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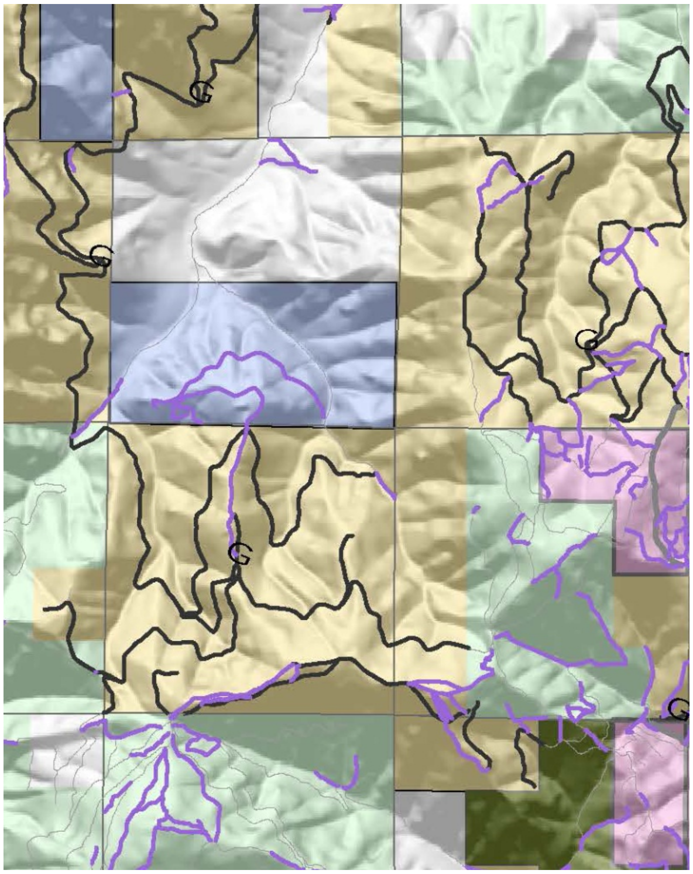

Timber Mountain Off-Highway Vehicle Noise Assessment

April 13, 2012

Prepared For

UNITED STATES DEPARTMENT OF THE INTERIOR
Bureau of Land Management Medford District Office

FINAL

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Timber Mountain Area Off-Highway Vehicle Noise Assessment

This report presents an analysis of existing community noise throughout the Bureau of Land Management (BLM) Timber Mountain Off-Highway Vehicle (OHV) Area (Project Area) in Jackson County, Oregon. A sound level measurement program was conducted at various locations around the proposed site. The goal of this noise assessment was to characterize the existing noise environment of the Project Area. The study methods, site locations, and noise study results are presented below.

1.1 Noise Metrics

There are several metrics with which sound (noise) levels are measured and quantified. All of them use the logarithmic decibel (dB) scale. The following information defines the noise measurement terminology used in this analysis.

Airborne sound is a rapid fluctuation of air pressure and local air velocity. Sound levels are measured and expressed in decibels (dB) with 0 dB roughly equal to the threshold of human hearing. The frequency of sound is a measure of the pressure fluctuations per second, measured in Hertz. Most sounds do not consist of a single frequency, but are comprised of a broad band of frequencies differing in level. The characterization of sound level magnitude with respect to frequency is the sound spectrum.

Many rating methods exist to analyze sound of different spectra. For community noise studies, the simplest method is generally used so that measurements may be made and noise impacts readily assessed using basic acoustical instrumentation. The method used in this noise assessment is a single weighting filter that progressively de-emphasizes frequency components below 10,000 Hertz and above 5,000 Hertz. This frequency, called A-weighting and measured in A-weighted decibels (dBA), reflects the relative decreased sensitivity of humans to both low and extremely high frequencies.

Because the sounds in the environment vary with time, they cannot simply be described with a single number. Several methods are used for describing variable sounds including the equivalent level (L_{eq}), the maximum level (L_{max}), and the percent exceeded levels (L_n). These metrics are derived from a large number of moment-to-moment A-weighted sound level measurements. Some common metrics reported in community noise monitoring studies are described below:

- L_{eq}, the equivalent level, is the level of a hypothetically steady sound that would have the same energy (i.e., the same time-averaged mean square sound pressure) as the actual fluctuating sound observed. The equivalent level is designated L_{eq}; and is A-weighted. The equivalent level represents the time average of the fluctuating sound pressure, but because sound is represented on a logarithmic scale and the averaging is done with linear mean square sound pressure values, the L_{eq} is most often determined by occasional loud, intrusive noises.

