4.12 Noise

4.12.1 Introduction

The purpose of the Noise section is to identify, describe, and evaluate noise sources and potential land use conflicts related to environmental noise.

4.12.2 Background on Environmental Noise

Noise is often described as sound traveling through the air, such as traffic from a nearby road. Sound is defined as any pressure variation in air that the ear can detect. If the pressure variations occur frequently enough, at least 20 times per second, they can be heard by the human ear and called "sound". The number of pressure variations per second is called the frequency of sound, and is expressed as cycles per second, called Hertz (Hz). The relative loudness or intensity of sound energy is measured in decibels (dB). A decibel is a logarithmic unit of sound energy that represents the smallest variance in sound that the human ear can detect.

The standard unit for measuring sound is the decibel (dB). Because the human ear is not equally sensitive to sound at all frequencies, a frequency-dependent rating scale has been devised to interpret noise levels relative to the sensitivity of human hearing. The A-weighted decibel scale accounts for this. Environmental noise is usually measured in A-weighted decibels (dBA) and typically fluctuates over time. An 'A-weighted' decibel (dBA) is a decibel corrected for the variation in frequency response of the typical human ear at commonly encountered noise levels. The following noise descriptors are commonly used to evaluate environmental noise:

- L_{eq} - The energy-equivalent noise level (L_{eq}), is the average acoustic energy content of noise, measured during a specific time period.
- L_{dn} – The day-night average noise level (L_{dn}), is a 24-hour average L_{eq} with a 10 dBA penalty added to noise occurring during the hours of 10pm and 7am to account for the greater nocturnal noise sensitivity of people.
- CNEL - the Community Noise Equivalent Level (CNEL), is also a 24-hour average L_{eq} with no penalty added to noise during the day time hours between 7am and 7pm, a penalty of 5 dB added to evening noise occurring between 7pm and 10pm, an penalty of 10 dB added to nighttime noise occurring between 10pm and 7am.

Noise levels from a source diminish as distance to the receptor increases. A rule of thumb for traffic noise is that for every doubling of distance from the road, the noise level is reduced by 3 to 4.5 dBA. For a single source of noise (i.e. stationary equipment) the noise is reduced by 6dBA for each doubling of distance away from the source. Noise levels can also vary with the presence of structures that can reflect sound and either intensify or diminish the noise level. Community reaction to a change in noise levels varies, depending upon the magnitude of the change. In general, a difference of 3 dBA is a minimally perceptible change, while a 5 dBA difference is the typical threshold that would cause a change in community reaction.

In the urban setting, street and traffic noise can be considered background noise. But unless a rural home is on a highway, one might notice a car coming on a rural road for miles. Noises in the rural setting can seem amplified if there are no barriers to the source. But noise levels are reduced by increasing distance, air density, wind, and obstructions (trees, buildings, and natural landscape features). Table 4.12.1 provides a list of expected decibel levels for common noise sources. Note that a rural forest in the absence of trucks and heavy machinery would have a relatively low background environmental noise level (i.e. 30 dBA).

Table 4.12.1
Decibel Levels for Common Noise Sources

Sound Pressure Level (dBA)	Noise Source
140	Jet Engine (at 25 meters)
130	Jet Aircraft (at 100 meters)
120	Rock and Roll Concert
110	Pneumatic Chipper
100	Jointer/Planer
90	Chainsaw
80	Heavy Truck Traffic
70	Business Office
60	Conversational Speech
50	Library
40	Bedroom
30	Secluded Woods
20	Whisper

4.12.3 Regulatory Setting

Federal and state laws have led to the establishment of noise guidelines for the protection of the population from adverse impacts from environmental noise. Many local noise goals are implemented as planning guidelines and by enforceable noise ordinances.

Federal

The Noise Control Act of 1972 directed the US EPA to develop noise guidelines that would protect the population from the adverse effects of environmental noise. These are guidelines and not construed as standards or regulations. In 1981, EPA concluded that noise pollution should be addressed at the local level and primary responsibility for regulating noise was transferred to State and local government.

