APPENDIX H
Fish, Wildlife, and Plants

This appendix contains additional biotic community and threatened and endangered species information used in Sections 4.6 and 5.6 of the EIS to describe existing conditions of, and projected impacts on, fish, wildlife, and plants.

H-1 Information Concerning Species of Elevated Concern

H-2 Mammoth Yosemite Airport Proposed Operations Specification Amendment Section 7 Consultation Effect Determination

H-3 Mammoth Yosemite Airport Assessment of Jet Overflight on Lekking Sage Grouse

H-4 Aircraft Noise Data for Assessment of Q400 Aircraft Overflights on Lekking Sage Grouse

Appendix H-1

Information Concerning Species of Elevated Concern

This appendix includes additional information concerning species identified by resource agencies as being of elevated concern during the scoping process for this EIS.

WILDLIFE

During the scoping process for the preparation of this EIS the following additional upland wildlife species known to occur in the vicinity of MMH were identified as being of elevated interest by the U.S. Fish and Wildlife Service (USFWS), Bureau of Land Management (BLM), and the Californian Department of Fish and Game (CDFG).

Mule deer

Mule deer are considered an important harvest species in California and the health of each migratory herd is monitored by the CDFG. Mule deer that inhabit the study area and surrounding vicinity are primarily from the Round Valley herd (Kucera 1988, Taylor 1988, U.S. Forest Service 1990). In the spring (early April), the herd typically migrates north from the Round Valley wintering range to a holding area near Mammoth Lakes. This holding area typically comprises approximately 11,300 acres at elevations between 7,200 and 8,000 feet. During this period, the deer feed on herbaceous growth. After they regain the condition lost over the winter, they migrate to summer range, located primarily on the eastern slopes of the Sierra Nevadas (Kucera 1988). Known points of concentrated migration movements are indicated in **Figure 1**.

Based on the Jones & Stokes Biological Study (2001) prepared for the Environmental Assessment of a previous proposed expansion at MMH, suitable vegetation for mule deer foraging is located on and adjacent to the airport. The area between the runway and U.S. Highway 395 is of lower quality due to high levels of disturbance from roads, airport facilities, and human activities. Based on a pellet group study, the deer utilize the western half of the airport property much more frequently, likely due to the higher habitat quality.

Sage grouse

The sage-grouse (*Centrocercus urophasianus*) is the largest of the North American grouse, ranging from 27 to 34 inches in length and weighing from five to seven pounds. It has a long, pointed tail with legs feathered to the base of the toes. Females are a mottled brown, black, and white color. Males are larger and have a large white ruff around their neck and bright yellow air sacks on their breasts, which they inflate during their mating display. The birds are found at elevations ranging from 4,000 to over 9,000 feet and are highly dependent on sagebrush for cover and food. The range of the sage-grouse in the vicinity of Mammoth Lakes is shown in Figure 1.

Sage grouse engage in a lek mating system. The males perform a strutting display that includes fanning of the tail feathers, expanding the esophageal pouches to produce a sound referred to as “plops.” The lek is considered to be the center of year-round activity for resident grouse populations. Typically, most grouse nests are located within 4 miles of the lek area; however, some females may nest more than 12 miles from the lek (Wakkinen et al. 1992).

In 2005, the USFWS declined a petition to list the sage grouse as Endangered. Greater sage grouse are currently estimated to number from approximately 100,000 to 500,000 individuals. Sage grouse populations are estimated to have declined an average of 3.5 percent per year from 1965 to 1985.

Since 1986, however, populations in several states have increased or generally stabilized and the rate of decline from 1985 to 2003 slowed to 0.37 percent annually for the species across its entire range. In addition to these data, other contributing factors to the decision to not list this species include: 92 percent of the known active leks occur in 10 core populations across eight western states, five of these populations are large and expansive, and there are approximately 160 million acres of sagebrush, a necessary habitat for sage grouse, currently exists across the western landscape. In response to the listing petition, state wildlife agencies and BLM have increased their management programs aimed at greater protection and enhancement of grouse habitat and populations. A subsequent petition to list the sage grouse has been submitted and is under consideration by the USFWS.

Sage grouse are found in Washington, Oregon, Idaho, Montana, North Dakota, eastern California, Nevada, Utah, western Colorado, South Dakota, Wyoming, and the Canadian provinces of Alberta and Saskatchewan. The sage grouse is a game species in 10 states. An ongoing study conducted by the USGS (Personal Communication 2004) has determined that the sage grouse utilize the area surrounding MMH for foraging, nesting, and breeding, as shown on Figure 1. URS biologists observed the response of grouse at the lek nearest to MMH to overflights of a small corporate jet aircraft (Appendix H-3).

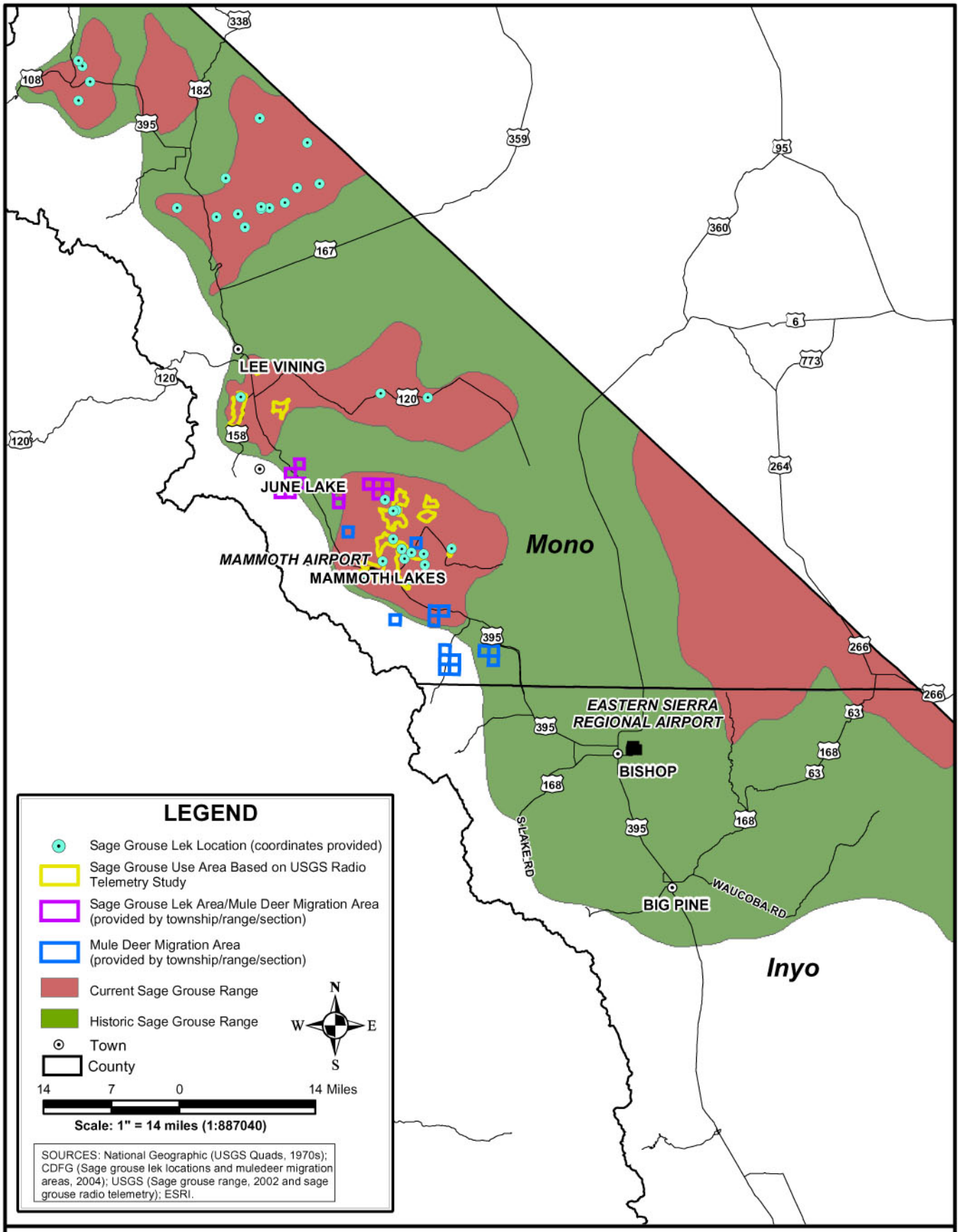
Pygmy Rabbit

Pygmy rabbits (*Brachylagus idahoensis*) are a small rabbit species endemic to the Great Basin desert and surrounding intermountain areas. The U. S. Fish and Wildlife Service (USFWS) has indicated this species may occupy lands in the vicinity of MMH. Pygmy rabbits require dense stands of big sagebrush (*Artemisia tridentata*) for both food and cover. Sagebrush comprises 99 percent of their winter diet, and 51 percent of their summer diet. Also unique among western North American rabbits is the pygmy rabbit's burrowing habit. Burrow systems are typically constructed under clumps of big sagebrush, once again reinforcing the vital role of sagebrush to pygmy rabbit survival.

The non-game pygmy rabbit is considered a sensitive species/species of concern. In May 2005 the USFWS declined an initial petition to list this species. While the pygmy rabbit is not currently a federally-listed species, the USFWS continues to monitor its status. Given their reliance on sagebrush, pygmy rabbits have been characterized as habitat specialists or obligates. Consequently, reductions of suitable sagebrush habitat by agriculture, grazing, and development have had a significant impact on this species. Another factor that affects the abundance of this species is its limited ability to disperse long distances and to cross open habitat.

SPECIAL STATUS SPECIES

Sensitive plants and animals are those identified as rare or endangered, or that are depleted or declining, as listed by the U.S. Fish and Wildlife Service (USFWS), California Department of Fish and Game (CDFG), and the California Native Plant Society (CNPS). Surveys were conducted on the property for plant and animal species and habitats that have been historically recorded from the project vicinity by the USFWS, CNPS, and the CDFG. Tables 1 and 2 list the special status species found in Inyo and Mono Counties, as identified by the USFWS letter dated August 5, 2004. **Figure 2** indicates the locations of sensitive species in the general vicinity of Mammoth Lakes.



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MAMMOTH AIRPORT EIS
SAGE GROUSE BREEDING AND MULE DEER MIGRATION AREAS

Figure 1

g:/gis/projects/1512/12004269/mxd/ml_eis_mammoth_utm83.mxd.

Yosemite toad
Sierra Nevada red fox
Crestview Roadside Rest
Lookout Mo
Mono milk-vetch
Mono milk-vetch
Mono Lake lupine
Mono Lak
northern goshawk
Mono milk-vetch
Mono milk-vetch
Bear Mountain
Mono milk-vetch
Mono milk-vetch
Inyo Crater Lakes
395
Smokey Bear Flat
Mono milk-vetch
Mono milk-vetch
Mono Lake lupine
Mono Lake lupine
Pacific fisher
Pacific fisher
Mono Lake lupine
MAMMOTH LAKES
Mono Lake lupine
Mono Lake lupine
395
Mammoth Mtn
great gray owl
Mammoth Pass
Yosemite toad
Yosemite toad
Laurel Mountain
hoary draba
Duck Pass
Bloody Mountain
goshawk
seep kobresia
mountain yellow-legged frog
mountain yellow-legged frog

OVERVIEW MAP

Mono County
MAMMOTH LAKES
Mammoth Lakes Airport
Eastern Sierra Regional Airport
Inyo County

LEGEND

- Sensitive Species Location (Federal Listed Species)
- Sensitive Species Location (CDFG Listed Species)
- Sensitive Species Location (State Listed Species)
- Sensitive Species Location (CNPS Listed Species)

Vegetation

- Dist/Dev/Ag
- Grassland
- Rocky/Barren
- Snow/Ice
- Forest/Woodland
- Riparian
- Shrub/Scrub
- Water

5 Mile Radius

Private Land

Terrain >25 % Slope
Note: Slope derived from BLM 500-ft hypsography data, 2000

1 0.5 0 1 Miles

Scale: 1" = 1 mile (1:63,360)

SOURCES: CA Dept. of Forestry (1998 FRAP Vegetation);
USFS (Ownership and Landmarks 2004);
CA GAP Analysis/UCSB (1998 GAP Vegetation);
BLM (Hypsography, 2000 and Hydrography, 1998);
CNDDB (October 2004); ESRI.