- L_{max} is the maximum sound level during a given time. The L_{max} is typically due to discrete, identifiable events such as an airplane overflight, car or truck passby, or a dog barking for example.
- L_{90} is the sound level in dBA exceeded 90 percent of the time during the measurement period. The L_{90} is close to the lowest sound level observed. It is essentially the same as the residual sound level, which is the sound level observed when there are no obvious nearby intermittent noise sources.
- L_{50} is the median sound level in dBA exceeded 50 percent of the time during the measurement period.
- L_{10} is the sound level in dBA exceeded only 10 percent of the time. It is close to the maximum level observed during the measurement period. The L_{10} is sometimes called the intrusive sound level because it is caused by occasional louder noises like those from passing motor vehicles.

One of the most important factors in sound propagation is topography. Berms or hills can provide a natural barrier between a sound source and receiver. Valleys can serve as natural amplifiers of sound from the source to the receiver. Similarly, trees and vegetation can provide noise absorption depending on their density and height. Such factors are considered when selecting noise monitoring locations.

1.2 Methodology

To quantify existing noise levels within the Project Area, noise measurements were conducted throughout the site on November 12th, 24th, and 28th, 2009. Noise measurements were taken at a total of 10 sites. The selection of the short-term monitoring locations was based upon review of the current and proposed land use in the area, topography, and proximity to sensitive noise receptors (i.e. residents). See Figures 1 and 2 for locations of the ambient noise measurement sites.

Within the Project Area, the existing noise environment includes traffic noise along Highway 238, local traffic along established roadways, residential/farm activities (e.g., farm equipment, chainsaws, livestock, dogs barking, etc.), natural environmental noises (e.g., wildlife calls), and intermittent OHV use of the existing staging areas, roads, and trails. Sensitive noise receptors include local residents throughout Project Area.

The existing ambient noise environment is considered to include noises that currently occur throughout the Project Area, which often includes intermittent OHV activity. To accurately characterize ambient noise conditions with OHV activity at existing staging areas, roads, and trails, volunteers were directed to stage typical OHV activity throughout the Project Area. The volunteer riders performed typical warm-up/staging activities and rode on specified existing trails and staged typical idling activities at the specified Demonstration Points as noise data was collected for these activities at various locations (see Figures 1 and 2). Staged idling activity consisted of intermittent “revving” of the OHV engines to simulate typical noise levels produced by OHV riders when they are waiting/idling at a single location. A combination of two-stroke and four-stroke engines was used for the study. All OHVs were in compliance with Oregon Administrative Rules Chapter 340, Division 35, which limits the noise emitted from off-road recreational vehicles to the levels included in Table 1 below.

Table 1 Off-Road Recreational Vehicle Standards (OAR 340-34-030)

		Maximum Noise Level (dBA and Distance from Vehicle Measurement Point)	
Vehicle Type	Model Year	Stationary Test 20 inches (1/2 meter) from exhaust outlet	Moving Test at 50 feet (15.2 meters)
Motorcycles	1975 and before	102	85
	After 1975	99	82
All Others (excluding boats and snowmobiles)			
Front Engine	All	95	78
Mid and Rear Engines	All	97	78

On November 12th, a total of six OHVs contributed to the staged noise study including one two-stroke engine and five four-stroke engines. On November 24th, a total of five OHVs contributed to the staged noise study including one two-stroke engine and four four-stroke engines. On November 28th, OHV activity was not staged since there was a moderate amount of OHV activity at the existing staging areas and trails due to good riding conditions and it being a holiday weekend. When possible, “background” noise levels were also collected at each site when there was no audible OHV activity in the area.

Daytime sound level measurements were made for a period of 5 minutes or for the duration of the staged OHV activity at each site. Although it can be argued that this is an insufficient length of time, both longer and shorter data runs showed similar noise patterns. The background noise measurements were standardized at this length because of data capacity limitation of the recorder used. The trails were generally short and took less than 5 minutes to complete in several instances. Noise measurements were recorded for the duration of the trail runs, and were extended whenever possible with the inclusion of static demonstrations wherever possible. If a rider fell, ran off the trail, or “killed” the engine, this time was included in the data analysis, since these occurrences are common to OHV operation. Noise measurements were collected on Thursday November 12, 2009, from approximately 8:00 a.m. to 3:00 p.m., Tuesday November 24, 2009, from approximately 9:15 a.m. to 2:15 p.m., and Saturday November 28, 2009 from approximately 12:00 p.m. to 1:30 p.m.

The sound levels were measured at a height of five feet above the ground and at locations where there were no large reflective surfaces to affect the measured levels. The measurements were made under low wind conditions. Wind speed measurements were made with a Kestrel 3500 electronic wind speed and temperature indicator. Unofficial observations about meteorology or land use in the area were made solely to characterize the existing sound levels in the area.

