:00:00	0.0%	38	34	53	39	38	37	36	36	86.67%
2021-08-26	09:00:00	0.0%	44	34	66	43	39	37	36	35	100.00%
2021-08-26	10:00:00	0.0%	44	34	65	43	38	37	35	35	96.67%
2021-08-26	11:00:00	0.0%	38	34	67	40	37	37	35	35	83.33%
2021-08-26	12:00:00	0.0%	45	33	74	39	37	36	35	35	90.00%
2021-08-26	13:00:00	0.0%	37	33	61	39	37	36	35	35	83.33%
2021-08-26	14:00:00	0.0%	37	33	57	39	37	36	34	35	63.33%
2021-08-26	15:00:00	0.0%	41	34	64	40	38	37	36	35	93.33%
2021-08-26	16:00:00	0.2%	43	34	68	42	39	38	36	36	93.33%
2021-08-26	17:00:00	35.1%	Excluded - Rain								66.67%
2021-08-26	18:00:00	13.4%	40	35	63	40	38	37	36	36	63.33%
2021-08-26	19:00:00	33.0%	Excluded - Rain								66.67%
2021-08-26	20:00:00	1.7%	38	34	67	39	37	36	35	36	60.00%
2021-08-26	21:00:00	0.1%	36	33	65	37	35	35	34	34	13.33%
2021-08-26	22:00:00	0.0%	35	32	62	35	34	34	33	34	10.00%
2021-08-26	23:00:00	27.5%	Excluded - Rain								10.00%
2021-08-27	00:00:00	0.0%	37	34	65	37	36	36	35	36	23.33%
2021-08-27	01:00:00	0.0%	36	35	51	37	36	36	35	36	16.67%

Date	Time	Percent Excluded	L_{eq}	L_{min}	L_{max}	L_{10}	L_{33}	L_{50}	L_{90}	L_{nat}	% Anth.[2] Noise
2021-08-27	02:00:00	0.1%	35	34	44	36	35	35	35	35	3.35%
2021-08-27	03:00:00	0.0%	35	34	43	35	35	35	34	35	3.33%
2021-08-27	04:00:00	0.0%	35	33	40	35	35	35	34	35	3.33%
2021-08-27	05:00:00	0.0%	35	33	49	36	35	35	34	35	20.00%
2021-08-27	06:00:00	0.0%	35	33	49	36	35	34	34	34	10.00%
2021-08-27	07:00:00	0.0%	36	33	57	37	35	35	34	34	60.00%
2021-08-27	08:00:00	0.0%	39	33	65	39	36	36	35	35	70.00%
2021-08-27	09:00:00	0.1%	43	34	68	43	38	37	35	35	83.33%
2021-08-27	10:00:00	0.0%	38	33	59	39	37	37	35	35	90.00%
2021-08-27	11:00:00	0.0%	41	35	69	40	38	38	37	36	86.67%
2021-08-27	12:00:00	0.0%	43	35	71	41	39	39	37	37	80.00%
2021-08-27	13:00:00	0.0%	39	35	58	40	39	38	37	37	76.67%
2021-08-27	14:00:00	12.5%	40	36	55	41	40	39	38	38	73.33%
2021-08-27	15:00:00	2.9%	41	36	60	43	40	40	38	38	83.33%
2021-08-27	16:00:00	0.0%	38	34	62	40	38	38	36	36	86.67%
2021-08-27	17:00:00	0.0%	37	34	60	39	37	37	35	35	96.67%
2021-08-27	18:00:00	0.0%	39	34	54	41	38	37	36	35	100.00%
2021-08-27	19:00:00	0.0%	39	34	59	41	38	37	36	35	100.00%
2021-08-27	20:00:00	0.0%	38	34	56	40	38	37	35	34	100.00%
2021-08-27	21:00:00	0.0%	37	34	51	38	37	36	35	35	93.33%
2021-08-27	22:00:00	0.0%	36	33	56	37	36	35	34	34	86.67%
2021-08-27	23:00:00	0.0%	36	33	54	38	36	35	34	34	93.33%
2021-08-28	00:00:00	0.0%	35	33	55	35	35	35	34	35	36.67%
2021-08-28	01:00:00	0.0%	35	34	43	36	35	35	35	35	33.33%
2021-08-28	02:00:00	0.1%	36	34	41	36	36	35	35	35	16.76%
2021-08-28	03:00:00	0.0%	36	35	38	36	36	36	35	36	20.00%
2021-08-28	04:00:00	0.0%	36	35	39	37	36	36	36	36	3.33%
2021-08-28	05:00:00	0.0%	37	35	41	37	37	37	36	37	6.67%
2021-08-28	06:00:00	0.0%	37	35	55	38	37	37	36	36	80.00%

Date	Time	Percent Excluded	L_{eq}	L_{min}	L_{max}	L_{10}	L_{33}	L_{50}	L_{90}	L_{nat}	% Anth.[2] Noise
2021-08-28	07:00:00	0.0%	38	35	57	39	38	37	36	36	96.67%
2021-08-28	08:00:00	0.0%	40	36	59	41	40	39	38	37	96.67%
2021-08-28	09:00:00	0.0%	41	37	62	43	41	40	38	38	96.67%
2021-08-28	10:00:00	0.1%	41	35	62	43	40	39	38	37	96.67%
2021-08-28	11:00:00	0.0%	41	35	72	42	39	38	36	36	86.67%
2021-08-28	12:00:00	0.0%	46	34	74	45	42	41	37	36	93.33%
2021-08-28	13:00:00	0.0%	40	34	63	41	39	38	36	36	80.00%
2021-08-28	14:00:00	0.0%	42	35	60	44	41	40	37	37	90.00%
2021-08-28	15:00:00	0.1%	42	37	61	45	42	41	39	39	96.67%
2021-08-28	16:00:00	0.0%	41	37	54	43	41	40	39	39	86.67%
2021-08-28	17:00:00	0.0%	41	37	56	42	40	40	39	38	96.67%
2021-08-28	18:00:00	0.0%	41	37	57	43	41	40	39	37	100.00%
2021-08-28	19:00:00	0.0%	40	36	61	42	40	39	38	36	100.00%
2021-08-28	20:00:00	0.0%	39	36	63	40	39	38	37	37	96.67%
2021-08-28	21:00:00	0.0%	40	35	71	39	37	37	36	36	86.67%
2021-08-28	22:00:00	0.0%	37	35	53	38	37	37	36	36	60.00%
2021-08-28	23:00:00	0.0%	37	35	55	37	37	37	36	36	46.67%
2021-08-29	00:00:00	0.0%	37	35	60	37	37	37	36	36	73.33%
2021-08-29	01:00:00	0.0%	37	36	41	37	37	37	36	36	73.33%
2021-08-29	02:00:00	0.1%	37	35	39	37	37	37	36	37	56.98%
2021-08-29	03:00:00	0.0%	37	36	40	38	37	37	37	37	63.33%
2021-08-29	04:00:00	0.0%	37	36	47	38	38	37	37	37	66.67%
2021-08-29	05:00:00	0.0%	38	36	48	39	38	38	37	37	76.67%
2021-08-29	06:00:00	0.0%	38	37	54	39	39	38	38	38	83.33%
2021-08-29	07:00:00	0.0%	40	36	60	39	39	38	38	38	73.33%
2021-08-29	08:00:00	0.0%	40	37	58	42	40	40	38	38	93.33%
2021-08-29	09:00:00	0.0%	40	36	64	42	40	40	38	37	100.00%
2021-08-29	10:00:00	0.1%	40	35	64	42	40	39	37	35	100.00%
2021-08-29	11:00:00	0.0%	42	35	71	42	40	39	37	37	96.67%

Date	Time	Percent Excluded	L_{eq}	L_{min}	L_{max}	L_{10}	L_{33}	L_{50}	L_{90}	L_{nat}	% Anth.[2] Noise
2021-08-29	12:00:00	0.0%	47	35	71	45	41	40	38	36	100.00%
2021-08-29	13:00:00	0.2%	43	36	69	44	41	40	39	38	83.33%
2021-08-29	14:00:00	0.0%	43	37	60	45	43	42	40	39	93.33%
2021-08-29	15:00:00	0.0%	43	37	62	45	43	41	39	38	90.00%
2021-08-29	16:00:00	0.0%	43	37	66	44	41	41	39	39	90.00%
2021-08-29	17:00:00	0.0%	41	36	61	42	40	40	38	38	83.33%
2021-08-29	18:00:00	0.2%	44	35	64	42	40	39	38	37	96.67%
2021-08-29	19:00:00	0.0%	39	35	60	40	39	38	37	37	93.33%
2021-08-29	20:00:00	0.0%	39	35	59	39	38	37	37	37	86.67%
2021-08-29	21:00:00	0.0%	37	35	49	38	37	37	36	37	66.67%
2021-08-29	22:00:00	0.0%	37	36	46	38	37	37	37	37	43.33%
2021-08-29	23:00:00	0.0%	37	35	42	37	37	37	36	36	30.00%
2021-08-30	00:00:01	0.0%	37	35	39	37	37	37	36	36	16.67%
2021-08-30	01:00:00	0.0%	36	35	44	37	36	36	36	36	3.33%
2021-08-30	02:00:00	0.1%	36	35	49	36	36	36	35	36	0.00%
2021-08-30	03:00:00	0.0%	36	34	41	37	36	36	35	36	16.67%
2021-08-30	04:00:00	0.0%	36	34	41	37	36	36	35	36	20.00%
2021-08-30	05:00:00	0.0%	35	34	39	36	35	35	35	35	6.67%
2021-08-30	06:00:00	0.0%	36	33	42	37	36	35	34	35	26.67%
2021-08-30	07:00:00	0.0%	36	33	52	37	36	35	34	34	76.67%
2021-08-30	08:00:00	0.1%	43	34	66	42	37	36	35	35	96.67%
2021-08-30	09:00:00	0.0%	42	33	69	42	37	37	35	35	90.00%
2021-08-30	10:00:00	0.1%	39	34	63	40	38	37	36	36	60.00%
2021-08-30	11:00:00	0.1%	44	34	75	46	41	38	37	36	83.33%
2021-08-30	12:00:00	0.1%	44	35	73	41	39	38	37	36	100.00%
2021-08-30	13:00:00	0.0%	40	35	58	43	40	39	37	36	100.00%
2021-08-30	14:00:00	0.0%	41	37	57	42	41	40	39	39	80.00%
2021-08-30	15:00:00	0.0%	42	38	60	44	42	41	40	40	76.67%
2021-08-30	16:00:00	0.0%	40	36	54	42	40	40	38	38	73.33%

Date	Time	Percent Excluded	L_{eq}	L_{min}	L_{max}	L_{10}	L_{33}	L_{50}	L_{90}	L_{nat}	% Anth.[2] Noise
2021-08-30	17:00:00	0.2%	40	35	62	42	38	38	36	37	70.00%
2021-08-30	18:00:00	0.0%	43	34	62	45	39	38	36	36	93.33%
2021-08-30	19:00:00	1.8%	40	34	61	41	39	38	36	36	90.00%
2021-08-30	20:00:00	7.3%	37	34	57	40	37	36	35	36	33.33%
2021-08-30	21:00:00	0.0%	35	33	55	35	34	34	34	34	10.00%
2021-08-30	22:00:00	0.0%	34	32	47	35	34	34	33	34	16.67%
2021-08-30	23:00:00	6.9%	36	34	54	38	35	35	34	35	0.00%
2021-08-31	00:00:00	0.0%	35	33	46	35	35	35	34	34	3.33%
2021-08-31	01:00:00	0.0%	35	33	42	35	35	35	34	35	3.33%
2021-08-31	02:00:00	0.1%	34	33	37	35	35	34	34	34	3.35%
2021-08-31	03:00:00	0.6%	36	33	58	36	36	35	34	35	6.67%
2021-08-31	04:00:00	0.1%	35	33	54	35	34	34	34	34	16.67%
2021-08-31	05:00:00	0.0%	34	33	40	35	34	34	34	34	6.67%
2021-08-31	06:00:00	0.0%	35	32	53	35	35	34	34	34	23.33%
2021-08-31	07:00:00	0.0%	36	33	59	36	35	34	34	34	63.33%
2021-08-31	08:00:00	0.0%	37	33	57	39	37	36	34	33	100.00%
2021-08-31	09:00:00	0.1%	40	33	61	42	38	37	35	34	100.00%
2021-08-31	10:00:00	42.3%	Excluded - Rain								83.33%
2021-08-31	11:00:00	11.6%	48	34	69	45	39	38	36	35	100.00%
2021-08-31	12:00:00	0.8%	46	35	72	42	39	38	37	36	100.00%
2021-08-31	13:00:00	0.0%	40	35	53	42	40	39	37	36	100.00%
2021-08-31	14:00:00	0.0%	40	35	51	41	40	39	37	38	70.00%
2021-08-31	15:00:00	0.0%	39	34	61	40	38	37	36	35	90.00%
2021-08-31	16:00:00	0.0%	39	34	58	40	38	37	35	35	80.00%
2021-08-31	17:00:00	0.0%	38	34	60	39	37	37	35	35	100.00%
2021-08-31	18:00:00	0.0%	41	34	66	41	37	37	35	35	100.00%
2021-08-31	19:00:00	0.0%	38	33	65	39	37	36	35	34	100.00%
2021-08-31	20:00:00	0.0%	35	33	53	36	35	35	34	34	66.67%
2021-08-31	21:00:00	0.0%	36	33	54	36	36	35	35	35	40.00%

Date	Time	Percent Excluded	L_{eq}	L_{min}	L_{max}	L_{10}	L_{33}	L_{50}	L_{90}	L_{nat}	% Anth.[2] Noise
2021-08-31	22:00:00	0.0%	36	34	44	36	36	36	35	36	23.33%
2021-08-31	23:00:00	0.0%	36	34	49	36	36	36	35	36	3.33%
2021-09-01	00:00:00	0.0%	38	34	59	36	36	35	35	N/A[1]	N/A[1]
2021-09-01	01:00:00	0.0%	36	34	39	36	36	36	35	N/A[1]	N/A[1]
2021-09-01	02:00:00	0.1%	36	34	48	37	36	36	35	N/A[1]	N/A[1]
2021-09-01	03:00:00	0.0%	36	34	43	37	36	36	35	N/A[1]	N/A[1]
2021-09-01	04:00:00	0.0%	36	35	44	37	36	36	36	N/A[1]	N/A[1]
2021-09-01	05:00:00	0.0%	37	35	49	37	37	36	36	N/A[1]	N/A[1]
2021-09-01	06:00:00	0.0%	37	35	55	38	37	37	36	N/A[1]	N/A[1]
2021-09-01	07:00:00	0.0%	38	35	61	39	38	37	36	N/A[1]	N/A[1]
2021-09-01	08:00:00	0.0%	38	35	56	39	38	38	37	N/A[1]	N/A[1]
2021-09-01	09:00:00	0.0%	41	35	67	43	38	38	36	N/A[1]	N/A[1]
2021-09-01	10:00:00	0.0%	42	35	59	44	41	39	36	N/A[1]	N/A[1]
2021-09-01	11:00:00	5.4%	47	39	77	48	45	43	41	N/A[1]	N/A[1]
2021-09-01	12:00:00	5.8%	51	39	84	48	45	44	42	N/A[1]	N/A[1]

1 Partial days were not analyzed for anthropogenic noise.
2 Anth. = anthropogenic

Table B-6. Hourly noise metrics, Newhalem Creek Campground spring 2022 measurement (dBA).[1]

Date	Time	Percent Excluded	L_{eq}	L_{min}	L_{max}	L_{10}	L_{33}	L_{50}	L_{90}	L_{nat}	% Anth.[2] Noise
2022-04-26	15:00:00	53.1%	Excluded - Rain								N/A[1]
2022-04-26	16:00:00	14.0%	40	38	50	40	40	39	39	N/A[1]	N/A[1]
2022-04-26	17:00:00	48.7%	Excluded - Rain								N/A[1]
2022-04-26	18:00:00	75.9%	Excluded - Rain								N/A[1]
2022-04-26	19:00:00	4.7%	42	39	61	41	40	40	40	N/A[1]	N/A[1]
2022-04-26	20:00:00	21.4%	60	38	80	42	41	40	40	N/A[1]	N/A[1]
2022-04-26	21:00:00	0.0%	40	37	67	40	39	39	38	N/A[1]	N/A[1]
2022-04-26	22:00:00	0.0%	38	37	49	39	39	38	38	N/A[1]	N/A[1]
2022-04-26	23:00:00	0.0%	38	37	47	39	38	38	38	N/A[1]	N/A[1]
2022-04-27	00:00:00	0.0%	38	37	45	39	39	38	38	38	3.33%
2022-04-27	01:00:00	0.0%	39	37	49	39	39	39	38	38	3.33%
2022-04-27	02:00:00	0.0%	39	37	46	40	39	39	38	39	0.00%
2022-04-27	03:00:00	0.0%	39	37	47	40	40	39	38	39	3.33%
2022-04-27	04:00:00	0.0%	39	38	46	40	40	39	39	39	0.00%
2022-04-27	05:00:00	0.0%	39	38	48	40	40	39	39	39	0.00%
2022-04-27	06:00:00	0.0%	39	37	47	39	39	38	38	38	6.67%
2022-04-27	07:00:00	0.0%	38	37	54	39	38	38	38	38	6.67%
2022-04-27	08:00:00	0.0%	38	37	56	39	38	38	38	38	23.33%
2022-04-27	09:00:00	0.0%	41	37	61	42	39	38	38	38	40.00%
2022-04-27	10:00:00	0.0%	39	37	63	41	38	38	38	38	40.00%
2022-04-27	11:00:00	0.0%	40	36	59	43	39	38	37	38	43.33%
2022-04-27	12:00:00	0.0%	47	36	75	41	38	38	37	37	56.67%
2022-04-27	13:00:00	0.0%	40	36	57	42	39	38	37	37	76.67%
2022-04-27	14:00:00	0.0%	42	37	55	45	43	42	38	38	76.67%
2022-04-27	15:00:00	0.0%	44	38	57	47	45	43	40	41	36.67%
2022-04-27	16:00:00	21.7%	41	38	54	43	42	40	39	40	30.00%
2022-04-27	17:00:00	0.0%	43	38	69	40	40	40	39	39	13.33%
2022-04-27	18:00:00	0.0%	41	37	61	40	39	38	38	38	10.00%

Date	Time	Percent Excluded	L_{eq}	L_{min}	L_{max}	L_{10}	L_{33}	L_{50}	L_{90}	L_{nat}	% Anth.[2] Noise
2022-04-27	19:00:00	0.0%	39	37	56	40	39	39	38	38	3.33%
2022-04-27	20:00:00	0.0%	39	38	67	39	39	39	39	39	0.00%
2022-04-27	21:00:00	0.0%	39	37	41	40	40	40	39	40	0.00%
2022-04-27	22:00:00	0.0%	39	38	42	40	39	39	39	39	0.00%
2022-04-27	23:00:00	0.0%	39	38	41	40	39	39	39	39	0.00%
2022-04-28	00:00:00	0.0%	40	38	41	40	40	40	39	40	0.00%
2022-04-28	01:00:00	0.0%	40	38	41	40	40	40	39	40	0.00%
2022-04-28	02:00:00	0.0%	40	39	42	41	40	40	39	40	0.00%
2022-04-28	03:00:00	0.0%	40	38	52	40	40	40	39	40	10.00%
2022-04-28	04:00:00	0.0%	41	39	42	41	41	41	40	41	0.00%
2022-04-28	05:00:00	0.0%	41	39	55	41	41	40	40	40	20.00%
2022-04-28	06:00:00	0.0%	41	39	52	41	41	40	40	40	6.67%
2022-04-28	07:00:00	0.0%	40	38	56	41	40	40	40	40	3.33%
2022-04-28	08:00:00	0.0%	49	37	74	41	40	39	39	39	20.00%
2022-04-28	09:00:00	0.0%	39	37	54	40	39	39	38	38	46.67%
2022-04-28	10:00:00	0.0%	42	36	63	40	39	38	37	38	70.00%
2022-04-28	11:00:00	0.0%	40	35	61	40	38	37	36	37	36.67%
2022-04-28	12:00:00	0.0%	46	35	74	41	38	38	37	37	33.33%
2022-04-28	13:00:00	0.0%	49	37	77	45	41	40	38	39	36.67%
2022-04-28	14:00:00	0.0%	41	37	49	42	41	40	39	40	16.67%
2022-04-28	15:00:00	0.0%	40	37	59	42	40	40	39	39	36.67%
2022-04-28	16:00:00	2.1%	40	37	51	41	39	39	38	39	23.33%
2022-04-28	17:00:00	0.0%	42	37	68	40	39	39	38	39	10.00%
2022-04-28	18:00:00	0.0%	41	37	61	42	40	40	38	39	10.00%
2022-04-28	19:00:00	22.9%	39	37	53	41	40	39	38	39	6.67%
2022-04-28	20:00:00	12.7%	39	37	59	39	38	38	38	38	0.00%
2022-04-28	21:00:00	0.0%	38	36	43	38	38	38	37	38	0.00%
2022-04-28	22:00:00	0.0%	38	36	42	38	38	38	37	38	0.00%
2022-04-28	23:00:00	0.0%	37	36	43	38	38	37	37	37	3.33%

Date	Time	Percent Excluded	L_{eq}	L_{min}	L_{max}	L_{10}	L_{33}	L_{50}	L_{90}	L_{nat}	% Anth.[2] Noise
2022-04-29	00:00:00	0.0%	38	36	41	38	38	38	37	38	3.33%
2022-04-29	01:00:00	0.0%	38	37	49	38	38	38	37	38	0.00%
2022-04-29	02:00:00	0.0%	38	37	52	38	38	38	37	38	0.00%
2022-04-29	03:00:00	0.0%	38	36	49	38	38	38	37	38	6.67%
2022-04-29	04:00:00	0.0%	37	36	42	38	38	38	37	37	3.33%
2022-04-29	05:00:00	0.0%	39	37	48	40	39	38	38	38	3.33%
2022-04-29	06:00:00	0.0%	38	36	51	39	38	38	37	38	6.67%
2022-04-29	07:00:00	0.0%	38	36	49	39	38	37	37	37	0.00%
2022-04-29	08:00:00	0.0%	38	36	49	38	38	37	37	37	10.00%
2022-04-29	09:00:00	0.0%	46	36	70	38	37	37	37	37	6.67%
2022-04-29	10:00:00	0.0%	43	36	70	39	37	37	37	37	13.33%
2022-04-29	11:00:00	0.0%	47	36	71	40	37	37	37	37	33.33%
2022-04-29	12:00:00	0.0%	46	35	75	38	37	37	36	36	30.00%
2022-04-29	13:00:00	8.7%	38	35	54	39	37	37	36	37	30.00%
2022-04-29	14:00:00	0.0%	47	35	67	49	40	38	36	37	53.33%
2022-04-29	15:00:00	0.0%	48	35	67	52	41	39	37	37	60.00%
2022-04-29	16:00:00	0.0%	48	37	72	52	45	40	38	38	60.00%
2022-04-29	17:00:00	0.0%	41	36	65	39	38	38	37	38	13.33%
2022-04-29	18:00:00	0.0%	38	36	48	39	38	38	37	38	10.00%
2022-04-29	19:00:00	0.0%	39	37	46	40	39	39	38	39	10.00%
2022-04-29	20:00:00	0.0%	41	38	56	41	40	40	40	40	3.33%
2022-04-29	21:00:00	0.0%	39	38	43	40	40	39	39	39	3.33%
2022-04-29	22:00:00	0.0%	39	38	41	40	39	39	39	39	0.00%
2022-04-29	23:00:00	0.0%	39	37	56	39	39	39	38	39	0.00%
2022-04-30	00:00:00	0.0%	39	37	40	39	39	39	38	39	0.00%
2022-04-30	01:00:00	0.0%	38	37	46	39	39	38	38	38	0.00%
2022-04-30	02:00:00	0.0%	38	37	40	39	38	38	38	38	0.00%
2022-04-30	03:00:00	0.0%	39	37	42	39	39	39	38	39	0.00%
2022-04-30	04:00:00	0.0%	38	37	40	39	38	38	38	38	0.00%

Date	Time	Percent Excluded	L_{eq}	L_{min}	L_{max}	L_{10}	L_{33}	L_{50}	L_{90}	L_{nat}	% Anth.[2] Noise
2022-04-30	05:00:00	0.0%	39	37	55	39	38	38	38	38	3.33%
2022-04-30	06:00:00	0.0%	38	37	53	39	38	38	38	38	0.00%
2022-04-30	07:00:00	0.0%	38	37	54	38	38	38	37	38	3.33%
2022-04-30	08:00:00	0.0%	38	36	48	38	38	38	37	38	3.33%
2022-04-30	09:00:00	0.0%	38	36	54	38	37	37	37	37	3.33%
2022-04-30	10:00:00	8.0%	39	36	57	40	39	38	37	38	13.33%
2022-04-30	11:00:00	60.6%	Excluded - Rain								6.67%
2022-04-30	12:00:00	72.0%	Excluded - Rain								10.00%
2022-04-30	13:00:00	22.9%	40	37	54	41	40	40	39	39	26.67%
2022-04-30	14:00:00	0.0%	39	36	53	39	38	38	37	38	3.33%
2022-04-30	15:00:00	0.0%	39	36	55	39	39	38	38	38	20.00%
2022-04-30	16:00:00	0.0%	38	36	54	38	38	38	37	37	10.00%
2022-04-30	17:00:00	0.0%	43	37	69	39	39	38	38	38	16.67%
2022-04-30	18:00:00	0.0%	40	37	49	41	40	40	38	39	10.00%
2022-04-30	19:00:00	0.0%	38	37	42	39	39	38	38	38	6.67%
2022-04-30	20:00:00	0.0%	38	37	52	39	39	38	38	38	3.33%
2022-04-30	21:00:00	0.0%	38	37	40	39	38	38	38	38	3.33%
2022-04-30	22:00:00	0.0%	38	37	43	39	38	38	38	38	3.33%
2022-04-30	23:00:00	0.0%	38	37	40	39	38	38	38	38	0.00%
2022-05-01	00:00:00	0.0%	38	37	40	39	39	38	38	38	0.00%
2022-05-01	01:00:00	0.0%	38	37	45	39	38	38	38	38	0.00%
2022-05-01	02:00:00	0.0%	38	37	47	39	38	38	37	38	0.00%
2022-05-01	03:00:00	0.0%	38	37	48	39	38	38	37	38	3.33%
2022-05-01	04:00:00	0.0%	38	37	39	38	38	38	37	38	0.00%
2022-05-01	05:00:00	0.0%	40	36	56	41	38	38	37	38	0.00%
2022-05-01	06:00:00	0.0%	38	36	49	38	38	38	37	38	0.00%
2022-05-01	07:00:00	0.0%	37	36	47	38	38	37	37	37	3.33%
2022-05-01	08:00:00	0.0%	38	36	57	38	37	37	37	37	0.00%
2022-05-01	09:00:00	0.0%	38	36	55	38	37	37	37	37	16.67%

Date	Time	Percent Excluded	L_{eq}	L_{min}	L_{max}	L_{10}	L_{33}	L_{50}	L_{90}	L_{nat}	% Anth.[2] Noise
2022-05-01	10:00:00	0.0%	37	36	51	38	38	37	37	37	20.00%
2022-05-01	11:00:00	0.0%	38	36	54	39	38	38	37	37	30.00%
2022-05-01	12:00:00	0.0%	46	36	75	38	38	37	37	37	23.33%
2022-05-01	13:00:00	0.0%	38	36	52	38	38	37	37	37	33.33%
2022-05-01	14:00:00	0.0%	39	36	62	39	38	38	37	38	20.00%
2022-05-01	15:00:00	0.0%	38	36	47	39	38	38	37	38	26.67%
2022-05-01	16:00:00	0.0%	38	36	54	38	38	38	37	37	23.33%
2022-05-01	17:00:00	0.0%	41	36	63	39	38	38	37	38	16.67%
2022-05-01	18:00:00	0.0%	39	37	54	39	39	39	38	38	10.00%
2022-05-01	19:00:00	0.0%	39	37	51	40	39	39	38	39	3.33%
2022-05-01	20:00:00	0.0%	40	38	62	41	40	40	39	40	6.67%
2022-05-01	21:00:00	0.0%	39	37	49	39	39	38	38	38	6.67%
2022-05-01	22:00:00	0.0%	38	37	40	39	39	39	38	39	0.00%
2022-05-01	23:00:00	0.0%	38	37	40	39	38	38	38	38	0.00%
2022-05-02	00:00:00	0.0%	38	37	40	39	39	38	38	38	0.00%
2022-05-02	01:00:00	0.0%	39	37	41	40	39	39	38	39	0.00%
2022-05-02	02:00:00	0.0%	40	38	43	41	40	40	39	40	0.00%
2022-05-02	03:00:00	0.0%	40	38	43	41	40	40	39	40	0.00%
2022-05-02	04:00:00	0.0%	40	38	43	41	41	40	39	40	0.00%
2022-05-02	05:00:00	0.0%	40	38	59	41	40	40	39	40	3.33%
2022-05-02	06:00:00	0.0%	40	38	53	40	40	39	39	39	10.00%
2022-05-02	07:00:00	0.0%	39	37	53	40	39	39	38	39	30.00%
2022-05-02	08:00:00	0.0%	39	37	47	40	39	39	38	38	43.33%
2022-05-02	09:00:00	0.0%	42	37	56	45	41	40	39	40	30.00%
2022-05-02	10:00:00	16.9%	44	38	55	47	45	44	40	38	100.00%
2022-05-02	11:00:00	5.1%	44	37	73	45	43	42	38	38	90.00%
2022-05-02	12:00:00	0.0%	47	36	75	45	38	38	37	38	40.00%
2022-05-02	13:00:00	0.0%	45	37	63	48	45	44	39	38	93.33%
2022-05-02	14:00:00	0.0%	45	38	60	47	45	44	39	39	83.33%