N
W E
S

Figure 2

Mammoth Lakes EIS
Vegetation and Sensitive Species
Mammoth Lakes, CA

Sensitive Plants

No special status plant species were identified in the MMH study area during the field surveys. No Federal or State listed plant species were identified by the CNNDB, but three CNPS plant species were identified: Alkali ivesia (*Ivesia kingii* var*. kingii*), Lemmon's milk-vetch (*Astragalus lemmoni*), and scalloped-leaved lousewort (*Pedicularis crenulata*). These plant species are summarized in Table 2. The following text describes these species in further detail.

Alkali ivesia is in the family Rosaceae. It is a perennial herb that is native to California, Nevada, and Utah. It is typically associated with the Sagebrush Scrub and Alkali Sink communities. It is ranked by the California Native Plant Society as rare (List 1B).

Lemmon's milk-vetch is in the family Fabaceae. It is a perennial herb that is native to California and is also found outside of California, but is confined to western North America. It is typically found in the Sagebrush Scrub community and adjacent wetlands. It is found at elevations between 4,265 and 7,218 feet. It is ranked by the CNPS as rare (List 1B).

Scalloped-leaved lousewort is a dicot in the family Scrophulariaceae. It is a perennial herb that is native to California and is also found outside of California, but is confined to western North America. It is typically associated with meadows and seeps. It is ranked by the CNPS as rare (List 1B).

Sensitive Wildlife

According to the CNNDB, there are four species that have the potential to occur in the vicinity of MMH: Owens pupfish (*Cyprinodon radiosus*), Owens speckled dace (*Rhinichthys osculus ssp.*), Owens sucker (*Catostomus fumeiventris*), and Owens tui chub (*Gila bicolor snyderi*). All four species are small fish endemic to the Owens River and tributaries. These species are summarized in Table 2. The following text describes these species in further detail.

Owens pupfish is listed as Federally endangered. Critical Habitat has not been designated (USFWS 1998). It is a small fish with a total length of 2.5 inches. The species is sexually dimorphic: males are bright blue and females are olive green with several dark vertical bands along the sides. Pupfish occupy most available habitat where water is relatively warm and food is plentiful. Population decline has been attributed to competition and predation by non-native species and habitat modification of the Owens River. Extant populations have been propagated from a remnant stock rediscovered in Fish Slough. Extant populations occur in refuges at Fish Slough, BLM Spring, and Warm Springs.

Owens speckled dace is a state Species of Concern (USFWS 1998). They are highly variable in morphology, but are generally distinguished by small, subterminal mouths, pointed snout, small, irregularly placed scales, and torpedo-shaped body. The total body length is usually less than 90 mm. Typically, dorsal fin rays number 8 (range 6-9) and anal fin rays number 7 (range 6-8). As their common name indicates, numerous black speckles cover the body. In general, speckled dace feed on small aquatic insects and algae (Moyle 1976). They typically live three years and attain a maximum size of 80 mm in inland basins (Moyle 1976). Speckled dace from the Owens Basin are known to occupy a variety

of habitats ranging from small coldwater streams and hot-spring systems, although they are rarely found in water exceeding 29 C.

Owens sucker is a state Species of Concern (USFWS 1998). Owens sucker is slate gray on the back that fades to faint blue on the laterals, and have a white belly. They occupy lakes and streams and probably require gravel substrates for spawning. They feed nocturnally on insects, mollusks, vegetation, and detritus. Threats to the Owens sucker include non-native fish (predators and competitors), introduced species that may hybridize, and water management strategies that dry habitats. They are common in Crowley and Convict Lakes in the upper Owens River and in Bishop Creek, Rock Creek, and irrigation canals near Bishop.

Owens tui chub is Federally listed as endangered (USFWS 1998). Critical habitat for the Owens tui chub includes two areas: 1) The Owens River from Long Valley Dam downstream for a distance of 8 stream miles and 2) a portion of Hot Creek and its outflows and includes areas of land within 50 feet on all sides of these drainages (50 FR 31594). It is one of several cyprinids found throughout the Great Basin and Pacific Ocean drainages. It is endemic to the Owens River basin in Mono County and is restricted to five isolated locations: Hot Creek headsprings, Owens River downstream from Crowley Lake, springs and seeps along the western shore of Owens Lake, Owns Valley Native Fish Sanctuary, and Little Hot Creek. They are opportunistic feeders with their principal food sources (chironomid larvae, caddisfly larvae, and detritus) eaten throughout the year. Owens tui chub spawn from late winter to early summer in areas of aquatic vegetation. The reasons for the decline of Owens tui chub have been attributed to the introduction of Lahontan tui chub into Crowley Lake, predation by exotic species, and water development. The nearest occurrence of fish is located at Hot Creek headsprings, approximately 0.75 miles northwest of the MMH airport runway (USFWS 1998).

Other special status species specifically identified by the USFWS in the previous consultation include the bald eagle (*Haliaeetus leucocephalus*), Lahontan cutthroat trout (*Oncorynchus clarki henshawi*), and Sierra Nevada bighorn sheep (*Ovis canadensis californiana*). The following text describes the species in further detail.

The bald eagle is primarily a fish and carrion feeder whose winter range includes portions of Mono County, including areas adjacent to the Town of Mammoth Lakes. The species' federal status was changed from endangered to threatened in 1995 and the species was removed from the Endangered Species List in 2007. It is still protected under the Migratory Bird Treaty Act and the Golden Eagle Protection Act. They are known to congregate at sites generally in proximity to open water with perch trees and night roosts. They have been reported perching on utility poles at the Hot Creek Fish Hatchery. Once seriously endangered by hunting, loss of habitat, and the use of DDT, recent surveys have indicated that western populations are on the increase (Jones and Stokes 1996).

Lahontan cutthroat trout is a subspecies endemic to the Lahontan basin in northern Nevada, eastern California, and southern Oregon. This trout was federally listed as endangered in 1970, but was reclassified as a threatened species in 1975 (40 FR 289864). The Lahontan cutthroat is both a river- and lake-residing fish. Lahontan cutthroat typically spawn from April through July, depending on water temperature and water flow; however, spawning later than this is not uncommon. The loss of riparian

vegetation, channelization, human development, water management, and hybridization with other trout have contributed to the species' decline. The closest population of Lahontan cutthroat trout is approximately 6 miles north of the project site in O'Harrel Canyon Creek, a tributary to the Owens River (Jones & Stokes 2001).

Sierra Nevada bighorn sheep is federally listed as endangered. It is one of three bighorn sheep subspecies to occur in California and is considered a distinct vertebrate population. These bighorn sheep use habitats ranging from the highest elevations (13,120 plus feet) along the crest of the Sierra Nevada to winter ranges at the eastern base of the range as low as 4,760 feet. These habitats range from Great Basin sagebrush scrub to alpine. In 1995 these bighorn sheep hit a population low of about 100 total individuals, distributed across 5 separate areas of the southern and central Sierra Nevada, but has subsequently increased to about 250 individuals in 2001 (USFWS 2003). The populations of sheep closest to the MMH project site are in Lee Vining Canyon and Wheeler Crest (USWFS 2003). The Wheeler Crest population is approximately 12 miles southeast of the airport and the Lee Vining population is approximately 20 miles northwest of the airport.

Table 1
Federal Status Species in Inyo and Mono Counties

Common Name	Scientific Name	Federal Status
Plants		
Fish Slough milk-vetch	*Astragalus lentiginosus var. piscinensis*	T
Amphibians		
Mountain yellow-legged frog	*Rana muscosa*	C
Yosemite Toad	*Bufo canorus*	C
Birds		
Bald eagle	*Haliaeetus leucocephalus*	SC
Least Bell's vireo	*Vireo bellii pisullus*	E, CH
Southwestern willow flycatcher	*Empindonax traillii extimus*	E
Yellow-billed cuckoo	*Coccyzus americanus*	C
Fish		
Owens tui chub	*Gila bicolor snyderi*	E, CH
Owens pupfish	*Cyprinodon radiosus*	E
Mammals		
Fisher	*Martes pennanti*	C
Desert bighorn sheep	*Ovis candanensis californiana*	E

C = Candidate, E = Endangered, T = Threatened,
SC = Species of Concern, CH = Critical Habitat

Source: USFWS letter dated August 5, 2004.

Table 2
Special Status Species in Vicinity of MMH

Common Name	Scientific Name	Federal Status	State Status	CNPS
Plants				
Alkali ivesia	*Ivesia kingii var. kingii*	--	--	1B
Lemmon's milk-vetch	*Astragalus lemmoni*	--	--	1B
Scalloped-leaved lousewort	*Pedicularis crenulata*	--	--	1B
Fish				
Owens pupfish	*Cyprinodon radiosus*	E		
Owens speckled dace	*Rhinichthys osculus sp.*	--	SC	
Owens sucker	*Catostomus fumeiventis*	--	SC	
Owens tui chub	*Gila bicolor snyderi*	E	E	--
Lahontan cutthroat trout	*Oncorhynchus clarki henshawi*	T		
Birds				
Bald eagle	*Haliaeetus leucocephalus*	T	E	
Mammals				
Sierra Nevada bighorn sheep	*Ovis canadensis californiana*	E	T	

Appendix H-2

Biological Assessment

This appendix contains the Mammoth Yosemite Airport Proposed Operations Specification Amendment Section 7 Consultation Effect Determination and associated correspondence between FAA and the U.S. Fish and Wildlife Service.

U.S Department
of Transportation

**Federal Aviation
Administration**

Western-Pacific Region
Airports Division
San Francisco Airports District Office

831 Mitten Road, Suite 210
Burlingame, CA 94010-1300

November 15, 2006

Mr. Ray Bransfield
United States Department of the Interior
Fish and Wildlife Service
Ventura Fish and Wildlife Office
2493 Portola Road, Suite B
Ventura, CA 93003

Dear Mr. Bransfield:

**Proposed Horizon Air Operation Specification Amendment
For Air Service to Mammoth Yosemite Airport
Mammoth Lakes, California
Biological Assessment**

As we discussed on August 12, 2006, the Federal Aviation Administration (FAA) received a request from Horizon Air to approve an amendment to its Operation Specifications to allow the airline to provide scheduled air service to Mammoth Yosemite Airport (MMH), Mammoth Lakes, California. Horizon Air proposes to provide regional air service to MMH using a Bombardier DHC 8-402 (Q400) turboprop aircraft. The initial service would be provided from Los Angeles International Airport to MMH with two flights per day during the winter ski season, approximately December through April. The Q400 can be accommodated within the existing configuration of the airport.

The FAA issued a notice of its intent to prepare a National Environmental Policy Act (NEPA) Environmental Impact Statement to evaluate the potential impacts of the proposed air service in the Federal Register on July 24, 2006. As part of the environmental evaluation process and in order to ensure compliance with the Endangered Species Act of 1973, as amended, the FAA prepared the enclosed Biological Assessment (BA) to document the potential of the proposed action to affect federally listed or proposed species and their critical habitat. The BA evaluates the species identified in your letter of October 3, 2006 and the federally listed species for the MMH area identified in the California Department of Fish and Game's Natural Diversity Data Base. Although not relevant for inclusion in this BA, the FAA will address species of heightened concern such as the sage grouse (*Centrocercus urophasianus*) in the FAA's NEPA document for the proposed action.

Based upon the analyses provided in the BA, the FAA has determined that the proposed action will not have any direct or indirect effect on the federally listed threatened or endangered species or their critical habitat. As a result of this determination the FAA believes that formal Section 7 consultation pursuant to Title 50 Code of Federal Regulations, Part 402.14 is not required.

We respectfully request FWS timely concurrence with our determination. Receipt of the FWS response by December 15, 2006 would be greatly appreciated. Please feel free to give me at call at (650) 876-2778 extension 613 if you have any questions or concerns regarding this matter.

Sincerely,

Camille Garibaldi
Environmental Protection Specialist

Enclosure

MAMMOTH YOSEMITE AIRPORT PROPOSED OPERATION SPECIFICATION AMENDMENT SECTION 7 CONSULTATION EFFECT DETERMINATION

This Biological Assessment (BA) is in support of FAA action to approve proposed scheduled air service into Mammoth Yosemite Airport (MMH) and is a follow-up to our August 22, 2006 meeting. The Federal Aviation Administration (FAA) is the lead agency under the National Environmental Policy Act (NEPA) for the preparation of an Environmental Impact Statement (EIS) regarding the proposed action. The EIS is being prepared by the FAA to evaluate the environmental impacts of the proposed action. This BA identifies the potential biological effects on threatened and endangered species protected under the Endangered Species Act (ESA) that my result from implementation of the proposed action and summary of effect determination. Other sensitive species of interest (e.g., California Department of Fish and Game [CDFG] and Bureau of Land Management [BLM],) are addressed in the EIS.