Wind speeds were measured at each noise measurement location throughout the day at microphone height. Speeds were calm for the duration of the noise study and ranged between 0.0 and 0.5 miles per hour (mph) on each of the three days of study. On November 12th, skies were overcast with occasional precipitation for the duration of the noise study. On November 24th and 28th, skies were clear for the duration of the studies. Accordingly, it is not believed that wind, fog, or rain significantly affected the measurement equipment or data on November 24th or 28th. Noise monitoring results may have been influenced by rainy conditions on November 12th. Temperatures ranged from 32 degrees in the mornings to 62 degrees Fahrenheit in the more sun exposed areas in the afternoon, which is within the operating range of the sound meters (i.e., less than +/- 0.5 dB over 14 to 122 degrees Fahrenheit).

The noise monitoring data collected during the study is included as Appendix 1 and summarized in Section 1.6.

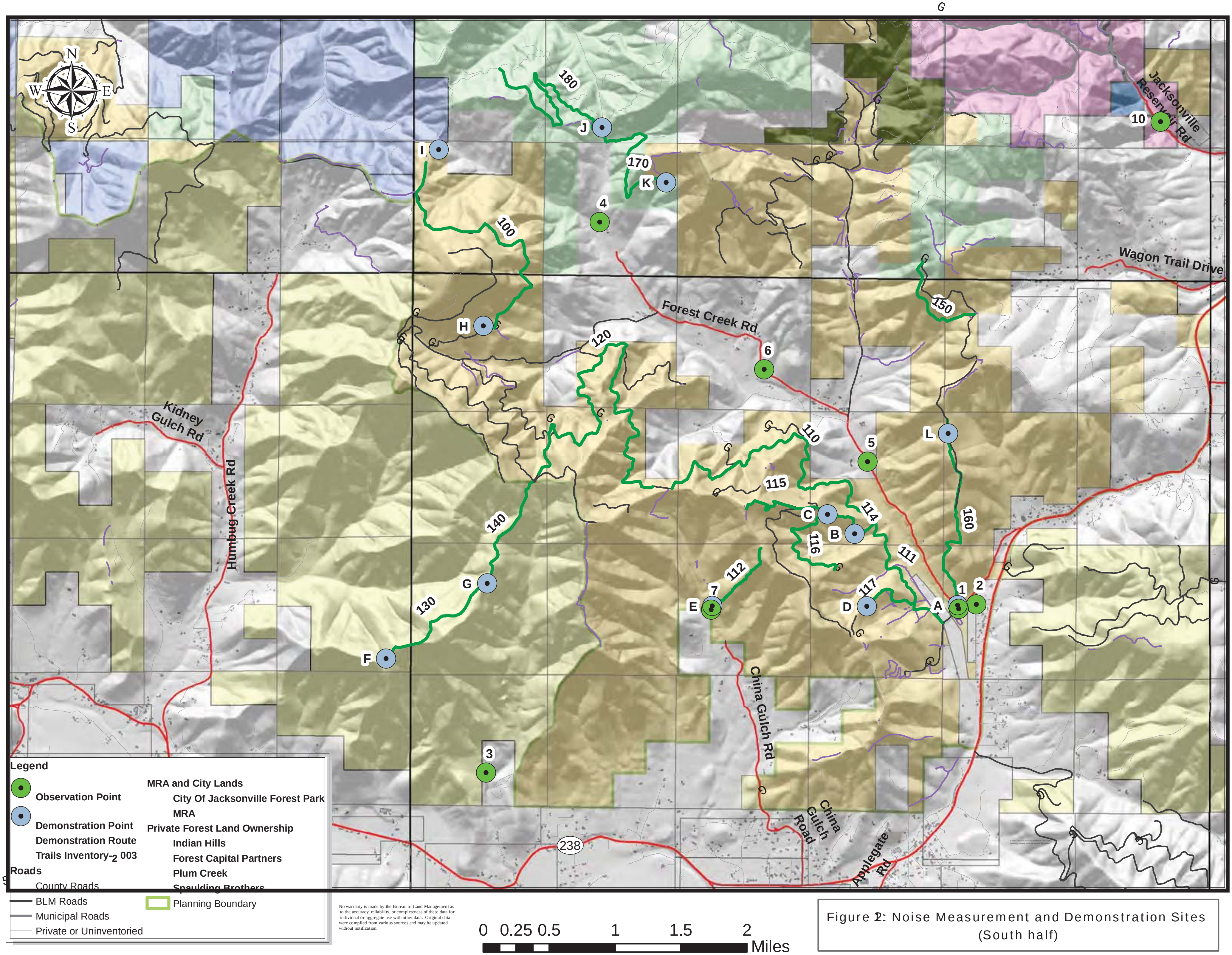

Figure 2: Noise Measurement and Demonstration Sites (South half)