Date	Time	Percent Excluded	L_{eq}	L_{min}	L_{max}	L_{10}	L_{33}	L_{50}	L_{90}	L_{nat}	% Anth.[2] Noise
2022-05-02	15:00:00	0.0%	44	38	68	47	43	40	39	39	56.67%
2022-05-02	16:00:00	0.0%	45	37	72	48	44	43	39	39	66.67%
2022-05-02	17:00:00	0.0%	39	37	54	40	39	39	39	39	10.00%
2022-05-02	18:00:00	0.0%	38	37	54	39	38	38	38	38	10.00%
2022-05-02	19:00:00	0.0%	39	37	54	40	39	39	38	39	10.00%
2022-05-02	20:00:00	0.0%	39	37	61	39	38	38	38	38	3.33%
2022-05-02	21:00:00	0.0%	38	37	44	38	38	38	38	38	3.33%
2022-05-02	22:00:00	0.0%	38	37	46	39	38	38	38	38	0.00%
2022-05-02	23:00:00	0.0%	38	37	45	39	38	38	38	38	0.00%
2022-05-03	00:00:00	0.0%	38	37	46	38	38	38	38	38	0.00%
2022-05-03	01:00:00	0.0%	38	37	44	39	38	38	38	38	0.00%
2022-05-03	02:00:00	0.0%	38	37	47	39	38	38	38	38	3.35%
2022-05-03	03:00:00	0.4%	39	37	54	39	38	38	38	38	0.00%
2022-05-03	04:00:00	20.5%	39	37	54	40	39	39	38	39	0.00%
2022-05-03	05:00:00	0.0%	40	38	58	41	39	39	39	39	0.00%
2022-05-03	06:00:00	0.0%	39	37	54	40	39	39	38	39	43.33%
2022-05-03	07:00:00	0.0%	39	37	46	40	39	39	38	38	43.33%
2022-05-03	08:00:00	0.0%	39	37	46	39	39	39	38	38	13.33%
2022-05-03	09:00:00	2.2%	44	38	59	48	45	40	39	39	63.33%
2022-05-03	10:00:00	3.3%	45	38	56	47	45	44	40	40	80.00%
2022-05-03	11:00:00	0.0%	45	41	59	47	45	44	43	42	100.00%
2022-05-03	12:00:00	0.0%	44	38	70	42	40	39	39	39	26.67%
2022-05-03	13:00:00	0.0%	44	41	54	46	44	43	42	41	100.00%
2022-05-03	14:00:00	0.0%	45	39	61	47	44	43	42	42	56.67%
2022-05-03	15:00:00	0.0%	44	41	52	46	44	44	42	41	100.00%
2022-05-03	16:00:00	0.0%	42	39	55	44	43	42	40	41	33.33%
2022-05-03	17:00:00	0.0%	41	38	61	41	40	40	39	40	13.33%
2022-05-03	18:00:00	0.0%	40	38	53	40	40	39	39	39	0.00%
2022-05-03	19:00:00	0.0%	40	38	48	41	40	40	39	40	3.33%

Date	Time	Percent Excluded	L_{eq}	L_{min}	L_{max}	L_{10}	L_{33}	L_{50}	L_{90}	L_{nat}	% Anth.[2] Noise
2022-05-03	20:00:00	0.0%	40	38	53	41	40	40	39	40	6.67%
2022-05-03	21:00:00	0.0%	39	37	50	40	39	39	38	39	3.33%
2022-05-03	22:00:00	0.0%	38	37	41	38	38	38	38	38	0.00%
2022-05-03	23:00:00	0.0%	38	37	39	38	38	38	37	38	0.00%
2022-05-04	00:00:00	0.0%	38	37	40	38	38	38	37	N/A[1]	N/A[1]
2022-05-04	01:00:00	0.0%	38	37	42	38	38	38	37	N/A[1]	N/A[1]
2022-05-04	02:00:00	0.0%	38	37	42	38	38	38	37	N/A[1]	N/A[1]
2022-05-04	03:00:00	2.4%	38	37	57	39	39	38	38	N/A[1]	N/A[1]
2022-05-04	04:00:00	41.0%	Excluded - Rain								N/A[1]
2022-05-04	05:00:00	42.3%	Excluded - Rain								N/A[1]
2022-05-04	06:00:00	13.1%	40	38	53	40	40	39	39	N/A[1]	N/A[1]
2022-05-04	07:00:00	12.8%	39	38	56	40	40	39	39	N/A[1]	N/A[1]
2022-05-04	08:00:00	4.2%	40	38	57	40	39	39	39	N/A[1]	N/A[1]
2022-05-04	09:00:00	0.0%	41	38	54	43	40	39	39	N/A[1]	N/A[1]
2022-05-04	10:00:00	0.0%	40	38	54	41	40	39	39	N/A[1]	N/A[1]
2022-05-04	11:00:00	3.1%	40	38	56	42	40	40	39	N/A[1]	N/A[1]
2022-05-04	12:00:00	37.1%	Excluded - Rain								N/A[1]
2022-05-04	13:00:00	3.3%	39	38	63	40	39	39	39	N/A[1]	N/A[1]

1 Partial days were not analyzed for anthropogenic noise.
2 Anth. = anthropogenic

Table B-7. Hourly noise metrics, Gorge bypass reach summer 2021 measurement (dBA).[1]

Date	Time	Percent Excluded	L_{eq}	L_{min}	L_{max}	L_{10}	L_{33}	L_{50}	L_{90}	L_{nat}	% Anth.[2] Noise
2021-08-25	11:00:00	0.0%	38	27	54	41	38	36	31	N/A[1]	N/A[1]
2021-08-25	12:00:00	0.2%	40	28	58	43	39	38	32	N/A[1]	N/A[1]
2021-08-25	13:00:00	2.2%	43	30	61	46	41	40	34	N/A[1]	N/A[1]
2021-08-25	14:00:00	7.0%	44	37	57	47	44	43	41	N/A[1]	N/A[1]
2021-08-25	15:00:00	9.8%	47	40	56	50	48	47	44	N/A[1]	N/A[1]
2021-08-25	16:00:00	3.5%	45	37	59	47	45	44	41	N/A[1]	N/A[1]
2021-08-25	17:00:00	5.7%	46	34	63	47	44	43	39	N/A[1]	N/A[1]
2021-08-25	18:00:00	0.4%	39	29	56	43	38	35	31	N/A[1]	N/A[1]
2021-08-25	19:00:00	0.0%	39	28	61	41	36	33	29	N/A[1]	N/A[1]
2021-08-25	20:00:00	0.0%	35	28	55	38	33	31	29	N/A[1]	N/A[1]
2021-08-25	21:00:00	0.0%	37	27	56	38	31	30	29	N/A[1]	N/A[1]
2021-08-25	22:00:00	0.1%	36	29	56	36	33	32	31	N/A[1]	N/A[1]
2021-08-25	23:00:00	0.1%	32	29	43	34	32	32	30	N/A[1]	N/A[1]
2021-08-26	00:00:00	0.1%	30	27	39	32	30	30	29	30	3.33%
2021-08-26	01:00:00	0.0%	31	28	42	33	31	31	30	31	3.33%
2021-08-26	02:00:00	0.1%	41	28	63	36	34	33	30	32	13.41%
2021-08-26	03:00:00	0.5%	34	28	41	36	34	33	31	33	6.67%
2021-08-26	04:00:00	0.2%	37	29	59	35	33	33	31	33	3.33%
2021-08-26	05:00:00	0.3%	37	32	46	39	36	36	34	36	6.67%
2021-08-26	06:00:00	0.0%	38	29	58	39	35	34	31	32	40.00%
2021-08-26	07:00:00	1.0%	38	30	54	41	37	36	33	34	40.00%
2021-08-26	08:00:00	0.0%	39	29	57	42	38	36	32	33	60.00%
2021-08-26	09:00:00	0.3%	43	30	70	44	40	37	33	34	66.67%
2021-08-26	10:00:00	0.4%	47	30	70	46	41	38	32	31	86.67%
2021-08-26	11:00:00	0.5%	42	30	62	44	40	38	33	34	73.33%
2021-08-26	12:00:00	0.5%	46	29	72	43	40	38	33	34	70.00%
2021-08-26	13:00:00	0.6%	43	29	61	45	41	40	34	33	86.67%
2021-08-26	14:00:00	0.9%	41	31	59	44	40	38	34	34	73.33%

Date	Time	Percent Excluded	L_{eq}	L_{min}	L_{max}	L_{10}	L_{33}	L_{50}	L_{90}	L_{nat}	% Anth.[2] Noise
2021-08-26	15:00:00	1.3%	43	32	69	44	41	40	36	36	80.00%
2021-08-26	16:00:00	1.4%	47	33	73	45	42	40	36	36	76.67%
2021-08-26	17:00:00	49.6%	Excluded - Rain								73.33%
2021-08-26	18:00:00	8.0%	47	28	70	46	41	37	31	32	66.67%
2021-08-26	19:00:00	36.2%	Excluded - Rain								60.00%
2021-08-26	20:00:00	6.4%	41	34	52	44	41	40	36	35	96.67%
2021-08-26	21:00:00	0.0%	37	30	53	39	36	35	32	31	100.00%
2021-08-26	22:00:00	0.0%	33	28	49	35	32	31	29	30	43.33%
2021-08-26	23:00:00	2.2%	43	28	54	46	43	40	29	38	26.67%
2021-08-27	00:00:00	2.4%	40	34	52	43	40	39	36	39	3.33%
2021-08-27	01:00:00	1.6%	39	32	49	41	39	38	35	38	0.00%
2021-08-27	02:00:00	0.2%	33	29	45	35	33	32	31	32	13.41%
2021-08-27	03:00:00	0.3%	33	29	50	34	32	32	30	32	3.33%
2021-08-27	04:00:00	0.3%	34	29	46	37	35	33	30	33	6.67%
2021-08-27	05:00:00	0.3%	36	30	51	38	35	34	32	33	16.67%
2021-08-27	06:00:00	0.3%	38	29	56	41	34	33	30	31	33.33%
2021-08-27	07:00:00	0.1%	36	28	54	39	34	31	29	30	33.33%
2021-08-27	08:00:00	2.1%	40	29	59	42	38	36	32	34	40.00%
2021-08-27	09:00:00	16.1%	41	31	57	44	40	38	34	35	60.00%
2021-08-27	10:00:00	2.9%	45	35	68	44	42	40	37	38	63.33%
2021-08-27	11:00:00	5.5%	45	37	65	47	44	43	40	41	63.33%
2021-08-27	12:00:00	3.8%	45	38	59	47	45	44	41	41	76.67%
2021-08-27	13:00:00	4.7%	45	35	62	48	45	43	40	38	93.33%
2021-08-27	14:00:00	6.8%	46	36	62	48	45	44	41	40	86.67%
2021-08-27	15:00:00	12.4%	46	39	59	48	46	45	42	42	86.67%
2021-08-27	16:00:00	5.1%	43	36	58	45	44	42	39	41	33.33%
2021-08-27	17:00:00	1.7%	42	32	57	44	42	40	36	37	60.00%
2021-08-27	18:00:00	1.3%	42	34	56	45	42	40	37	38	56.67%
2021-08-27	19:00:00	0.1%	42	31	65	44	40	38	34	36	46.67%

Date	Time	Percent Excluded	L_{eq}	L_{min}	L_{max}	L_{10}	L_{33}	L_{50}	L_{90}	L_{nat}	% Anth.[2] Noise
2021-08-27	20:00:00	0.0%	40	28	59	43	38	35	31	33	36.67%
2021-08-27	21:00:00	0.0%	37	28	59	39	34	31	29	29	76.67%
2021-08-27	22:00:00	0.0%	32	27	47	34	30	29	28	27	100.00%
2021-08-27	23:00:00	0.0%	32	27	51	31	29	29	28	27	100.00%
2021-08-28	00:00:00	0.0%	31	28	42	33	31	30	29	28	100.00%
2021-08-28	01:00:00	0.0%	36	28	59	34	33	32	29	28	100.00%
2021-08-28	02:00:00	0.1%	31	28	43	33	32	32	29	31	13.41%
2021-08-28	03:00:00	0.0%	32	28	43	34	33	32	30	32	3.33%
2021-08-28	04:00:00	0.0%	34	29	51	34	32	31	30	30	23.33%
2021-08-28	05:00:00	0.0%	34	28	50	36	30	29	29	29	30.00%
2021-08-28	06:00:00	0.0%	36	28	54	39	33	30	29	30	30.00%
2021-08-28	07:00:00	0.0%	38	28	56	41	36	33	29	30	56.67%
2021-08-28	08:00:00	0.0%	39	29	50	43	40	38	31	33	63.33%
2021-08-28	09:00:00	0.0%	40	31	59	43	40	38	33	33	73.33%
2021-08-28	10:00:00	0.0%	43	28	69	45	40	37	31	33	56.67%
2021-08-28	11:00:00	0.0%	44	27	60	47	42	40	32	32	80.00%
2021-08-28	12:00:00	1.6%	47	31	68	48	43	42	37	36	86.67%
2021-08-28	13:00:00	1.1%	43	31	61	46	42	40	35	36	70.00%
2021-08-28	14:00:00	0.5%	44	31	64	47	43	41	37	36	86.67%
2021-08-28	15:00:00	1.6%	44	31	65	46	43	41	36	37	66.67%
2021-08-28	16:00:00	1.7%	43	31	62	46	43	41	36	37	63.33%
2021-08-28	17:00:00	0.9%	41	29	56	44	41	39	34	36	60.00%
2021-08-28	18:00:00	0.0%	41	28	56	44	41	38	32	34	66.67%
2021-08-28	19:00:00	0.0%	40	27	58	44	39	37	30	30	80.00%
2021-08-28	20:00:00	0.0%	38	27	51	41	38	35	30	29	86.67%
2021-08-28	21:00:00	0.0%	35	28	49	38	33	32	30	28	100.00%
2021-08-28	22:00:00	0.0%	33	27	45	36	34	30	28	27	100.00%
2021-08-28	23:00:00	0.0%	31	27	51	33	31	30	28	27	100.00%
2021-08-29	00:00:01	0.0%	31	27	50	32	30	29	28	27	100.00%

Date	Time	Percent Excluded	L_{eq}	L_{min}	L_{max}	L_{10}	L_{33}	L_{50}	L_{90}	L_{nat}	% Anth.[2] Noise
2021-08-29	01:00:00	0.0%	29	27	44	30	29	29	28	27	100.00%
2021-08-29	02:00:00	0.1%	29	27	42	30	29	29	28	28	80.45%
2021-08-29	03:00:00	0.0%	30	27	46	31	30	29	28	29	10.00%
2021-08-29	04:00:00	0.0%	31	28	42	31	30	30	29	30	6.67%
2021-08-29	05:00:00	0.0%	32	28	47	34	32	31	30	31	10.00%
2021-08-29	06:00:00	0.0%	34	27	50	36	32	31	29	30	16.67%
2021-08-29	07:00:00	0.0%	36	29	49	39	35	34	32	33	23.33%
2021-08-29	08:00:00	0.0%	41	32	55	43	41	39	35	38	30.00%
2021-08-29	09:00:00	0.2%	40	29	61	41	38	36	32	33	63.33%
2021-08-29	10:00:00	0.0%	41	27	60	43	40	38	31	31	80.00%
2021-08-29	11:00:00	0.0%	43	28	62	46	42	40	34	34	80.00%
2021-08-29	12:00:00	1.8%	48	34	71	49	45	43	39	40	66.67%
2021-08-29	13:00:00	1.5%	49	35	69	50	44	43	39	39	76.67%
2021-08-29	14:00:00	3.3%	47	33	64	50	45	43	39	39	70.00%
2021-08-29	15:00:00	3.6%	45	31	78	47	44	42	38	38	73.33%
2021-08-29	16:00:00	3.8%	45	35	65	47	45	44	41	42	46.67%
2021-08-29	17:00:00	1.5%	43	32	54	46	43	41	37	38	70.00%
2021-08-29	18:00:00	0.0%	45	27	70	45	40	38	32	33	66.67%
2021-08-29	19:00:00	0.0%	39	28	57	43	38	36	30	32	60.00%
2021-08-29	20:00:00	0.0%	36	27	52	40	35	32	29	29	60.00%
2021-08-29	21:00:00	0.0%	34	27	52	37	32	31	29	30	36.67%
2021-08-29	22:00:00	0.0%	35	30	48	37	34	33	32	33	26.67%
2021-08-29	23:00:00	0.7%	36	30	44	38	36	35	32	34	13.33%
2021-08-30	00:00:00	0.9%	37	32	51	39	37	36	35	32	100.00%
2021-08-30	01:00:00	2.5%	38	34	45	40	39	38	36	34	100.00%
2021-08-30	02:00:00	1.1%	38	33	48	40	38	38	36	37	60.34%
2021-08-30	03:00:00	1.8%	39	34	51	40	39	38	37	38	3.33%
2021-08-30	04:00:00	2.4%	40	34	60	40	39	38	36	38	3.33%
2021-08-30	05:00:00	2.3%	39	33	50	42	38	37	35	37	13.33%

Date	Time	Percent Excluded	L_{eq}	L_{min}	L_{max}	L_{10}	L_{33}	L_{50}	L_{90}	L_{nat}	% Anth.[2] Noise
2021-08-30	06:00:00	2.8%	42	34	54	45	42	41	37	39	33.33%
2021-08-30	07:00:00	4.3%	43	37	52	45	43	42	39	41	36.67%
2021-08-30	08:00:00	8.8%	46	38	58	48	46	45	42	44	23.33%
2021-08-30	09:00:00	4.3%	45	37	60	47	45	44	41	43	30.00%
2021-08-30	10:00:00	2.9%	43	35	59	45	43	42	39	41	40.00%
2021-08-30	11:00:00	6.7%	44	38	51	47	45	44	41	42	46.67%
2021-08-30	12:00:00	6.1%	43	35	58	46	43	42	38	39	70.00%
2021-08-30	13:00:00	2.7%	43	33	57	45	42	41	37	38	63.33%
2021-08-30	14:00:00	1.8%	44	31	65	44	41	39	33	34	66.67%
2021-08-30	15:00:00	3.9%	45	30	56	49	46	43	36	39	56.67%
2021-08-30	16:00:00	7.5%	46	37	58	49	47	45	42	44	33.33%
2021-08-30	17:00:00	3.7%	42	30	53	46	43	41	34	38	36.67%
2021-08-30	18:00:00	0.8%	41	30	60	43	39	37	33	35	43.33%
2021-08-30	19:00:00	22.2%	42	33	61	45	41	40	36	39	30.00%
2021-08-30	20:00:00	40.6%	Excluded - Rain								13.33%
2021-08-30	21:00:00	3.0%	37	29	56	39	36	34	31	34	6.67%
2021-08-30	22:00:00	2.0%	37	30	50	39	36	35	33	35	6.67%
2021-08-30	23:00:00	39.8%	Excluded - Rain								0.00%
2021-08-31	00:00:00	7.8%	33	28	53	34	32	31	30	30	53.33%
2021-08-31	01:00:00	0.6%	33	28	50	35	32	32	30	31	13.33%
2021-08-31	02:00:00	3.2%	32	28	54	34	32	31	29	31	20.11%
2021-08-31	03:00:00	18.1%	34	28	52	37	30	30	29	30	13.33%
2021-08-31	04:00:00	0.2%	32	27	51	33	31	30	29	30	10.00%
2021-08-31	05:00:00	0.2%	33	28	47	36	33	32	29	32	6.67%
2021-08-31	06:00:00	2.1%	35	28	50	39	34	32	29	32	23.33%
2021-08-31	07:00:00	4.2%	38	29	53	41	37	34	31	33	30.00%
2021-08-31	08:00:00	0.6%	38	30	50	41	38	36	33	34	56.67%
2021-08-31	09:00:00	0.6%	39	30	54	43	39	37	33	34	66.67%
2021-08-31	10:00:00	46.9%	Excluded - Rain								76.67%

Date	Time	Percent Excluded	L_{eq}	L_{min}	L_{max}	L_{10}	L_{33}	L_{50}	L_{90}	L_{nat}	% Anth.[2] Noise
2021-08-31	11:00:00	62.9%	Excluded - Rain								76.67%
2021-08-31	12:00:00	5.6%	43	30	73	45	42	40	35	36	63.33%
2021-08-31	13:00:00	3.9%	42	31	59	45	42	40	36	37	63.33%
2021-08-31	14:00:00	0.8%	42	33	55	44	42	40	36	38	56.67%
2021-08-31	15:00:00	5.1%	42	32	64	44	41	40	36	37	73.33%
2021-08-31	16:00:00	2.0%	40	31	54	43	40	39	34	35	63.33%
2021-08-31	17:00:00	1.6%	41	28	64	43	40	38	33	36	46.67%
2021-08-31	18:00:00	0.1%	41	29	64	42	37	35	31	32	63.33%
2021-08-31	19:00:00	0.1%	38	28	59	41	35	32	30	31	56.67%
2021-08-31	20:00:00	0.3%	35	29	50	37	33	32	30	31	23.33%
2021-08-31	21:00:00	0.0%	32	27	47	34	30	29	28	29	20.00%
2021-08-31	22:00:00	0.0%	32	27	45	34	32	30	28	29	20.00%
2021-08-31	23:00:00	0.0%	31	26	46	34	31	28	27	28	16.67%
2021-09-01	00:00:01	0.0%	35	26	61	28	27	27	27	N/A[1]	N/A[1]
2021-09-01	01:00:00	0.0%	28	26	41	29	28	28	27	N/A[1]	N/A[1]
2021-09-01	02:00:00	0.1%	29	27	51	30	28	28	27	N/A[1]	N/A[1]
2021-09-01	03:00:00	0.0%	30	26	50	31	28	27	27	N/A[1]	N/A[1]
2021-09-01	04:00:00	0.0%	37	26	62	33	28	28	27	N/A[1]	N/A[1]
2021-09-01	05:00:00	0.0%	37	27	58	37	30	28	27	N/A[1]	N/A[1]
2021-09-01	06:00:00	0.0%	35	27	50	38	33	31	29	N/A[1]	N/A[1]

1 Partial days were not analyzed for anthropogenic noise.
2 Anth. = anthropogenic

Table B-8. Hourly noise metrics, Gorge bypass reach spring 2022 measurements (dBA).[1]

Date	Time	Percent Excluded	L_{eq}	L_{min}	L_{max}	L_{10}	L_{33}	L_{50}	L_{90}	L_{nat}	% Anth.[2] Noise
2022-04-26	16:00:00	23.5%	60	59	62	60	60	60	60	N/A[1]	N/A[1]
2022-04-26	17:00:00	52.9%	Excluded - Rain								N/A[1]
2022-04-26	18:00:00	97.8%	Excluded - Rain								N/A[1]
2022-04-26	19:00:00	6.8%	55	54	63	55	55	55	54	N/A[1]	N/A[1]
2022-04-26	20:00:00	0.0%	54	53	64	55	54	54	54	N/A[1]	N/A[1]
2022-04-26	21:00:00	0.0%	54	53	55	54	54	54	54	N/A[1]	N/A[1]
2022-04-26	22:00:00	0.0%	54	53	55	54	54	54	54	N/A[1]	N/A[1]
2022-04-26	23:00:00	0.0%	54	53	59	54	54	54	54	N/A[1]	N/A[1]
2022-04-27	00:00:00	0.0%	54	53	55	54	54	54	54	54	0.00%
2022-04-27	01:00:00	0.0%	54	53	55	54	54	54	54	54	0.00%
2022-04-27	02:00:00	0.0%	54	53	55	54	54	54	54	54	0.00%
2022-04-27	03:00:00	0.0%	54	53	55	54	54	54	54	54	3.33%
2022-04-27	04:00:00	0.0%	54	53	55	54	54	54	54	54	0.00%
2022-04-27	05:00:00	0.0%	54	53	58	54	54	54	54	54	0.00%
2022-04-27	06:00:00	0.0%	54	53	62	54	54	54	54	54	3.33%
2022-04-27	07:00:00	0.0%	59	53	64	60	60	59	54	59	3.33%
2022-04-27	08:00:00	0.0%	60	59	61	60	60	60	59	60	10.00%
2022-04-27	09:00:00	0.0%	59	59	67	60	60	59	59	59	3.33%
2022-04-27	10:00:00	0.0%	59	58	64	60	60	59	59	59	3.33%
2022-04-27	11:00:00	0.0%	59	58	61	60	59	59	59	59	16.67%
2022-04-27	12:00:00	0.0%	59	58	63	60	60	59	59	59	13.33%
2022-04-27	13:00:00	0.0%	59	58	62	59	59	59	59	59	23.33%
2022-04-27	14:00:00	25.3%	Excluded - Rain								10.00%
2022-04-27	15:00:00	0.0%	59	58	73	60	59	59	59	59	3.33%
2022-04-27	16:00:00	41.2%	Excluded - Rain								36.67%
2022-04-27	17:00:00	0.0%	59	58	70	60	60	60	58	60	3.33%
2022-04-27	18:00:00	0.0%	58	56	62	58	58	58	57	58	6.67%
2022-04-27	19:00:00	0.0%	56	55	61	57	56	56	56	56	3.33%

Date	Time	Percent Excluded	L_{eq}	L_{min}	L_{max}	L_{10}	L_{33}	L_{50}	L_{90}	L_{nat}	% Anth.[2] Noise
2022-04-27	20:00:00	0.0%	55	54	58	56	55	55	55	55	6.67%
2022-04-27	21:00:00	0.0%	55	54	56	55	55	55	55	55	0.00%
2022-04-27	22:00:00	0.0%	55	54	56	55	55	55	55	55	3.33%
2022-04-27	23:00:00	0.0%	55	54	56	55	55	55	55	55	0.00%
2022-04-28	00:00:00	0.0%	55	54	59	55	55	55	55	55	0.00%
2022-04-28	01:00:00	0.0%	55	54	56	55	55	55	55	55	0.00%
2022-04-28	02:00:00	0.0%	55	54	56	55	55	55	55	55	0.00%
2022-04-28	03:00:00	0.0%	55	54	57	55	55	55	55	55	3.33%
2022-04-28	04:00:00	0.0%	55	54	56	55	55	55	55	55	0.00%
2022-04-28	05:00:00	0.0%	55	54	64	56	55	55	55	55	3.33%
2022-04-28	06:00:00	0.0%	56	54	62	59	56	55	55	55	6.67%
2022-04-28	07:00:00	0.0%	60	59	61	60	60	60	59	60	0.00%
2022-04-28	08:00:00	0.0%	60	59	61	60	60	60	59	60	0.00%
2022-04-28	09:00:00	0.0%	60	59	75	60	60	60	59	60	0.00%
2022-04-28	10:00:00	0.0%	59	58	72	60	59	59	59	59	3.33%
2022-04-28	11:00:00	0.0%	59	58	70	59	59	59	59	59	10.00%
2022-04-28	12:00:00	0.0%	59	58	73	59	59	59	58	59	3.33%
2022-04-28	13:00:00	0.0%	59	58	76	59	59	59	59	59	3.33%
2022-04-28	14:00:00	0.0%	59	58	64	60	59	59	59	59	6.67%
2022-04-28	15:00:00	0.0%	59	58	74	60	59	59	59	59	3.33%
2022-04-28	16:00:00	24.4%	60	58	63	60	60	60	59	60	0.00%
2022-04-28	17:00:00	0.0%	59	57	69	60	60	59	58	59	6.67%
2022-04-28	18:00:00	10.6%	56	53	59	58	57	55	54	55	3.33%
2022-04-28	19:00:00	52.0%	Excluded - Rain								0.00%
2022-04-28	20:00:00	1.8%	54	53	59	54	54	54	54	54	0.00%
2022-04-28	21:00:00	0.0%	54	53	55	54	54	54	54	54	0.00%
2022-04-28	22:00:00	0.0%	54	53	55	54	54	54	54	54	6.67%
2022-04-28	23:00:00	0.4%	54	53	55	54	54	54	54	54	0.00%
2022-04-29	00:00:00	0.0%	54	53	55	54	54	54	54	54	0.00%