DESCRIPTION OF THE AREA

The MMH is located within the East Sierra Nevada Region of the Great Basin Floristic Province at approximately 7,080 to 7,130 feet above sea level (ASL). The study area is within and in the vicinity of the existing MMH airport, U.S. Highway 395 (US 395), and Airport Road. The site is dominated by big sagebrush and includes a non-jurisdictional dry meadow located between the east end of the airport runway and Benton Crossing Road. The study area was initially determined by the Community Noise Equivalent Level (CNEL) 65 dB contour of the airport (Figure 1) then was expanded to consider the area surrounding the airport. The proposed action will result in no change to the Airport Layout Plan for MMH.

PROJECT DESCRIPTION

PROPOSED ACTION

Horizon Air has provided the FAA with a letter indicating its intent to initiate passenger service into MMH using Bombardier DHC 8-402 (Q400) aircraft (see Figure 2 for photo of the Q400 aircraft). Horizon Air is proposing to begin scheduled regional air carrier service using existing facilities at MMH beginning in December 2007 with two flights per day from Los Angeles International Airport (LAX) during the winter season (December to April). Proposed winter ski season service is projected to increase to a maximum of eight flights per day by the year 2011. The approved aviation activity forecast also projects the addition of two flights per day during the summer months beginning in 2011. The Town of Mammoth Lakes has provided a forecast of future commercial aircraft operations and enplanements at MMH, should the Horizon Air proposed service be approved. The FAA has reviewed and approved the aviation forecast, which is summarized in Table 1.

The establishment of scheduled commercial service into MMH also necessitates a change in the airport's Operating Certificate from Class IV to Class I, pursuant to Title 14, Code

of Federal Regulations, Part 139. Class I airports may provide scheduled service by aircraft capable of carrying 30 or more passengers. The airport can currently accommodate non-scheduled passenger air service with similar sized aircraft under its current Part 139 Class IV certification. The proposed air service will utilize the existing airport runway and facilities.

NO ACTION

Under the No Action Alternative, the FAA would not approve the revised operations specifications submitted for Horizon Air and would not approve the request for reclassification of MMH Part 139 Certificate from Class IV to Class I. Non-scheduled passenger air service operations at MMH would continue under the existing Part 139 Class IV Certificate.

SPECIES EVALUTATION

Special status plants and animals are those identified as rare or endangered, or that are depleted or declining, as listed by the U.S. Fish and Wildlife Service (USFWS). Surveys were conducted on the project site for plant and animal species and habitats that have been historically recorded from the project vicinity as summarized by Jones & Stokes (2001). Prior to conducting field surveys, a literature and information search to identify special status species known to occur in or with the potential to occur in the project region. Sources included the California Natural Diversity Database (CNDDB 2000), the California Native Plant Society (CNPS) Inventory of Rare and Endangered Vascular Plants of California, current wildlife literature, previously prepared environmental documents, and local agency personnel such as CDFG, U.S. Forest Service (USFS), and BLM. The CNDDB was queried to determine if any new special status species were documented in the project region (Bloody Mountain, Convict Lake, Old Mammoth, and Whitmore Hot Springs 7.5' USGS quadrangle maps) on October 18, 2006.

No special status plants were listed in the databases in the project vicinity. Surveys were conducted for special status plant species during the surveys for special status wildlife species. No special status plant species were detected.

According to the letter received from the USFWS, dated October 3, 2006, there are three Federally-listed wildlife species that have the potential to occur in the vicinity of MMH (summarized in Table 2): Owens tui chub (*Gila bicolor snyderi*), Sierra Nevada bighorn sheep (*Ovis canadensis californiana*), and bald eagle (*Haliaeetus leucocephalus*). According to the CNDDB, there are four additional Federally-listed wildlife species that have the potential to occur in the project region (summarized in Table 3): Lahontan cutthroat trout (*Oncorynchus clarki henshawi*), mountain yellow-legged frog (*Rana muscosa*), Yosemite toad (*Bufo canorus*), and Pacific fisher (*Martes pennanti*). Although these additional species identified by the CNDDB are known to occur in the region, they do not occur in the airport vicinity and would, therefore, not be affected by the proposed action. No further analysis is required for these species. The following text describes species identified by the USFWS in further detail.

ENDANGERED SPECIES

Owens Tui Chub

Status: Owens tui chub was listed as Federally Endangered on August 5, 1985 (50 FR 31592) and State listed as Endangered on January 10, 1974. Critical habitat has been designated at two sites (50 FR 31594): 1) 8 miles of Owens River, including 50 feet of riparian vegetation on either side of the river, encompassing a total of 97 acres in Owens Gorge; and 2) two spring provinces and 50 feet of riparian vegetation on either side of spring brooks, encompassing approximately 5 acres at Hot Creek Fish Hatchery. A Recovery Plan was finalized in 1998 (USFWS 1998).

Description: The Owens tui chub is a small fish, reaching total lengths up to 12 inches. The dorsal and lateral coloration varies from bronze to dusky green, grading to silver or white on the belly. They are believed to be derived from the Lahontan tui chub and are distinguished from the Lahontan tui chub by scales with a weakly developed or absent basal shield, lateral and apical radii than number 13 to 29, the number of anal fin rays, and 52 to 58 lateral line scales.

Distribution: Early collections in the Owens Basin documented tui chub in Owens Lake, sites along Owens River from Long Valley to Lone Pine, tributary streams near the Owens River, and irrigation ditches and ponds near Bishop, Big Pine, and Lone Pine (USFWS 1998). This distribution suggests that Owens tui chub occupied all valley floor wetlands near the Owens River in Inyo and Mono Counties. Habitats currently occupied by Owens tui chub include headsprings at Hot Creek Fish Hatchery, Owens River downstream from Crowley Lake, ponds at Cabin Bar Ranch near Lone Pine, and Mule Spring. The nearest occurrence of the Owens tui chub to MMH is located at Hot Creek Fish Hatchery, approximately 0.75 mile northwest, as shown on Figures 1 and 3 (USFWS 1998).

Habitat: Owens tui chub prefer pool habitats with low current velocities and dense aquatic vegetation that provide adequate cover and habitat for insect food items. They also consume detritus and aquatic vegetation.

Natural History: Few studies have examined Owens tui chub behavior, so the life history is generally surmised from studies of other tui chub species. They congregate in late winter to early summer to spawn over aquatic vegetation or gravel substrate. Females produce a large number of eggs. They may reach sexual maturity at 2 years and may live for more than 30 years.

Reason for Decline/Vulnerability: Population decline for this species has been attributed to the introduction of Lahontan tui chub into Crowley Lake (competition and hybridization), predation by exotic species, and water development that affects their habitat.

Potential Effects of Proposed Action: The proposed action will not affect the Owens tui chub at Cabin Bar Ranch, and Mule Spring. We have reached this conclusion because of

the distance from these locations from MMA (i.e., approximately 90 miles to Cabin Bar Ranch and over 20 miles to Mule Spring).

Because of the proximity of MMH to the Hot Creek Fish Hatchery and the Owens River, we determined that the proposed action may affect the Owens tui chub and its critical habitat. Runoff from MMH could potentially enter habitat of the Owens tui chub at the Hot Creek Fish Hatchery or the Owens River; MMH is located approximately 0.75 and 1 mile away from the Hatchery and Owens River, respectively.

We subsequently determined that the proposed action is not likely to adversely affect the Owens tui chub or its critical habitat at the Hot Creek Fish Hatchery or in the Owens River. We have reached this conclusion for several reasons. First, the proposed action does not involve any ground-disturbing activities or increased impervious areas that could result in water quality degradation at the Hatchery or of the Owens River.

Second, runoff from the designated deicing area, in the event that it is used, will be contained in existing drainage structures and potential contaminants properly disposed of pursuant to U.S. Environmental Protection Agency (USEPA) Deicing Guidelines 821-R-00-016 (EPA 2000). Due to of the historically moderate ambient temperatures and storm patterns at MMH, the need to deice aircraft has been limited. As stated in the 2000 EA, Airport management indicated that there have been only three times in the past three years when aircraft have required deicing services. From 1992 through 1995, when two airlines provided five flights per day, no deicing services were necessary (Town of Mammoth Lakes 2000). For the EIS analysis we have assumed that deicing might be required for up to one-third of the Q400 flights, based on the experience of Horizon Air at other mountain airports. Even under this assumed level of deicing activity, the containment facility and spent fluid disposal process has the capacity to prevent discharges.

Finally, MMH is located in an area with very high surface infiltration rates, with groundwater flows from west to east across the surface drainage divide from the Mammoth Creek/Hot Creek watershed to the Convict Creek watershed (Triad/Holmes Associates 1997). Groundwater gradient maps indicate that MMH and its water supply wells are down-gradient from the Hot Creek Fish Hatchery and the headsprings of Hot Creek (Lahontan Regional Water Quality Board 2002).

Sierra Nevada Bighorn Sheep

Status: The population of bighorn sheep in the Sierra Nevada of California was Federally listed as Endangered on January 3, 2000 (65 FR 20), following emergency listing on April 20, 1999 (64 FR 19300). A Draft Recovery Plan was released in 2003 (USFWS 2003). There is no critical habitat. It was listed as State Threatened on June 27, 1971 and reclassified as Endangered on August 27, 1999.

Description: The Sierra Nevada bighorn sheep is one of three bighorn sheep subspecies to occur in California and is considered a distinct vertebrate population (USFWS 2003). Bighorn sheep have a generally stocky build. As adults, Sierra Nevada bighorn sheep

stand about three feet tall at the withers and weigh up to 140 pounds for females and 220 pounds for males. Coat color is variable from almost white to dark brown with a distinctive large white rump patch and a short dark tail. Females carry small narrow horns which rarely exceed 12 inches in length, while males carry more massive horns used in ritual jousting matches for dominance. The horns of male Sierra Nevada bighorn sheep are notably wide and flaring, but are relatively small compared to other bighorn sheep species.

Distribution: Historically, bighorn sheep herds were scattered along and east of the alpine crest of the Sierra Nevada from the Sonora Pass area south to Olancha Peak. In 1995, these bighorn sheep hit a population low of about 100 total individuals and were distributed across 5 separate areas of the southern and central Sierra Nevada. By 1999, they had increased to about 125. Since then, conditions have been particularly favorable for population growth, with the total number of individuals reaching about 250 in 2001. The populations of sheep closest to the MMH project site are in Lee Vining Canyon and Wheeler Crest (USWFS 2003). The Wheeler Crest population is approximately 12 miles southeast of the airport and the Lee Vining population is approximately 20 miles northwest of the airport, as shown on Figure 4, which is taken from the 2003 Draft Recovery Plan.

Habitat: These bighorn sheep use habitats ranging from the highest elevations along the crest of the Sierra Nevada (13,120+ feet) to winter ranges at the eastern base of the range as low as 4,760 feet. These habitats range from Great Basin sagebrush scrub to alpine. Within this range, primary elements of preferred habitats are visual openness and close proximity to steep rocky escape terrain. Forage resources vary greatly across habitats used by these bighorn sheep, and plant species eaten vary accordingly. Of particular importance to population parameters is the nutrient content of forages eaten. Nutrient quality of diets varies greatly with season and elevation and is limited primarily by effects of temperature and soil moisture on plant growth. Because of the relationship between elevation and temperature, low elevation winter ranges provide an important source of high quality forage early in the growing season. In past years, bighorn sheep in the Sierra Nevada used low elevation ranges extensively in winter and early spring, alpine ranges in summer and fall, and some intermediate ranges during transition periods (USFWS 2003). During the second half of the 1980's, this seasonal pattern changed to one of avoidance of low elevation winter ranges (USFWS 2003).

Natural History: Sierra Nevada bighorn sheep breed in the fall and have slow population growth rates, because of their life history attributes. Unlike many desert populations, bighorn sheep in the Sierra Nevada have a restricted lambing season in spring and early summer. The timing of lambing has been found to vary with patterns of nutrient intake. Nutrition also strongly influences growth rates of lambs, age at sexual maturity, frequency of lambing, and lamb survival to adulthood, all of which affect population growth rates. At best, females bear their first lamb at two years of age and bear only one lamb per year. When nutrition is poor, they may not bear their first lamb until they are four years of age and breed only in alternate years.