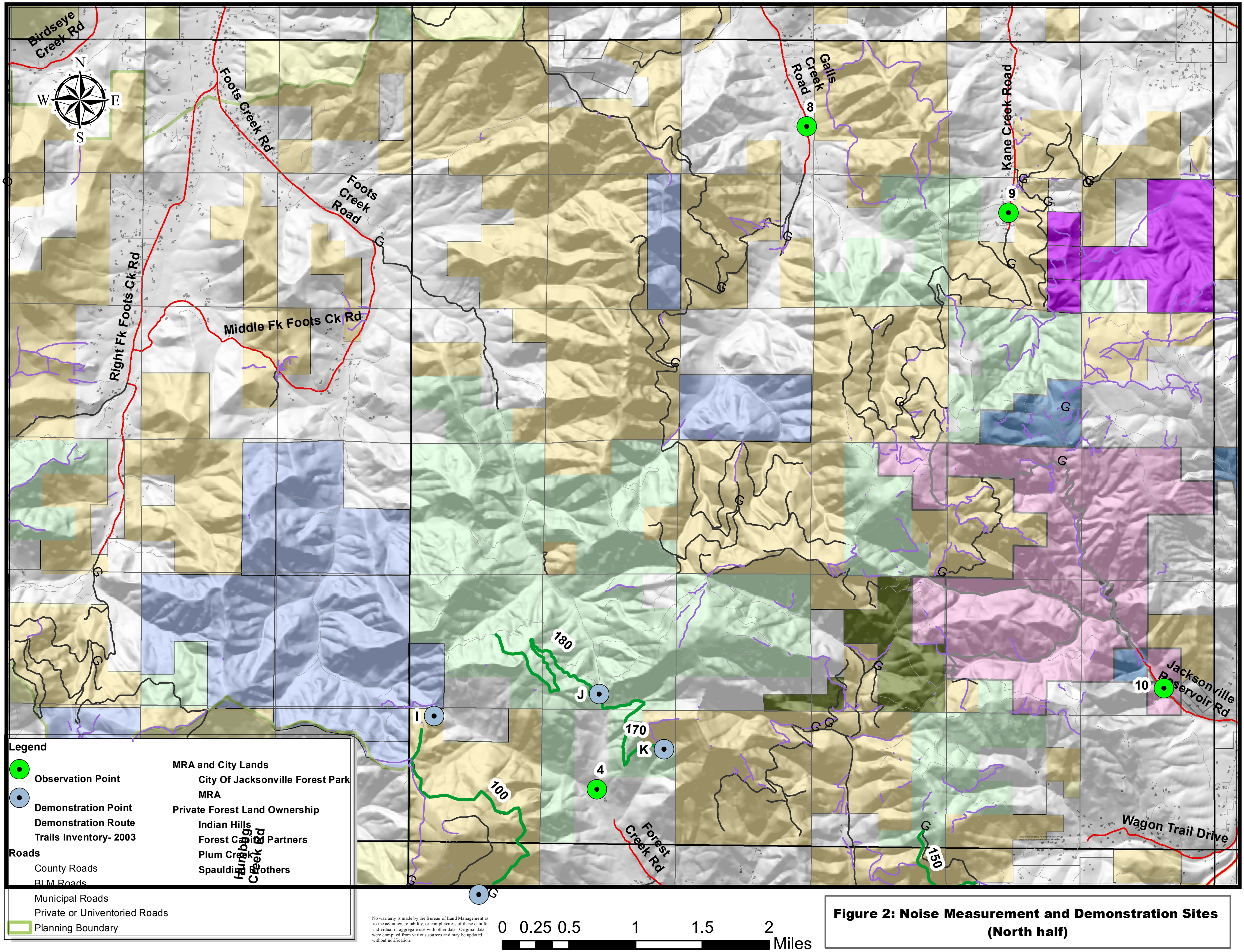

Figure 2: Noise Measurement and Demonstration Sites (North half)

1.3 Sound Meter Equipment

The noise data was collected using Quest Technologies model 1900 integrated sound level meters, which meet ANSI S1.4 1997, IEC 60651-1979, IEC 60804-1985, and CE Mark standards for precision Type 1 sound level meters.