Date	Time	Percent Excluded	L_{eq}	L_{min}	L_{max}	L_{10}	L_{33}	L_{50}	L_{90}	L_{nat}	% Anth.[2] Noise
2022-04-29	01:00:00	0.0%	54	53	56	54	54	54	54	54	0.00%
2022-04-29	02:00:00	0.0%	54	53	56	54	54	54	54	54	0.00%
2022-04-29	03:00:00	0.0%	54	53	55	54	54	54	54	54	3.33%
2022-04-29	04:00:00	0.0%	54	53	55	54	54	54	54	54	0.00%
2022-04-29	05:00:00	0.0%	54	53	57	54	54	54	54	54	0.00%
2022-04-29	06:00:00	0.0%	56	53	62	60	55	54	54	54	0.00%
2022-04-29	07:00:00	0.0%	60	59	63	60	60	60	59	60	0.00%
2022-04-29	08:00:00	0.0%	59	59	74	60	60	60	59	60	0.00%
2022-04-29	09:00:00	0.0%	60	59	75	60	60	59	59	59	0.00%
2022-04-29	10:00:00	0.0%	60	58	76	60	59	59	59	59	6.67%
2022-04-29	11:00:00	0.0%	59	58	76	60	59	59	59	59	3.33%
2022-04-29	12:00:00	7.9%	59	58	61	60	59	59	59	59	6.67%
2022-04-29	13:00:00	0.0%	59	58	67	59	59	59	59	59	3.33%
2022-04-29	14:00:00	0.0%	59	58	64	59	59	59	59	59	10.00%
2022-04-29	15:00:00	0.0%	59	58	80	60	59	59	59	59	26.67%
2022-04-29	16:00:00	0.0%	59	53	61	60	60	59	56	59	20.00%
2022-04-29	17:00:00	0.0%	50	47	71	53	50	49	48	49	13.33%
2022-04-29	18:00:00	0.0%	47	46	66	48	48	47	47	47	6.67%
2022-04-29	19:00:00	0.0%	47	45	66	47	47	46	46	46	6.67%
2022-04-29	20:00:00	0.0%	46	45	61	47	46	46	46	46	3.33%
2022-04-29	21:00:00	0.0%	46	45	47	46	46	46	45	46	0.00%
2022-04-29	22:00:00	0.0%	46	45	47	46	46	46	45	46	0.00%
2022-04-29	23:00:00	0.0%	45	44	57	46	45	45	45	45	0.00%
2022-04-30	00:00:00	0.0%	45	44	49	45	45	45	45	45	3.33%
2022-04-30	01:00:00	0.0%	45	44	46	45	45	45	45	45	0.00%
2022-04-30	02:00:00	0.0%	45	44	46	45	45	45	45	45	0.00%
2022-04-30	03:00:00	0.0%	45	44	47	45	45	45	45	45	0.00%
2022-04-30	04:00:00	0.0%	45	44	46	45	45	45	45	45	0.00%
2022-04-30	05:00:00	0.0%	46	44	63	46	45	45	45	45	0.00%

Date	Time	Percent Excluded	L_{eq}	L_{min}	L_{max}	L_{10}	L_{33}	L_{50}	L_{90}	L_{nat}	% Anth.[2] Noise
2022-04-30	06:00:00	0.0%	46	44	62	47	45	45	45	45	0.00%
2022-04-30	07:00:00	0.0%	46	44	55	47	45	45	45	45	6.67%
2022-04-30	08:00:00	0.0%	49	43	63	53	45	45	44	45	3.33%
2022-04-30	09:00:00	0.0%	46	43	60	48	45	45	44	45	13.33%
2022-04-30	10:00:00	26.5%	Excluded - Rain								33.33%
2022-04-30	11:00:00	51.5%	Excluded - Rain								80.00%
2022-04-30	12:00:00	77.7%	Excluded - Rain								100.00%
2022-04-30	13:00:00	28.2%	Excluded - Rain								100.00%
2022-04-30	14:00:00	0.0%	46	44	54	47	46	46	45	46	20.00%
2022-04-30	15:00:00	0.0%	45	44	57	46	45	45	45	45	13.33%
2022-04-30	16:00:00	0.0%	45	44	56	46	45	45	45	45	10.00%
2022-04-30	17:00:00	0.0%	47	44	66	47	46	46	45	45	16.67%
2022-04-30	18:00:00	0.0%	47	45	60	49	46	46	45	46	13.33%
2022-04-30	19:00:00	0.0%	46	45	57	47	46	46	45	46	3.33%
2022-04-30	20:00:00	0.0%	47	45	62	49	47	46	46	46	3.33%
2022-04-30	21:00:00	0.0%	46	45	48	46	46	46	46	46	0.00%
2022-04-30	22:00:00	0.0%	46	45	48	46	46	46	46	46	3.33%
2022-04-30	23:00:00	3.3%	46	46	50	47	46	46	46	46	13.33%
2022-05-01	00:00:00	0.0%	46	45	48	47	46	46	46	46	0.00%
2022-05-01	01:00:00	0.0%	46	45	48	46	46	46	46	46	0.00%
2022-05-01	02:00:00	0.0%	46	45	48	47	46	46	46	46	0.00%
2022-05-01	03:00:00	0.0%	46	45	48	46	46	46	46	46	3.33%
2022-05-01	04:00:00	0.0%	46	45	49	46	46	46	46	46	0.00%
2022-05-01	05:00:00	0.0%	49	45	62	52	47	46	46	47	3.33%
2022-05-01	06:00:00	0.0%	48	45	63	50	47	47	46	46	10.00%
2022-05-01	07:00:00	0.0%	47	45	67	48	46	46	46	46	3.33%
2022-05-01	08:00:00	0.0%	46	45	65	47	46	46	46	46	10.00%
2022-05-01	09:00:00	0.0%	47	45	60	47	46	46	46	46	13.33%
2022-05-01	10:00:00	0.0%	46	45	55	47	46	46	45	46	6.67%

Date	Time	Percent Excluded	L_{eq}	L_{min}	L_{max}	L_{10}	L_{33}	L_{50}	L_{90}	L_{nat}	% Anth.[2] Noise
2022-05-01	11:00:00	0.0%	46	45	56	47	46	46	46	46	23.33%
2022-05-01	12:00:00	0.0%	46	44	54	47	46	46	45	46	23.33%
2022-05-01	13:00:00	0.0%	46	44	55	47	46	46	45	46	6.67%
2022-05-01	14:00:00	0.0%	46	44	57	47	46	46	45	46	30.00%
2022-05-01	15:00:00	0.0%	46	45	51	47	46	46	45	46	23.33%
2022-05-01	16:00:00	0.0%	46	45	53	47	46	46	46	46	20.00%
2022-05-01	17:00:00	0.0%	47	45	66	47	47	46	46	46	16.67%
2022-05-01	18:00:00	0.0%	47	46	54	48	47	47	47	47	16.67%
2022-05-01	19:00:00	0.0%	47	46	55	48	47	47	47	47	6.67%
2022-05-01	20:00:00	0.0%	48	46	59	48	48	48	47	47	6.67%
2022-05-01	21:00:00	0.0%	47	46	54	48	47	47	47	47	3.33%
2022-05-01	22:00:00	0.0%	47	46	48	47	47	47	47	47	0.00%
2022-05-01	23:00:00	0.0%	47	46	48	47	47	47	47	47	0.00%
2022-05-02	00:00:00	0.0%	47	46	48	47	47	47	47	47	0.00%
2022-05-02	01:00:00	0.0%	47	46	48	47	47	47	47	47	0.00%
2022-05-02	02:00:00	0.0%	47	46	48	47	47	47	47	47	0.00%
2022-05-02	03:00:00	0.0%	47	46	48	47	47	47	46	47	0.00%
2022-05-02	04:00:00	0.0%	47	45	48	47	47	47	46	47	0.00%
2022-05-02	05:00:00	0.0%	48	46	64	50	47	47	46	47	0.00%
2022-05-02	06:00:00	0.0%	49	45	61	52	48	47	46	47	13.33%
2022-05-02	07:00:00	0.0%	47	45	56	48	47	47	46	47	6.67%
2022-05-02	08:00:00	0.0%	48	46	58	50	48	47	47	47	6.67%
2022-05-02	09:00:00	9.8%	48	46	55	49	48	48	47	47	40.00%
2022-05-02	10:00:00	30.3%	Excluded - Rain								66.67%
2022-05-02	11:00:00	0.0%	48	46	60	48	48	47	47	47	23.33%
2022-05-02	12:00:00	0.0%	48	46	61	49	48	48	47	47	30.00%
2022-05-02	13:00:00	0.0%	49	46	58	50	49	48	47	48	43.33%
2022-05-02	14:00:00	0.0%	49	47	55	50	49	49	48	48	36.67%
2022-05-02	15:00:00	0.0%	48	46	54	49	49	48	48	48	23.33%

Date	Time	Percent Excluded	L_{eq}	L_{min}	L_{max}	L_{10}	L_{33}	L_{50}	L_{90}	L_{nat}	% Anth.[2] Noise
2022-05-02	16:00:00	0.0%	48	46	55	49	48	48	47	48	3.33%
2022-05-02	17:00:00	0.0%	48	47	56	49	48	48	47	48	3.33%
2022-05-02	18:00:00	0.0%	48	47	63	49	48	48	47	48	13.33%
2022-05-02	19:00:00	0.0%	48	47	54	49	48	48	48	48	3.33%
2022-05-02	20:00:00	0.0%	48	47	60	49	48	48	48	48	0.00%
2022-05-02	21:00:00	0.0%	48	47	65	48	48	48	48	48	6.67%
2022-05-02	22:00:00	0.0%	48	46	49	48	48	48	47	48	0.00%
2022-05-02	23:00:00	0.0%	48	47	49	48	48	48	47	48	0.00%
2022-05-03	00:00:00	0.0%	48	47	50	48	48	48	47	48	0.00%
2022-05-03	01:00:00	0.0%	48	47	49	48	48	48	47	48	0.00%
2022-05-03	02:00:00	27.4%	Excluded - Rain								36.89%
2022-05-03	03:00:00	0.0%	48	47	52	48	48	48	48	48	0.00%
2022-05-03	04:00:00	12.5%	48	47	51	48	48	48	48	48	33.33%
2022-05-03	05:00:00	0.0%	49	47	68	50	48	48	48	48	0.00%
2022-05-03	06:00:00	0.0%	49	47	59	50	49	48	48	48	13.33%
2022-05-03	07:00:00	0.0%	49	47	65	50	48	48	48	48	43.33%
2022-05-03	08:00:00	0.0%	49	47	62	50	49	48	48	48	73.33%
2022-05-03	09:00:00	14.8%	48	47	55	49	48	48	48	48	30.00%
2022-05-03	10:00:00	42.0%	Excluded - Rain								23.33%
2022-05-03	11:00:00	100.0%	Excluded - Rain								16.67%
2022-05-03	12:00:00	100.0%	Excluded - Rain								36.67%
2022-05-03	13:00:00	100.0%	Excluded - Rain								86.67%
2022-05-03	14:00:00	59.9%	Excluded - Rain								76.67%
2022-05-03	15:00:00	0.2%	49	47	55	50	49	49	48	49	6.67%
2022-05-03	16:00:00	0.0%	48	47	56	49	48	48	48	48	6.67%
2022-05-03	17:00:00	0.0%	49	47	59	50	49	49	48	49	6.67%
2022-05-03	18:00:00	0.0%	48	47	61	49	48	48	48	48	0.00%
2022-05-03	19:00:00	0.0%	49	47	58	49	49	48	48	48	3.33%
2022-05-03	20:00:00	0.0%	49	47	59	50	49	48	48	48	3.33%

Date	Time	Percent Excluded	L_{eq}	L_{min}	L_{max}	L_{10}	L_{33}	L_{50}	L_{90}	L_{nat}	% Anth.[2] Noise
2022-05-03	21:00:00	0.0%	48	47	59	49	49	48	48	48	3.33%
2022-05-03	22:00:00	0.0%	48	47	50	49	48	48	48	48	0.00%
2022-05-03	23:00:00	0.0%	48	47	50	48	48	48	48	48	0.00%
2022-05-04	00:00:00	0.0%	48	47	49	49	48	48	48	N/A[1]	N/A[1]
2022-05-04	01:00:00	0.0%	48	47	49	49	48	48	48	N/A[1]	N/A[1]
2022-05-04	02:00:00	0.0%	48	47	50	49	48	48	48	N/A[1]	N/A[1]
2022-05-04	03:00:00	26.3%	Excluded - Rain								N/A[1]
2022-05-04	04:00:00	54.5%	Excluded - Rain								N/A[1]
2022-05-04	05:00:00	38.6%	Excluded - Rain								N/A[1]
2022-05-04	06:00:00	7.4%	48	47	55	49	48	48	48	N/A[1]	N/A[1]
2022-05-04	07:00:00	12.4%	48	47	59	49	48	48	48	N/A[1]	N/A[1]
2022-05-04	08:00:00	0.0%	49	47	58	51	49	48	48	N/A[1]	N/A[1]
2022-05-04	09:00:00	0.3%	48	47	56	49	48	48	47	N/A[1]	N/A[1]
2022-05-04	10:00:00	2.5%	49	47	73	51	49	48	47	N/A[1]	N/A[1]
2022-05-04	11:00:00	16.8%	49	47	67	50	49	49	48	N/A[1]	N/A[1]
2022-05-04	12:00:00	48.3%	Excluded - Rain								N/A[1]

1 Partial days were not analyzed for anthropogenic noise.
2 Anth. = anthropogenic

Table B-9. Hourly noise metrics, Pyramid Lake Trail summer 2021 measurement (dBA).[1]

Date	Time	Percent Excluded	L_{eq}	L_{min}	L_{max}	L_{10}	L_{33}	L_{50}	L_{90}	L_{nat}	% Anth.[2] Noise
2021-08-24	14:00:00	0.0%	42	41	51	42	42	42	41	N/A[1]	N/A[1]
2021-08-24	15:00:00	0.0%	42	40	45	42	42	42	41	N/A[1]	N/A[1]
2021-08-24	16:00:00	0.0%	42	41	52	42	42	42	42	N/A[1]	N/A[1]
2021-08-24	17:00:00	0.0%	42	41	48	43	42	42	42	N/A[1]	N/A[1]
2021-08-24	18:00:00	0.0%	43	41	60	43	43	42	42	N/A[1]	N/A[1]
2021-08-24	19:00:00	0.0%	42	41	46	43	42	42	42	N/A[1]	N/A[1]
2021-08-24	20:00:00	0.0%	42	41	44	42	42	42	42	N/A[1]	N/A[1]
2021-08-24	21:00:00	0.0%	42	41	45	42	42	42	42	N/A[1]	N/A[1]
2021-08-24	22:00:00	0.0%	42	41	44	42	42	42	42	N/A[1]	N/A[1]
2021-08-24	23:00:00	0.0%	42	41	43	42	42	42	42	N/A[1]	N/A[1]
2021-08-25	00:00:00	0.0%	42	41	43	42	42	42	42	42	0.00%
2021-08-25	01:00:00	0.0%	42	41	43	42	42	42	41	42	0.00%
2021-08-25	02:00:00	0.1%	42	41	43	42	42	42	42	42	0.00%
2021-08-25	03:00:00	0.0%	42	41	43	42	42	42	41	42	6.67%
2021-08-25	04:00:00	0.0%	42	41	43	42	42	42	41	42	3.33%
2021-08-25	05:00:00	0.0%	42	41	43	42	42	42	41	42	0.00%
2021-08-25	06:00:00	0.0%	42	41	46	42	42	42	41	42	0.00%
2021-08-25	07:00:00	0.0%	42	41	46	42	42	42	41	41	10.00%
2021-08-25	08:00:00	0.0%	42	41	47	42	42	42	41	42	10.00%
2021-08-25	09:00:00	0.0%	42	41	59	42	42	42	41	42	13.33%
2021-08-25	10:00:00	0.0%	42	41	63	42	42	41	41	41	20.00%
2021-08-25	11:00:00	0.0%	42	40	62	42	41	41	41	41	6.67%
2021-08-25	12:00:00	0.0%	42	40	66	42	41	41	41	41	13.33%
2021-08-25	13:00:00	0.1%	43	40	62	42	41	41	41	41	30.00%
2021-08-25	14:00:00	0.4%	41	40	56	42	41	41	41	41	20.00%
2021-08-25	15:00:00	0.5%	42	40	57	42	41	41	41	41	33.33%
2021-08-25	16:00:00	0.6%	41	40	56	42	41	41	41	41	23.33%
2021-08-25	17:00:00	0.4%	42	40	60	42	41	41	41	41	26.67%

Date	Time	Percent Excluded	L_{eq}	L_{min}	L_{max}	L_{10}	L_{33}	L_{50}	L_{90}	L_{nat}	% Anth.[2] Noise
2021-08-25	18:00:00	0.0%	42	40	61	42	41	41	41	41	16.67%
2021-08-25	19:00:00	0.0%	42	40	60	42	42	41	41	41	16.67%
2021-08-25	20:00:00	0.0%	42	41	54	42	42	42	41	42	3.33%
2021-08-25	21:00:00	0.0%	42	41	46	42	42	42	42	42	3.33%
2021-08-25	22:00:00	0.1%	42	40	51	43	42	42	41	42	3.33%
2021-08-25	23:00:00	0.4%	42	41	47	43	42	42	42	42	0.00%
2021-08-26	00:00:00	2.3%	43	40	50	45	43	42	41	42	0.00%
2021-08-26	01:00:00	0.9%	43	40	50	44	43	42	41	42	0.00%
2021-08-26	02:00:00	0.1%	42	40	46	42	42	41	41	41	6.70%
2021-08-26	03:00:00	0.0%	41	40	46	42	42	41	41	41	3.33%
2021-08-26	04:00:00	0.0%	42	40	46	42	42	42	41	41	6.67%
2021-08-26	05:00:00	7.4%	45	41	62	48	43	42	41	42	0.00%
2021-08-26	06:00:00	3.2%	44	41	57	47	43	42	41	42	0.00%
2021-08-26	07:00:00	0.0%	41	40	48	42	41	41	41	41	0.00%
2021-08-26	08:00:00	0.0%	41	40	45	42	41	41	41	41	20.00%
2021-08-26	09:00:00	0.2%	44	41	61	45	43	42	42	42	13.33%
2021-08-26	10:00:00	0.1%	44	41	62	45	43	42	42	42	23.33%
2021-08-26	11:00:00	0.0%	43	41	63	44	42	42	41	42	23.33%
2021-08-26	12:00:00	1.9%	45	41	69	46	44	43	42	42	30.00%
2021-08-26	13:00:00	0.6%	44	41	55	46	44	43	42	43	20.00%
2021-08-26	14:00:00	0.5%	43	41	59	45	43	42	42	42	26.67%
2021-08-26	15:00:00	0.3%	44	40	67	44	43	42	41	42	16.67%
2021-08-26	16:00:00	0.2%	43	41	58	44	42	42	41	42	23.33%
2021-08-26	17:00:00	33.3%	Excluded - Rain								26.67%
2021-08-26	18:00:00	8.6%	42	41	57	42	42	42	41	42	23.33%
2021-08-26	19:00:00	19.8%	43	41	60	43	42	42	42	42	13.33%
2021-08-26	20:00:00	13.0%	43	41	64	43	42	42	42	42	10.00%
2021-08-26	21:00:00	3.1%	42	41	62	42	42	42	42	42	10.00%
2021-08-26	22:00:00	0.0%	42	42	57	43	42	42	42	42	0.00%

Date	Time	Percent Excluded	L_{eq}	L_{min}	L_{max}	L_{10}	L_{33}	L_{50}	L_{90}	L_{nat}	% Anth.[2] Noise
2021-08-26	23:00:00	2.9%	43	42	62	44	43	43	42	43	0.00%
2021-08-27	00:00:00	1.0%	43	42	62	44	43	43	43	43	0.00%
2021-08-27	01:00:00	6.9%	44	42	58	45	44	43	43	43	0.00%
2021-08-27	02:00:00	5.9%	46	42	59	48	44	44	43	44	3.35%
2021-08-27	03:00:00	6.7%	47	42	59	50	46	45	43	45	3.33%
2021-08-27	04:00:00	3.4%	46	42	56	48	45	44	43	44	0.00%
2021-08-27	05:00:00	1.0%	43	42	50	44	43	43	42	43	10.00%
2021-08-27	06:00:00	1.6%	43	41	50	44	43	43	42	43	10.00%
2021-08-27	07:00:00	0.0%	42	41	46	43	42	42	42	42	3.33%
2021-08-27	08:00:00	18.4%	42	41	45	43	42	42	42	42	33.33%
2021-08-27	09:00:00	0.8%	42	41	53	43	42	42	42	42	13.33%
2021-08-27	10:00:00	0.8%	43	41	55	45	43	42	42	42	36.67%
2021-08-27	11:00:00	0.8%	44	41	62	46	43	42	42	42	23.33%
2021-08-27	12:00:00	1.3%	44	41	66	44	43	42	42	42	43.33%
2021-08-27	13:00:00	0.2%	43	41	54	43	42	42	42	42	33.33%
2021-08-27	14:00:00	1.1%	44	42	55	46	44	43	43	43	36.67%
2021-08-27	15:00:00	0.3%	43	42	50	44	43	43	42	43	23.33%
2021-08-27	16:00:00	0.6%	44	42	70	44	43	43	43	43	33.33%
2021-08-27	17:00:00	2.9%	44	41	53	45	43	43	42	43	23.33%
2021-08-27	18:00:00	2.6%	45	42	58	48	44	44	43	43	13.33%
2021-08-27	19:00:00	3.5%	45	41	55	47	44	43	42	43	16.67%
2021-08-27	20:00:00	1.7%	43	41	55	44	43	42	42	42	26.67%
2021-08-27	21:00:00	0.3%	42	41	52	43	42	42	42	42	13.33%
2021-08-27	22:00:00	0.0%	42	41	43	42	42	42	42	42	3.33%
2021-08-27	23:00:00	0.0%	42	41	49	42	42	42	42	42	0.00%
2021-08-28	00:00:00	0.0%	42	41	43	42	42	42	42	42	3.33%
2021-08-28	01:00:00	0.0%	42	41	67	42	42	42	42	42	6.67%
2021-08-28	02:00:00	0.1%	42	41	43	42	42	42	42	42	0.00%
2021-08-28	03:00:00	0.0%	42	41	43	42	42	42	42	42	0.00%

Date	Time	Percent Excluded	L_{eq}	L_{min}	L_{max}	L_{10}	L_{33}	L_{50}	L_{90}	L_{nat}	% Anth.[2] Noise
2021-08-28	04:00:00	0.0%	42	41	47	42	42	42	42	42	0.00%
2021-08-28	05:00:00	0.0%	42	41	44	42	42	42	41	42	13.33%
2021-08-28	06:00:00	0.0%	42	41	52	42	42	42	41	42	10.00%
2021-08-28	07:00:00	0.0%	41	41	53	42	42	41	41	41	10.00%
2021-08-28	08:00:00	0.0%	41	41	49	42	42	41	41	41	10.00%
2021-08-28	09:00:00	0.0%	42	41	46	42	42	42	41	42	6.67%
2021-08-28	10:00:00	0.0%	42	40	56	42	42	42	41	41	26.67%
2021-08-28	11:00:00	0.0%	47	41	69	43	42	42	41	41	60.00%
2021-08-28	12:00:00	0.0%	47	41	71	43	42	42	41	41	56.67%
2021-08-28	13:00:00	0.0%	42	40	56	42	42	42	41	41	43.33%
2021-08-28	14:00:00	0.0%	42	40	52	42	42	42	41	41	43.33%
2021-08-28	15:00:00	0.1%	42	40	54	43	42	42	41	41	53.33%
2021-08-28	16:00:00	0.0%	42	40	51	42	42	42	41	41	40.00%
2021-08-28	17:00:00	0.0%	42	40	51	42	42	42	41	42	26.67%
2021-08-28	18:00:00	0.0%	42	41	62	43	42	42	42	42	46.67%
2021-08-28	19:00:00	1.7%	43	41	57	44	43	42	41	42	20.00%
2021-08-28	20:00:00	0.1%	42	41	46	43	42	42	41	42	10.00%
2021-08-28	21:00:00	0.0%	42	41	43	42	42	42	41	42	0.00%
2021-08-28	22:00:00	0.0%	42	41	44	42	42	42	42	42	3.33%
2021-08-28	23:00:00	0.0%	42	41	43	42	42	42	41	42	3.33%
2021-08-29	00:00:00	0.0%	42	41	43	42	42	42	41	42	3.33%
2021-08-29	01:00:00	0.0%	42	41	42	42	42	42	41	42	0.00%
2021-08-29	02:00:00	0.1%	42	41	43	42	42	42	41	42	0.00%
2021-08-29	03:00:00	0.0%	42	41	42	42	42	42	41	42	3.33%
2021-08-29	04:00:00	0.0%	42	41	42	42	42	42	41	42	3.33%
2021-08-29	05:00:00	0.0%	41	41	42	42	42	41	41	41	0.00%
2021-08-29	06:00:00	0.0%	42	41	53	42	42	42	41	41	13.33%
2021-08-29	07:00:00	0.0%	41	41	44	42	42	41	41	41	0.00%
2021-08-29	08:00:00	0.0%	42	41	45	42	42	42	41	42	13.33%

Date	Time	Percent Excluded	L_{eq}	L_{min}	L_{max}	L_{10}	L_{33}	L_{50}	L_{90}	L_{nat}	% Anth.[2] Noise
2021-08-29	09:00:00	0.0%	42	41	58	42	42	42	41	42	20.00%
2021-08-29	10:00:00	0.0%	41	40	48	42	42	41	41	41	26.67%
2021-08-29	11:00:00	0.0%	42	40	67	42	42	41	41	41	53.33%
2021-08-29	12:00:00	1.3%	46	41	69	44	42	42	41	42	60.00%
2021-08-29	13:00:00	0.4%	42	40	57	44	42	41	41	41	60.00%
2021-08-29	14:00:00	0.0%	42	40	56	43	42	41	41	41	66.67%
2021-08-29	15:00:00	0.0%	42	40	53	42	42	42	41	41	73.33%
2021-08-29	16:00:00	0.0%	43	40	66	42	42	42	41	41	53.33%
2021-08-29	17:00:00	0.0%	42	41	53	43	42	42	41	42	43.33%
2021-08-29	18:00:00	0.0%	45	41	65	43	42	42	42	42	30.00%
2021-08-29	19:00:00	0.0%	42	41	46	43	42	42	42	42	16.67%
2021-08-29	20:00:00	2.9%	44	41	54	47	44	43	42	43	13.33%
2021-08-29	21:00:00	3.6%	45	41	56	48	45	43	42	43	0.00%
2021-08-29	22:00:00	0.2%	42	41	51	43	42	42	42	42	3.33%
2021-08-29	23:00:00	0.0%	42	41	45	42	42	42	42	42	0.00%
2021-08-30	00:00:01	0.0%	42	41	43	42	42	42	41	42	6.67%
2021-08-30	01:00:00	0.0%	41	41	42	42	42	42	41	42	0.00%
2021-08-30	02:00:00	0.1%	41	41	44	42	41	41	41	41	0.00%
2021-08-30	03:00:00	0.0%	41	41	43	42	42	41	41	41	10.00%
2021-08-30	04:00:00	0.0%	41	41	44	42	41	41	41	41	6.67%
2021-08-30	05:00:00	0.0%	41	40	49	42	41	41	41	41	3.33%
2021-08-30	06:00:00	0.3%	41	41	46	42	41	41	41	41	6.67%
2021-08-30	07:00:00	0.9%	42	40	54	42	41	41	41	41	16.67%
2021-08-30	08:00:00	14.9%	48	41	61	52	48	46	42	45	13.33%
2021-08-30	09:00:00	10.6%	49	42	64	52	47	46	43	45	10.00%
2021-08-30	10:00:00	31.8%	Excluded – Overloads (due to wind)								13.33%
2021-08-30	11:00:00	26.2%	Excluded – Overloads (due to wind)								6.67%
2021-08-30	12:00:00	7.0%	48	44	60	51	48	47	45	46	26.67%
2021-08-30	13:00:00	10.0%	51	44	66	54	51	50	46	49	16.67%

Date	Time	Percent Excluded	L_{eq}	L_{min}	L_{max}	L_{10}	L_{33}	L_{50}	L_{90}	L_{nat}	% Anth.[2] Noise
2021-08-30	14:00:00	3.5%	47	42	58	50	47	45	43	45	23.33%
2021-08-30	15:00:00	3.0%	44	41	64	44	43	42	42	42	23.33%
2021-08-30	16:00:00	0.2%	43	41	55	45	43	42	42	42	26.67%
2021-08-30	17:00:00	0.2%	42	40	52	42	42	41	41	41	16.67%
2021-08-30	18:00:00	0.0%	43	40	65	43	42	41	41	41	36.67%
2021-08-30	19:00:00	14.8%	43	41	64	44	42	42	41	42	20.00%
2021-08-30	20:00:00	19.1%	43	41	52	44	43	42	41	42	3.33%
2021-08-30	21:00:00	0.5%	42	41	51	43	42	42	41	42	3.33%
2021-08-30	22:00:00	7.4%	42	40	55	43	42	42	41	42	3.33%
2021-08-30	23:00:00	21.0%	42	41	54	43	42	42	41	42	0.00%
2021-08-31	00:00:00	14.9%	42	40	54	42	42	41	41	41	0.00%
2021-08-31	01:00:00	2.1%	41	40	46	42	41	41	41	41	0.00%
2021-08-31	02:00:00	4.8%	42	40	53	42	41	41	41	41	10.06%
2021-08-31	03:00:00	9.6%	41	40	50	41	41	41	41	41	3.33%
2021-08-31	04:00:00	0.0%	42	41	48	42	42	42	41	41	6.67%
2021-08-31	05:00:00	0.0%	42	41	50	42	42	42	41	42	0.00%
2021-08-31	06:00:00	0.0%	42	41	44	42	42	42	41	42	10.00%
2021-08-31	07:00:00	0.5%	42	41	52	42	42	42	41	42	13.33%
2021-08-31	08:00:00	1.6%	42	40	46	42	42	41	41	41	13.33%
2021-08-31	09:00:00	1.6%	43	41	49	44	43	42	41	42	10.00%
2021-08-31	10:00:00	2.9%	42	41	50	43	42	42	41	42	10.00%
2021-08-31	11:00:00	0.6%	43	41	66	43	42	42	42	42	16.67%
2021-08-31	12:00:00	1.1%	46	41	70	47	44	43	42	43	30.00%
2021-08-31	13:00:00	5.8%	47	42	58	50	47	46	43	45	26.67%
2021-08-31	14:00:00	5.4%	48	42	62	51	48	47	44	46	13.33%
2021-08-31	15:00:00	7.3%	48	42	58	51	48	47	44	46	16.67%
2021-08-31	16:00:00	1.7%	45	41	54	46	44	44	42	43	16.67%
2021-08-31	17:00:00	0.3%	44	41	53	45	43	43	42	43	13.33%
2021-08-31	18:00:00	0.4%	43	41	64	43	42	42	42	42	20.00%