Reason for Decline/Vulnerability: Significant population declines beginning in the late 1980's were associated with these bighorn sheep avoiding low elevation winter ranges. This avoidance behavior has been suggested to be linked to increasing predation pressure from mountain lions on winter ranges during the 1980's (USFWS 2003). Because of population collapses that have occurred since this winter range avoidance began, some of the herds may now be too small to allow the group sizes necessary to provide bighorn sheep the psychological comfort to make use of winter ranges. Longer-term limiting factors have included contact with domestic sheep leading to pneumonia epizootics in the bighorn sheep; domestic sheep grazing adjacent to bighorn sheep ranges has continued to be a significant threat in recent decades. Because almost all bighorn sheep habitat in the Sierra Nevada is in public ownership, loss of habitat to human use has not been a limiting factor.

Potential Effects of Proposed Action: We determined that the proposed action may affect the Sierra Nevada bighorn sheep because of potential increased noise of aircraft in occupied habitats and of increased visitor use of its habitat. Increases in noise levels could potentially decrease reproductive success or cause the animals to reduce use of noise-affected habitat. Based on the projected flight paths, the closest flight path to known bighorn sheep habitat is 3 miles (Figure 4). The altitude of the planes approaching and departing from MMH relative to occupied bighorn sheep areas would be greater than 4,000 feet above ground level (AGL). MacArthur et al. (1979) found that bighorn sheep showed little change in heart rate in response to low-flying fixed-wing aircraft or helicopters at distances of 0.5 to 1.5 km (1,600 to 4,900 feet). Stockwell and Bateman (1991) analyzed time budgets for desert bighorn sheep in the presence and absence of helicopter overflights at Grand Canyon National Park to determine the extent to which food intake may be impaired. They found that bighorn were sensitive to disturbance during winter, but not during spring and recommended a disturbance distance threshold of 250–450 m (820 to 1,400 feet). Weisenberger et al. (1996) evaluated the effects of low-altitude jet aircraft noise on the behavior and physiology of captive desert bighorn sheep. They found that all animals became habituated to sounds of low-altitude aircraft and that heart rates increased during overflights, but returned to resting rates in less than 2 minutes. Based on these studies, low-level (<1,500 feet AGL) aircraft overflights may have an insignificant adverse effect on bighorn sheep, particularly during winter.

Passenger service to MMH may affect the Sierra Nevada bighorn sheep, if recreational use of occupied habitat results from more visitors to the region. Sierra Nevada bighorn sheep could be disturbed more frequently and possibly avoid preferred areas. However, Sierra Nevada bighorn sheep primarily use remote USFS lands designated as Wilderness Area, where access is strictly regulated by the number of back-country permits issued annually. Furthermore, the USFS does not permit entry into some Sierra Nevada bighorn sheep use areas in the Sierra Nevada between July 1 and December 15 to reduce the potential for disturbance of sheep.

In summary, bighorn sheep become habituated to noise from aircraft overflights, the planned flights would fly far from and high above Sierra Nevada bighorn sheep habitat, and existing levels of aircraft overflights in the region do not seem to affect Sierra Nevada bighorn sheep. Increased recreational use of Sierra Nevada bighorn sheep habitat is unlikely because of the permit system used by the USFS. Consequently, we have determined that the proposed air service to MMH is not likely to adversely affect Sierra Nevada bighorn sheep.

THREATENED SPECIES

Bald Eagle

Status: The bald eagle was Federally listed as Endangered on March 11, 1967 (32 FR 4001), was reclassified as a Threatened species on July 12, 1995 (60 FR 35999), and was proposed for delisting on July 6, 1999 (64 FR 36543). An extension for the comment period for delisting was recently released on May 16, 2006 (71 FR 28293). There is no designated critical habitat. A Recovery Plan for the southwestern population was finalized in 1982 (USFWS 1982). It was listed as State Endangered on June 27, 1971.

Description: The bald eagle is the second largest North American bird of prey with an average 7-foot wingspan. It has a distinctive white head and white tail offset against a dark brown body and wings in adult birds. Females are about 25% larger than males; sexes are otherwise similar in appearance.

Distribution: The current range of the bald eagle includes all of the contiguous United States and Alaska. The bald eagle is especially common in areas with large expanses of aquatic habitat, including Florida, Chesapeake Bay, Maine, and the Maritime Provinces of Canada, the Great Lakes and lake regions of Ontario, Manitoba, and Saskatchewan, northern California, Oregon, Washington, and coastal British Columbia and Alaska. Once seriously endangered by hunting, loss of habitat, and the use of DDT, recent surveys have indicated that western populations are on the increase. The bald eagle is primarily a fish and carrion feeder whose winter range includes portions of Mono County, including areas north and northeast of MMH. Bald eagle use in the project vicinity is primarily along Hot Creek, the alkali ponds, Laurel Pond, and Crowley Reservoir (Jones & Stokes 2001). The relationship of these areas to MMH is shown in Figure 5. Eagles do not nest in the project vicinity. They are known to congregate at sites generally in proximity to open water with perch trees and night roosts and have been reported perching on utility poles at the Hot Creek Fish Hatchery, approximately 0.75 miles northwest of the MMH airport runway (Jones & Stokes 2001).

Habitat: The breeding range of the bald eagle is associated with aquatic habitats (coastal areas, river, lakes, and reservoirs) with forested shorelines or cliffs in North America. Throughout their range, they select large, super-canopy roost trees that are open and accessible, mostly conifers. They winter primarily in coastal estuaries and river systems of the lower 48 states and Alaska, where thousands of bald eagles migrate each fall to take advantage of salmon-spawning runs.

Natural History: Bald eagles are monogamous and thought to mate for life unless one mate dies. Bald eagles build large stick nests lined with soft materials and nests are used for several years by the same pair of eagles. Nests measure up to 6 feet across and may weigh hundreds of pounds. Courtship and breeding vary by regions, for example, in Florida, breeding behaviors commence in September; in Ohio, breeding usually occurs in February. The average clutch size is 2 eggs. Young eagles can fly in 11 to 12 weeks, but the parents continue to feed them for 4 to 6 weeks while they learn to hunt. Bald eagles have lived up to 36 years in captivity.

Reason for Decline/Vulnerability: The decline of the bald eagle coincided with the introduction of the pesticide DDT in 1947. Eagles contaminated with DDT failed to lay eggs or produced thin eggshells that broke during incubation. Other causes of decline included shooting, trapping, and poisoning. Loss of nesting habitat due to development along the coast and near inland rivers and waterways also has resulted in decreasing numbers.

Potential Effects of Proposed Action: Bald eagles do not nest in the immediate vicinity of the airport; however they have been observed during winter months within 1 mile of the airport. Winter use of the project vicinity by bald eagles is largely concentrated north to northeast of the project site and outside of the flight paths for aircraft. Because there would no ground-disturbing activities, there would be no loss of habitat for foraging or roosting bald eagles.

There is the potential for a bald eagle to be injured or killed from an aircraft strike. However, no bird strike incidents have occurred at MMH in the last 10 years and the likelihood of a bald eagle air strike from the proposed scheduled air service is considered low. The proposed action would add a very limited number of additional flights to the area.

Bald eagles do not nest near MMH, concentrate their wintering activities outside the flight path, and would not experience any loss of habitat as a result of the proposed flights. Additionally, the likelihood of a bald eagle being struck by a planr associated with the proposed action is discountable. Consequently, we have determined that the proposed action is not likely to adversely affect the bald eagle.

CONCLUSIONS

In summary, the proposed action is not likely to adversely affect the Owens tui chub, Sierra Nevada bighorn sheep, or bald eagle. The proposed action would have no effect on the Lahontan cutthroat trout, mountain yellow-legged frog, Yosemite toad, and Pacific fisher.

Attachments:

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Table 1
MMH Aviation Forecast

Year	Number of Flights/Day	Plane Capacity	Number of Days	Load Factor	Projected Enplanements	Destination Airport
FY 2007-08 Winter	2	80	112	57%	10,214	2 x LAX
FY 2008-09 Winter	4	80	112	65%	23,296	3 x LAX 1 x SFO*
FY 2009-10 Winter	6	80	112	82%	44,083	3 x LAX 2 x SFO*; 1 X LAS
FY 2010-11 Winter	8	80	112	85%	60,928	3 x LAX; 2 x SFO* 2 x LAS; 1 x SAN**
FY 2011-12 Summer	2	80	60	57%	5,472	2 x LAX
Winter	8	80	112	85%	60,928	3 x LAX; 2 x SFO*
Total					66,400	2 x LAS; 1 x SAN**
FY 2012-13 Summer	2	80	60	65%	6,240	2 x LAX
Winter	8	80	112	85%	60,928	3 x LAX; 2 x SFO*
Total					67,168	2 x LAS; 1 x SAN**
FY 2013-14 Summer	2	80	60	65%	6,240	2 x LAX
Winter	8	80	112	85%	60,928	3 x LAX; 2 x SFO*
Total					67,168	2 x LAS; 1 x SAN**
FY 2014-15 Summer	2	80	60	65%	6,240	2 x LAX
Winter	8	80	112	85%	60,928	3 x LAX; 2 x SFO*
Total					67,168	2 x LAS; 1 x SAN**
FY 2015-16 Summer	2	80	60	65%	6,240	2 x LAX
Winter	8	80	112	85%	60,928	3 x LAX; 2 x SFO*
Total					67,168	2 x LAS; 1 x SAN**

*SFO or an alternative northern California airport, ** SAN or an alternative southern California airport

Source: Town of Mammoth Lakes, 2006.

Table 2
Federal Status Species in the Vicinity of MMH

Common Name	Scientific Name	Federal Status	Effect Determination
Birds			
Bald eagle	*Haliaeetus leucocephalus*	T	No effect
Fish			
Owens tui chub	*Gila bicolor snyderi*	E	No effect
Mammals			
Sierra Nevada bighorn sheep	*Ovis Canadensis californiana*	E	No effect

CH = Critical Habitat, E = Endangered, T = Threatened

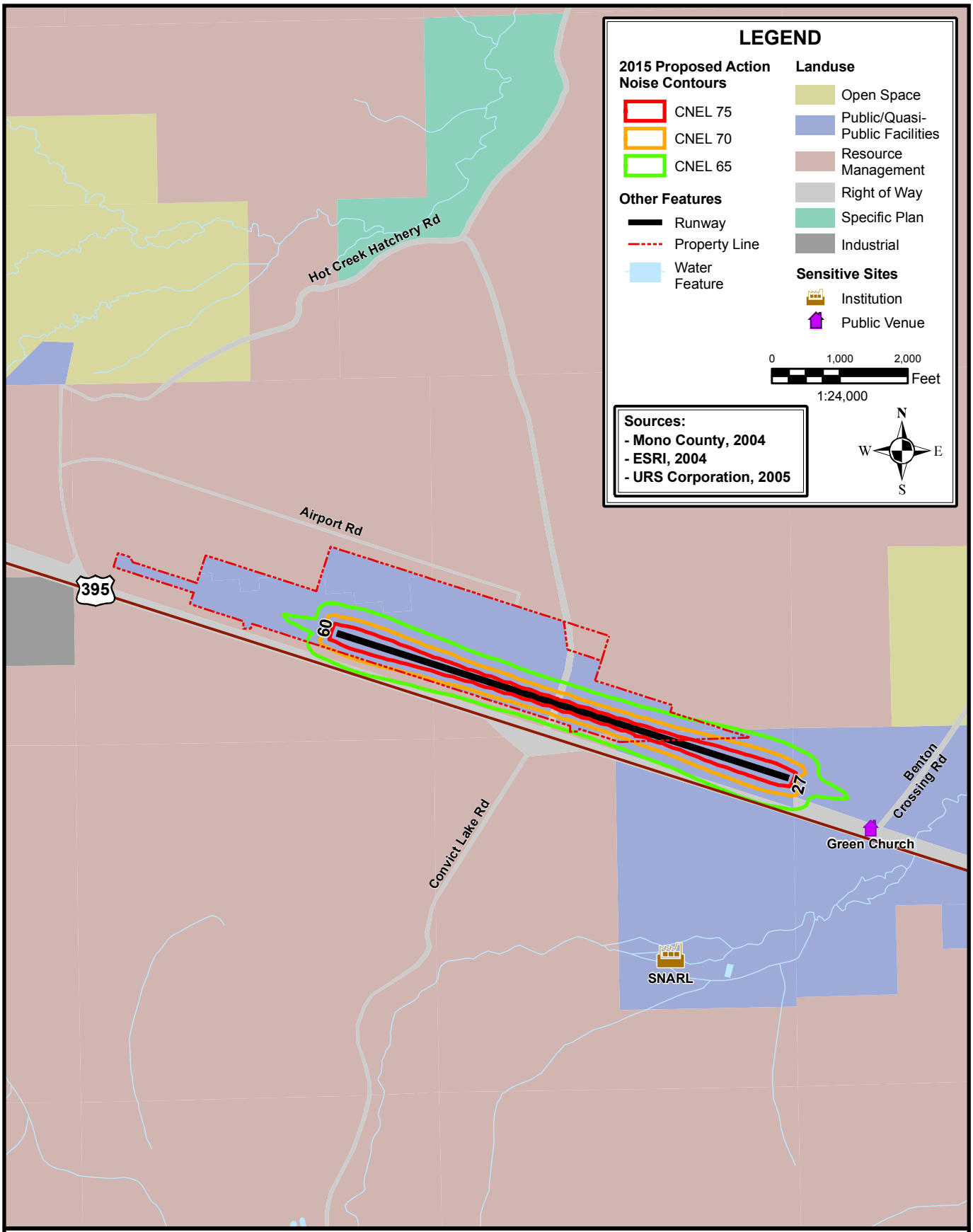
Source: USFWS letter dated October 3, 2006