The meter was calibrated in the field prior to the noise studies using a Quest Technologies model QC-20 acoustic calibrator, which meets the standards of the IEC 942 (1988) Class 1 and ANSI S1.40-1984. The calibration frequency was 1000 Hz with an accuracy of +/- 2% at the calibration level of 114.0 dB. The calibrator and analyzer were certified as accurate to standards set by the US National Institute of Standards and Technology by an independent laboratory within 12 months of use of the equipment.

For the short-term noise measurements, the sound meter was fitted with a four-inch foam windscreen and was mounted at a height of approximately 5-feet above ground surface. The short-term monitor was programmed to measure and store Leq, L_{max}, L_{10} and L_{90} (L_{peak} was also monitored although it is not typically used to characterize environmental noise). The short-term measurements were made for a period of 5 minutes or for the duration of the staged OHV activity at each site. Some studies were run longer to capture the entire duration of the staged OHV activity. The noise studies were conducted throughout the day on November 12th, 24th, and in the late morning/early afternoon on November 28th.

The sound meters were set for A-weighted measurements and the time-weighting was set for the “slow” response (1 second) with a 3 dB exchange rate. The data were logged every 5 seconds for the short-term measurements. At the end of the noise studies, the data was uploaded from the meter to a field computer for storage and analysis. QuestSuite Professional software developed by Quest Technologies was used to compile and analyze the sound data included in Appendix 1.

1.4 Noise Study Site Locations

A description of each noise study measurement site and extraneous noise sources contributing to noise levels during the measurement periods are described below:

- **Observation Point 1**: The short-term measurement site is located at the Bunny Meadows Staging Area which is accessed by Forest Creek Road. The primary noise sources were vehicle traffic along Forest Creek Road and Highway 238 as well as the staged noise activity of OHVs warming up. Noise measurements were collected approximately 20 feet from the OHVs at this site starting at approximately 9:15 a.m. on November 12th and again starting at approximately 8:00 a.m. on November 24th.
- **Observation Point 2**: The short-term measurement site is located adjacent to the closest residence on Longnecker Road to the Bunny Meadows Staging Area. The primary noise sources here were vehicle traffic on Highway 238, livestock as well as the staged noise activity of six OHVs warming up. Noise measurements were collected at this site starting at approximately 9:35 a.m. on November 12th and again starting at approximately 9:30 a.m. on November 24th.
- **Observation Point 3**: The short-term measurement site is located approximately 100 yards from the Calahan Residence off of Highway 238. The primary noise sources here were

vehicle traffic on Highway 238, rain, and the staged noise activity of six OHVs on nearby existing trails. Noise measurements were collected at this site starting at approximately 10:45 a.m. on November 12th.

- **Observation Point 4**: The short-term measurement site is located approximately 100 yards from the Duggan Residence off West Forest Creek Road. The primary noise sources were wildlife (e.g. birds chirping and rustling of wildlife in brush), chainsaw activity on Forest Creek Road, and the staged noise activity of six OHVs on adjacent existing trails. Noise measurements were collected at this site starting at approximately 11:55 a.m. on November 12th.
- **Observation Point 5**: The short-term measurement site is located on Forest Creek Road adjacent to the Giesi Residence. The primary noise sources were vehicle traffic on Forest Creek Road and Highway 238, wildlife, and the staged noise activity of OHVs on adjacent existing trails. Noise measurements were collected at this site starting at approximately 2:30 p.m. on November 12th and again starting at approximately 10:30 on November 24th.
- **Observation Point 6**: The short-term measurement site is located on West Forest Creek Road, north of the Forest Creek Road fork. The primary noise sources were vehicle traffic on West Forest Creek Road, wildlife, and the staged noise activity of five OHVs on adjacent existing trails. Noise measurements were collected at this site starting at approximately 1:00 p.m. on November 24th.
- **Observation Point 7**: The short-term measurement site is located at the top of China Gulch Road, approximately 100 yards from the uppermost China Gulch Road residence. The primary noise sources were people yelling in nearby hills, wildlife, and the staged noise activity of OHVs riding on adjacent existing trails. Noise measurements were collected at this site starting at approximately 2:05 p.m. on November 24th.
- **Observation Point 8**: The short-term measurement site is located on Galls Creek Road, approximately 100 yards from the 4285 Galls Creek Road residence. The primary noise sources were OHVs on nearby trails, wildlife, airplanes, and gun activity in nearby hills. This noise measurement was conducted at approximately 12:05 p.m. on November 28th.
- **Observation Point 9**: The short-term measurement site is located on Kane Creek Road, approximately 50 yards from the 4137 Kane Creek Road residence. The primary noise sources were vehicle traffic on Kane Creek Road, wildlife, chainsaws at nearby residence, and gun activity in nearby hills. This noise measurement was conducted at approximately 12:50 p.m. on November 28th.
- **Observation Point 10**: The short-term measurement site is located on Jacksonville Reservoir Road adjacent to the Jacksonville Reservoir dam structure. The primary noise sources were vehicle traffic on Jacksonville Reservoir Road and Highway 238, dogs barking, and airplanes flying overhead. This noise measurement was conducted at approximately 1:30 p.m. on November 28th.