Date	Time	Percent Excluded	L_{eq}	L_{min}	L_{max}	L_{10}	L_{33}	L_{50}	L_{90}	L_{nat}	% Anth.[2] Noise
2021-08-31	19:00:00	1.4%	44	41	66	46	43	42	42	42	6.67%
2021-08-31	20:00:00	0.0%	42	41	53	43	42	42	41	42	3.33%
2021-08-31	21:00:00	0.0%	41	41	45	42	42	42	41	41	3.33%
2021-08-31	22:00:00	0.0%	41	41	43	42	42	41	41	41	0.00%
2021-08-31	23:00:00	0.0%	41	41	43	42	42	41	41	41	6.67%
2021-09-01	00:00:00	0.0%	42	40	59	42	41	41	41	N/A[1]	N/A[1]
2021-09-01	01:00:00	0.0%	41	40	42	42	41	41	41	N/A[1]	N/A[1]
2021-09-01	02:00:00	0.1%	41	40	46	41	41	41	41	N/A[1]	N/A[1]
2021-09-01	03:00:00	0.0%	41	40	59	42	41	41	41	N/A[1]	N/A[1]
2021-09-01	04:00:00	0.0%	41	40	43	41	41	41	41	N/A[1]	N/A[1]
2021-09-01	05:00:00	0.0%	41	40	44	41	41	41	41	N/A[1]	N/A[1]
2021-09-01	06:00:00	0.0%	41	40	50	42	41	41	41	N/A[1]	N/A[1]
2021-09-01	07:00:00	0.0%	41	40	44	42	41	41	41	N/A[1]	N/A[1]

1 Partial days were not analyzed for anthropogenic noise.
2 Anth. = anthropogenic

Table B-10. Hourly noise metrics, Pyramid Lake Trail spring 2022 measurement (dBA).[1]

Date	Time	Percent Excluded	L_{eq}	L_{min}	L_{max}	L_{10}	L_{33}	L_{50}	L_{90}	L_{nat}	% Anth.[2] Noise
2022-04-26	11:00:00	0.0%	48	45	63	49	48	47	46	N/A[1]	N/A[1]
2022-04-26	12:00:00	0.0%	47	45	68	47	46	46	46	N/A[1]	N/A[1]
2022-04-26	13:00:00	28.9%	Excluded - Rain								N/A[1]
2022-04-26	14:00:00	0.0%	46	44	56	47	46	46	45	N/A[1]	N/A[1]
2022-04-26	15:00:00	55.4%	Excluded - Rain								N/A[1]
2022-04-26	16:00:00	30.5%	Excluded - Rain								N/A[1]
2022-04-26	17:00:00	37.9%	Excluded - Rain								N/A[1]
2022-04-26	18:00:00	100.0%	Excluded - Rain								N/A[1]
2022-04-26	19:00:00	8.1%	47	45	68	48	47	46	46	N/A[1]	N/A[1]
2022-04-26	20:00:00	0.0%	46	45	70	47	46	46	46	N/A[1]	N/A[1]
2022-04-26	21:00:00	0.0%	46	45	66	47	46	46	46	N/A[1]	N/A[1]
2022-04-26	22:00:00	0.0%	46	45	63	46	46	46	46	N/A[1]	N/A[1]
2022-04-26	23:00:00	0.0%	46	45	60	46	46	46	45	N/A[1]	N/A[1]
2022-04-27	00:00:00	0.0%	46	45	62	46	46	46	45	46	0.00%
2022-04-27	01:00:00	0.0%	46	45	52	46	46	46	45	46	3.33%
2022-04-27	02:00:00	0.0%	45	45	66	46	46	45	45	45	0.00%
2022-04-27	03:00:00	0.0%	45	45	51	46	46	46	45	45	3.33%
2022-04-27	04:00:00	0.0%	45	45	54	46	46	45	45	45	0.00%
2022-04-27	05:00:00	0.0%	45	45	63	46	46	45	45	45	0.00%
2022-04-27	06:00:00	0.0%	46	45	58	46	46	45	45	45	3.33%
2022-04-27	07:00:00	0.0%	45	44	53	46	45	45	45	45	0.00%
2022-04-27	08:00:00	0.0%	45	44	48	46	45	45	45	45	6.67%
2022-04-27	09:00:00	0.0%	45	44	59	46	45	45	45	45	0.00%
2022-04-27	10:00:00	0.0%	45	44	53	46	45	45	45	45	3.33%
2022-04-27	11:00:00	0.0%	45	44	49	45	45	45	45	45	13.33%
2022-04-27	12:00:00	0.0%	47	44	70	46	45	45	45	45	6.67%
2022-04-27	13:00:00	0.0%	45	44	47	45	45	45	45	45	3.33%
2022-04-27	14:00:00	0.0%	45	44	56	46	45	45	45	45	13.33%
2022-04-27	15:00:00	3.1%	45	44	50	46	45	45	45	45	0.00%

Date	Time	Percent Excluded	L_{eq}	L_{min}	L_{max}	L_{10}	L_{33}	L_{50}	L_{90}	L_{nat}	% Anth.[2] Noise
2022-04-27	16:00:00	14.1%	49	44	57	52	49	47	46	47	3.33%
2022-04-27	17:00:00	0.0%	46	44	66	45	45	45	45	45	3.33%
2022-04-27	18:00:00	0.0%	45	44	54	46	45	45	45	45	6.67%
2022-04-27	19:00:00	0.0%	45	44	55	46	45	45	45	45	6.67%
2022-04-27	20:00:00	0.0%	45	44	47	45	45	45	45	45	0.00%
2022-04-27	21:00:00	0.0%	45	44	46	46	45	45	45	45	3.33%
2022-04-27	22:00:00	0.0%	45	44	46	45	45	45	45	45	0.00%
2022-04-27	23:00:00	0.0%	45	44	46	45	45	45	45	45	0.00%
2022-04-28	00:00:00	0.0%	45	44	46	45	45	45	45	45	0.00%
2022-04-28	01:00:00	0.0%	45	44	46	45	45	45	45	45	0.00%
2022-04-28	02:00:00	0.0%	45	44	46	45	45	45	45	45	0.00%
2022-04-28	03:00:00	0.0%	45	44	53	45	45	45	45	45	10.00%
2022-04-28	04:00:00	0.0%	45	44	46	45	45	45	45	45	0.00%
2022-04-28	05:00:00	0.0%	45	44	57	45	45	45	45	45	0.00%
2022-04-28	06:00:00	0.0%	45	44	49	46	45	45	45	45	3.33%
2022-04-28	07:00:00	0.0%	45	44	47	45	45	45	45	45	0.00%
2022-04-28	08:00:00	0.0%	45	44	54	46	45	45	45	45	0.00%
2022-04-28	09:00:00	0.0%	46	44	62	46	45	45	45	45	10.00%
2022-04-28	10:00:00	1.3%	46	44	65	45	45	45	44	45	3.33%
2022-04-28	11:00:00	0.0%	45	44	62	45	45	45	44	45	13.33%
2022-04-28	12:00:00	0.0%	47	44	67	47	46	45	45	45	6.67%
2022-04-28	13:00:00	0.0%	47	44	55	49	47	46	45	46	6.67%
2022-04-28	14:00:00	0.0%	47	44	55	49	47	46	45	46	6.67%
2022-04-28	15:00:00	0.0%	49	44	58	51	49	47	45	47	0.00%
2022-04-28	16:00:00	0.6%	48	44	59	51	48	47	45	47	3.33%
2022-04-28	17:00:00	0.0%	47	44	64	49	47	46	45	46	6.67%
2022-04-28	18:00:00	1.3%	46	44	55	47	46	46	45	46	3.33%
2022-04-28	19:00:00	4.2%	46	45	59	47	46	46	45	46	0.00%
2022-04-28	20:00:00	3.4%	46	44	54	46	45	45	45	45	0.00%
2022-04-28	21:00:00	0.4%	45	44	50	46	45	45	45	45	0.00%

Date	Time	Percent Excluded	L_{eq}	L_{min}	L_{max}	L_{10}	L_{33}	L_{50}	L_{90}	L_{nat}	% Anth.[2] Noise
2022-04-28	22:00:00	0.0%	45	44	53	46	45	45	45	45	0.00%
2022-04-28	23:00:00	0.0%	45	44	52	46	45	45	45	45	0.00%
2022-04-29	00:00:00	0.0%	45	44	48	45	45	45	45	45	0.00%
2022-04-29	01:00:00	0.0%	45	44	49	45	45	45	45	45	3.33%
2022-04-29	02:00:00	0.0%	45	44	49	45	45	45	45	45	0.00%
2022-04-29	03:00:00	0.0%	45	44	52	45	45	45	45	45	6.67%
2022-04-29	04:00:00	0.0%	45	44	46	45	45	45	45	45	0.00%
2022-04-29	05:00:00	0.0%	46	44	57	46	45	45	45	45	0.00%
2022-04-29	06:00:00	0.0%	45	44	52	45	45	45	45	45	3.33%
2022-04-29	07:00:00	0.0%	45	44	50	45	45	45	45	45	0.00%
2022-04-29	08:00:00	17.5%	45	44	49	45	45	45	45	45	16.67%
2022-04-29	09:00:00	0.0%	46	44	65	45	45	45	45	45	0.00%
2022-04-29	10:00:00	0.0%	47	44	67	45	45	45	44	45	6.67%
2022-04-29	11:00:00	0.0%	45	44	61	45	45	45	44	45	6.67%
2022-04-29	12:00:00	0.0%	46	43	67	46	45	45	44	45	3.33%
2022-04-29	13:00:00	0.0%	45	43	50	45	45	45	44	45	10.00%
2022-04-29	14:00:00	0.0%	45	43	57	46	45	45	44	45	10.00%
2022-04-29	15:00:00	0.0%	45	43	58	46	45	45	44	45	13.33%
2022-04-29	16:00:00	0.0%	46	44	53	47	46	45	45	45	3.33%
2022-04-29	17:00:00	0.0%	46	44	61	46	45	45	45	45	13.33%
2022-04-29	18:00:00	0.0%	45	44	52	46	46	45	45	45	6.67%
2022-04-29	19:00:00	0.0%	45	44	54	46	46	45	45	45	3.33%
2022-04-29	20:00:00	0.0%	47	44	61	46	45	45	45	45	0.00%
2022-04-29	21:00:00	0.0%	45	44	47	46	45	45	45	45	0.00%
2022-04-29	22:00:00	0.0%	45	44	46	46	45	45	45	45	0.00%
2022-04-29	23:00:00	0.0%	45	44	52	46	45	45	45	45	0.00%
2022-04-30	00:00:00	0.0%	45	44	46	46	45	45	45	45	3.33%
2022-04-30	01:00:00	0.0%	45	44	46	45	45	45	45	45	0.00%
2022-04-30	02:00:00	0.0%	45	44	46	45	45	45	45	45	0.00%
2022-04-30	03:00:00	1.6%	45	44	46	46	45	45	45	45	0.00%

Date	Time	Percent Excluded	L_{eq}	L_{min}	L_{max}	L_{10}	L_{33}	L_{50}	L_{90}	L_{nat}	% Anth.[2] Noise
2022-04-30	04:00:00	0.0%	46	45	47	46	46	46	45	46	0.00%
2022-04-30	05:00:00	0.0%	46	45	56	46	46	46	45	46	0.00%
2022-04-30	06:00:00	0.0%	46	45	59	47	46	46	45	46	0.00%
2022-04-30	07:00:00	0.0%	45	44	54	46	45	45	45	45	0.00%
2022-04-30	08:00:00	0.0%	45	44	49	45	45	45	45	45	0.00%
2022-04-30	09:00:00	7.2%	45	44	57	45	45	45	45	45	3.33%
2022-04-30	10:00:00	11.4%	45	44	47	45	45	45	45	45	0.00%
2022-04-30	11:00:00	54.4%	Excluded - Rain								3.33%
2022-04-30	12:00:00	50.8%	Excluded - Rain								6.67%
2022-04-30	13:00:00	4.3%	45	44	64	46	45	45	45	45	3.33%
2022-04-30	14:00:00	1.2%	45	44	60	45	45	45	45	45	6.67%
2022-04-30	15:00:00	0.0%	45	44	65	46	45	45	45	45	6.67%
2022-04-30	16:00:00	0.0%	45	44	55	46	46	45	45	45	0.00%
2022-04-30	17:00:00	0.0%	46	45	62	46	46	46	45	46	6.67%
2022-04-30	18:00:00	0.0%	46	44	50	46	46	46	45	46	3.33%
2022-04-30	19:00:00	0.0%	46	45	47	46	46	46	45	46	0.00%
2022-04-30	20:00:00	0.0%	46	45	59	46	46	46	45	46	0.00%
2022-04-30	21:00:00	0.0%	46	45	47	46	46	46	45	46	0.00%
2022-04-30	22:00:00	29.8%	Excluded - Rain								0.00%
2022-04-30	23:00:00	0.0%	46	45	46	46	46	46	45	46	0.00%
2022-05-01	00:00:00	0.0%	45	45	46	46	46	46	45	46	0.00%
2022-05-01	01:00:00	0.0%	46	45	52	46	46	46	45	46	3.33%
2022-05-01	02:00:00	0.0%	46	45	47	46	46	46	45	46	0.00%
2022-05-01	03:00:00	0.0%	46	45	46	46	46	46	45	46	0.00%
2022-05-01	04:00:00	0.0%	45	45	46	46	46	45	45	45	0.00%
2022-05-01	05:00:00	0.0%	46	45	56	47	46	46	45	46	0.00%
2022-05-01	06:00:00	0.0%	46	45	59	46	46	46	45	46	3.33%
2022-05-01	07:00:00	0.0%	46	45	56	47	46	46	45	46	0.00%
2022-05-01	08:00:00	0.0%	45	44	50	46	45	45	45	45	3.33%
2022-05-01	09:00:00	0.0%	45	44	60	46	45	45	45	45	10.00%

Date	Time	Percent Excluded	L_{eq}	L_{min}	L_{max}	L_{10}	L_{33}	L_{50}	L_{90}	L_{nat}	% Anth.[2] Noise
2022-05-01	10:00:00	0.0%	45	44	47	45	45	45	45	45	0.00%
2022-05-01	11:00:00	0.0%	45	44	58	45	45	45	45	45	10.00%
2022-05-01	12:00:00	0.0%	46	44	70	45	45	45	45	45	3.33%
2022-05-01	13:00:00	0.0%	45	44	54	46	45	45	45	45	3.33%
2022-05-01	14:00:00	0.0%	46	44	65	47	46	46	45	46	10.00%
2022-05-01	15:00:00	0.0%	47	44	55	48	47	46	45	46	3.33%
2022-05-01	16:00:00	0.0%	46	45	60	47	46	46	46	46	3.33%
2022-05-01	17:00:00	0.0%	46	45	61	47	46	46	45	46	6.67%
2022-05-01	18:00:00	0.0%	46	45	56	46	46	46	46	46	3.33%
2022-05-01	19:00:00	0.0%	46	45	59	46	46	46	46	46	3.33%
2022-05-01	20:00:00	0.0%	46	45	58	46	46	46	46	46	6.67%
2022-05-01	21:00:00	0.0%	46	45	52	46	46	46	46	46	3.33%
2022-05-01	22:00:00	0.0%	46	45	47	46	46	46	46	46	0.00%
2022-05-01	23:00:00	0.0%	46	45	47	46	46	46	46	46	0.00%
2022-05-02	00:00:00	0.0%	46	45	47	46	46	46	46	46	0.00%
2022-05-02	01:00:00	0.0%	46	45	47	46	46	46	46	46	0.00%
2022-05-02	02:00:00	0.0%	46	45	47	46	46	46	46	46	0.00%
2022-05-02	03:00:00	0.0%	46	45	47	47	46	46	46	46	0.00%
2022-05-02	04:00:00	0.0%	46	45	47	47	46	46	46	46	0.00%
2022-05-02	05:00:00	0.0%	47	45	55	48	46	46	46	46	0.00%
2022-05-02	06:00:00	0.0%	46	45	51	46	46	46	46	46	3.33%
2022-05-02	07:00:00	0.0%	46	45	54	46	46	46	46	46	0.00%
2022-05-02	08:00:00	0.0%	46	45	48	46	46	46	46	46	3.33%
2022-05-02	09:00:00	0.0%	48	45	56	50	48	48	46	48	0.00%
2022-05-02	10:00:00	0.0%	54	47	66	57	54	52	49	52	0.00%
2022-05-02	11:00:00	0.3%	52	47	64	55	51	50	48	50	0.00%
2022-05-02	12:00:00	0.6%	53	46	73	56	52	51	48	50	3.33%
2022-05-02	13:00:00	0.4%	55	46	66	58	55	53	49	53	10.00%
2022-05-02	14:00:00	0.2%	52	45	65	54	51	50	47	50	6.67%
2022-05-02	15:00:00	0.3%	52	47	64	55	52	50	48	50	0.00%

Date	Time	Percent Excluded	L_{eq}	L_{min}	L_{max}	L_{10}	L_{33}	L_{50}	L_{90}	L_{nat}	% Anth.[2] Noise
2022-05-02	16:00:00	0.0%	51	46	63	54	51	49	47	49	3.33%
2022-05-02	17:00:00	0.0%	54	48	65	57	54	53	50	53	0.00%
2022-05-02	18:00:00	0.0%	53	47	66	56	53	51	49	51	3.33%
2022-05-02	19:00:00	0.0%	48	46	57	49	48	47	47	47	6.67%
2022-05-02	20:00:00	0.0%	47	46	52	48	47	47	47	47	0.00%
2022-05-02	21:00:00	0.0%	47	46	51	47	47	47	46	47	0.00%
2022-05-02	22:00:00	0.0%	47	46	50	47	47	47	46	47	0.00%
2022-05-02	23:00:00	0.0%	47	46	52	48	47	47	47	47	0.00%
2022-05-03	00:00:00	0.0%	47	46	58	48	47	47	47	47	3.33%
2022-05-03	01:00:00	0.0%	47	46	50	47	47	47	47	47	0.00%
2022-05-03	02:00:00	0.0%	47	46	50	47	47	47	47	47	0.00%
2022-05-03	03:00:00	0.0%	47	46	48	47	47	47	47	47	0.00%
2022-05-03	04:00:00	0.0%	47	46	51	47	47	47	47	47	0.00%
2022-05-03	05:00:00	0.0%	47	46	56	48	47	47	47	47	0.00%
2022-05-03	06:00:00	0.0%	47	46	51	47	47	47	46	47	0.00%
2022-05-03	07:00:00	0.0%	47	46	51	47	47	47	46	47	0.00%
2022-05-03	08:00:00	0.0%	47	46	53	48	47	47	47	47	0.00%
2022-05-03	09:00:00	0.0%	47	46	55	48	47	47	47	47	0.00%
2022-05-03	10:00:00	0.0%	49	46	59	51	49	48	47	48	0.00%
2022-05-03	11:00:00	0.0%	51	46	62	53	50	49	48	49	6.67%
2022-05-03	12:00:00	0.0%	52	47	72	54	51	50	48	50	3.33%
2022-05-03	13:00:00	0.0%	51	46	61	54	50	49	47	49	0.00%
2022-05-03	14:00:00	0.0%	51	46	65	54	51	50	48	50	6.67%
2022-05-03	15:00:00	0.0%	50	47	58	52	49	49	48	49	0.00%
2022-05-03	16:00:00	0.0%	49	46	58	50	48	48	47	48	3.33%
2022-05-03	17:00:00	0.0%	48	46	56	49	48	47	47	47	13.33%
2022-05-03	18:00:00	0.0%	47	46	61	47	47	47	47	47	0.00%
2022-05-03	19:00:00	0.0%	47	46	54	48	47	47	47	47	0.00%
2022-05-03	20:00:00	0.0%	48	47	53	49	48	48	47	48	3.33%
2022-05-03	21:00:00	0.0%	48	46	57	49	48	48	47	48	3.33%

Date	Time	Percent Excluded	L_{eq}	L_{min}	L_{max}	L_{10}	L_{33}	L_{50}	L_{90}	L_{nat}	% Anth.[2] Noise
2022-05-03	22:00:00	0.0%	47	46	50	48	47	47	47	47	0.00%
2022-05-03	23:00:00	0.0%	48	46	55	49	48	48	47	48	0.00%
2022-05-04	00:00:00	0.0%	48	46	52	49	48	48	47	N/A[1]	N/A[1]
2022-05-04	01:00:00	0.0%	47	46	49	47	47	47	47	N/A[1]	N/A[1]
2022-05-04	02:00:00	0.0%	47	46	49	47	47	47	47	N/A[1]	N/A[1]
2022-05-04	03:00:00	8.3%	47	46	49	47	47	47	47	N/A[1]	N/A[1]
2022-05-04	04:00:00	50.6%	Excluded - Rain								N/A[1]
2022-05-04	05:00:00	48.0%	Excluded - Rain								N/A[1]
2022-05-04	06:00:00	11.0%	47	46	64	47	47	47	47	N/A[1]	N/A[1]
2022-05-04	07:00:00	14.4%	47	46	63	47	47	47	47	N/A[1]	N/A[1]
2022-05-04	08:00:00	32.8%	Excluded - Rain								N/A[1]
2022-05-04	09:00:00	3.8%	47	46	59	47	47	47	47	N/A[1]	N/A[1]
2022-05-04	10:00:00	37.6%	Excluded - Rain								N/A[1]
2022-05-04	11:00:00	11.9%	47	46	55	47	47	47	47	N/A[1]	N/A[1]

1 Partial days were not analyzed for anthropogenic noise.
2 Anth. = anthropogenic

Table B-11. Hourly noise metrics, Caskey Lake summer 2021 measurement (dBA).[1]

Date	Time	Percent Excluded	L_{eq}	L_{min}	L_{max}	L_{10}	L_{33}	L_{50}	L_{90}	L_{nat}	% Anth.[2] Noise
2021-08-24	19:00:00	100.00%	Excluded - Rain							N/A[1]	N/A[1]
2021-08-24	20:00:00	100.00%	Excluded - Rain							N/A[1]	N/A[1]
2021-08-24	21:00:00	100.00%	Excluded - Rain							N/A[1]	N/A[1]
2021-08-24	22:00:00	100.00%	Excluded - Rain							N/A[1]	N/A[1]
2021-08-24	23:00:00	100.00%	Excluded - Rain							N/A[1]	N/A[1]
2021-08-25	00:00:00	0.0%	30	27	40	31	30	29	28	27	100.00%
2021-08-25	01:00:00	0.0%	31	27	47	32	31	30	29	27	100.00%
2021-08-25	02:00:00	0.1%	30	27	45	31	30	30	28	27	100.00%
2021-08-25	03:00:00	0.0%	31	27	46	32	30	29	29	28	100.00%
2021-08-25	04:00:00	0.0%	32	27	44	35	31	30	29	27	100.00%
2021-08-25	05:00:00	0.0%	32	26	65	33	30	30	27	27	96.67%
2021-08-25	06:00:00	0.0%	34	27	49	37	33	32	29	28	100.00%
2021-08-25	07:00:00	0.0%	33	27	52	36	32	31	28	27	100.00%
2021-08-25	08:00:00	0.0%	31	25	47	33	31	30	28	26	100.00%
2021-08-25	09:00:00	0.0%	29	24	43	31	29	29	27	25	100.00%
2021-08-25	10:00:00	0.0%	29	24	43	30	29	29	27	25	100.00%
2021-08-25	11:00:00	0.4%	33	25	52	36	29	29	28	26	100.00%
2021-08-25	12:00:00	0.2%	42	25	66	38	30	29	28	25	100.00%
2021-08-25	13:00:00	10.3%	31	26	47	34	31	30	28	26	100.00%
2021-08-25	14:00:00	16.5%	36	30	58	36	34	33	31	30	100.00%
2021-08-25	15:00:00	33.2%	Excluded – Staff Onsite								100.00%
2021-08-25	16:00:00	33.2%	Excluded – Overload (wind)								100.00%
2021-08-25	17:00:00	18.6%	36	25	58	38	35	33	28	25	100.00%
2021-08-25	18:00:00	1.6%	33	24	55	34	30	30	27	24	100.00%
2021-08-25	19:00:00	0.2%	30	25	46	31	30	29	28	25	100.00%
2021-08-25	20:00:00	0.5%	42	26	68	33	30	29	27	26	100.00%
2021-08-25	21:00:00	0.0%	27	25	38	29	28	27	26	26	86.67%
2021-08-25	22:00:00	0.0%	28	24	50	28	26	26	25	24	96.67%

Date	Time	Percent Excluded	L_{eq}	L_{min}	L_{max}	L_{10}	L_{33}	L_{50}	L_{90}	L_{nat}	% Anth.[2] Noise
2021-08-25	23:00:00	0.0%	27	24	37	28	27	27	26	25	100.00%
2021-08-26	00:00:00	0.0%	26	24	40	28	27	26	25	25	100.00%
2021-08-26	01:00:00	0.0%	29	25	45	31	28	27	26	25	100.00%
2021-08-26	02:00:00	0.1%	26	24	43	28	26	25	25	24	97.21%
2021-08-26	03:00:00	0.0%	26	24	41	28	26	25	25	24	100.00%
2021-08-26	04:00:00	0.0%	29	24	50	30	27	27	25	25	100.00%
2021-08-26	05:00:00	0.0%	35	24	64	31	28	27	25	24	100.00%
2021-08-26	06:00:00	0.0%	32	25	57	34	30	29	26	25	100.00%
2021-08-26	07:00:00	0.0%	32	25	46	34	32	31	28	26	100.00%
2021-08-26	08:00:00	0.0%	30	25	46	32	30	29	27	25	100.00%
2021-08-26	09:00:00	0.0%	42	24	67	33	30	29	26	25	100.00%
2021-08-26	10:00:00	0.1%	40	25	63	33	31	29	27	25	100.00%
2021-08-26	11:00:00	0.0%	33	26	53	34	32	31	29	26	100.00%
2021-08-26	12:00:00	1.9%	34	27	52	36	33	32	30	28	100.00%
2021-08-26	13:00:00	3.1%	33	27	50	35	33	32	30	28	100.00%
2021-08-26	14:00:00	0.3%	35	24	53	38	35	33	31	25	100.00%
2021-08-26	15:00:00	1.7%	42	24	64	45	40	38	34	25	100.00%
2021-08-26	16:00:00	38.5%	Excluded - Rain								100.00%
2021-08-26	17:00:00	0.7%	38	24	60	35	30	30	26	25	100.00%
2021-08-26	18:00:00	21.4%	43	24	67	40	33	31	25	24	100.00%
2021-08-26	19:00:00	0.0%	31	24	54	32	30	28	26	25	100.00%
2021-08-26	20:00:00	13.8%	37	28	60	38	32	31	30	28	100.00%
2021-08-26	21:00:00	92.8%	Excluded - Rain								100.00%
2021-08-26	22:00:00	68.1%	Excluded - Rain								100.00%
2021-08-26	23:00:00	0.3%	41	32	65	44	41	39	36	34	100.00%
2021-08-27	00:00:00	0.0%	34	29	58	36	34	33	31	30	100.00%
2021-08-27	01:00:00	0.0%	32	28	57	33	32	31	30	29	100.00%
2021-08-27	02:00:00	0.1%	31	28	61	32	31	31	30	29	97.21%
2021-08-27	03:00:00	0.0%	31	27	56	33	31	30	29	28	100.00%

Date	Time	Percent Excluded	L_{eq}	L_{min}	L_{max}	L_{10}	L_{33}	L_{50}	L_{90}	L_{nat}	% Anth.[2] Noise
2021-08-27	04:00:00	0.0%	30	27	59	31	30	29	28	28	100.00%
2021-08-27	05:00:00	0.0%	32	27	56	35	32	30	28	28	100.00%
2021-08-27	06:00:00	0.0%	33	28	61	35	33	32	30	28	100.00%
2021-08-27	07:00:00	0.0%	31	26	53	34	31	30	28	26	100.00%
2021-08-27	08:00:00	0.2%	31	26	51	32	30	29	28	26	100.00%
2021-08-27	09:00:00	0.2%	33	27	44	36	34	33	29	27	100.00%
2021-08-27	10:00:00	3.2%	35	27	57	35	34	33	30	28	100.00%
2021-08-27	11:00:00	3.1%	48	27	76	42	34	33	30	27	100.00%
2021-08-27	12:00:00	9.7%	36	28	58	37	34	33	31	29	100.00%
2021-08-27	13:00:00	30.1%	Excluded – Overload (wind)								100.00%
2021-08-27	14:00:00	18.1%	34	29	50	36	34	33	32	30	100.00%
2021-08-27	15:00:00	19.0%	32	26	44	34	32	31	29	27	100.00%
2021-08-27	16:00:00	0.0%	37	24	60	32	29	28	25	25	80.00%
2021-08-27	17:00:00	0.0%	27	23	51	29	27	26	24	25	46.67%
2021-08-27	18:00:00	0.0%	32	23	57	28	25	25	24	24	50.00%
2021-08-27	19:00:00	0.0%	29	24	47	30	27	26	25	25	76.67%
2021-08-27	20:00:00	0.0%	26	23	58	27	25	25	24	24	46.67%
2021-08-27	21:00:00	0.0%	25	22	45	25	25	24	24	24	46.67%
2021-08-27	22:00:00	0.0%	25	23	35	27	25	25	24	24	56.67%
2021-08-27	23:00:00	0.0%	25	24	31	26	25	25	24	24	100.00%
2021-08-28	00:00:00	0.0%	25	23	44	26	26	25	25	25	33.33%
2021-08-28	01:00:00	0.0%	25	23	40	26	25	25	24	25	10.00%
2021-08-28	02:00:00	0.1%	25	23	36	26	26	25	24	25	16.76%
2021-08-28	03:00:00	0.0%	25	23	38	26	25	25	24	24	13.33%
2021-08-28	04:00:00	0.0%	25	23	36	25	25	25	24	25	3.33%
2021-08-28	05:00:00	0.0%	26	23	52	26	24	24	24	24	0.00%
2021-08-28	06:00:00	0.0%	26	23	39	27	25	25	24	24	80.00%
2021-08-28	07:00:00	0.0%	29	23	53	29	27	26	25	24	100.00%
2021-08-28	08:00:00	0.0%	39	26	62	38	32	30	27	26	100.00%