Table 3
CNDDB Query Results: Federal Status Species in Region of MMH

Common Name	Scientific Name	Federal Status
Amphibians		
Mountain yellow-legged frog	*Rana muscosa*	E
Yosemite toad	*Bufo canorus*	C
Birds		
Bald eagle	*Haliaeetus leucocephalus*	T
Fish		
Lahontan cutthroat trout	*Oncorhyncus clarkia henshawi*	T
Owens tui chub	*Gila bicolor snyderi*	E
Mammals		
Pacific fisher	*Martes pennanti*	C

C = Candidate, E = Endangered, T = Threatened

Source: CNDDB October 2006 Query (Bloody Mountain, Convict Lake, Old Mammoth, Whitmore Hot Springs 7.5' USGS quadrangle maps)



H:\projects\Mammoth_Lakes\12004269\Applications\mxd\Biological Assessment\Figure 1. Location of MMH and Noise Contours.mxd {rpf 11/07/06}

Mammoth Yosemite Airport Proposed Air Service Section 7 Consultation Effect Determination	Location of MMH and Noise Contours	FIGURE 1

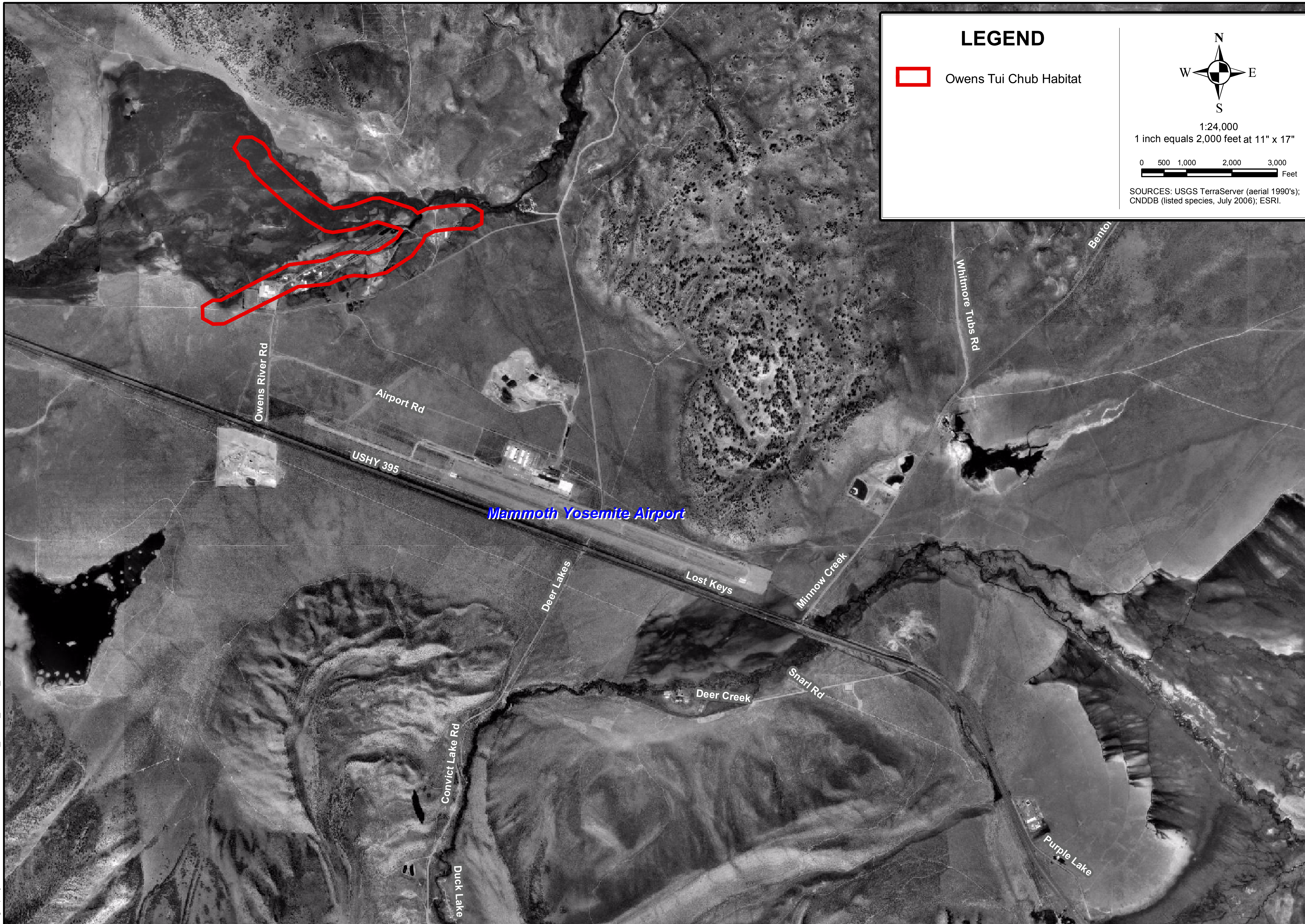
Sources: www.alaskaair.com, 2006

Mammoth Yosemite Airport
Proposed Air Service
Section 7 Consultation
Effect Determination

Photographs of Q400 Aircraft

FIGURE 2

H:\projects\Mammoth_Lakes\12004269\Applications\mxd\Biological Assessment\Figure 2. Photograph of Q400 Aircraft.mxd {rpf 11/07/06}

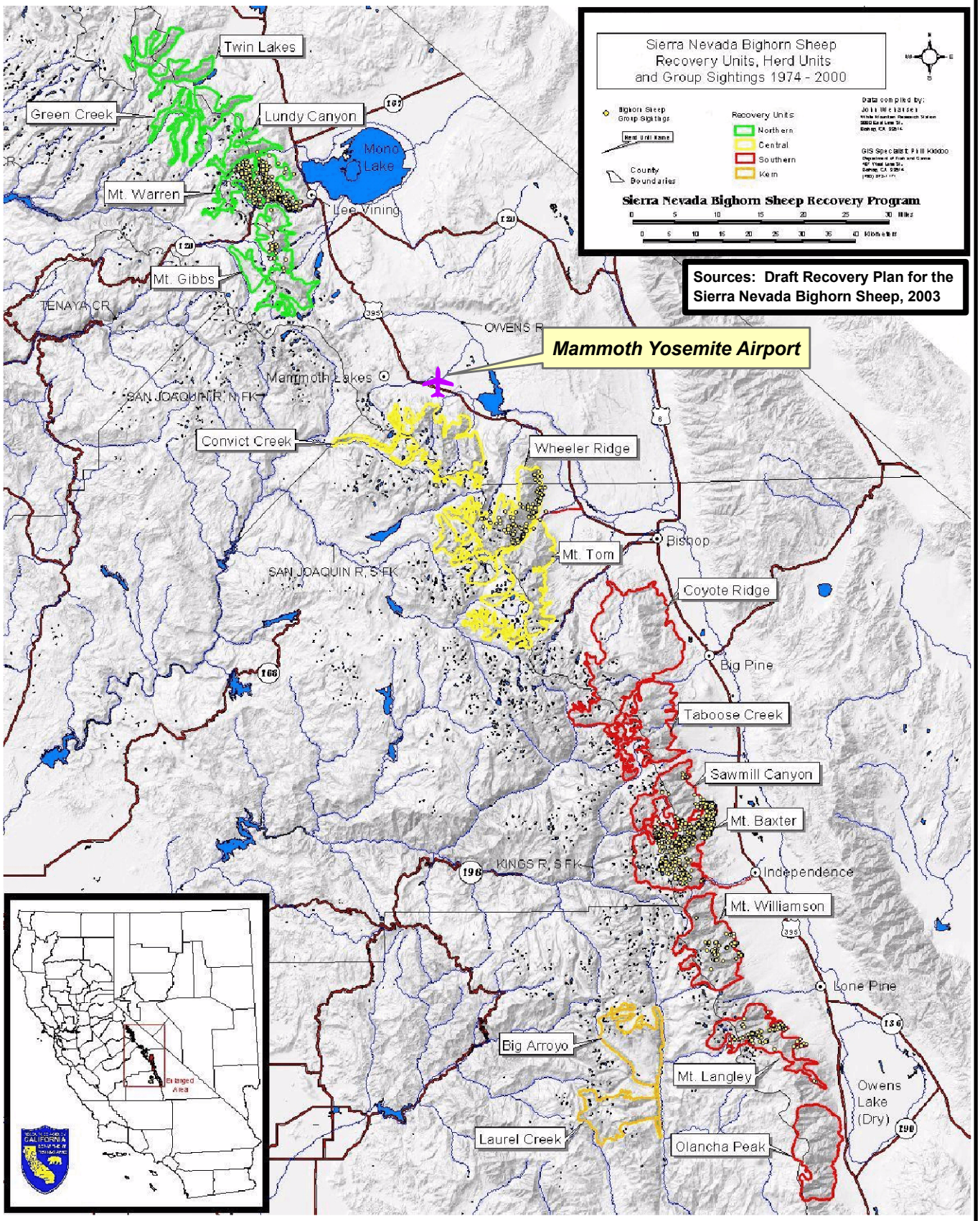


G:\gis\projects\1512\12006395\mxd\mammoth_cnddb_federal_listed2.mxd

Mammoth Yosemite Airport
Proposed Air Service
Section 7 Consultation
Effect Determination

Location of Owens Tui Chub in Vicinity of MMH

FIGURE 3



H:\projects\Mammoth_Lakes\12004269\Applications\mxd\Biological Assessment\Figure 4, Location of Sierra Nevada Bighorn Sheep in Vicinity of MMH.mxd {rpf, 11/08/06}

Mammoth Yosemite Airport
Proposed Air Service
Section 7 Consultation
Effect Determination

Location of Sierra Nevada Bighorn Sheep in Vicinity of MMH

FIGURE 4

LEGEND

Water Bodies

- Intermittent Lake
- Marsh/Swamp
- Perennial Lake
- Highlighted Hydrologic Features

Other Features

- Roads
- Runway
- Wilderness Area
- Areas Where Bald Eagles Have Been Observed

N
W E
S

1:48,000
1 inch equals 4,000 feet at 11" x 17"

0 0.25 0.5 1 Miles

HOT CREEK HATCHERY

MMH

395

Owens River Rd.

Benton Crossing Rd.

Crowley Lake Dr.

Hot Creek

Mammoth Creek

Convict Creek

Crowley Lake

John Muir Wilderness

Convict Lake

G:\gis\projects\151212006395\mxd\Bald_Eagle_Locations.mxd

Mammoth Yosemite Airport
Proposed Air Service
Section 7 Consultation
Effect Determination

Location of Bald Eagle in Vicinity of MMH

FIGURE 5

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ventura Fish and Wildlife Office
2493 Portola Road, Suite B
Ventura, California 93003

TAKE PRIDE IN AMERICA

IN REPLY REFER TO:
PAS 909-1013-6907

February 22, 2007

Camille Garibaldi
Environmental Protection Specialist
Federal Aviation Administration
831 Mitten Road, Suite 210
Burlingame, California 94010-1300

Subject: Proposed Horizon Air Service to Mammoth Yosemite Airport, Mammoth Lakes, Mono County, California

Dear Ms. Garibaldi:

We have reviewed your request for our concurrence that the new air service by Horizon Air for the Mammoth Yosemite Airport is not likely to adversely affect the federally endangered Owens tui chub (*Gila bicolor snyderi*) and Sierra Nevada bighorn sheep (*Ovis canadensis californiana*), and the threatened bald eagle (*Haliaeetus leucocephalus*). Your request and our response are made pursuant to section 7(a)(2) of the Endangered Species Act of 1973, as amended. We received your initial request on November 20, 2006. After discussing your request with Ray Bransfield of my staff, you submitted a revised request for concurrence, which we received on January 22, 2007.