1.5 Noise Study Results

The short-term sound level measurements observed during the study are presented in Table 2 and summarized below. Detailed sound level data for each measurement site are included as

Appendix 1. The noise observation sites and OHV activity and demonstration site locations are illustrated in Figures 1 and 2.

The L_{eq} is referenced in this study since it represents the occasional loud, intrusive noises that may be produced by OHV activity. However, at each of the Observation Points, noise produced by wildlife and residential activity was observed and may have contributed to greater L_{eq} noise levels measured during background and staged OHV activities. Specifically, cars passing on local roads in close proximity to the noise meter, nearby bird calls, and chainsaw activity often produced intermittent "spikes" in noise levels during the noise study from that recorded during the OHV activity without these other noises. In several instances, the L_{max} was attributed to these same noise sources. The L_{eq} is strongly influenced by occasional loud, intrusive noises and one high sound level from an extraneous noise source can dominate the entire noise sample. As such, the L_{90} may better represent the overall noise environment during the background noise measurements and the L_{10} may better represent the noise environment with OHV activity when extraneous noises were recorded during the monitoring period (see Table 2).

Table 2 Ambient Noise Monitoring Results

Site#	Noise Measurement Collection Location	Date	Activity	Measured Sound Level (dBA)			
				Average (L_{eq})	L_{10}	Residual (L_{90})	Max (L_{max})
1	Bunny Meadows Staging Area	11-12-09	Background	44.6	46.2	35.1	60.0
		11-12-09	Six OHVs Warming Up at Demonstration Point A	71.3	73.7	55.7	84.6
		11-24-09	Background	57.3	49.6	38.4	76.7
		11-24-09	Five OHVs Warming Up at Demonstration Point A	78.0	80.5	72.9	83.8
2	Longnecker Road Residential Area	11-24-09	Background	44.3	46.1	38.7	52.5
		11-12-09	Six OHVs Warming Up at Demonstration Point A	50.3	47.1	41.6	73.6
		11-24-09	Five OHVs Warming Up at Demonstration Point A	44.8	48.2	37.7	59.4
		11-24-09	Five OHVs Riding on Trail 160 South-North	44.3	46.6	40.2	49.0
		11-24-09	Five OHVs Riding on Trail 160 North-South	43.4	46.4	34.6	51.4
		11-24-09	Five OHVs Riding on Trail 111 from Demonstration Point A to the Junction of Trail 114	44.4	46.7	37.5	56.5
		11-24-09	Five OHVs Riding on Trail 111 from the Junction of Trail 114 to Demonstration Point A	46.7	48.7	41.5	57.1
3	Calahan Residence	11-12-09	Background	32.9[1]	32.1[1]	26.5[1]	55.2[1]
		11-12-09	Six OHVs Riding on Trails 130 and 140 and Idling at Demonstration Points F and G	36.7[1]	38.8[1]	28.3[1]	60.5[1]
4	Duggan Residence	11-12-09	Background	28.4[1]	30.8[1]	25.5[1]	39.1[1]
		11-12-09	Six OHVs Idling at Demonstration Point H and Riding on South Half of Trail 100 South-North	40.3[1]	41.9[1]	26.1[1]	62.1[1]