Occupational Safety and Health Act (OSHA)

Under the Occupational Safety and Health Act of 1970 (29 USC § 651 et seq.), the Department of Labor, Occupational Safety and Health Administration (OSHA) has adopted regulations (29 CFR § 1910.95) that establish maximum noise levels to which workers at a facility may be exposed. These OSHA noise regulations are designed to protect workers against the effects of noise exposure, and list permissible noise level exposure as a function of the amount of time during which the worker is exposed.

State

State law (Gov. Code, 65300) requires that cities and counties prepare and adopt a General Plan. The California Code of Regulations (CCR), section 65302(f) establishes that a noise element is a required component of a General Plan. In addition, California Department of Health Services (1987) has developed noise guidelines for the noise elements in local General Plans. The state guidelines also recommend that local jurisdictions consider adopting local nuisance noise control ordinances.

Cal-OSHA

As a result of the passage of Cal-OSHA the California Occupational Safety and Health Administration (Cal-OSHA) has promulgated Occupational Noise Exposure Regulations (Cal. Code Regs., tit. 8, § 5095 et seq.) that set employee noise exposure limits. These standards are equivalent to the federal OSHA standards described above.

4.12.4 Regional Setting and Existing Conditions

The Vegetation Treatment Program (VTP) program is a statewide program and while it typically would be operating in rural forested and range settings, it also is likely to operate in WUI where communities are developing in areas with high fuel loads. These are predominately rural areas that can be characterized as generally quiet, but can frequently experience increased noise levels for a short duration that are associated with timber/forestry operations, ranching and related farm equipment, recreation activities, motor vehicles, and wildlife. Ambient (background) sources of natural noise range from short-term soft sounds, as in the sound of the wind in the trees (30-50db), to short-term loud cracks and rumbles, as in the sound of falling rocks (60-80db). Ambient noise can also be loud and constant, as in the deafening sound of a large waterfall (100db). Community noise or “ambient” noise includes background noise from traffic, machines, and people. Ambient forest and range noise comes from both natural and man-caused sources. Noise associated with VTP activities vary with treatment type. Some noise is short-term; some is constant, but any potential impacts should be of a limited duration. The following is a description of the various sources of man-made ambient noise that could be associated with the VTP program:

- Vehicle traffic (adjacent highways, access roads, and railroads)
- Construction roads if needed to gain access to treatment sites
- Equipment usage for VMT activities (machines, chain saws, chippers…)

Vehicle Traffic Noise–Traffic noise is a function of the receptor’s distance from roads, which cannot be adequately assessed at the programmatic level. Rather, it requires consideration during project level review.

Noise from Construction and Equipment Usage–Construction noise is similar to that of VTP equipment usages; essentially it is the sound of machinery at work. Machinery may include chainsaws, chippers, back-up beepers, yarding tooters, diesel motors, cable yarders, helicopters, and other power tools and engines. Table 4.12.2 provides an estimation of noise levels associated with timber harvesting equipment. Machine equipment used to conduct VTP projects could be expected to produce comparable levels of noise.

Table 4.12.2
Active Timber Harvest Site Equipment And Activity Noise Level Measurements

Equipment/ Activity	Source	Equivalent Continuous Noise Level (Leq)–Db[1]
Heel Boom Loader	Caterpillar 325	60[2]
Bull Dozer	Caterpillar D8N	63
Bull Dozer	Caterpillar D7G	63[3]
Chainsaw	Stihl 046	65
Clearing Deck Debris & Stacking Logs	Caterpillar 325	60
Skidding & Stacking Logs	Caterpillar 325, Caterpillar S8N w/ backup alarm	65
Shaking Heel Boom Grappler	Caterpillar 325	70
Skidding & Stacking Logs	Caterpillar 325, Caterpillar D7G	64
Skidding & Stacking Logs	Caterpillar 325, Caterpillar D8N, Caterpillar D7G	68
Cutting Trees	Stihl 046	68
Tree Falling	Tree	58[4]

1. Sight line noise measurements distance = 150 feet
2. Idling 56 dB
3. Idling 58 dB
4. Sight line noise measurement distance = 250 feet

Source: CAL FIRE, 2005b, JDSF Draft Environmental Impact Report