Horizon Air proposes to provide regional air service using a Bombardier DHC 8-402 turboprop aircraft. Scheduled air services would begin in December 2007 with two flights per day from Los Angeles International Airport during the winter season. Proposed winter ski season service is projected to increase to a maximum of eight flights per day by the year 2011. The proposed action will result in no change to the airport layout plan for Mammoth Yosemite Airport; specifically, no new construction would occur at the airport as a result of approving this service. Your January 22, 2007, letter fully describes the actions that the Federal Aviation Administration proposes to approve.

The proposed action would not result in any ground-disturbing activities or increase in the impervious areas of the airport. Drainage from designated de-icing areas would be contained in existing drainage structures and properly disposed of pursuant to U.S. Environmental Protection Agency de-icing guidelines. For these reasons, the Federal Aviation Administration has concluded that the proposed action is not likely to affect the Owen's tui chub.

Aircraft noise is not anticipated to be of concern because the closest flight path to known Sierra Nevada bighorn sheep habitat is 3 miles away, with an altitude of 4,000 feet. The overall increase in noise levels would be less than 1 dBA Community Noise Equivalent Level. The

proposed action would not cause any loss of habitat of the Sierra Nevada bighorn sheep. For these reasons, the Federal Aviation Administration has concluded that the proposed action is not likely to adversely affect the Sierra Nevada bighorn sheep.

Bald eagles do not nest in the immediate vicinity of the airport. The proposed action will not cause any loss of habitat for foraging or roosting bald eagles. Although bald eagles have been observed during winter months within a mile of the airport outside of the flight paths for the aircraft, no bird strike incidents have occurred at Mammoth Yosemite Airport in the last 10 years. For these reasons, the Federal Aviation Administration has concluded that the proposed action will not affect the bald eagle.

We concur with your determination that the proposed air service into Mammoth Yosemite Airport is not likely to adversely affect the Owens tui chub, Sierra Nevada bighorn sheep, and bald eagle. We have reached this conclusion because the proposed action would not cause any loss of habitat, would not affect water quality, and would increases overall noise levels by less than 1 dBA. Consequently, further consultation, pursuant to section 7(a)(2) of the Endangered Species Act, is not required. If the proposed project changes in a manner that may affect the Owens tui chub, Sierra Nevada bighorn sheep, and bald eagle that has not been considered, please contact us as soon as possible to determine whether additional consultation is necessary.

If you have any questions, please contact Michael Glenn of my staff at (805) 644-1766, extension 328.

Sincerely,

Carl T. Benz
~~Assistant Field Supervisor~~
Mojave/Great Basin Desert Division

Appendix H-3

Mammoth Yosemite Airport Assessment of Jet Overflight on Lekking Sage Grouse

This appendix provides a description of noise measurements and behavioral observations made at Sage Grouse Lek #2 approximately 2 miles east of MMH during staged overflights by jet aircraft in April 2004.

URS

MAMMOTH YOSEMITE AIRPORT

ASSESSMENT OF JET OVERFLIGHT ON LEKKING SAGE GROUSE

On April 14, 2004, URS Corporation (URS) conducted a noise assessment at a greater sage grouse (*Centrocercus urophasianus*) lekking area in Long Valley, Mono County, California, located in close proximity to the departure and arrival flight paths to and from the Mammoth Yosemite Airport (MMH). The following summarizes the results of the field investigation and findings.

NOISE BACKGROUND

Noise is generally defined as loud, unpleasant, unexpected, or undesired sound that is typically associated with human activity and that interferes with or disrupts normal activities. Although exposure to high noise levels has been demonstrated to cause hearing loss, the principal human response to environmental noise is annoyance. The response of individuals to similar noise events is diverse and influenced by the type of noise, the perceived importance of the noise and its appropriateness in the setting, the time of day and the type of activity during which the noise occurs, and the sensitivity of the individual.

Sound is a physical phenomenon consisting of minute vibrations that travel through a medium, such as air, and are sensed by the human ear. Sound is generally characterized by several variables, including frequency and intensity. Frequency describes the sound's pitch and is measured in Hertz (Hz), while intensity describes the sound's loudness and is measured in decibels (dB). Decibels are measured using a logarithmic scale. A sound level of 0 dB is approximately the threshold of human hearing and is barely audible under extremely quiet listening conditions. Normal speech has a sound level of approximately 60 dB. Sound levels above about 120 dB begin to be felt inside the human ear as discomfort and eventually pain at still higher levels. The minimum change in the sound level of individual events that an average human ear can detect is about 3 dB. A change in sound level of about 10 dB is usually perceived by the average person as a doubling (or halving) of the sound's loudness, and this relation holds true for loud sounds and for quieter sounds.

Because of the logarithmic nature of the decibel unit, sound levels cannot be added or subtracted directly and are somewhat cumbersome to handle mathematically. However, some simple rules are useful in dealing with sound levels. First, if a sound's intensity is doubled, the sound level increases by 3 dB, regardless of the initial sound level. Thus, 60 dB + 60 dB = 63 dB, and 80 dB + 80 dB = 83 dB.

Hertz is a measure of how many times each second the crest of a sound pressure wave passes a fixed point. For example, when a drummer beats a drum, the skin of the drum vibrates a number of times per second. A particular tone that makes the drum skin vibrate 100 times per second generates a sound pressure wave that is oscillating at 100 Hz, and this pressure oscillation is perceived as a tonal pitch of 100 Hz. Sound frequencies between 20 and 20,000 Hz are within the range of sensitivity of the best human ear.

Sound from a tuning fork (a pure tone) contains a single frequency, but most sounds one hears in the environment do not consist of a single frequency but rather a broad band of frequencies differing in sound level. The method commonly used to quantify environmental sounds consists of evaluating all frequencies of a sound according to a weighting system that reflects that human hearing is less sensitive at low frequencies and extremely high frequencies than at the mid-range frequencies. This is called "A" weighting, and the decibel level measured is called the A-weighted sound level (dBA). In practice, the level of a noise source is conveniently measured using a sound level meter that includes a filter corresponding to the dBA curve.

Although the A-weighted sound level may adequately indicate the level of environmental noise at any instant in time, community noise levels vary continuously. Most environmental noise includes a conglomeration of noise from distant sources that creates a relatively steady background noise in which no particular source is identifiable. A single descriptor called the L_{eq} (equivalent sound level) is used. L_{eq} is the energy-mean A-weighted sound level during a measured time interval. It is the "equivalent" constant sound level that would have to be produced by a given source to equal the fluctuating level measured. In addition, it is often desirable to know the acoustic range of the noise source being measured. This is accomplished through the Lmax and Lmin indicators, which represent the RMS (or root-mean-square) maximum and minimum obtainable noise levels during the monitoring interval. The Lmin value obtained for a particular monitoring location is often called the acoustic floor for that location.

To describe time-varying character of environmental noise, the statistical noise descriptors L10, L50, and L90 are commonly used. They are the noise levels equaled or exceeded during 10 percent, 50 percent, and 90 percent of a stated time. Sound levels associated with the L10 typically describe transient or short-term events, while levels associated with the L90 describe the steady-state (or most prevalent) noise conditions.

METHODOLOGY

During the week of April 11 through April 15, 2004, URS biologists and noise specialists conducted noise measurements and behavioral observations at a sage grouse lek located approximately three miles east of MMH. The measurement locations (ML) are shown on Figure 1. Behavioral observations were documented using a Sony DVD-D100 digital video camera mounted on a tripod. Sound level measurements were conducted using three types of Larson Davis Integrating Sound Level meters, including a Model 720 Type 2 meter, a Model 820 Type 1 meter, and two Model 824 Type 1 octave band meters. The sound level meters were mounted on tripods at five feet above ground level and were all calibrated before and after the measurement periods.

BASELINE OBSERVATIONS

Baseline noise measurements and behavioral observations were conducted April 12 and April 13, 2004 between the hours 6:00 and 9:00 a.m. at the northwest edge of the lek (ML1). Sage grouse presence on the lek was highest prior to dawn through 7:30 a.m., slowly waned with time, with all birds absent from the lek after 9:00 a.m. Noise sources consisted of vehicular traffic on Highway 395 to the west, birds vocalizing (grouse and songbirds), people whispering, and occasional propeller aircraft overflights. The

ambient hourly sound levels ranged between 39.7 dBA and 50.1 dBA Leq and are summarized in Table 1.

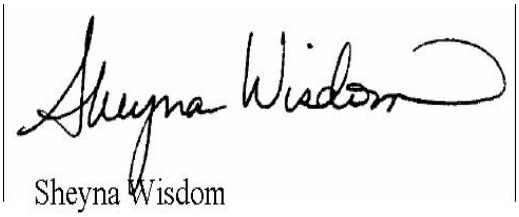
JET OVERFLIGHTS

On April 14, 2004, a Westwind jet aircraft equipped with Garrett TFE 731-3-1G engines (3700 lbs of static thrust) was chartered by URS to conduct departures and arrivals at MMH for the purpose of assessing the response of lekking sage grouse to the overflights. Two types of sound level measurements were conducted to determine sound levels associated with the overflights: a long-term measurement was taken in the middle of the lek and short-term measurements were taken during each overflight at the edge of the lek and near the runway.

Long Term Measurement: A Larson Davis Model 720 Type 2 meter was placed in the center of lek (ML2) on the afternoon of April 13 and was programmed to collect 19 consecutive hours of 15minute average sound level data before, during, and after the overflights between 1:45 p.m. on April 13 and 8:15 a.m. on April 14, 2004. The average 15-minute Leq was 45.3 dBA, ranging between 29.8 and 75.0 dBA. The results are summarized in Figure 2 and are consistent with Table 5.6-1 of the EIS.

Short Term Measurements: Two Larson Davis Model 824 Type 1 meters were placed at the south edge of the lek (ML3) and at the extended centerline of the runway near the lek (ML4) and one Larson Davis Model 820 Type 1 meter was placed 100 feet from the end of the runway (ML5) to collect sound levels during each overflight. The results are summarized in Table 2.

Behavioral Observations: Behavioral observations during the overflights were documented using the Sony DVD-D100 video camera. A CD with the samples of digital video during overflights is included with this report. The video contains seven video files (mpeg format) labeled Overflight 1 – 7 and one file labeled “All Overflights”, which is a compilation of all seven overflights. In general, the sage grouse did not respond to the early morning jet activity, but their motivation to remain on the lek waned through the morning, similar to the overall behavior documented during the baseline observations. Two overflights coincided with two large groups of grouse flushing from the lek: the RW27 arrival (from Bishop) at 7:34 a.m. and the RW9 departure (towards Bishop) at 7:45 a.m. The response is likely due to the combination of the noise and visual of the jet passing over the lek. The results of the overflights, number of grouse, and corresponding video files are summarized in Table 3. The responses were observed by both Dr. Pat Mock, URS Senior Biologist, and Denyse Racine, California Department of Fish and Game Biologist.



Patrick J. Mock, PhD Senior Biologist/Noise Analyst

April 19, 2005

URS

Table 1
Ambient Sound Level Measurements (dBA) at Northwest Edge of Lek

Date/Time	L_{eq}	L_{min}	L_{max}	L_{10}	L_{50}	L_{90}	Wind (mph)	Temperature (°F)	Relative Humidity (%)
4/12/04 05:50-06:50	41.1	27.4	58.98	43.4	38.9	31.3	0	33	74.0
4/12/04 07:00-08:00	43.7	31.9	62.8	46.4	39.4	35.6	0	35.4	72.0
4/12/04 08:00-08:35	39.7	31.3	58.8	41.1	36.9	34.4	0	43.2	71.5
4/13/04 06:00-07:00	47.1	38.0	65.5	52.4	41.6	39.0	1	34.3	63.9
4/13/04 07:00-08:00	50.6	31.3	70.9	53.1	43.1	36.6	2	33.1	87.4

Note: Measurements taken at Location ML1 as shown on Figure 1.

