

F. NOISE

F.1 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.

F.1.1 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 (EPA, 2006).

F.1.2 OCCUPATIONAL SAFETY AND HEALTH ACT (OSHA)

Under the Occupational Safety and Health Act of 1970 (29 USC § 651 et seq.), the federal 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.

F.1.3 STATE

State law (GOV § 65300) requires that cities and counties prepare and adopt a General Plan. Government Code 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.

F.1.4 CAL/OSHA

The Occupational Safety and Health Standards Board, the standards setting agency within Cal/OSHA, has promulgated Occupational Noise Exposure Regulations (8 CCR § 5095 et seq.) that set employee noise exposure limits. These standards are equivalent to the federal OSHA standards described above.

F.2 BACKGROUND

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 F.2-1 provides a list of expected decibel levels for common noise sources. Note that a forest in the absence of trucks and heavy machinery would have a relatively low background environmental noise level (30 dBA).

Table F.2-1 Decibel levels for Common Noise Sources¹

Sound Pressure Level (dBA)	Noise Source
150	Jet Engine Takeoff at 25 meters
140	Aircraft Carrier Deck
130	Military Jet Takeoff
120	Chain Saw
110	Pneumatic Chipper
100	Power Lawn Mower
90	Boeing 737, one nautical mile before landing
80	Heavy Truck Traffic
70	Freeway at 10am
60	Business Office
50	Conservational Speech
40	Library, Bird Calls
30	Secluded Woods
20	Whisper

¹Adapted from "Noise Sources and their Effects," Purdue University Department of Chemistry, and "Best Practices Guide: Controlling Noise on Construction Sites," Laborer's Health and Safety Fund of North America

F.3 DATA AND ASSUMPTIONS

The Proposed Program potential treatment acreage by bioregion is described in Chapter 2. Total acreage treated over a ten-year period is projected to be approximately 600,000 acres, which represents about 2.5 percent of the total treatable acreage. Annual acreage treated is expected to about 60,000 acres.

Table F.3-1 provides an estimation of noise levels associated with timber harvesting equipment. Machine equipment used to conduct VTP subsequent activities could be expected to produce comparable levels of noise. Table F.3-1 also includes the sound

levels from chainsaws measured at 250 feet. Table F.3-2 describes the dBA at 50 feet of various types of equipment and machinery, which would be used or is similar to equipment likely to be used in the proposed Program and Alternatives. Noise impacts from helicopters (used for ignition of prescribed fire) are based on FAA Advisory Circular-AC36-1G, Bell Series and Hughes models noise levels (CAL FIRE, 2005).

Table F.3-1 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, 2008, Jackson Demonstration State Forest Management Plan Final Environmental Impact Report.

Table F.3-2 Noise levels of equipment likely to be operated under proposed program

Equipment	dBA at 50'		
Dozer	85-90		
Tractor	77-82		
Front End Loader	86-90		
Hydraulic backhoe	81-90		
Hydraulic excavator	81-91		
16 wheel Truck	81-87		
Chainsaw	90		
Mobile Chippers	115		
Helicopter	Flyover	Takeoff	Landing
	dBA at 150 meter	dBA at 50'	dBA at 50'
Bell 206 L-111	86.9	87.6	91.1
Bell 206 L-IV	83.3	84.1	87.3
Bell 206 B-III	85.2	88.4	90.7
Hughes 500 D	88.7	n/a	n/a

Table F.3-3 Production rates and associated noise levels for equipment used in proposed program.

	Production (acres/day)	Days to Complete a Project	Equipment	dBA @ 50'	Assumptions
Mechanical mowing	50	5.2	Tractor	80	BLM, plus 1 16-wheel lowbed for move in/out
Mechanical dozer blade and pile	6	44.2	Dozer	87	BLM, plus 1 16-wheel lowbed for move in/out
Mechanical chaining (2 dozers)	11	22.7	2 dozers	87	est., 2 dozers 500' apart at 2000'/day, also 2 16-wheel lowbed for move in/out
Mechanical excavator mastication	5	52	excavator	85	est., plus one 16 wheel lowbed for move in/out
Road side chipping	7	39	Feller bunches, skidder and mobile 200-400 hp chipper	115	Remove 190 tpa 7" in diameter with feller buncher, skid to landing, chip and blow into chip vans
Hand pulling cutting, shoveling	1	52	None	45	BLM 5-person crew clearing 5 acres/day
Hand cutting and hand clearing	1	52	5 chainsaws	90	BLM 5-person crew clearing 5 acres/day
Herbicide backpack spray	1	52	None	45	BLM 5-person crew spraying 5 acres/day
Herbicide ATV spray	10	26	ATV	70	BLM, 10 acres/day
Prescribed fire hand ignition	260	1	Pickup truck, fire engines	65	7 igniters, 1 command vehicle, 1 crew rig, 2 fire engines
Prescribed fire helitorch	260	1	Helicopter	90	2 fire engines, command vehicle, helicopter, helicopter support trucks
Prescribed herbivory	10	26	Pickup truck	65	1 person tending with 1 rt/day

Based on estimates from ENSR International (ENSR International, 2005) for BLM (USDI BLM, 2005)