Date	Time	Percent Excluded	L_{eq}	L_{min}	L_{max}	L_{10}	L_{33}	L_{50}	L_{90}	L_{nat}	% Anth.[2] Noise
2021-08-28	09:00:00	0.1%	31	25	63	31	29	28	27	25	100.00%
2021-08-28	10:00:00	0.1%	30	24	45	31	29	29	27	25	100.00%
2021-08-28	11:00:00	1.4%	40	26	69	36	31	30	28	27	100.00%
2021-08-28	12:00:00	0.7%	33	25	56	31	29	29	28	26	100.00%
2021-08-28	13:00:00	1.9%	30	25	43	31	30	29	28	26	100.00%
2021-08-28	14:00:00	7.2%	35	27	55	34	31	30	29	27	100.00%
2021-08-28	15:00:00	2.5%	31	26	48	31	30	30	28	26	100.00%
2021-08-28	16:00:00	15.1%	34	27	53	37	33	32	29	27	100.00%
2021-08-28	17:00:00	13.3%	33	29	52	35	33	32	30	29	100.00%
2021-08-28	18:00:00	2.4%	33	28	50	34	32	32	30	29	100.00%
2021-08-28	19:00:00	0.0%	33	27	46	35	32	32	30	28	100.00%
2021-08-28	20:00:00	0.0%	31	26	57	31	30	29	28	26	100.00%
2021-08-28	21:00:00	0.0%	30	25	38	32	30	29	27	26	100.00%
2021-08-28	22:00:00	0.0%	29	26	40	30	29	28	27	26	100.00%
2021-08-28	23:00:00	0.0%	28	25	44	29	28	27	26	26	100.00%
2021-08-29	00:00:00	0.0%	28	25	36	29	28	27	26	25	100.00%
2021-08-29	01:00:00	0.0%	28	25	43	29	28	27	26	25	100.00%
2021-08-29	02:00:00	0.1%	27	25	39	27	27	26	26	25	100.00%
2021-08-29	03:00:00	0.0%	27	25	39	28	27	27	26	26	100.00%
2021-08-29	04:00:00	0.0%	27	25	39	29	27	27	26	25	100.00%
2021-08-29	05:00:00	0.0%	31	25	57	30	29	28	26	26	100.00%
2021-08-29	06:00:00	0.0%	33	28	47	35	33	33	30	29	100.00%
2021-08-29	07:00:00	0.0%	35	32	49	36	35	35	34	33	100.00%
2021-08-29	08:00:00	0.0%	32	25	51	35	32	30	27	27	80.00%
2021-08-29	09:00:00	0.0%	28	24	47	30	28	27	26	25	96.67%
2021-08-29	10:00:00	0.6%	34	24	59	31	29	28	27	25	100.00%
2021-08-29	11:00:00	9.1%	39	27	65	34	31	31	29	28	100.00%
2021-08-29	12:00:00	7.6%	40	27	63	35	31	30	29	27	100.00%
2021-08-29	13:00:00	2.3%	36	27	58	32	30	29	28	27	100.00%

Date	Time	Percent Excluded	L_{eq}	L_{min}	L_{max}	L_{10}	L_{33}	L_{50}	L_{90}	L_{nat}	% Anth.[2] Noise
2021-08-29	14:00:00	16.7%	33	27	57	33	31	31	29	27	100.00%
2021-08-29	15:00:00	32.1%	Excluded – Overload (wind)								100.00%
2021-08-29	16:00:00	37.4%	Excluded – Overload (wind)								100.00%
2021-08-29	17:00:00	17.9%	36	30	49	38	35	34	32	30	100.00%
2021-08-29	18:00:00	6.4%	38	29	60	37	34	33	31	30	100.00%
2021-08-29	19:00:00	0.1%	35	28	57	33	32	32	30	28	100.00%
2021-08-29	20:00:00	0.0%	31	27	47	33	32	31	29	27	100.00%
2021-08-29	21:00:00	0.0%	31	27	46	33	31	30	29	28	100.00%
2021-08-29	22:00:00	0.0%	28	25	43	29	28	27	26	25	100.00%
2021-08-29	23:00:00	0.0%	27	25	36	29	27	27	26	25	100.00%
2021-08-30	00:00:01	0.0%	28	24	40	29	28	28	27	26	100.00%
2021-08-30	01:00:00	0.0%	27	24	40	28	27	26	25	25	100.00%
2021-08-30	02:00:00	0.1%	27	24	38	27	27	26	26	25	97.21%
2021-08-30	03:00:00	0.0%	28	25	37	30	28	27	26	25	100.00%
2021-08-30	04:00:00	0.0%	33	24	61	30	28	28	26	27	56.67%
2021-08-30	05:00:00	0.0%	32	25	55	34	32	31	28	27	86.67%
2021-08-30	06:00:00	0.0%	37	29	56	39	36	35	32	29	100.00%
2021-08-30	07:00:00	0.0%	34	28	52	38	32	31	30	29	100.00%
2021-08-30	08:00:00	0.0%	37	29	50	39	37	36	34	30	100.00%
2021-08-30	09:00:00	0.1%	34	26	47	37	34	33	30	27	100.00%
2021-08-30	10:00:00	0.4%	32	25	54	31	30	29	28	25	100.00%
2021-08-30	11:00:00	0.4%	29	25	44	30	29	28	27	25	100.00%
2021-08-30	12:00:00	0.2%	32	24	55	31	29	28	26	25	96.67%
2021-08-30	13:00:00	0.1%	28	24	38	30	28	27	26	24	100.00%
2021-08-30	14:00:00	1.5%	37	27	64	37	35	34	30	27	100.00%
2021-08-30	15:00:00	2.2%	35	27	56	37	34	33	30	28	100.00%
2021-08-30	16:00:00	0.2%	32	24	54	32	31	31	28	25	93.33%
2021-08-30	17:00:00	0.0%	27	23	38	28	27	26	25	25	76.67%
2021-08-30	18:00:00	5.6%	38	24	61	37	33	32	29	24	100.00%

Date	Time	Percent Excluded	L_{eq}	L_{min}	L_{max}	L_{10}	L_{33}	L_{50}	L_{90}	L_{nat}	% Anth.[2] Noise
2021-08-30	19:00:00	17.7%	36	27	51	39	37	35	31	27	100.00%
2021-08-30	20:00:00	10.1%	38	26	53	43	38	36	29	27	100.00%
2021-08-30	21:00:00	0.0%	30	25	55	32	30	29	26	25	100.00%
2021-08-30	22:00:00	8.8%	31	25	62	34	30	28	27	25	100.00%
2021-08-30	23:00:00	0.0%	26	24	42	27	26	26	25	25	100.00%
2021-08-31	00:00:00	0.0%	25	23	36	26	25	25	24	24	100.00%
2021-08-31	01:00:00	0.0%	25	23	42	26	25	25	24	23	100.00%
2021-08-31	02:00:00	0.1%	27	23	44	28	27	26	24	24	100.00%
2021-08-31	03:00:00	0.0%	32	25	56	31	29	28	26	25	100.00%
2021-08-31	04:00:00	0.2%	47	25	75	38	32	30	27	26	100.00%
2021-08-31	05:00:00	0.0%	32	27	52	33	31	31	29	28	100.00%
2021-08-31	06:00:00	2.7%	34	27	58	36	33	32	29	27	100.00%
2021-08-31	07:00:00	5.9%	47	26	75	36	32	30	28	27	100.00%
2021-08-31	08:00:00	33.7%	Excluded - Rain								100.00%
2021-08-31	09:00:00	0.1%	50	28	77	40	37	34	31	28	100.00%
2021-08-31	10:00:00	0.9%	50	26	79	50	35	32	28	27	100.00%
2021-08-31	11:00:00	3.4%	43	26	73	38	34	33	30	26	100.00%
2021-08-31	12:00:00	23.7%	47	31	70	42	38	36	33	31	100.00%
2021-08-31	13:00:00	0.0%	42	29	72	37	35	34	32	30	100.00%
2021-08-31	14:00:00	28.1%	Excluded - Rain								100.00%
2021-08-31	15:00:00	8.1%	35	25	59	38	34	32	27	26	100.00%
2021-08-31	16:00:00	0.6%	33	25	54	35	30	29	27	25	100.00%
2021-08-31	17:00:00	0.0%	32	23	53	29	27	26	24	25	76.67%
2021-08-31	18:00:00	0.0%	29	23	49	29	25	24	24	24	50.00%
2021-08-31	19:00:00	0.0%	30	23	54	26	25	24	24	24	56.67%
2021-08-31	20:00:00	0.0%	35	24	62	31	27	26	25	25	36.67%
2021-08-31	21:00:00	0.0%	28	24	50	27	26	26	25	24	96.67%
2021-08-31	22:00:00	0.0%	26	23	33	27	26	25	24	24	70.00%
2021-08-31	23:00:00	0.0%	26	23	34	27	26	25	25	24	100.00%

Date	Time	Percent Excluded	L_{eq}	L_{min}	L_{max}	L_{10}	L_{33}	L_{50}	L_{90}	L_{nat}	% Anth.[2] Noise
2021-09-01	00:00:00	0.0%	26	24	37	27	26	26	25	N/A[1]	N/A[1]
2021-09-01	01:00:00	0.0%	26	24	37	27	26	26	25	N/A[1]	N/A[1]
2021-09-01	02:00:00	0.1%	28	25	38	29	28	27	26	N/A[1]	N/A[1]
2021-09-01	03:00:00	0.0%	33	28	48	34	33	33	30	N/A[1]	N/A[1]
2021-09-01	04:00:00	0.5%	52	31	76	42	36	35	33	N/A[1]	N/A[1]
2021-09-01	05:00:00	0.1%	50	30	76	44	38	37	33	N/A[1]	N/A[1]
2021-09-01	06:00:00	0.0%	49	30	74	42	39	37	33	N/A[1]	N/A[1]
2021-09-01	07:00:00	0.0%	46	27	72	41	37	36	32	N/A[1]	N/A[1]
2021-09-01	08:00:00	0.2%	50	31	77	49	44	41	35	N/A[1]	N/A[1]
2021-09-01	09:00:00	0.6%	51	29	76	44	39	38	34	N/A[1]	N/A[1]
2021-09-01	10:00:00	0.0%	47	27	74	39	36	34	32	N/A[1]	N/A[1]
2021-09-01	11:00:00	1.4%	47	27	77	40	36	34	31	N/A[1]	N/A[1]
2021-09-01	12:00:00	16.6%	49	28	74	39	36	35	33	N/A[1]	N/A[1]
2021-09-01	13:00:00	3.4%	44	28	73	40	37	36	32	N/A[1]	N/A[1]
2021-09-01	14:00:00	11.8%	42	27	72	39	36	35	32	N/A[1]	N/A[1]

1 Partial days were not analyzed for anthropogenic noise.
2 Anth. = anthropogenic

Table B-12. Hourly noise metrics, Caskey Lake spring 2022 measurement (dBA).[1]

Date	Time	Percent Excluded	L_{eq}	L_{min}	L_{max}	L_{10}	L_{33}	L_{50}	L_{90}	L_{nat}	% Anth.[2] Noise
2022-04-26	16:00:00	42.4%	Excluded - Rain								N/A[1]
2022-04-26	17:00:00	63.4%	Excluded - Rain								N/A[1]
2022-04-26	18:00:00	74.0%	Excluded - Rain								N/A[1]
2022-04-26	19:00:00	39.4%	Excluded - Rain								N/A[1]
2022-04-26	20:00:00	45.8%	Excluded - Rain								N/A[1]
2022-04-26	21:00:00	0.0%	42	32	67	40	37	36	34	N/A[1]	N/A[1]
2022-04-26	22:00:00	0.0%	36	32	58	36	34	34	33	N/A[1]	N/A[1]
2022-04-26	23:00:00	0.0%	33	31	59	35	33	33	32	N/A[1]	N/A[1]
2022-04-27	00:00:00	0.0%	37	32	63	35	34	33	32	33	23.33%
2022-04-27	01:00:00	0.0%	34	31	62	35	34	33	33	33	56.67%
2022-04-27	02:00:00	0.0%	33	30	62	34	33	33	32	32	46.95%
2022-04-27	03:00:00	0.0%	34	31	51	35	34	33	32	33	26.67%
2022-04-27	04:00:00	0.0%	37	30	64	34	33	32	32	32	20.00%
2022-04-27	05:00:00	0.0%	33	30	49	35	33	32	31	32	26.67%
2022-04-27	06:00:00	0.0%	35	29	54	37	34	33	31	33	20.00%
2022-04-27	07:00:00	0.0%	34	29	59	34	32	31	30	31	46.67%
2022-04-27	08:00:00	0.0%	31	28	46	31	30	30	29	30	53.33%
2022-04-27	09:00:00	0.0%	32	28	50	33	30	29	29	29	43.33%
2022-04-27	10:00:00	0.0%	35	28	55	32	30	30	29	29	30.00%
2022-04-27	11:00:00	0.0%	43	28	70	40	31	30	29	29	43.33%
2022-04-27	12:00:00	0.0%	36	27	61	34	31	30	29	29	23.33%
2022-04-27	13:00:00	7.9%	36	28	59	39	36	33	29	30	50.00%
2022-04-27	14:00:00	20.5%	35	29	53	39	34	32	30	31	26.67%
2022-04-27	15:00:00	0.0%	33	28	52	35	32	31	29	31	13.33%
2022-04-27	16:00:00	0.0%	34	27	58	34	30	29	28	29	13.33%
2022-04-27	17:00:00	0.0%	35	28	59	34	31	30	29	30	20.00%
2022-04-27	18:00:00	0.0%	30	27	37	31	30	29	28	29	6.67%
2022-04-27	19:00:00	0.0%	35	28	56	35	30	30	29	30	10.00%

Date	Time	Percent Excluded	L_{eq}	L_{min}	L_{max}	L_{10}	L_{33}	L_{50}	L_{90}	L_{nat}	% Anth.[2] Noise
2022-04-27	20:00:00	0.0%	31	28	47	32	31	30	29	30	13.33%
2022-04-27	21:00:00	0.0%	33	28	54	32	30	30	29	29	20.00%
2022-04-27	22:00:00	0.0%	35	28	57	32	30	30	29	29	6.67%
2022-04-27	23:00:00	0.0%	30	28	41	31	30	30	29	30	3.33%
2022-04-28	00:00:00	0.0%	30	28	39	32	30	30	29	30	6.67%
2022-04-28	01:00:00	0.0%	31	29	40	32	31	31	29	30	10.00%
2022-04-28	02:00:00	0.0%	30	28	41	31	30	30	29	30	3.35%
2022-04-28	03:00:00	0.0%	29	28	35	30	30	29	29	29	3.33%
2022-04-28	04:00:00	0.0%	30	28	39	31	30	30	29	30	3.33%
2022-04-28	05:00:00	0.0%	35	29	55	34	31	31	30	31	13.33%
2022-04-28	06:00:00	0.0%	33	29	49	35	33	32	31	32	13.33%
2022-04-28	07:00:00	0.0%	34	29	62	35	32	32	30	32	3.33%
2022-04-28	08:00:00	0.0%	39	28	59	39	31	30	29	30	13.33%
2022-04-28	09:00:00	0.0%	35	27	53	35	30	30	29	29	13.33%
2022-04-28	10:00:00	0.0%	31	27	49	33	30	29	29	29	3.33%
2022-04-28	11:00:00	0.0%	32	27	48	32	30	30	29	29	20.00%
2022-04-28	12:00:00	0.0%	33	27	56	33	30	29	28	29	3.33%
2022-04-28	13:00:00	41.6%	Excluded - Rain								10.00%
2022-04-28	14:00:00	24.2%	35	29	56	37	34	32	31	32	16.67%
2022-04-28	15:00:00	54.5%	Excluded - Rain								63.33%
2022-04-28	16:00:00	0.0%	38	29	59	39	35	33	30	33	10.00%
2022-04-28	17:00:00	25.0%	Excluded - Rain								20.00%
2022-04-28	18:00:00	17.2%	38	31	53	40	39	38	35	38	10.00%
2022-04-28	19:00:00	17.5%	36	31	52	38	37	36	34	36	16.67%
2022-04-28	20:00:00	19.5%	39	34	55	41	40	39	37	38	30.00%
2022-04-28	21:00:00	0.0%	39	32	59	39	36	36	34	36	6.67%
2022-04-28	22:00:00	0.0%	38	30	64	36	33	33	32	33	0.00%
2022-04-28	23:00:00	0.0%	32	29	51	34	32	31	31	31	0.00%
2022-04-29	00:00:00	0.0%	32	30	48	34	32	32	31	31	73.33%

Date	Time	Percent Excluded	L_{eq}	L_{min}	L_{max}	L_{10}	L_{33}	L_{50}	L_{90}	L_{nat}	% Anth.[2] Noise
2022-04-29	01:00:00	0.0%	32	30	51	33	32	31	31	30	100.00%
2022-04-29	02:00:00	0.0%	32	30	50	33	32	32	31	31	100.00%
2022-04-29	03:00:00	0.0%	32	30	50	33	32	32	31	30	100.00%
2022-04-29	04:00:00	0.0%	32	30	49	33	32	32	31	31	100.00%
2022-04-29	05:00:00	2.5%	33	31	49	35	33	33	32	31	100.00%
2022-04-29	06:00:00	0.0%	33	30	48	34	33	33	31	31	100.00%
2022-04-29	07:00:00	0.0%	31	29	49	32	31	31	30	29	100.00%
2022-04-29	08:00:00	0.0%	37	28	59	31	30	30	29	28	100.00%
2022-04-29	09:00:00	0.0%	41	28	63	35	30	29	29	29	80.00%
2022-04-29	10:00:00	0.0%	33	28	53	33	30	30	29	29	76.67%
2022-04-29	11:00:00	0.0%	40	27	69	32	30	29	29	29	26.67%
2022-04-29	12:00:00	0.0%	35	27	60	35	31	30	29	29	76.67%
2022-04-29	13:00:00	0.0%	32	27	54	33	30	29	28	28	73.33%
2022-04-29	14:00:00	7.1%	32	26	52	33	29	29	28	28	70.00%
2022-04-29	15:00:00	0.0%	30	27	45	30	29	29	28	28	76.67%
2022-04-29	16:00:00	0.0%	30	27	48	31	29	29	28	29	46.67%
2022-04-29	17:00:00	0.0%	38	26	60	34	29	28	28	28	60.00%
2022-04-29	18:00:00	0.0%	39	28	60	32	31	30	29	29	16.67%
2022-04-29	19:00:00	0.0%	43	28	73	35	31	31	29	30	26.67%
2022-04-29	20:00:00	0.0%	32	29	52	33	32	31	30	31	13.33%
2022-04-29	21:00:00	0.0%	34	31	43	35	34	33	32	33	16.67%
2022-04-29	22:00:00	0.0%	33	31	52	34	33	33	32	33	3.33%
2022-04-29	23:00:00	0.0%	34	30	54	34	33	32	31	32	13.33%
2022-04-30	00:00:00	0.0%	31	29	42	32	31	30	29	30	6.67%
2022-04-30	01:00:00	0.0%	31	29	38	32	31	31	30	30	33.33%
2022-04-30	02:00:00	23.4%	32	28	44	34	32	32	30	29	100.00%
2022-04-30	03:00:00	6.9%	33	29	49	35	32	31	30	29	100.00%
2022-04-30	04:00:00	10.3%	34	30	47	37	34	33	31	30	100.00%
2022-04-30	05:00:00	31.7%	Excluded - Rain								100.00%

Date	Time	Percent Excluded	L_{eq}	L_{min}	L_{max}	L_{10}	L_{33}	L_{50}	L_{90}	L_{nat}	% Anth.[2] Noise
2022-04-30	06:00:00	0.0%	41	34	51	43	42	41	37	34	100.00%
2022-04-30	07:00:00	21.6%	35	31	51	37	35	34	33	32	100.00%
2022-04-30	08:00:00	8.5%	40	31	52	43	41	40	34	31	100.00%
2022-04-30	09:00:00	9.2%	35	29	49	38	35	33	31	30	100.00%
2022-04-30	10:00:00	71.7%	Excluded - Rain								100.00%
2022-04-30	11:00:00	40.5%	Excluded - Rain								100.00%
2022-04-30	12:00:00	8.2%	34	30	49	37	34	33	31	31	90.00%
2022-04-30	13:00:00	1.1%	40	30	64	42	39	37	34	35	66.67%
2022-04-30	14:00:00	0.4%	37	31	51	40	36	35	33	34	43.33%
2022-04-30	15:00:00	0.0%	34	28	44	36	34	33	30	29	100.00%
2022-04-30	16:00:00	0.0%	33	28	44	35	33	32	30	30	76.67%
2022-04-30	17:00:00	0.0%	35	27	57	31	29	29	28	28	86.67%
2022-04-30	18:00:00	0.0%	33	27	61	32	30	29	28	29	33.33%
2022-04-30	19:00:00	0.0%	31	29	62	32	31	31	30	30	40.00%
2022-04-30	20:00:00	0.0%	31	29	50	32	31	31	30	31	26.67%
2022-04-30	21:00:00	0.0%	31	29	42	32	31	31	30	30	40.00%
2022-04-30	22:00:00	0.0%	30	28	42	30	30	29	29	29	0.00%
2022-04-30	23:00:00	0.0%	30	28	37	30	30	30	29	30	6.67%
2022-05-01	00:00:00	0.0%	31	28	38	33	31	31	29	30	3.33%
2022-05-01	01:00:00	0.0%	31	29	48	33	31	31	30	30	10.00%
2022-05-01	02:00:00	0.0%	30	28	36	31	30	30	29	30	10.06%
2022-05-01	03:00:00	0.0%	30	28	45	30	30	30	29	29	26.67%
2022-05-01	04:00:00	0.0%	29	27	34	29	29	28	28	28	3.33%
2022-05-01	05:00:00	0.0%	33	28	55	32	30	29	29	29	3.33%
2022-05-01	06:00:00	0.0%	31	28	50	32	30	29	29	29	0.00%
2022-05-01	07:00:00	0.0%	31	27	47	33	29	29	28	29	10.00%
2022-05-01	08:00:00	0.0%	31	27	59	31	29	29	28	28	63.33%
2022-05-01	09:00:00	0.0%	30	28	50	31	30	29	29	29	83.33%
2022-05-01	10:00:00	0.0%	34	28	54	33	31	30	29	29	86.67%

Date	Time	Percent Excluded	L_{eq}	L_{min}	L_{max}	L_{10}	L_{33}	L_{50}	L_{90}	L_{nat}	% Anth.[2] Noise
2022-05-01	11:00:00	0.0%	32	27	52	33	31	30	29	29	66.67%
2022-05-01	12:00:00	0.0%	32	27	51	35	31	30	29	29	73.33%
2022-05-01	13:00:00	0.0%	30	27	41	31	29	29	28	28	50.00%
2022-05-01	14:00:00	0.0%	32	27	57	34	31	30	28	28	60.00%
2022-05-01	15:00:00	0.0%	33	26	54	30	28	28	27	28	43.33%
2022-05-01	16:00:00	0.0%	30	27	50	30	29	29	28	28	43.33%
2022-05-01	17:00:00	0.0%	34	27	60	31	29	29	28	28	60.00%
2022-05-01	18:00:00	0.0%	33	26	54	32	29	28	27	28	43.33%
2022-05-01	19:00:00	0.0%	31	28	49	31	30	30	29	29	23.33%
2022-05-01	20:00:00	0.0%	31	28	49	32	30	30	29	29	30.00%
2022-05-01	21:00:00	0.0%	32	28	54	33	30	30	29	29	16.67%
2022-05-01	22:00:00	0.0%	29	28	38	30	29	29	29	29	0.00%
2022-05-01	23:00:00	0.0%	29	28	33	30	30	29	29	29	0.00%
2022-05-02	00:00:00	0.0%	29	28	41	30	30	29	29	29	3.33%
2022-05-02	01:00:00	0.0%	30	28	41	30	30	30	29	30	3.33%
2022-05-02	02:00:00	0.0%	31	28	50	31	30	30	29	30	26.83%
2022-05-02	03:00:00	0.0%	30	28	43	32	30	30	29	30	23.33%
2022-05-02	04:00:00	7.7%	38	29	52	41	37	36	32	30	93.33%
2022-05-02	05:00:00	0.0%	41	37	53	42	41	41	39	37	100.00%
2022-05-02	06:00:00	0.0%	38	32	49	40	39	38	35	33	100.00%
2022-05-02	07:00:00	31.6%	Excluded - Rain								100.00%
2022-05-02	08:00:00	32.2%	Excluded - Rain								100.00%
2022-05-02	09:00:00	0.0%	35	31	51	38	36	35	32	31	100.00%
2022-05-02	10:00:00	17.2%	37	32	56	38	37	36	34	33	100.00%
2022-05-02	11:00:00	0.0%	34	29	56	35	34	33	31	30	100.00%
2022-05-02	12:00:00	0.3%	31	28	41	33	31	30	29	29	76.67%
2022-05-02	13:00:00	4.5%	32	27	53	33	30	30	28	29	66.67%
2022-05-02	14:00:00	0.0%	34	27	60	31	29	28	28	28	23.33%
2022-05-02	15:00:00	0.0%	33	27	54	34	33	32	28	28	63.33%

Date	Time	Percent Excluded	L_{eq}	L_{min}	L_{max}	L_{10}	L_{33}	L_{50}	L_{90}	L_{nat}	% Anth.[2] Noise
2022-05-02	16:00:00	0.0%	32	27	48	34	31	30	29	29	60.00%
2022-05-02	17:00:00	0.0%	32	27	54	30	29	29	28	28	13.33%
2022-05-02	18:00:00	0.0%	35	28	49	36	36	35	29	28	93.33%
2022-05-02	19:00:00	0.0%	32	28	49	34	31	30	29	30	60.00%
2022-05-02	20:00:00	0.0%	31	28	49	31	30	29	29	29	13.33%
2022-05-02	21:00:00	0.0%	31	28	48	32	30	30	29	30	16.67%
2022-05-02	22:00:00	0.0%	29	27	39	30	29	29	28	29	0.00%
2022-05-02	23:00:00	0.0%	30	28	43	30	30	29	29	29	36.67%
2022-05-03	00:00:00	0.0%	30	28	43	31	30	30	29	29	36.67%
2022-05-03	01:00:00	2.0%	31	28	45	35	30	30	29	30	36.67%
2022-05-03	02:00:00	0.0%	45	36	52	48	46	45	37	36	97.26%
2022-05-03	03:00:00	4.5%	45	40	54	46	45	45	42	41	100.00%
2022-05-03	04:00:00	18.0%	43	39	53	45	43	43	41	40	100.00%
2022-05-03	05:00:00	0.0%	41	39	53	43	42	41	40	39	100.00%
2022-05-03	06:00:00	16.5%	44	38	53	46	45	44	40	39	100.00%
2022-05-03	07:00:00	30.3%	Excluded - Rain								100.00%
2022-05-03	08:00:00	25.1%	Excluded - Rain								100.00%
2022-05-03	09:00:00	0.0%	37	31	50	40	37	35	33	32	100.00%
2022-05-03	10:00:00	0.0%	35	30	64	34	33	32	31	31	100.00%
2022-05-03	11:00:00	0.0%	31	29	47	33	31	31	30	29	100.00%
2022-05-03	12:00:00	0.0%	41	28	67	37	31	30	29	29	96.67%
2022-05-03	13:00:00	0.0%	39	29	60	42	32	31	30	29	100.00%
2022-05-03	14:00:00	0.0%	36	28	61	34	32	31	30	30	96.67%
2022-05-03	15:00:00	0.0%	30	28	40	31	30	30	29	29	66.67%
2022-05-03	16:00:00	35.3%	Excluded - Rain								100.00%
2022-05-03	17:00:00	13.4%	40	36	48	41	40	40	38	36	100.00%
2022-05-03	18:00:00	0.0%	33	29	40	35	33	32	30	29	100.00%
2022-05-03	19:00:00	0.0%	31	28	50	33	31	31	30	30	60.00%
2022-05-03	20:00:00	0.0%	33	28	51	33	32	31	30	30	73.33%

Date	Time	Percent Excluded	L_{eq}	L_{min}	L_{max}	L_{10}	L_{33}	L_{50}	L_{90}	L_{nat}	% Anth.[2] Noise
2022-05-03	21:00:00	0.0%	34	30	49	35	33	33	31	30	100.00%
2022-05-03	22:00:00	0.0%	34	28	55	31	30	30	29	29	96.67%
2022-05-03	23:00:00	0.0%	29	28	35	30	29	29	29	29	33.33%
2022-05-04	00:00:00	0.0%	29	28	36	29	29	29	28	N/A[1]	N/A[1]
2022-05-04	01:00:00	0.0%	29	27	33	29	29	29	28	N/A[1]	N/A[1]
2022-05-04	02:00:00	0.0%	28	27	39	29	28	28	28	N/A[1]	N/A[1]
2022-05-04	03:00:00	0.0%	28	27	33	29	29	28	28	N/A[1]	N/A[1]
2022-05-04	04:00:00	14.6%	32	27	46	35	32	29	28	N/A[1]	N/A[1]
2022-05-04	05:00:00	19.8%	44	33	55	47	45	44	35	N/A[1]	N/A[1]
2022-05-04	06:00:00	0.0%	43	40	55	44	43	43	42	N/A[1]	N/A[1]
2022-05-04	07:00:00	3.8%	43	40	49	44	43	42	42	N/A[1]	N/A[1]
2022-05-04	08:00:00	0.0%	41	36	51	43	42	42	38	N/A[1]	N/A[1]
2022-05-04	09:00:00	0.0%	34	31	50	36	34	33	32	N/A[1]	N/A[1]
2022-05-04	10:00:00	1.9%	36	30	53	37	34	34	32	N/A[1]	N/A[1]
2022-05-04	11:00:00	23.5%	36	31	54	37	35	35	33	N/A[1]	N/A[1]
2022-05-04	12:00:00	5.1%	34	30	58	35	33	32	31	N/A[1]	N/A[1]
2022-05-04	13:00:00	2.5%	57	29	87	40	33	32	30	N/A[1]	N/A[1]
2022-05-04	14:00:00	0.0%	39	28	60	34	31	30	29	N/A[1]	N/A[1]

1 Partial days were not analyzed for anthropogenic noise.
2 Anth. = anthropogenic

PROJECT SOUND ASSESSMENT REPORT

ATTACHMENT C

BASE NOISE MODELING CONTOUR MAPBOOK

SKAGIT RIVER HYDROELECTRIC PROJECT (FERC NO. 553) NOISE MODELING CONTOURS: CONTINUOUS NOISE SOURCES

- FERC Project Boundary
- Project River Miles (PRM)
- Water Features (Lakes, Rivers)
- Non-Recreation Facility
- Recreation Facility
- Sound Monitor Location
- Noise Source: Switchyard
- Noise Source: Transmission Lines

Lmax (dBA)

- 35 - 39
- 40 - 44
- 45 - 49
- 50 - 54
- 55 - 59
- 60 - 64
- 65 - 69
- 70 - 75

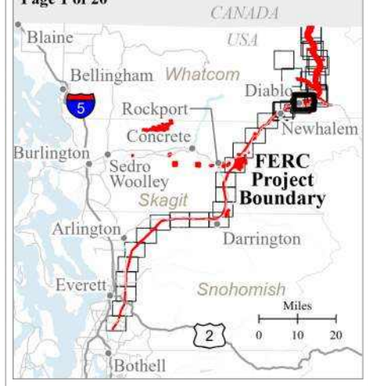
Land Ownership

- National Park Service
- National Recreation Area (NPS)
- Seattle City Light

N

0 1,000 2,000 Feet

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Seattle City Light

SKAGIT RIVER HYDROELECTRIC PROJECT (FERC NO. 553)

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Data Source: USGS (2018), City Light 2022.