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Table 2
Short-Term Sound Levels During Overflights (Leq dBA)

Description	South Edge of Lek (ML3)	Extended Runway Centerline (ML4)	100 feet from Runway (ML5)
RW27 Departure (towards Mammoth)	53.1	50.8	71.1
RW27 Arrival (from Bishop)	49.8	52.2	68.7
RW9 Departure (towards Bishop)	48.5	61.6	86.1
RW9 Arrival (from Mammoth)	60.9	54.7	80.8
RW27 Departure (towards Mammoth)	62.0	51.7	60.9
RW27 Arrival (from Bishop)	56.9	55.1	83.3
RW9 Departure (towards Bishop)	61.7	57.7	79.0
RW9 Arrival (from Mammoth)	57.1	49.7	62.2

Sound level measurements only conducted during overflight and expressed in dBA Leq

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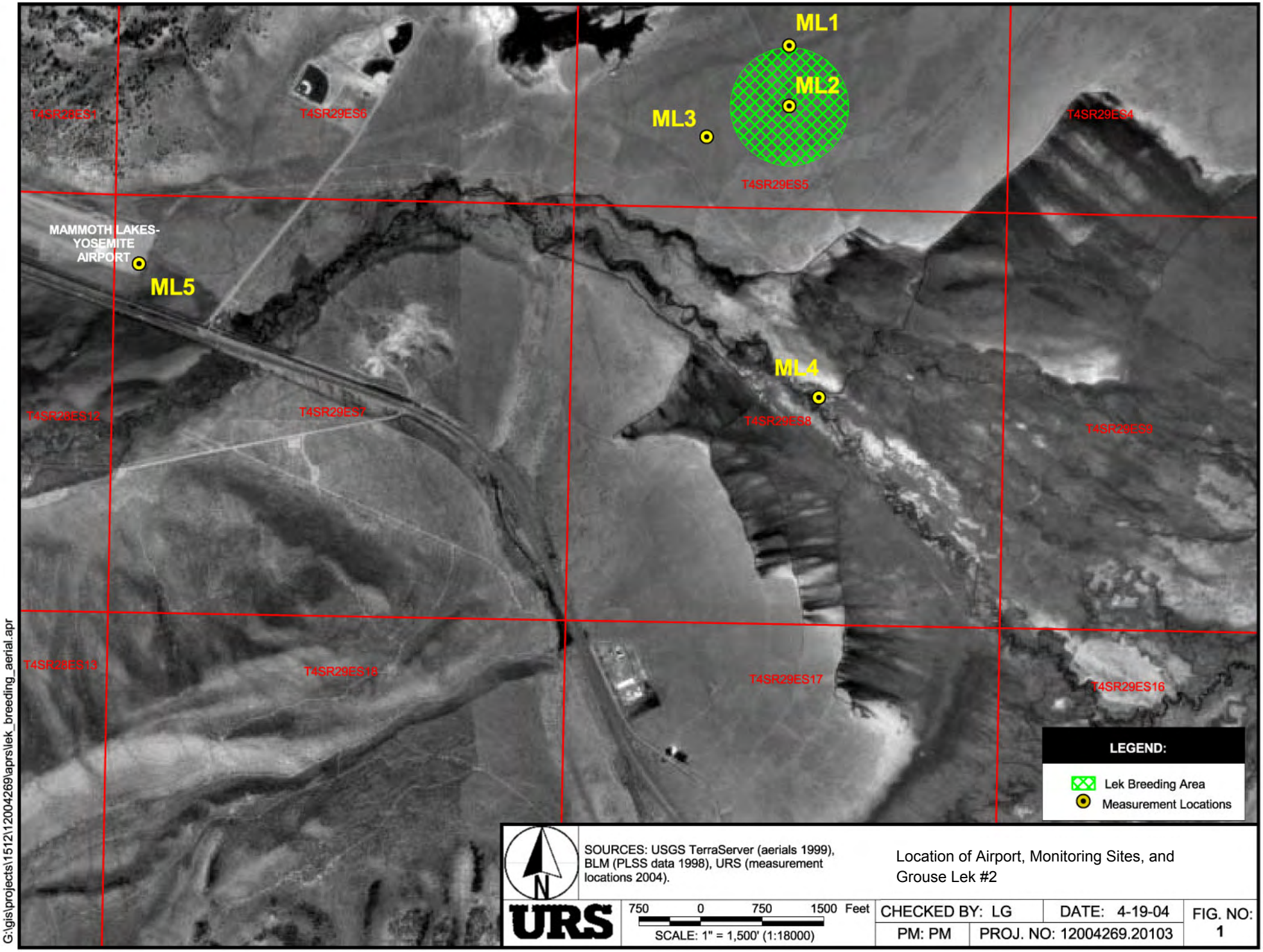
Table 3
Summary of Sage Grouse Response to Overflights

Description	Time	Number of Grouse prior to Overflight	Response	Video File
RW27 Departure (towards Mammoth)	06:29 – 06:32	230	No Visible Response	Overflight1.mpeg
RW27 Arrival (from Bishop)	06:45 – 06:48	230	No Visible Response	Overflight2.mpeg
RW9 Departure (towards Bishop)	06:58 – 07:00	210	No Visible Response	Overflight3.mpeg
RW9 Arrival (from Mammoth)	07:08 – 07:12	195	No Visible Response	Overflight4.mpeg
RW27 Departure (towards Mammoth)	07:18 – 07:21	195	No Visible Response	Overflight5.mpeg
RW27 Arrival (from Bishop)	07:34 – 07:37	160	~60 flushed as plane passed (visual response)	Overflight6.mpeg
RW9 Departure (towards Bishop)	07:45 – 07:49	100	~40 flushed as plane passed (visual response)	Overflight7.mpeg
RW9 Arrival (from Mammoth)	08:01 – 08:03	40	No Visible Response	No file

A compilation of all overflights is provided in the file All Overflights.mpeg.



G:\gis\projects\1512\12004269\aprs\lek_breeding_aerial.apr

SOURCES: USGS TerraServer (aerials 1999), BLM (PLSS data 1998), URS (measurement locations 2004).

Location of Airport, Monitoring Sites, and Grouse Lek #2

URS

750 0 750 1500 Feet

SCALE: 1" = 1,500' (1:18000)

CHECKED BY: LG	DATE: 4-19-04	FIG. NO: 1
PM: PM	PROJ. NO: 12004269.20103	

URS

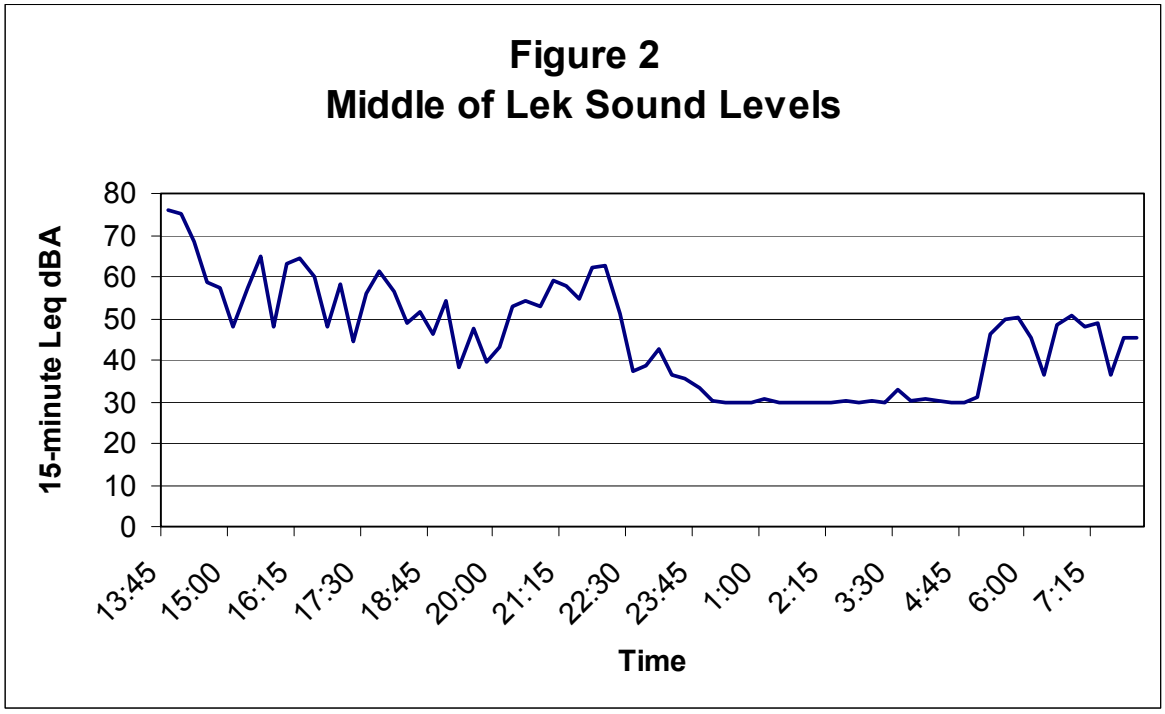


Figure 2
Middle of Lek Sound Levels
15-minute Leq dBA
80
70
60
50
40
30
20
10
0
13:45
15:00
16:15
17:30
18:45
20:00
21:15
22:30
23:45
1:00
2:15
3:30
4:45
6:00
7:15
Time

Appendix H-4

Aircraft Noise Data for Assessment of Q400 Aircraft Overflights on Lekking Sage Grouse

This appendix contains a table indicating the results of INM modeling of the loudest noise levels at Sage Grouse Lek #2 associated with various projected aircraft operations at MMH. This appendix also provides a comparison of the noise footprint of the Q400 aircraft with various other aircraft already operating at MMH.