Site#	Noise Measurement Collection Location	Date	Activity	Measured Sound Level (dBA)			
				Average (Leq)	L_{10}	Residual (L_{90})	Max (L_{max})
		11-12-09	Six OHVs Riding on North Half of Trail 100 South-North and Idling at Demonstration Point I	32.2[1]	35.6[1]	25.7[1]	48.7[1]
		11-12-09	Six OHVs Idling at Demonstration Point J	35.5[1]	33.3[1]	31.0[1]	54.1[1]
		11-12-09	Six OHVs Riding on Trails 170 and 180 West-East and Idling at Demonstration Point K	37.8[1]	39.1[1]	32.9[1]	56.1[1]
		11-12-09	Six OHVs Riding on Trails 170 and 180 East-West	40.7[1]	43.7[1]	31.7[1]	55.3[1]
5	Forest Creek Road at Giesi Residence	11-24-09	Background	33.5	35.7	31.6	46.1
		11-12-09	Six OHVs Idling at Demonstration Point L	35.8	38.9	29.2	50.8
		11-12-09	Six OHVs Riding on Trails 150 and 160 North-South	41.0	34.1	26.2	65.1
		11-24-09	Five OHVs Riding on Trail 111 from Demonstration Point A to the Junction of Trail 114	32.9	37.0	26.0	45.6
		11-24-09	Five OHVs Riding on Trail 114 from the Junction of Trail 111 to the Junction of Trail 116 and Idling at Demonstration Point B	43.7	39.3	25.6	65.6
		11-24-09	Five OHVs Riding a Short Distance North on Trail 115 from the Junction of Trail 116	54.5	53.0	26.3	72.0
		11-24-09	Three OHVs Riding on Trail 115 Roundtrip from Just North of the Junction of Trail 116 to the Terminus of Trail 115	31.7	34.8	25.4	51.6
		11-24-09	Five OHVs Riding on Trail 115 from a Point Just North of the Junction of Trail 116 to the Junction of Trail 116 and Idling at Demonstration Point C	53.1	45.6	25.8	73.0
		11-24-09	Five OHVs Riding on Trail 116 from the Junction of Trail 114 to the Terminus of Trail 116	34.4	36.8	25.0	47.2
		11-24-09	Five OHVs Idling at Demonstration Point D and Riding on Trail 117 from the Terminus to the Junction of Trail 111 (Downhill)	49.0	44.8	26.8	69.7
		11-24-09	Five OHVs Riding on Trail 117 from the Junction of Trail 111 to Terminus (Uphill)	42.2	44.5	31.6	61.1
		11-24-09	Five OHVs Riding on Trail 117 to the Junction of Trail 111 (Downhill)	34.2	36.0	31.6	46.4
		11-24-09	Five OHVs Riding on Trail 111 from the Junction of Trail 117 to the Junction of Trail 114	35.7	38.7	31.6	49.8
		11-24-09	Five OHVs Riding on Trail 110 from the Junction of Trail 114 to Terminus	40.4	45.1	31.6	51.4
		11-24-09	Five OHVs Riding on Trail 110 from Terminus to the Junction of Trail 114	50.7	42.9	31.6	74.82

Site#	Noise Measurement Collection Location	Date	Activity	Measured Sound Level (dBA)			
				Average (Leq)	L_{10}	Residual (L_{90})	Max (L_{max})
6	West Forest Creek Road	11-24-09	Background	32.0	31.6	31.6	42.3
		11-24-09	Five OHVs Riding on Trail 111 and Trail 110 from Demonstration Point A to the Terminus of Trail 110	50.3	46.5	31.6	71.2[3]
		11-24-09	Five OHVs Riding on Trail 120 from Junction of Trail 110 to Junction of Trail 140	33.5	34.5	31.6	51.7
7	China Gulch Road	11-24-09	Background	NA	NA	NA	NA
		11-24-09	Two OHVs Riding Trail 112 Hill Climb (Roundtrip) and Idling at Demonstration Point E	60.6	57.1	31.6	82.0
8	Galls Creek Road	11-28-09	Background	NA	NA	NA	NA
		11-28-09	Ambient (With Audible OHV Activity)	32.8	32.0	31.6	46.5
9	Kane Creek Road	11-28-09	Background	NA	NA	NA	NA
		11-28-09	Ambient (With Audible OHV Activity)	36.3	37.9	33.1	51.1
10	Jacksonville Reservoir Road	11-28-09	Background	NA		NA	NA
		11-28-09	Ambient (With Audible OHV Activity)	48.5	40.4	31.6	66.8

NA – Background noise levels could not be assessed due to audible OHV activity in the area.

1 – Noise Measurements taken during foggy and drizzly weather conditions which may have affected audible sound levels (Bohn, 1988).

2 – Maximum recorded noise level of 74.8 dBA was associated with vehicle on Forest Creek Road passing in close proximity to noise meter during study; maximum noise level observed from OHV activity was 54.4 dBA.