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SKAGIT RIVER HYDROELECTRIC PROJECT (FERC NO. 553) NOISE MODELING CONTOURS: CONTINUOUS NOISE SOURCES

- FERC Project Boundary
- Project River Miles (PRM)
- Water Features (Lakes, Rivers)
- Non-Recreation Facility
- Recreation Facility
- Sound Monitor Location
- Noise Source: Switchyard
- Noise Source: Transmission Lines

Lmax (dBA)

- 35 - 39
- 40 - 44
- 45 - 49
- 50 - 54
- 55 - 59
- 60 - 64
- 65 - 69
- 70 - 75
- 76 - 79

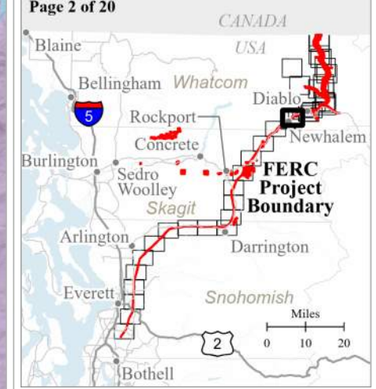
Land Ownership

- National Park Service
- National Recreation Area (NPS)
- Seattle City Light

N

0 1,000 2,000 Feet

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Seattle City Light

SKAGIT RIVER HYDROELECTRIC PROJECT (FERC NO. 553)

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SKAGIT RIVER HYDROELECTRIC PROJECT (FERC NO. 553) NOISE MODELING CONTOURS: CONTINUOUS NOISE SOURCES

- FERC Project Boundary
- Mitigation Parcel
- Project River Miles (PRM)
- Water Features (Lakes, Rivers)
- Noise Source: Transmission Lines

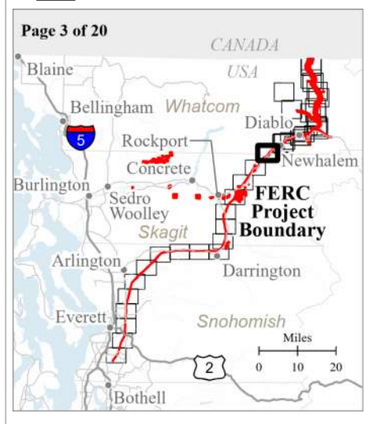
Lmax (dBA)

- 35 - 39
- 40 - 44
- 45 - 49
- 50 - 54
- 55 - 59

Land Ownership

- National Park Service
- National Recreation Area (NPS)
- U.S. Forest Service
- Seattle City Light

0 1,000 2,000 Feet



Seattle City Light

SKAGIT RIVER HYDROELECTRIC PROJECT (FERC NO. 553)

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Data Source: USGS (2018), City Light 2022.

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SKAGIT RIVER HYDROELECTRIC PROJECT (FERC NO. 553) NOISE MODELING CONTOURS: CONTINUOUS NOISE SOURCES

- FERC Project Boundary
- Mitigation Parcel
- Project River Miles (PRM)
- Water Features (Lakes, Rivers)
- Noise Source: Transmission Lines

Lmax (dBA)

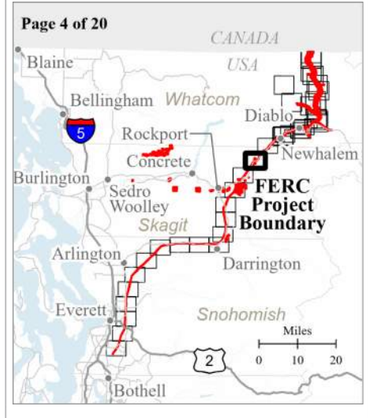
- 35 - 39
- 40 - 44
- 45 - 49
- 50 - 54

Land Ownership

- National Recreation Area (NPS)
- U.S. Forest Service
- Seattle City Light

N

0 1,000 2,000 Feet



Seattle City Light

SKAGIT RIVER HYDROELECTRIC PROJECT (FERC NO. 553)

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Data Source: USGS (2018), City Light 2022.

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SKAGIT RIVER HYDROELECTRIC PROJECT (FERC NO. 553) NOISE MODELING CONTOURS: CONTINUOUS NOISE SOURCES

- FERC Project Boundary
- Mitigation Parcel
- Project River Miles (PRM)
- Water Features (Lakes, Rivers)
- Swamp/Marsh
- Noise Source: Transmission Lines

Lmax (dBA)

- 35 - 39
- 40 - 44
- 45 - 49
- 50 - 54

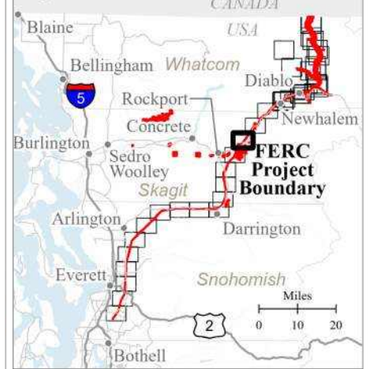
Land Ownership

- U.S. Forest Service
- Seattle City Light

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0 1,000 2,000 Feet

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Seattle City Light

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SKAGIT RIVER HYDROELECTRIC PROJECT (FERC NO. 553) NOISE MODELING CONTOURS: CONTINUOUS NOISE SOURCES

- FERC Project Boundary
- Mitigation Parcel
- Project River Miles (PRM)
- Water Features (Lakes, Rivers)
- Swamp/Marsh
- Noise Source: Transmission Lines

Lmax (dBA)

- 35 - 39
- 40 - 44
- 45 - 49
- 50 - 54

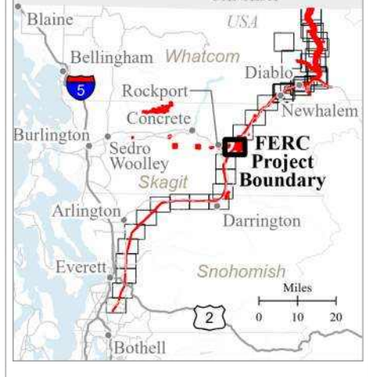
Land Ownership

- U.S. Forest Service
- Seattle City Light

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Seattle City Light

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SKAGIT RIVER HYDROELECTRIC PROJECT (FERC NO. 553) NOISE MODELING CONTOURS: CONTINUOUS NOISE SOURCES

- FERC Project Boundary
- Water Features (Lakes, Rivers)
- Swamp/Marsh
- Sound Monitor Location
- Noise Source: Transmission Lines

Lmax (dBA)

- 35 - 39
- 40 - 44
- 45 - 49
- 50 - 54

Land Ownership

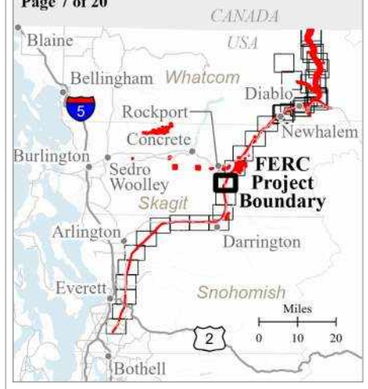
- U.S. Forest Service
- Seattle City Light

Hill Creek
530
Sauk River
Hill Lake
MT. BAKER-SNOQUALMIE NATIONAL FOREST
White Creek
Elhume Creek
6
Rinker Creek
Caskey Lake

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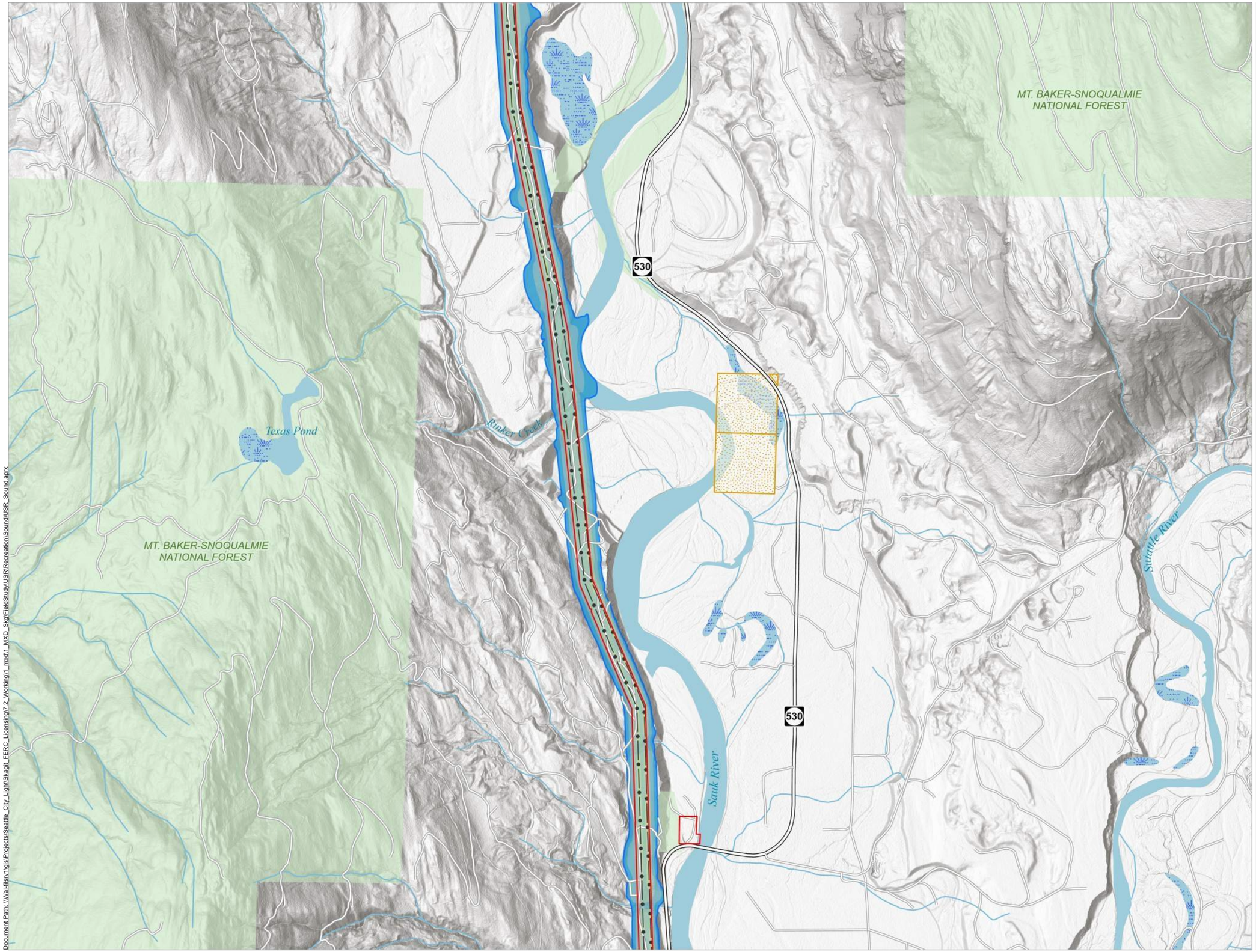
- FERC Project Boundary
- Water Features (Lakes, Rivers)
- Swamp/Marsh
- Noise Source: Transmission Lines

Lmax (dBA)

- 35 - 39
- 40 - 44
- 45 - 49
- 50 - 54

Land Ownership

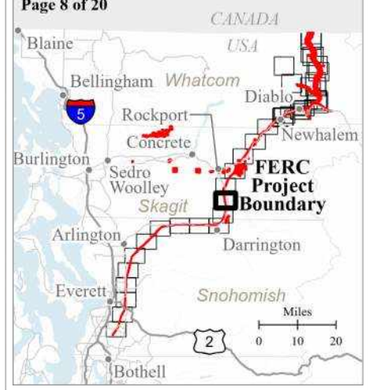
- U.S. Forest Service
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Seattle City Light

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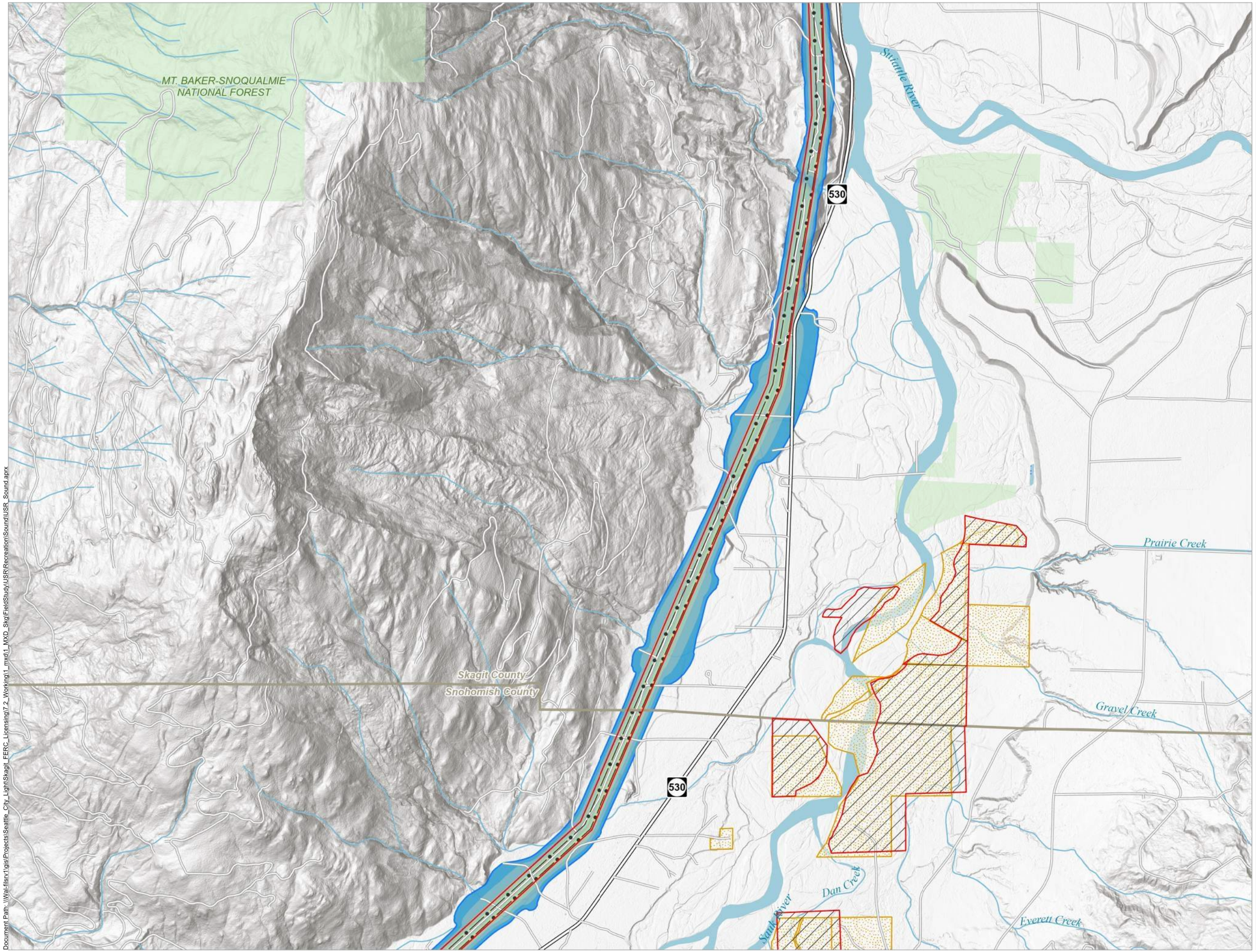
- FERC Project Boundary
- Mitigation Parcel
- Water Features (Lakes, Rivers)
- Swamp/Marsh
- Noise Source: Transmission Lines

Lmax (dBA)

- 35 - 39
- 40 - 44
- 45 - 49
- 50 - 54

Land Ownership

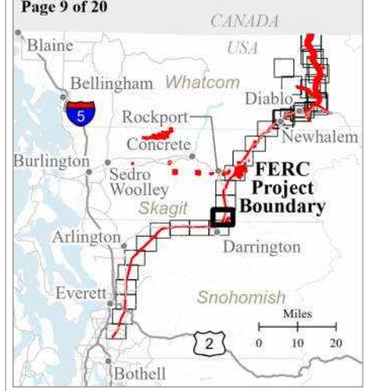
- U.S. Forest Service
- Seattle City Light



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Seattle City Light

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SKAGIT RIVER HYDROELECTRIC PROJECT (FERC NO. 553) NOISE MODELING CONTOURS: CONTINUOUS NOISE SOURCES

- FERC Project Boundary
- Mitigation Parcel
- Water Features (Lakes, Rivers)
- Swamp/Marsh
- Noise Source: Transmission Lines

Lmax (dBA)

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- 40 - 44
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- 50 - 54

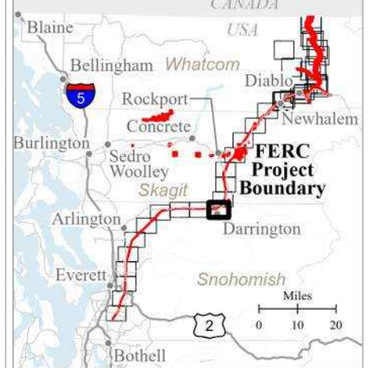
Land Ownership

- U.S. Forest Service
- Seattle City Light

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Seattle City Light

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- Water Features (Lakes, Rivers)
- Swamp/Marsh
- Noise Source: Transmission Lines

Lmax (dBA)

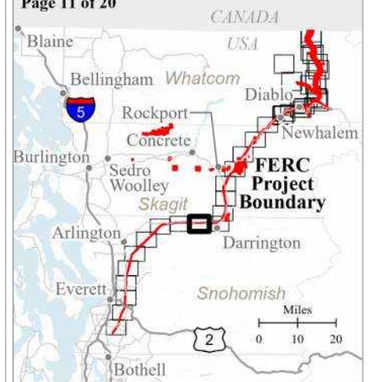
- 35 - 39
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- 45 - 49
- 50 - 54

Land Ownership

- U.S. Forest Service
- Seattle City Light

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- Noise Source: Transmission Lines

Lmax (dBA)

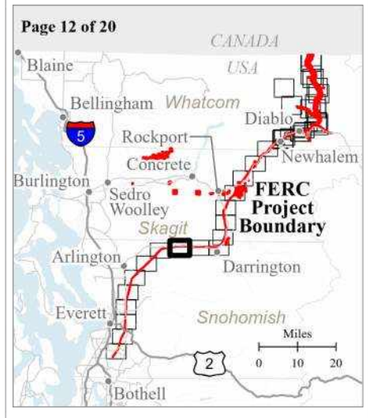
- 35 - 39
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- 45 - 49
- 50 - 54

Land Ownership

- U.S. Forest Service
- Seattle City Light

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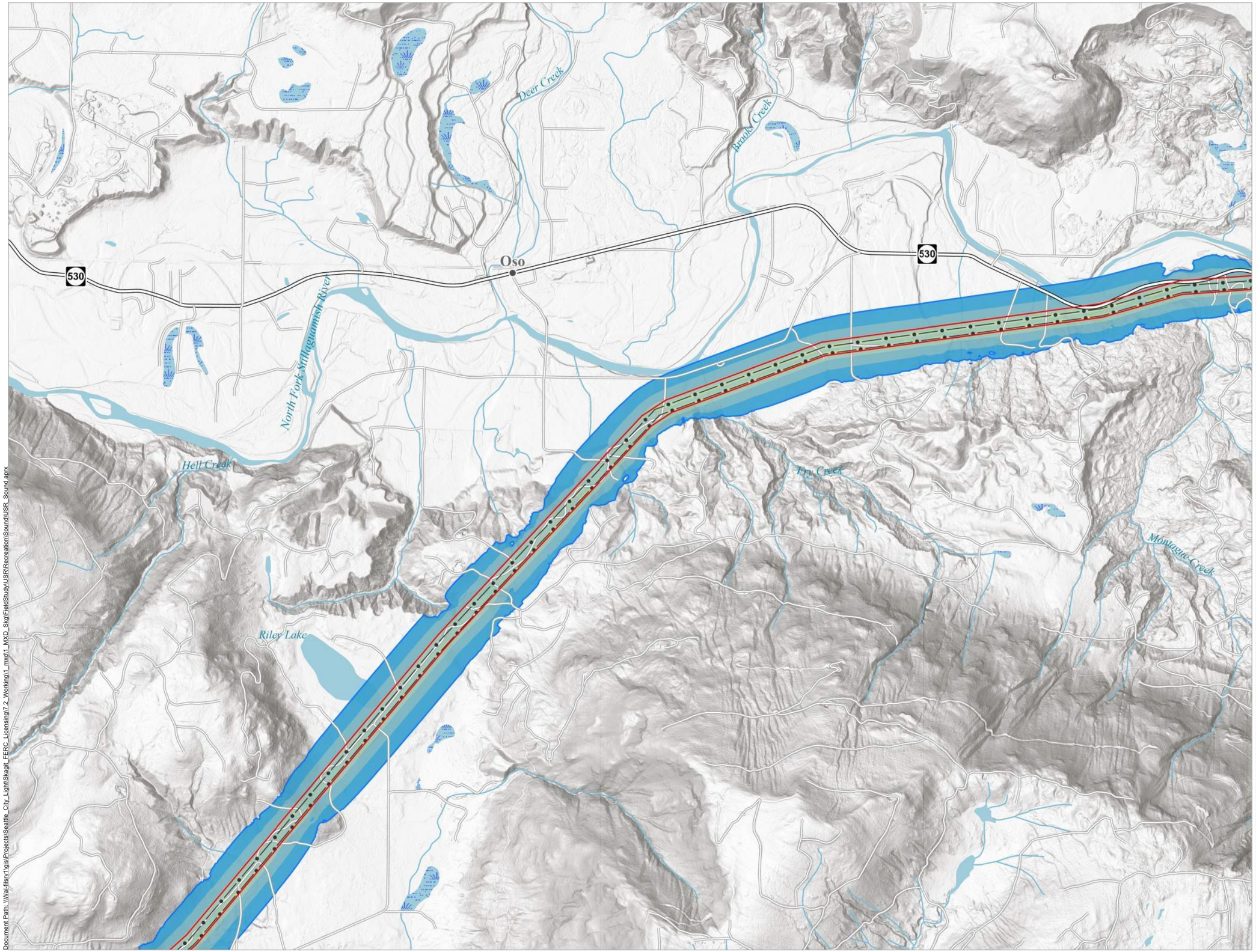
- FERC Project Boundary
- Water Features (Lakes, Rivers)
- Swamp/Marsh
- Noise Source: Transmission Lines

Lmax (dBA)

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- 40 - 44
- 45 - 49
- 50 - 54

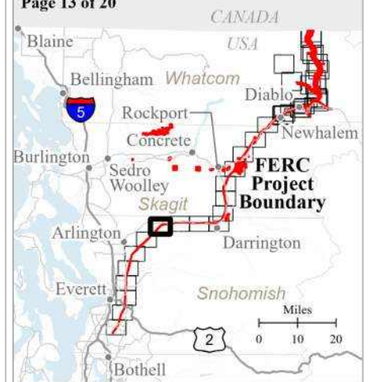
Land Ownership

- Seattle City Light



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SKAGIT RIVER HYDROELECTRIC PROJECT (FERC NO. 553) NOISE MODELING CONTOURS: CONTINUOUS NOISE SOURCES

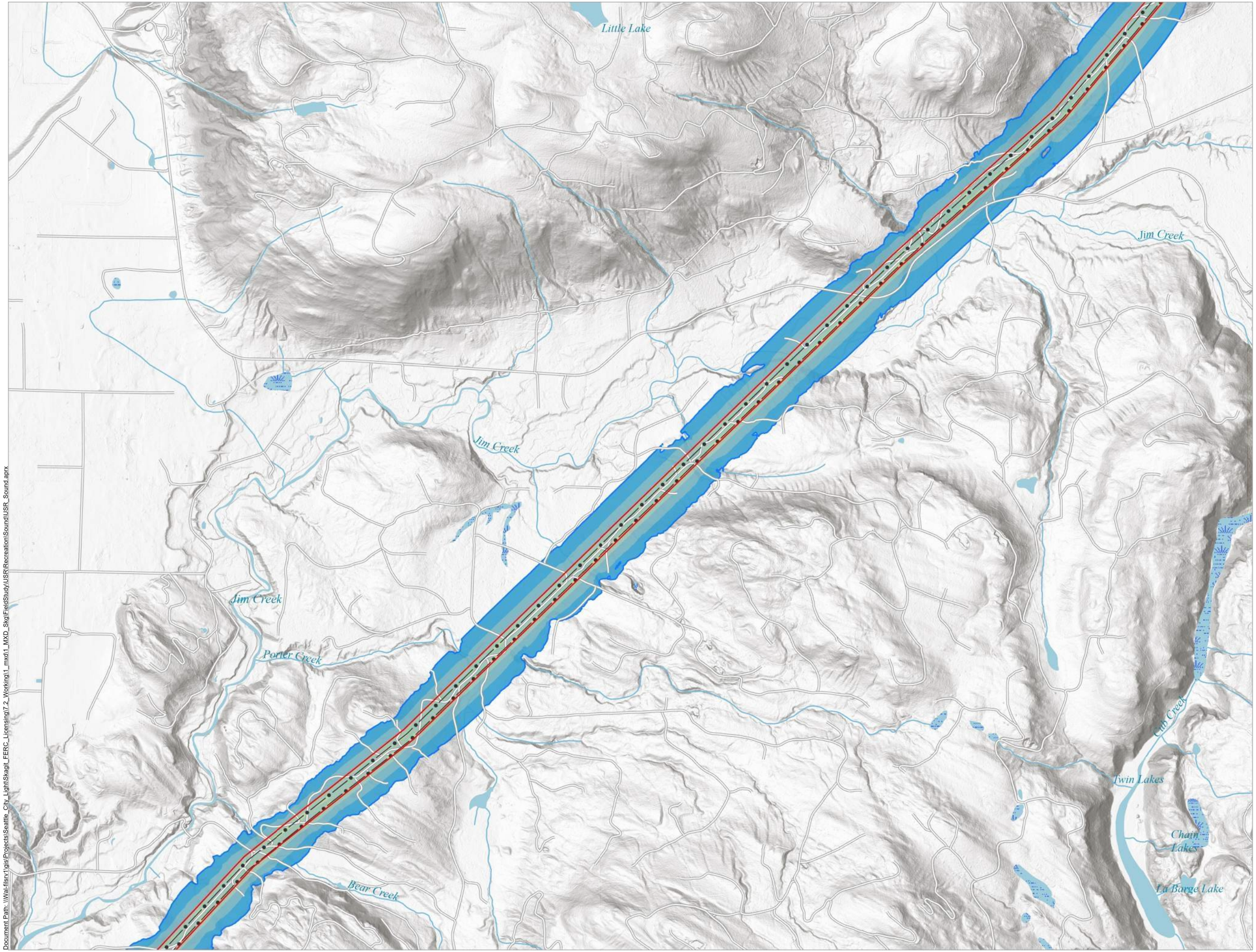
- FERC Project Boundary
- Water Features (Lakes, Rivers)
- Swamp/Marsh
- Noise Source: Transmission Lines