3 – Maximum recorded noise level of 71.2 dBA associated with vehicle on West Forest Creek Road passing in close proximity to noise meter during study; maximum noise level observed from OHV activity was 54.0 dBA

During the noise study, the short-term background (noise environment without audible OHV activity) L_{eq} measurements ranged from 28.4 dBA (with a L_{max} of 39.1 dBA) measured at Observation Point 4 to 44.6 dBA (with a L_{max} of 60.0 dBA) measured at Observation Point 1. The background noise at Observation Point 1 was heavily influenced by vehicle traffic on Forest Creek Road and Highway 238. The OHV warm-up activities at Demonstration Point A (Bunny Meadows Staging Area) generated the greatest noise levels as measured at that site with a L_{eq} of 71.3 dBA and L_{max} of 84.6 dBA primarily. These levels are greater primarily due to the close proximity of OHVs to the noise monitoring location. The L_{eq} noise measurement of the OHV warm-up activities measured at the nearest sensitive receptor (i.e. residence on Longnecker Road) was 50.3 dBA (with a L_{max} of 73.6 dBA). The only measured L_{eq} of greater than 60 dBA observed in close proximity to a sensitive receptor was observed at Observation Point 7, which was approximately 100 yards from a residence adjacent to the existing trails. Specifically, the staged activity of two OHVs completing a roundtrip up the adjacent Trail 112 hill-climb produced a L_{eq} of 60.6 dBA with a L_{max} of 82.0 dBA as measured at Observation Point 7.

Weather conditions during the noise studies at Observation Points 3 and 4 were rainy with a low overcast. Precipitation, rain, or fog has an insignificant effect on sound levels although the presence of precipitation will affect relative humidity which does have an effect on sound levels (Truax, 1999). In general, audible sound increases with an increase in relative humidity (Attenborough et. al., 2007). Accordingly, the measured sound during the staged OHV activities may be greater than during clear weather conditions when relative humidity is low. At Observation Point 3, the measured background L_{eq} was 32.9 dBA with a Lmax of 55.2 dBA. The "residual" noise level is represented by the L_{90} of 26.5 dBA. At Observation Point 4, the measured background L_{eq} was 28.4 dBA with a L_{90} of 25.5 and Lmax of 39.1 dBA. At Observation Point 3 the measured L_{eq} and L_{90} produced during the staged OHV activity of riding on Trails 130 and 140 with the staged idling activity at Demonstration Points F and G was 36.7 dBA and 28.3 dBA respectively with a measured L_{max} of 60.5 dBA. At Observation Point 4, the measured L_{eq} for the staged OHV activity ranged from 32.2 dBA to 40.7 dBA depending on which trail was run. The L_{90} for those activities ranged from 25.7 to 32.9 dBA with measured L_{max} ranging from 48.7 dBA to 62.1 dBA. The L_{eq} for all the staged OHV activities at both Observation Points 3 and 4 were greater than the L_{eq} observed during the background noise measurements when there was no staged OHV activity.

Noise levels measured at Observation Point 5 were generally greatest during the staged OHV activity on Trail 115. The L_{eq} noise levels generated by the staged OHV activity as measured at Observation Point 5 ranged 31.7 dBA to 54.5 dBA and L_{max} ranging from 45.6 dBA to 74.8 dBA. However, the L_{max} of 74.8 dBA was attributed to cars passing by on Forest Creek Road. In this instance the L_{10} of 42.9 dBA may be more representative of the noise environment with staged OHV activity than the Leq of 50.7 dBA measured during this test. The L_{eq} for the staged activities were less than the background noise L_{eq} in 2 of the 14 noise measurements, although the L_{eq} for the staged activities were all greater than the background L_{90} of 31.6 dBA.

The greatest noise levels measured at Observation Point 6 were due to vehicle traffic on West Forest Creek Road that produced a L_{max} of 71.2 dBA. The L_{10} of 46.5 dBA observed during the staged OHV activity may be more representative of the noise environment during the study than the L_{eq} of 50.3 dBA. Not including the L_{max} produced by local traffic, the L_{max} associated with the staged OHV activity was 54.0 dBA with five OHVs riding on Trails 111 and 110. The staged OHV activity on Trail 120 resulted in a L_{max} of 51.7 dBA. The L_{max} of the stage OHV activity as measured at Observation Point 6 was somewhat greater than the L_{max} of 42.3 dBA that was observed during the background noise measurement.

OHV noise levels are generally greater while traveling up hill. Accordingly, the staged OHV hill-climb on Trail 112 produced one of the greatest noise levels observed during the study at Observation Point 7 with a L_{max} of 82.0 dBA. Background noise levels could not be measured at Observation Point 7 because there was additional nearby OHV activity that influenced the noise environment. The L_{eq} at Observation Point 7 during the staged OHV activity was 60.6 dBA with a L_{10} of 57.1 dBA.

No staged OHV activity was performed during the noise study at Observation Points 8, 9, and 10 although there was OHV activity on adjacent trails which precluded background noise measurements. The L_{eq} at those locations ranged from 32.8 to 48.5 dBA with L_{max} ranging from 46.5 to 66.8 dBA. The residual noise levels at those locations were relatively high with the L_{90} ranging from 31.6 to 33.1 dBA.

1.6 References

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