Lmax (dBA)

- 35 - 39
- 40 - 44
- 45 - 49
- 50 - 54

Land Ownership

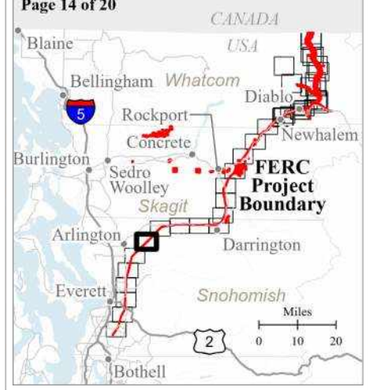
- Seattle City Light



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Seattle City Light

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SKAGIT RIVER HYDROELECTRIC PROJECT (FERC NO. 553) NOISE MODELING CONTOURS: CONTINUOUS NOISE SOURCES

- FERC Project Boundary
- Water Features (Lakes, Rivers)
- Swamp/Marsh
- Noise Source: Transmission Lines

Lmax (dBA)

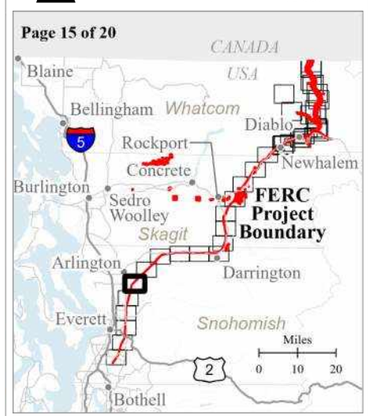
- 35 - 39
- 40 - 44
- 45 - 49
- 50 - 54

Land Ownership

- Seattle City Light

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Seattle City Light

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SKAGIT RIVER HYDROELECTRIC PROJECT (FERC NO. 553) NOISE MODELING CONTOURS: CONTINUOUS NOISE SOURCES

- FERC Project Boundary
- Water Features (Lakes, Rivers)
- Swamp/Marsh
- Noise Source: Transmission Lines

Lmax (dBA)

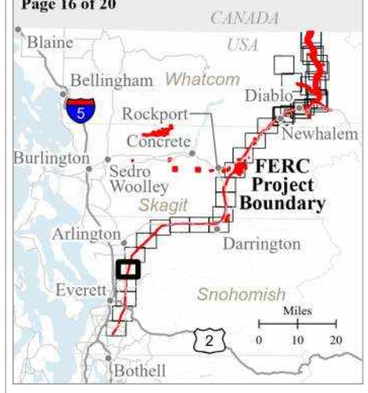
- 35 - 39
- 40 - 44
- 45 - 49
- 50 - 54

Land Ownership

- Seattle City Light

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0 1,000 2,000 Feet



Seattle City Light

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SKAGIT RIVER HYDROELECTRIC PROJECT (FERC NO. 553) NOISE MODELING CONTOURS: CONTINUOUS NOISE SOURCES

- FERC Project Boundary
- Water Features (Lakes, Rivers)
- Swamp/Marsh
- Noise Source: Transmission Lines

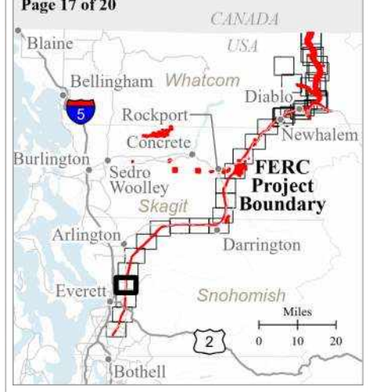
Lmax (dBA)

- 35 - 39
- 40 - 44
- 45 - 49
- 50 - 54
- 55 - 59

N

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Seattle City Light

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SKAGIT RIVER HYDROELECTRIC PROJECT (FERC NO. 553) NOISE MODELING CONTOURS: CONTINUOUS NOISE SOURCES

- FERC Project Boundary
- Water Features (Lakes, Rivers)
- Swamp/Marsh
- Noise Source: Transmission Lines

Lmax (dBA)

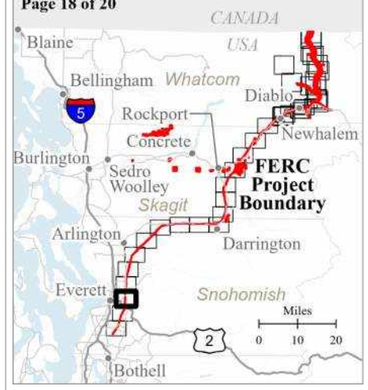
- 35 - 39
- 40 - 44
- 45 - 49
- 50 - 54
- 55 - 59
- 60 - 64

Land Ownership

- Seattle City Light

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0 1,000 2,000 Feet



Seattle City Light

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SKAGIT RIVER HYDROELECTRIC PROJECT (FERC NO. 553) NOISE MODELING CONTOURS: CONTINUOUS NOISE SOURCES

- FERC Project Boundary
- Water Features (Lakes, Rivers)
- Swamp/Marsh
- Noise Source: Transmission Lines

Lmax (dBA)

- 35 - 39
- 40 - 44
- 45 - 49
- 50 - 54
- 55 - 59

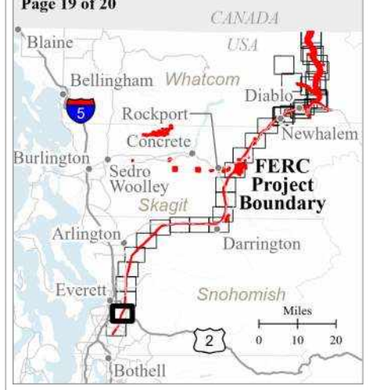
Land Ownership

- Seattle City Light

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Seattle City Light

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SKAGIT RIVER HYDROELECTRIC PROJECT (FERC NO. 553) NOISE MODELING CONTOURS: CONTINUOUS NOISE SOURCES

- FERC Project Boundary
- Water Features (Lakes, Rivers)
- Swamp/Marsh
- Non-Recreation Facility
- Noise Source: Transmission Lines

Lmax (dBA)

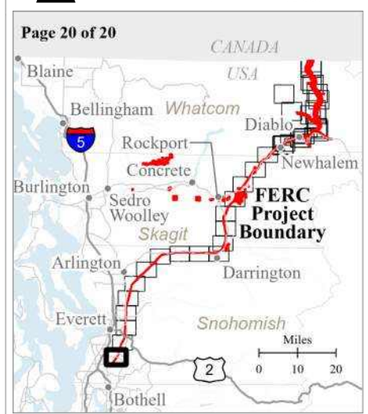
- 35 - 39
- 40 - 44
- 45 - 49
- 50 - 54
- 55 - 59
- 60 - 64
- 65 - 69
- 70 - 75
- 76 - 79
- 80 - 84
- >85

Land Ownership

- Seattle City Light

N

0 1,000 2,000 Feet



Seattle City Light

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SKAGIT RIVER HYDROELECTRIC PROJECT (FERC NO. 553) NOISE MODELING CONTOURS: SIRENS

- FERC Project Boundary
- Project River Miles (PRM)
- Water Features (Lakes, Rivers)
- Non-Recreation Facility
- Recreation Facility
- Sound Monitor Location
- Noise Source: Sirens
- Siren Model Extent*

Lmax (dBA)

- 35 - 39
- 40 - 44
- 45 - 49
- 50 - 54
- 55 - 59
- 60 - 64
- 65 - 69
- 70 - 74
- 75 - 79
- 80 - 84
- >85

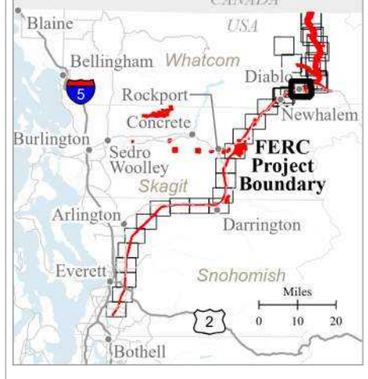
Land Ownership

- National Park Service
- National Recreation Area (NPS)
- Seattle City Light

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Seattle City Light

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NORTH CASCADES NATIONAL PARK - NORTH UNIT
ROSS LAKE NATL. REC. AREA
Stetattle Creek
Camp Dawn Creek
Sourdough Creek
Riprap Creek
Diablo Lake
Gorge Lake
Thunder Lake
Pyramid Lake
Pyramid Creek
Colonial Creek
Ross Lodge Picnic Shelter
West Ferry Landing
North Cascades Environmental Learning Center
Gorge Boat Launch & Dock
Diablo Powerhouse
Diablo
Diablo Dam
99
100
101
102
103
104
20
5
2

* Sirens are extremely loud; as a result the 35 dBA noise contour extends beyond the bounds of the model in most directions, so the noise contours presented in this report have been clipped to the model extent.

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SKAGIT RIVER HYDROELECTRIC PROJECT (FERC NO. 553) NOISE MODELING CONTOURS: SIRENS

- FERC Project Boundary
- Mitigation Parcel
- Project River Miles (PRM)
- Water Features (Lakes, Rivers)
- Non-Recreation Facility
- Recreation Facility
- Sound Monitor Location
- Noise Source: Sirens
- Siren Model Extent*

Lmax (dBA)

- 35 - 39
- 40 - 44
- 45 - 49
- 50 - 54
- 55 - 59
- 60 - 64
- 65 - 69
- 70 - 74
- 75 - 79
- 80 - 84
- >85

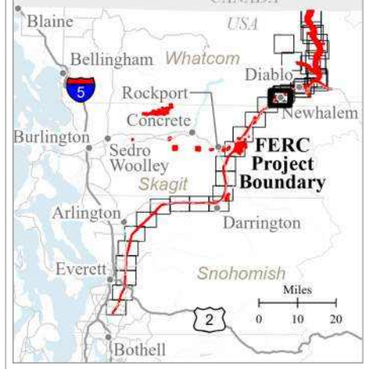
Land Ownership

- National Park Service
- National Recreation Area (NPS)
- Seattle City Light

N

0 1,000 2,000 Feet

Page 2 of 2



Seattle City Light

SKAGIT RIVER HYDROELECTRIC PROJECT (FERC NO. 553)

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Data Source: USGS (2018), City Light 2022.

* Sirens are extremely loud; as a result the 35 dBA noise contour extends beyond the bounds of the model in most directions, so the noise contours presented in this report have been clipped to the model extent.

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SKAGIT RIVER HYDROELECTRIC PROJECT (FERC NO. 553) NOISE MODELING CONTOURS: TELEPHONE ALERTS

- FERC Project Boundary
- Project River Miles (PRM)
- Water Features (Lakes, Rivers)
- Non-Recreation Facility
- Recreation Facility
- Sound Monitor Location
- Noise Source: Telephone

Lmax (dBA)

- 35 - 39
- 40 - 44
- 45 - 49
- 50 - 54
- 55 - 59
- 60 - 64
- 65 - 69
- 70 - 74
- 75 - 79
- 80 - 84
- >85

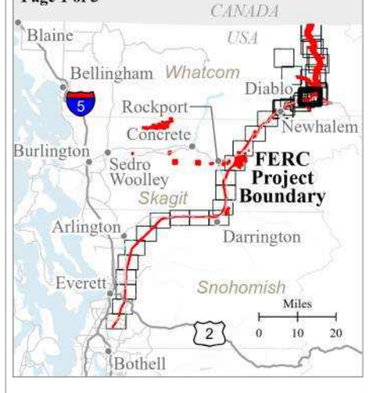
Land Ownership

- National Park Service
- National Recreation Area (NPS)
- Seattle City Light

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Seattle City Light

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SKAGIT RIVER HYDROELECTRIC PROJECT (FERC NO. 553) NOISE MODELING CONTOURS: TELEPHONE ALERTS

- FERC Project Boundary
- Project River Miles (PRM)
- Water Features (Lakes, Rivers)
- Non-Recreation Facility
- Recreation Facility
- Sound Monitor Location
- Noise Source: Telephone

Lmax (dBA)

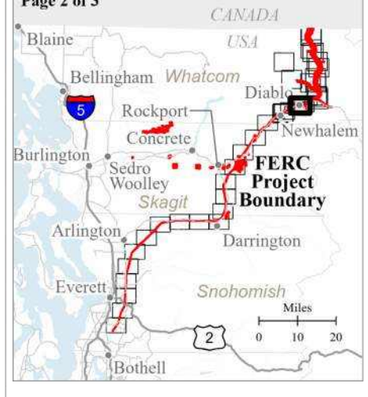
- 35 - 39
- 40 - 44
- 45 - 49
- 50 - 54
- 55 - 59
- 60 - 64
- 65 - 69
- 70 - 74
- 75 - 79
- 80 - 84
- >85

Land Ownership

- National Park Service
- National Recreation Area (NPS)
- Seattle City Light

N

0 1,000 2,000 Feet



Seattle City Light

SKAGIT RIVER HYDROELECTRIC PROJECT (FERC NO. 553)

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SKAGIT RIVER HYDROELECTRIC PROJECT (FERC NO. 553) NOISE MODELING CONTOURS: TELEPHONE ALERTS

- FERC Project Boundary
- Project River Miles (PRM)
- Water Features (Lakes, Rivers)
- Non-Recreation Facility
- Recreation Facility
- Sound Monitor Location
- Noise Source: Telephone

Lmax (dBA)

- 35 - 39
- 40 - 44
- 45 - 49
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- 65 - 69
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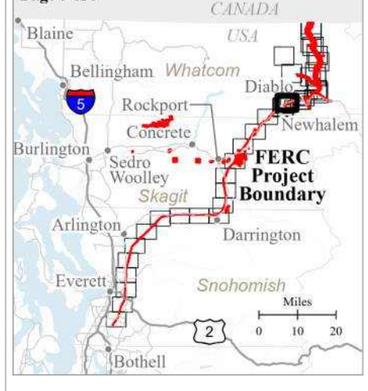
Land Ownership

- National Park Service
- National Recreation Area (NPS)
- Seattle City Light

N

0 1,000 2,000 Feet

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Seattle City Light

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SKAGIT RIVER HYDROELECTRIC PROJECT (FERC NO. 553) NOISE MODELING CONTOURS: DAM SPILLS (AVERAGE MAXIMUM ANNUAL FLOW)

- FERC Project Boundary
- Project River Miles (PRM)
- Water Features (Lakes, Rivers)
- Non-Recreation Facility
- Recreation Facility
- Sound Monitor Location

1-hour Leq (dBA)

- 35 - 39
- 40 - 44
- 45 - 49
- 50 - 54
- 55 - 59
- 60 - 64
- 65 - 69
- 70 - 74
- 75 - 79
- 80 - 84
- >85

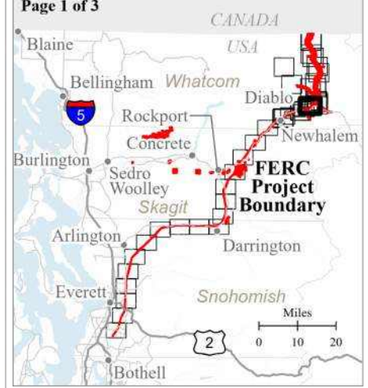
Land Ownership

- National Park Service
- National Recreation Area (NPS)
- Seattle City Light

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Page 1 of 3



Seattle City Light

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Pierce Creek
NORTH CASCADES NATIONAL PARK - NORTH UNIT
Riprap Creek
Sourdough Creek
Ross Lake
108
107
106
Ross Dam
Ross Powerhouse
1
Happy Creek
20
105
East Ferry Landing
West Ferry Landing
North Cascades Environmental Learning Center
2
Diablo Dam
Gorge Lake
102
103
104
Diablo Lake
Horsetail Creek
ROSS LAKE NATL. REC. AREA
Lillian Creek
20

SKAGIT RIVER HYDROELECTRIC PROJECT (FERC NO. 553) NOISE MODELING CONTOURS: DAM SPILLS (AVERAGE MAXIMUM ANNUAL FLOW)

- FERC Project Boundary
- Project River Miles (PRM)
- Water Features (Lakes, Rivers)
- Non-Recreation Facility
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- Sound Monitor Location

1-hour Leq (dBA)

- 35 - 39
- 40 - 44
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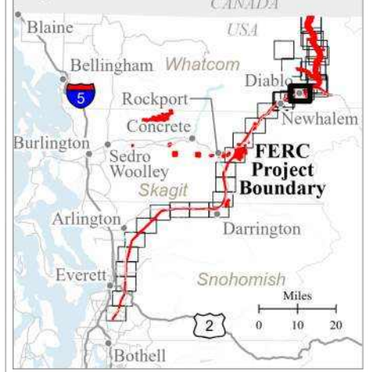
Land Ownership

- National Park Service
- National Recreation Area (NPS)
- Seattle City Light

N

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Seattle City Light

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SKAGIT RIVER HYDROELECTRIC PROJECT (FERC NO. 553) NOISE MODELING CONTOURS: DAM SPILLS (AVERAGE MAXIMUM ANNUAL FLOW)

- FERC Project Boundary
- Project River Miles (PRM)
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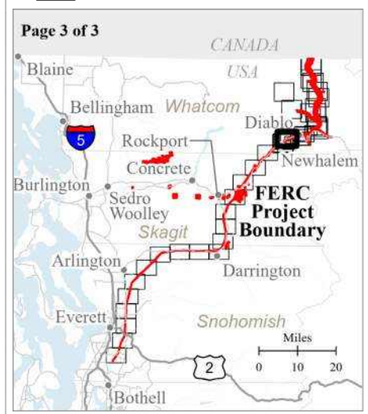
Land Ownership

- National Park Service
- National Recreation Area (NPS)
- Seattle City Light

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Seattle City Light

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SKAGIT RIVER HYDROELECTRIC PROJECT (FERC NO. 553) NOISE MODELING CONTOURS: DAM SPILLS (MAXIMUM HISTORICAL FLOW)

- FERC Project Boundary
- Project River Miles (PRM)
- Water Features (Lakes, Rivers)
- Non-Recreation Facility
- Recreation Facility
- Sound Monitor Location

1-hour Leq (dBA)

- 35 - 39
- 40 - 44
- 45 - 49
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- 60 - 64
- 65 - 69
- 70 - 74
- 75 - 79
- 80 - 84
- >85

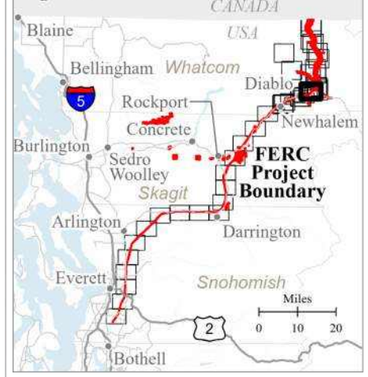
Land Ownership

- National Park Service
- National Recreation Area (NPS)
- Seattle City Light

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Seattle City Light

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SKAGIT RIVER HYDROELECTRIC PROJECT (FERC NO. 553) NOISE MODELING CONTOURS: DAM SPILLS (MAXIMUM HISTORICAL FLOW)

- FERC Project Boundary
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- Water Features (Lakes, Rivers)
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- Recreation Facility
- Sound Monitor Location

1-hour Leq (dBA)

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- >85

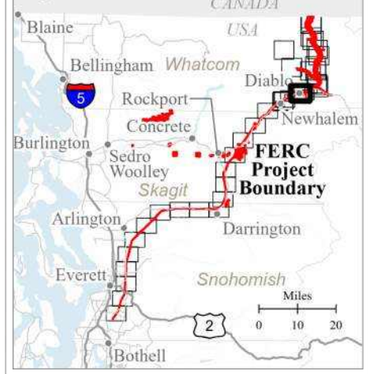
Land Ownership

- National Park Service
- National Recreation Area (NPS)
- Seattle City Light

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Seattle City Light

SKAGIT RIVER HYDROELECTRIC PROJECT (FERC NO. 553)

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SKAGIT RIVER HYDROELECTRIC PROJECT (FERC NO. 553) NOISE MODELING CONTOURS: DAM SPILLS (MAXIMUM HISTORICAL FLOW)

- FERC Project Boundary
- Project River Miles (PRM)
- Water Features (Lakes, Rivers)
- Non-Recreation Facility
- Recreation Facility
- Sound Monitor Location

1-hour Leq (dBA)

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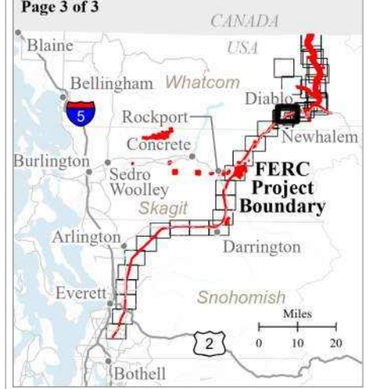
Land Ownership

- National Park Service
- National Recreation Area (NPS)
- Seattle City Light

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Seattle City Light

SKAGIT RIVER HYDROELECTRIC PROJECT (FERC NO. 553)

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SKAGIT RIVER HYDROELECTRIC PROJECT (FERC NO. 553) NOISE MODELING CONTOURS: HELICOPTER (NEWHALEM TO HOZOMEEN CAMP)

- FERC Project Boundary
- Mitigation Parcel
- Project River Miles (PRM)
- Water Features (Lakes, Rivers)
- Non-Recreation Facility
- Recreation Facility
- Sound Monitor Location
- Noise Source: Helicopter Path

Pass-by Lmax (dBA)

- 35 - 39
- 40 - 44
- 45 - 49
- 50 - 54
- 55 - 59
- 60 - 64
- 65 - 69
- 70 - 74
- 75 - 79
- 80 - 84
- >85

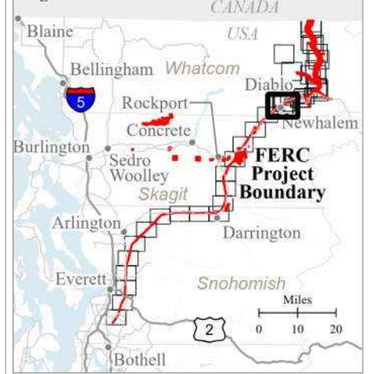
Land Ownership

- National Park Service
- National Recreation Area (NPS)
- Seattle City Light

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0 2,000 4,000 Feet

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Seattle City Light

SKAGIT RIVER HYDROELECTRIC PROJECT (FERC NO. 553)

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SKAGIT RIVER HYDROELECTRIC PROJECT (FERC NO. 553) NOISE MODELING CONTOURS: HELICOPTER (NEWHALEM TO HOZOMEEN CAMP)

- FERC Project Boundary
- Project River Miles (PRM)
- Water Features (Lakes, Rivers)
- Non-Recreation Facility
- Recreation Facility
- Sound Monitor Location
- Noise Source: Helicopter Path

Pass-by Lmax (dBA)

- 35 - 39
- 40 - 44
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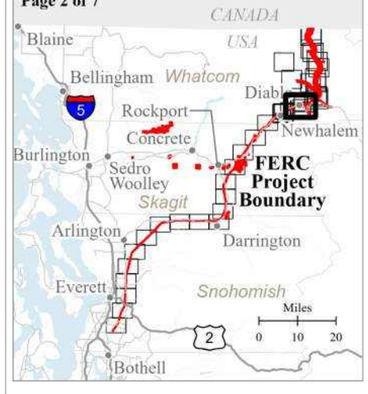
Land Ownership

- National Park Service
- National Recreation Area (NPS)
- Seattle City Light

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0 2,000 4,000 Feet

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Seattle City Light

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SKAGIT RIVER HYDROELECTRIC PROJECT (FERC NO. 553) NOISE MODELING CONTOURS: HELICOPTER (NEWHALEM TO HOZOMEEN CAMP)

- FERC Project Boundary
- Project River Miles (PRM)
- Water Features (Lakes, Rivers)
- Non-Recreation Facility
- Recreation Facility
- Sound Monitor Location
- Noise Source: Helicopter Path

Pass-by Lmax (dBA)

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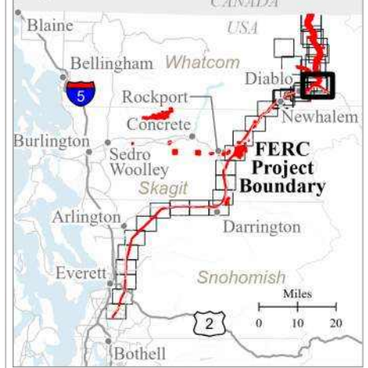
Land Ownership

- National Park Service
- National Recreation Area (NPS)
- U.S. Forest Service
- Seattle City Light

N

0 2,000 4,000 Feet

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Seattle City Light

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SKAGIT RIVER HYDROELECTRIC PROJECT (FERC NO. 553) NOISE MODELING CONTOURS: HELICOPTER (NEWHALEM TO HOZOMEEN CAMP)

- FERC Project Boundary
- Project River Miles (PRM)
- Water Features (Lakes, Rivers)
- Noise Source: Helicopter Path

Pass-by Lmax (dBA)

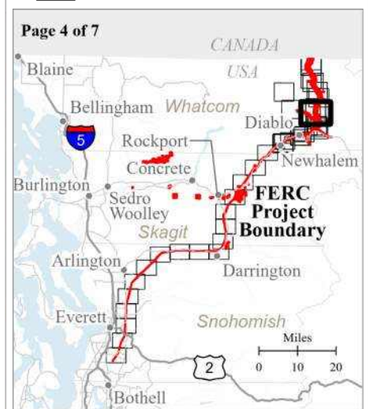
- 35 - 39
- 40 - 44
- 45 - 49
- 50 - 54
- 55 - 59
- 60 - 64
- 65 - 69
- 70 - 74
- 75 - 79

Land Ownership

- National Park Service
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N

0 2,000 4,000 Feet



Seattle City Light

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SKAGIT RIVER HYDROELECTRIC PROJECT (FERC NO. 553) NOISE MODELING CONTOURS: HELICOPTER (NEWHALEM TO HOZOMEEN CAMP)

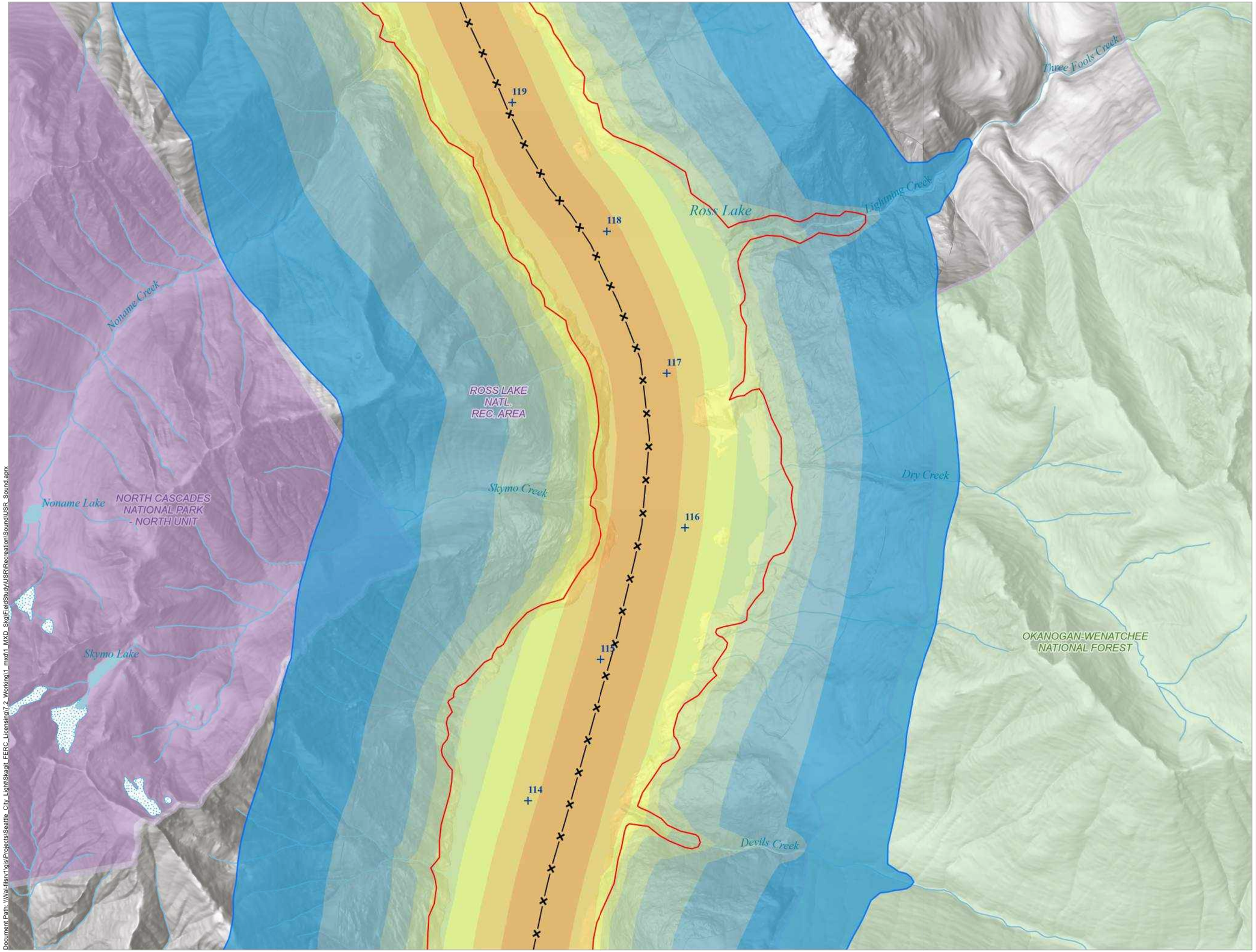
- FERC Project Boundary
- Project River Miles (PRM)
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- Noise Source: Helicopter Path

Pass-by Lmax (dBA)

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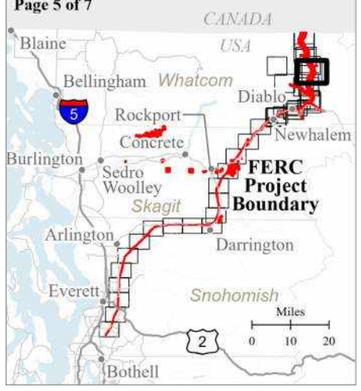
Land Ownership

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- National Recreation Area (NPS)
- U.S. Forest Service



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Seattle City Light

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SKAGIT RIVER HYDROELECTRIC PROJECT (FERC NO. 553) NOISE MODELING CONTOURS: HELICOPTER (NEWHALEM TO HOZOMEEN CAMP)

- FERC Project Boundary
- Project River Miles (PRM)
- Water Features (Lakes, Rivers)
- Noise Source: Helicopter Path

Pass-by Lmax (dBA)

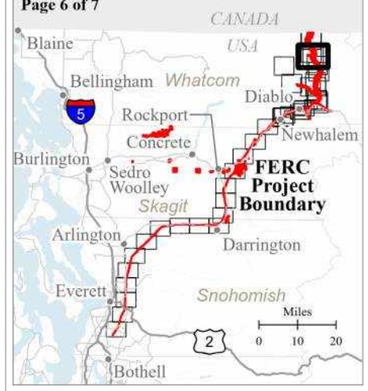
- 35 - 39
- 40 - 44
- 45 - 49
- 50 - 54
- 55 - 59
- 60 - 64
- 65 - 69
- 70 - 74

Land Ownership

- National Park Service
- National Recreation Area (NPS)
- U.S. Forest Service

N

0 2,000 4,000 Feet



Seattle City Light

SKAGIT RIVER HYDROELECTRIC PROJECT (FERC NO. 553)

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SKAGIT RIVER HYDROELECTRIC PROJECT (FERC NO. 553) NOISE MODELING CONTOURS: HELICOPTER (NEWHALEM TO HOZOMEEN CAMP)

- FERC Project Boundary
- Project River Miles (PRM)
- Water Features (Lakes, Rivers)
- Swamp/Marsh
- Noise Source: Helicopter Path

Pass-by Lmax (dBA)

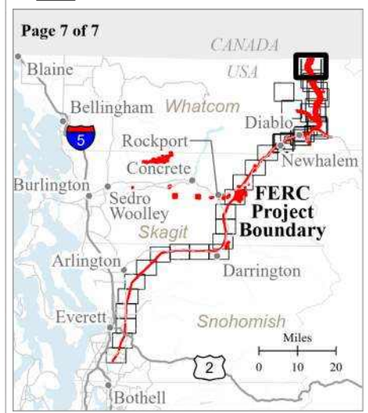
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- 55 - 59
- 60 - 64
- 65 - 69
- 70 - 74
- 75 - 79
- 80 - 84
- >85

Land Ownership

- National Park Service
- National Recreation Area (NPS)
- U.S. Forest Service

N

0 2,000 4,000 Feet



Seattle City Light

SKAGIT RIVER HYDROELECTRIC PROJECT (FERC NO. 553)

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SKAGIT RIVER HYDROELECTRIC PROJECT (FERC NO. 553) NOISE MODELING CONTOURS: HELICOPTER (BIG BEAVER CREEK PASS SNOTEL SITE)

- FERC Project Boundary
- Mitigation Parcel
- Project River Miles (PRM)
- Water Features (Lakes, Rivers)
- Non-Recreation Facility
- Recreation Facility
- Sound Monitor Location
- Noise Source: Helicopter Path

Pass-by Lmax (dBA)

- 35 - 39
- 40 - 44
- 45 - 49
- 50 - 54
- 55 - 59
- 60 - 64
- 65 - 69
- 70 - 74
- 75 - 79
- 80 - 84
- >85

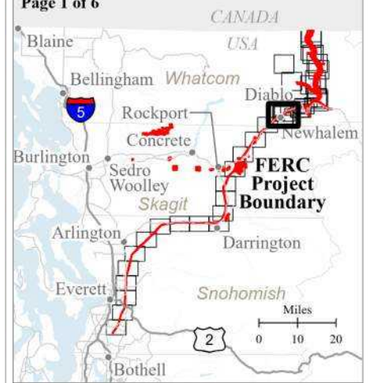
Land Ownership

- National Park Service
- National Recreation Area (NPS)
- Seattle City Light

N

0 2,000 4,000 Feet

Page 1 of 6



Seattle City Light

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SKAGIT RIVER HYDROELECTRIC PROJECT (FERC NO. 553) NOISE MODELING CONTOURS: HELICOPTER (BIG BEAVER CREEK PASS SNOTEL SITE)

- FERC Project Boundary
- Project River Miles (PRM)
- Water Features (Lakes, Rivers)
- Non-Recreation Facility
- Recreation Facility
- Sound Monitor Location
- Noise Source: Helicopter Path

Pass-by Lmax (dBA)

- 35 - 39
- 40 - 44
- 45 - 49
- 50 - 54
- 55 - 59
- 60 - 64
- 65 - 69
- 70 - 74
- 75 - 79
- 80 - 84
- >85

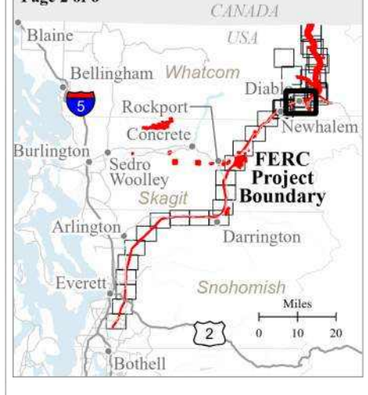
Land Ownership

- National Park Service
- National Recreation Area (NPS)
- Seattle City Light

N

0 2,000 4,000 Feet

Page 2 of 6



Seattle City Light

SKAGIT RIVER HYDROELECTRIC PROJECT (FERC NO. 553)

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SKAGIT RIVER HYDROELECTRIC PROJECT (FERC NO. 553) NOISE MODELING CONTOURS: HELICOPTER (BIG BEAVER CREEK PASS SNOTEL SITE)

- FERC Project Boundary
- Project River Miles (PRM)
- Water Features (Lakes, Rivers)
- Non-Recreation Facility
- Recreation Facility
- Sound Monitor Location
- Noise Source: Helicopter Path

Pass-by Lmax (dBA)

- 35 - 39
- 40 - 44
- 45 - 49
- 50 - 54
- 55 - 59
- 60 - 64
- 65 - 69
- 70 - 74
- 75 - 79
- 80 - 84
- >85

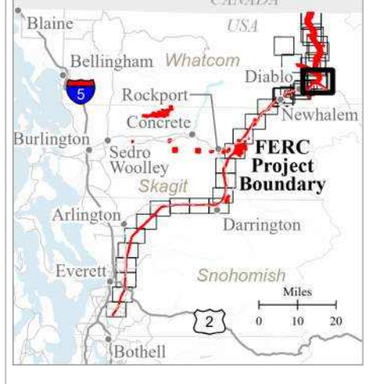
Land Ownership

- National Park Service
- National Recreation Area (NPS)
- U.S. Forest Service
- Seattle City Light

N

0 2,000 4,000 Feet

Page 3 of 6



Seattle City Light

SKAGIT RIVER HYDROELECTRIC PROJECT (FERC NO. 553)

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SKAGIT RIVER HYDROELECTRIC PROJECT (FERC NO. 553) NOISE MODELING CONTOURS: HELICOPTER (BIG BEAVER CREEK PASS SNOTEL SITE)

- FERC Project Boundary
- Project River Miles (PRM)
- Water Features (Lakes, Rivers)
- Noise Source: Helicopter Path

Pass-by Lmax (dBA)

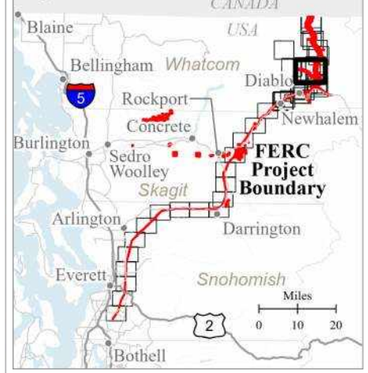
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- 70 - 74

Land Ownership

- National Park Service
- National Recreation Area (NPS)
- U.S. Forest Service

N

0 2,000 4,000 Feet



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SKAGIT RIVER HYDROELECTRIC PROJECT (FERC NO. 553) NOISE MODELING CONTOURS: HELICOPTER (BIG BEAVER CREEK PASS SNOTEL SITE)

- FERC Project Boundary
- Water Features (Lakes, Rivers)
- Noise Source: Helicopter Path

Pass-by Lmax (dBA)

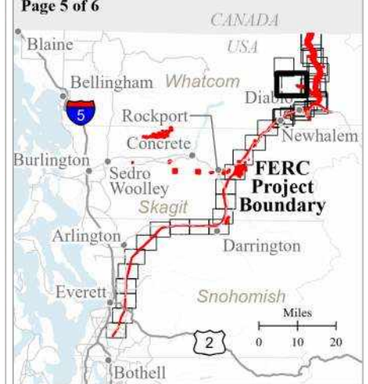
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Land Ownership

- National Park Service
- National Recreation Area (NPS)

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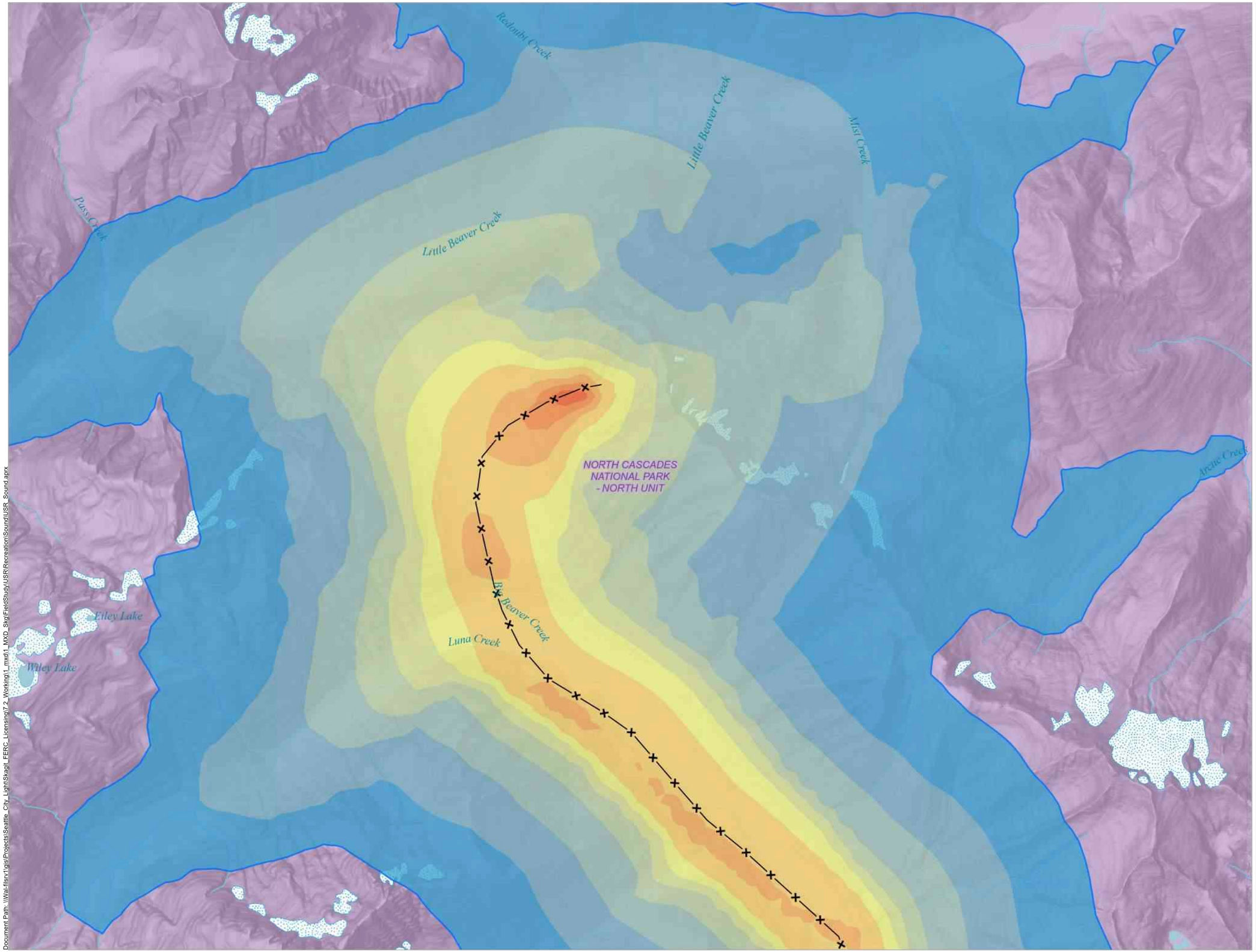


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SKAGIT RIVER HYDROELECTRIC PROJECT (FERC NO. 553) NOISE MODELING CONTOURS: HELICOPTER (BIG BEAVER CREEK PASS SNOTEL SITE)

- Water Features (Lakes, Rivers)
- Noise Source: Helicopter Path

Pass-by Lmax (dBA)

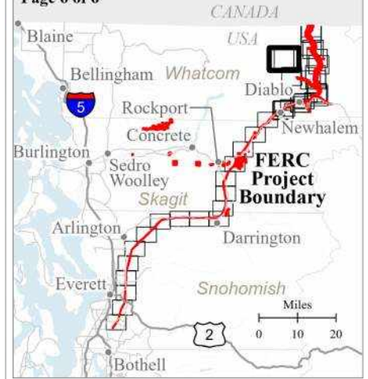
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- 80 - 84
- >85

Land Ownership

- National Park Service

N

0 2,000 4,000 Feet



Seattle City Light

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SKAGIT RIVER HYDROELECTRIC PROJECT (FERC NO. 553) NOISE MODELING CONTOURS: TOUR BOAT ON DIABLO LAKE

- FERC Project Boundary
- Project River Miles (PRM)
- Water Features (Lakes, Rivers)
- Non-Recreation Facility
- Recreation Facility
- Sound Monitor Location
- Noise Source: Diablo Tour Boat Route (Alice Ross IV)

Pass-by Lmax (dBA)

- 35 - 39
- 40 - 44
- 45 - 49
- 50 - 54
- 55 - 59
- 60 - 64
- 65 - 69
- 70 - 74
- 75 - 79
- 80 - 84
- >85

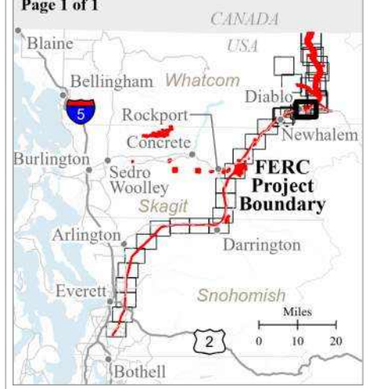
Land Ownership

- National Park Service
- National Recreation Area (NPS)
- Seattle City Light

N

0 1,000 2,000 Feet

Page 1 of 1



Seattle City Light

SKAGIT RIVER HYDROELECTRIC PROJECT (FERC NO. 553)

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SKAGIT RIVER HYDROELECTRIC PROJECT (FERC NO. 553) NOISE MODELING CONTOURS: CREW BOAT ON DIABLO LAKE

- FERC Project Boundary
- Project River Miles (PRM)
- Water Features (Lakes, Rivers)
- Non-Recreation Facility
- Recreation Facility
- Sound Monitor Location
- Noise Source: Diablo Crew Boat Route (Skagit Queen)

Pass-by Lmax (dBA)

- 35 - 39
- 40 - 44
- 45 - 49
- 50 - 54
- 55 - 59
- 60 - 64
- 65 - 69
- 70 - 74
- 75 - 79
- 80 - 84
- >85

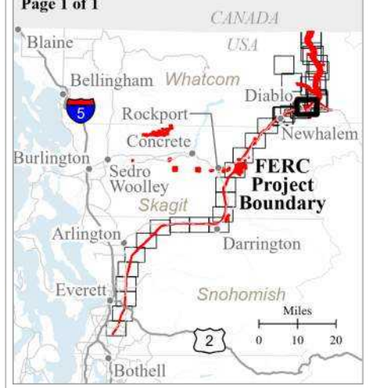
Land Ownership

- National Park Service
- National Recreation Area (NPS)
- Seattle City Light

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Page 1 of 1



Seattle City Light

SKAGIT RIVER HYDROELECTRIC PROJECT (FERC NO. 553)

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SKAGIT RIVER HYDROELECTRIC PROJECT (FERC NO. 553) NOISE MODELING CONTOURS: CREW BOAT ON ROSS LAKE (ROSS DAM TO HOZOMEEN

- FERC Project Boundary
- Project River Miles (PRM)
- Water Features (Lakes, Rivers)
- Non-Recreation Facility
- Recreation Facility
- Sound Monitor Location
- Noise Source: Diablo Tour Boat Route (Alice Ross IV)

Pass-by Lmax (dBA)

- 35 - 39
- 40 - 44
- 45 - 49
- 50 - 54
- 55 - 59
- 60 - 64
- 65 - 69
- 70 - 74
- 75 - 79
- 80 - 84
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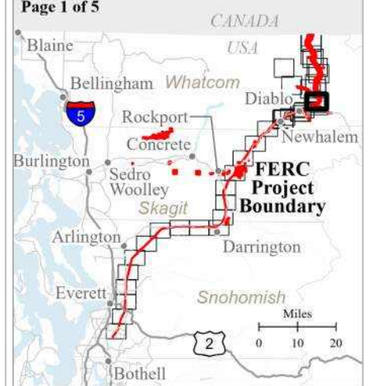
Land Ownership

- National Park Service
- National Recreation Area (NPS)
- U.S. Forest Service

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0 1,000 2,000 Feet

Page 1 of 5



Seattle City Light

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Big Beaver Creek
Big Beaver Creek
Pierce Creek
NORTH CASCADES NATIONAL PARK - NORTH UNIT
ROSS LAKE NATL REC. AREA
OKANOGAN-WENATCHEE NATIONAL FOREST
Roland Creek
Riprap Creek
Ross Dam
Diablo Lake
Ross Powerhouse
East Ferry Landing
Happy Creek
Lone Tree Creek
Ross Lake
20
110
109
108
107
106
105
1

SKAGIT RIVER HYDROELECTRIC PROJECT (FERC NO. 553) NOISE MODELING CONTOURS: CREW BOAT ON ROSS LAKE (ROSS DAM TO HOZOMEEN

- FERC Project Boundary
- Project River Miles (PRM)
- Water Features (Lakes, Rivers)
- Noise Source: Diablo Tour Boat Route (Alice Ross IV)

Pass-by Lmax (dBA)

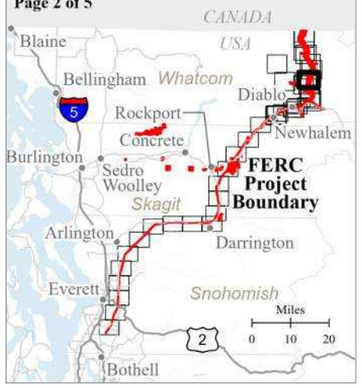
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- >85

Land Ownership

- National Park Service
- National Recreation Area (NPS)
- U.S. Forest Service

N

0 1,000 2,000 Feet



Seattle City Light

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SKAGIT RIVER HYDROELECTRIC PROJECT (FERC NO. 553) NOISE MODELING CONTOURS: CREW BOAT ON ROSS LAKE (ROSS DAM TO HOZOMEEN

- FERC Project Boundary
- Project River Miles (PRM)
- Water Features (Lakes, Rivers)
- Noise Source: Diablo Tour Boat Route (Alice Ross IV)

Pass-by Lmax (dBA)

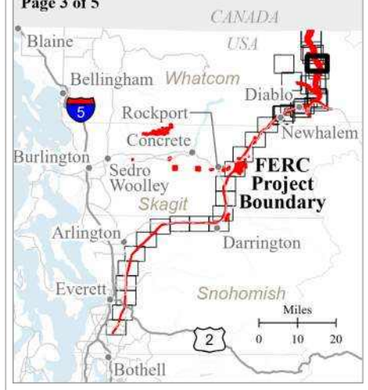
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- 55 - 59
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- 70 - 74
- 75 - 79
- 80 - 84
- >85

Land Ownership

- National Park Service
- National Recreation Area (NPS)
- U.S. Forest Service

N

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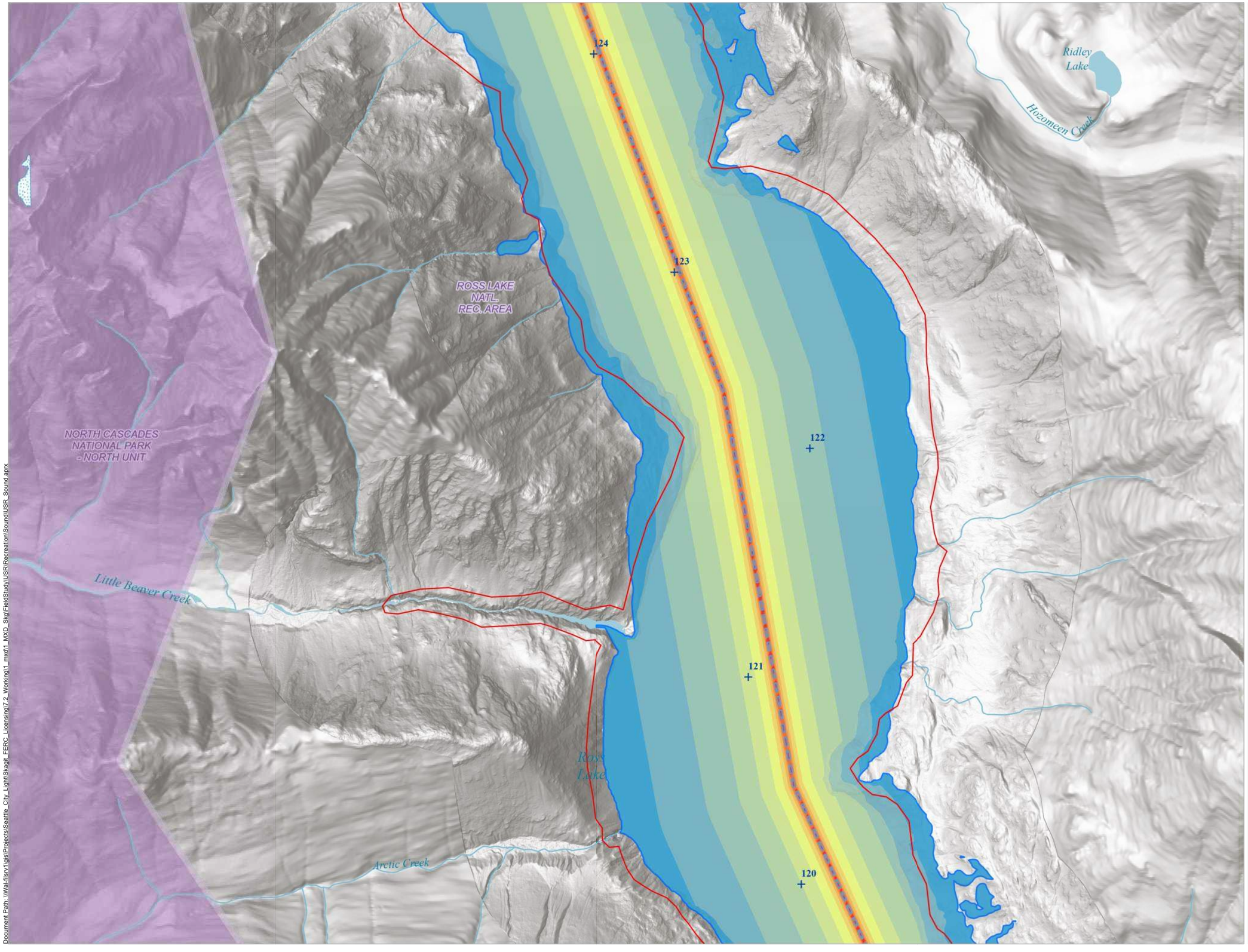
Seattle City Light

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SKAGIT RIVER HYDROELECTRIC PROJECT (FERC NO. 553) NOISE MODELING CONTOURS: CREW BOAT ON ROSS LAKE (ROSS DAM TO HOZOMEEN



- FERC Project Boundary
- Project River Miles (PRM)
- Water Features (Lakes, Rivers)
- Noise Source: Diablo Tour Boat Route (Alice Ross IV)

Pass-by Lmax (dBA)

- 35 - 39
- 40 - 44
- 45 - 49
- 50 - 54
- 55 - 59
- 60 - 64
- 65 - 69
- 70 - 74
- 75 - 79
- 80 - 84
- >85

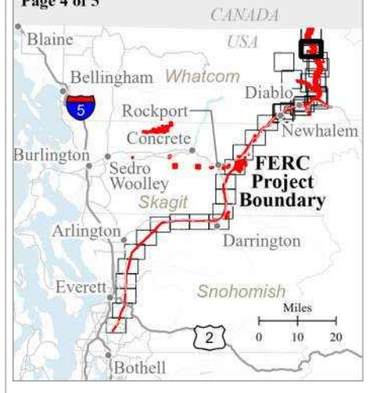
Land Ownership

- National Park Service
- National Recreation Area (NPS)

N

0 1,000 2,000 Feet

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Seattle City Light

SKAGIT RIVER HYDROELECTRIC PROJECT (FERC NO. 553)

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SKAGIT RIVER HYDROELECTRIC PROJECT (FERC NO. 553) NOISE MODELING CONTOURS: CREW BOAT ON ROSS LAKE (ROSS DAM TO HOZOMEEN

- FERC Project Boundary
- Project River Miles (PRM)
- Water Features (Lakes, Rivers)
- Swamp/Marsh
- Noise Source: Diablo Tour Boat Route (Alice Ross IV)

Pass-by Lmax (dBA)

- 35 - 39
- 40 - 44
- 45 - 49
- 50 - 54
- 55 - 59
- 60 - 64
- 65 - 69
- 70 - 74
- 75 - 79
- 80 - 84
- >85

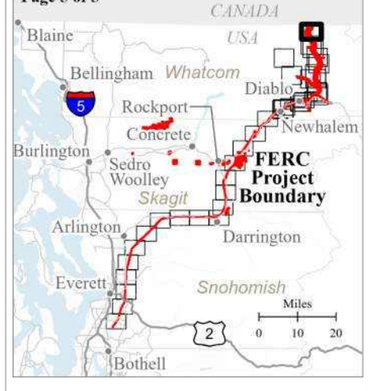
Land Ownership

- National Park Service
- National Recreation Area (NPS)
- U.S. Forest Service

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Page 5 of 5



Seattle City Light

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SKAGIT RIVER HYDROELECTRIC PROJECT (FERC NO. 553) NOISE MODELING CONTOURS: LAWN MAINTENANCE IN NEWHALEM AND DIABLO

- FERC Project Boundary
- Project River Miles (PRM)
- Water Features (Lakes, Rivers)
- Non-Recreation Facility
- Recreation Facility
- Sound Monitor Location
- Noise Source: Lawnmower

1-hour Leq (dBA)

- 35 - 39
- 40 - 44
- 45 - 49
- 50 - 54
- 55 - 59
- 60 - 64
- 65 - 69
- 70 - 74
- 75 - 79
- 80 - 85

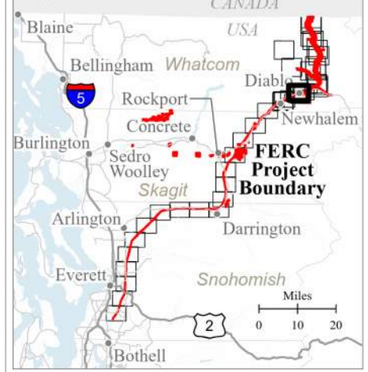
Land Ownership

- National Park Service
- National Recreation Area (NPS)
- Seattle City Light

N

0 1,000 2,000 Feet

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Seattle City Light

SKAGIT RIVER HYDROELECTRIC PROJECT (FERC NO. 553)

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Data Source: USGS (2018), City Light 2022.

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SKAGIT RIVER HYDROELECTRIC PROJECT (FERC NO. 553) NOISE MODELING CONTOURS: LAWN MAINTENANCE IN NEWHALEM AND DIABLO

- FERC Project Boundary
- Mitigation Parcel
- Project River Miles (PRM)
- Water Features (Lakes, Rivers)
- Non-Recreation Facility
- Recreation Facility
- Sound Monitor Location
- Noise Source: Lawnmower

1-hour Leq (dBA)

- 35 - 39
- 40 - 44
- 45 - 49
- 50 - 54
- 55 - 59
- 60 - 64
- 65 - 69
- 70 - 74
- 75 - 79

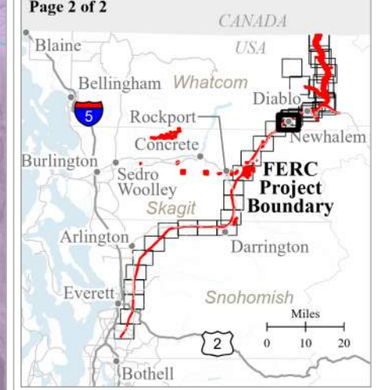
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N

0 1,000 2,000 Feet

Page 2 of 2



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