TABLE H-4.1
L_{MAX} NOISE LEVELS AT SAGE GROUSE LEK #2

METRIC	GRID_I	ACFT_ID	OP_TYPE	RWY_ID	TRK_ID1	DISTANCE	ALTITUDE	ELEV_ANG	SPEED	THR_SET	OPS_EQUIV	L_{MAX}	PERCENT
LAMAX	LEK	LEAR25	D	09	09D5	1941.8	1850	72.3	197.6	2513.95	0.0011	93.8	100.000
LAMAX	LEK	LEAR25	D	09	09D5	1969.3	1848	69.8	197.6	2513.93	0.0042	93.6	0.000
LAMAX	LEK	LEAR25	D	09	09D5	2002.1	1847	67.3	197.6	2513.90	0.0068	93.4	0.000
LAMAX	LEK	LEAR25	D	09	09D5	2040.4	1845	64.7	197.6	2513.87	0.0042	93.1	0.000
LAMAX	LEK	LEAR25	D	09	09D5	2084.3	1843	62.2	197.6	2513.83	0.0011	92.8	0.000
LAMAX	LEK	LEAR25	D	09	09D7	2829.3	1792	39.3	197.4	2512.85	0.0159	87.2	0.000
LAMAX	LEK	LEAR25	D	09	09D7	2885.5	1787	38.3	197.4	2512.76	0.0588	86.9	0.000
LAMAX	LEK	LEAR25	D	09	09D7	2940.5	1782	37.3	197.4	2512.67	0.0955	86.5	0.000
LAMAX	LEK	LEAR25	D	09	09D7	2994.1	1777	36.4	197.4	2512.57	0.0588	86.2	0.000
LAMAX	LEK	LEAR25	D	09	09D7	3046.3	1772	35.6	197.3	2512.47	0.0159	85.9	0.000
LAMAX	LEK	LEAR25	A	27	27A6	1109.9	1052	71.4	161.7	1026.50	0.0162	84.9	0.000
LAMAX	LEK	LEAR25	A	27	27A7	1114.6	1052	70.7	161.7	1026.50	0.0046	84.8	0.000
LAMAX	LEK	LEAR25	A	27	27A7	1171.3	1051	63.9	161.7	1026.49	0.0171	84.2	0.000
LAMAX	LEK	LEAR25	A	27	27A6	1171.3	1051	63.9	161.7	1026.49	0.0599	84.2	0.000
LAMAX	LEK	C130	D	09	09D5	1991.4	1907	73.3	162.7	123.28	0.0003	83.9	0.000
LAMAX	LEK	C130	D	09	09D5	2018.5	1906	70.8	162.7	123.29	0.0009	83.7	0.000
LAMAX	LEK	C130	D	09	09D5	2050.9	1905	68.3	162.7	123.31	0.0015	83.5	0.000
LAMAX	LEK	LEAR25	A	27	27A7	1248.2	1051	57.4	161.7	1026.47	0.0278	83.4	0.000
LAMAX	LEK	LEAR25	A	27	27A6	1248.2	1051	57.3	161.7	1026.47	0.0973	83.4	0.000
LAMAX	LEK	C130	D	09	09D5	2088.6	1904	65.7	162.7	123.32	0.0009	83.3	0.000
LAMAX	LEK	GIIB	D	09	09D5	1655.7	1561	70.5	179.4	5301.51	0.0003	83.3	0.000
LAMAX	LEK	C130	D	09	09D5	2131.9	1903	63.2	162.6	123.34	0.0003	83.1	0.000
LAMAX	LEK	GIIB	D	09	09D5	1688.8	1560	67.5	179.4	5301.51	0.0009	83.1	0.000
LAMAX	LEK	GIIB	D	09	09D5	1727.9	1560	64.5	179.4	5301.52	0.0015	82.9	0.000
LAMAX	LEK	GIIB	D	09	09D5	1773.2	1559	61.5	179.4	5301.52	0.0009	82.6	0.000
LAMAX	LEK	LEAR25	A	27	27A7	1336.9	1050	51.8	161.7	1026.45	0.0171	82.4	0.000
LAMAX	LEK	LEAR25	A	27	27A6	1336.9	1050	51.8	161.7	1026.45	0.0599	82.4	0.000
LAMAX	LEK	GIIB	D	09	09D5	1824.7	1558	58.6	179.4	5301.53	0.0003	82.2	0.000
LAMAX	LEK	LEAR25	A	27	27A7	1422.8	1050	47.5	161.7	1026.42	0.0046	81.5	0.000
LAMAX	LEK	LEAR25	A	27	27A6	1434.2	1050	47.0	161.7	1026.42	0.0162	81.3	0.000
LAMAX	LEK	LEAR25	D	27	27D7	4519.3	3713	55.2	241.3	2248.32	0.0078	80.5	0.000
LAMAX	LEK	LEAR25	A	27	27A4	1553.1	1064	43.2	161.7	1026.97	0.0012	80.2	0.000
LAMAX	LEK	C130	D	09	09D7	2871.9	1864	40.5	161.9	123.76	0.0035	79.7	0.000
LAMAX	LEK	LEAR25	A	27	27A4	1604.4	1061	41.4	161.7	1026.87	0.0043	79.7	0.000
LAMAX	LEK	LEAR35	D	09	09D5	2083.2	2005	74.2	189.2	2857.68	0.0008	79.6	0.000
LAMAX	LEK	C130	D	09	09D7	2927.9	1860	39.4	161.8	123.80	0.0131	79.5	0.000
LAMAX	LEK	IA1125	D	09	09D5	1435.1	1323	67.2	186.8	2991.76	0.0004	79.4	0.000
LAMAX	LEK	LEAR25	D	27	27D7	4747.3	3709	51.4	241.2	2248.33	0.0288	79.4	0.000
LAMAX	LEK	LEAR35	D	09	09D5	2109.3	2004	71.8	189.1	2857.77	0.0028	79.4	0.000
LAMAX	LEK	C130	D	09	09D7	2982.8	1857	38.5	161.7	123.84	0.0212	79.2	0.000
LAMAX	LEK	LEAR35	D	09	09D5	2140.3	2003	69.4	189.1	2857.88	0.0046	79.2	0.000
LAMAX	LEK	IA1125	D	09	09D5	1472.9	1322	63.8	186.8	2991.76	0.0014	79.1	0.000
LAMAX	LEK	C130	D	09	09D7	3036.4	1853	37.6	161.7	123.88	0.0131	79.0	0.000

TABLE H-4.1
L_{MAX} NOISE LEVELS AT SAGE GROUSE LEK #2

METRIC	GRID_I	ACFT_ID	OP_TYPE	RWY_ID	TRK_ID1	DISTANCE	ALTITUDE	ELEV_ANG	SPEED	THR_SET	OPS_EQUIV	L_{MAX}	PERCENT
LAMAX	LEK	LEAR35	D	09	09D5	2176.6	2002	66.9	189.0	2858.00	0.0028	79.0	0.000
LAMAX	LEK	C130	D	09	09D7	3088.6	1849	36.8	161.6	123.92	0.0035	78.8	0.000
LAMAX	LEK	IA1125	D	09	09D5	1517.4	1321	60.5	186.8	2991.77	0.0023	78.8	0.000
LAMAX	LEK	LEAR35	D	09	09D5	2218.4	2001	64.4	189.0	2858.14	0.0008	78.7	0.000
LAMAX	LEK	LEAR25	A	27	27A4	1724.8	1059	37.9	161.7	1026.78	0.0069	78.6	0.000
LAMAX	LEK	LEAR25	D	27	27D7	4994.3	3705	47.9	241.1	2248.34	0.0468	78.4	0.000
LAMAX	LEK	IA1125	D	09	09D5	1568.5	1320	57.3	186.8	2991.77	0.0014	78.3	0.000
LAMAX	LEK	MU3001	D	09	09D5	2168.7	2096	75.1	183.1	2165.00	0.0080	78.1	0.000
LAMAX	LEK	MU3001	D	09	09D5	2193.9	2095	72.7	183.1	2165.07	0.0294	78.0	0.000
LAMAX	LEK	IA1125	D	09	09D5	1626.3	1318	54.1	186.8	2991.78	0.0004	77.8	0.000
LAMAX	LEK	MU3001	D	09	09D5	2224.0	2094	70.3	183.0	2165.15	0.0477	77.8	0.000
LAMAX	LEK	MU3001	D	09	09D5	2259.2	2094	67.9	183.0	2165.25	0.0294	77.6	0.000
LAMAX	LEK	LEAR25	A	27	27A4	1855.5	1056	34.7	161.7	1026.67	0.0043	77.5	0.000
LAMAX	LEK	LEAR25	D	27	27D7	5257.5	3700	44.7	240.9	2248.35	0.0288	77.4	0.000
LAMAX	LEK	MU3001	D	09	09D5	2299.6	2093	65.5	182.9	2165.35	0.0080	77.4	0.000
LAMAX	LEK	C130	A	27	27A6	1109.9	1052	71.4	155.0	29.40	0.0036	77.2	0.000
LAMAX	LEK	C130	A	27	27A7	1114.6	1052	70.7	155.0	29.40	0.0010	77.1	0.000
LAMAX	LEK	GIIB	D	09	09D7	2665.3	1534	35.1	179.4	5301.73	0.0035	77.1	0.000
LAMAX	LEK	GIIB	D	09	09D7	2726.7	1531	34.2	179.4	5301.75	0.0131	77.1	0.000
LAMAX	LEK	GIIB	D	09	09D7	2902.1	1524	31.7	179.3	5301.81	0.0035	77.0	0.000
LAMAX	LEK	GIIB	D	09	09D7	2845.2	1527	32.4	179.3	5301.79	0.0131	77.0	0.000
LAMAX	LEK	GIIB	D	09	09D7	2786.8	1529	33.3	179.3	5301.77	0.0212	77.0	0.000
LAMAX	LEK	C130	A	27	27A7	1171.3	1051	63.9	155.0	29.40	0.0038	76.6	0.000
LAMAX	LEK	C130	A	27	27A6	1171.3	1051	63.9	155.0	29.40	0.0133	76.6	0.000
LAMAX	LEK	LEAR25	A	27	27A4	1969.2	1053	32.3	161.7	1026.56	0.0012	76.6	0.000
LAMAX	LEK	LEAR25	D	27	27D7	5534.3	3694	41.9	240.8	2248.37	0.0078	76.4	0.000
LAMAX	LEK	C130	A	27	27A7	1248.2	1051	57.4	155.0	29.40	0.0062	75.9	0.000
LAMAX	LEK	C130	A	27	27A6	1248.2	1051	57.3	155.0	29.40	0.0216	75.9	0.000
LAMAX	LEK	C130	A	27	27A7	1336.9	1050	51.8	155.0	29.40	0.0038	75.1	0.000
LAMAX	LEK	C130	A	27	27A6	1336.9	1050	51.8	155.0	29.40	0.0133	75.1	0.000
LAMAX	LEK	DHC6	A	27	27A6	1109.9	1052	71.4	69.3	46.69	0.1153	75.1	0.000
LAMAX	LEK	CL600	D	09	09D5	2209.2	2135	75.1	204.9	5886.07	0.0003	75.0	0.000
LAMAX	LEK	DHC6	A	27	27A7	1114.6	1052	70.7	69.3	46.69	0.0329	75.0	0.000
LAMAX	LEK	GIIB	A	27	27A6	1109.9	1052	71.4	165.9	2602.49	0.0036	75.0	0.000
LAMAX	LEK	CL600	D	09	09D5	2233.8	2134	72.8	204.9	5886.23	0.0009	74.9	0.000
LAMAX	LEK	GIIB	A	27	27A7	1114.6	1052	70.7	165.9	2602.36	0.0010	74.9	0.000
LAMAX	LEK	CL600	D	09	09D5	2263.1	2133	70.5	204.8	5886.42	0.0015	74.7	0.000
LAMAX	LEK	CL600	D	09	09D5	2297.4	2132	68.1	204.8	5886.64	0.0009	74.6	0.000
LAMAX	LEK	DHC6	A	27	27A7	1171.3	1051	63.9	69.3	46.69	0.1217	74.6	0.000
LAMAX	LEK	DHC6	A	27	27A6	1171.3	1051	63.9	69.3	46.69	0.4258	74.6	0.000
LAMAX	LEK	C130	A	27	27A7	1422.8	1050	47.5	155.0	29.40	0.0010	74.4	0.000
LAMAX	LEK	CL600	D	09	09D5	2337.0	2131	65.8	204.7	5886.89	0.0003	74.4	0.000
LAMAX	LEK	GIIB	A	27	27A7	1171.3	1051	63.9	165.9	2602.94	0.0038	74.4	0.000

TABLE H-4.1
L_{MAX} NOISE LEVELS AT SAGE GROUSE LEK #2

METRIC	GRID_I	ACFT_ID	OP_TYPE	RWY_ID	TRK_ID1	DISTANCE	ALTITUDE	ELEV_ANG	SPEED	THR_SET	OPS_EQUIV	L_{MAX}	PERCENT
LAMAX	LEK	GIIB	A	27	27A6	1171.3	1051	63.9	165.9	2602.88	0.0133	74.4	0.000
LAMAX	LEK	BEC58P	D	09	09D5	2028.7	1949	73.9	147.8	109.49	0.0057	74.3	0.000
LAMAX	LEK	C130	A	27	27A6	1434.2	1050	47.0	155.0	29.40	0.0036	74.3	0.000
LAMAX	LEK	BEC58P	D	09	09D5	2055.5	1948	71.4	147.8	109.51	0.0211	74.1	0.000
LAMAX	LEK	BEC58P	D	09	09D5	2087.4	1947	68.9	147.8	109.52	0.0344	74.0	0.000
LAMAX	LEK	DHC6	A	27	27A7	1248.2	1051	57.4	69.3	46.69	0.1977	73.9	0.000
LAMAX	LEK	DHC6	A	27	27A6	1248.2	1051	57.3	69.3	46.69	0.6920	73.9	0.000
LAMAX	LEK	BEC58P	D	09	09D5	2124.6	1946	66.3	147.7	109.54	0.0211	73.8	0.000
LAMAX	LEK	GIIB	D	27	27D7	3657.5	2609	45.5	182.4	5293.02	0.0017	73.7	0.000
LAMAX	LEK	LEAR35	D	09	09D7	2939.6	1968	42.0	187.5	2861.88	0.0106	73.7	0.000
LAMAX	LEK	BEC58P	D	09	09D5	2167.4	1945	63.8	147.7	109.56	0.0057	73.6	0.000
LAMAX	LEK	GIIB	A	27	27A7	1248.2	1051	57.4	165.9	2603.68	0.0062	73.6	0.000
LAMAX	LEK	GIIB	A	27	27A6	1248.2	1051	57.3	165.9	2603.70	0.0216	73.6	0.000
LAMAX	LEK	C130	A	27	27A4	1553.1	1064	43.2	155.0	29.42	0.0003	73.4	0.000
LAMAX	LEK	LEAR35	D	09	09D7	2994.7	1965	41.0	187.4	2862.23	0.0392	73.4	0.000
LAMAX	LEK	MU3001	D	09	09D7	3006.0	2068	43.5	180.9	2168.17	0.1114	73.4	0.000
LAMAX	LEK	DHC6	A	27	27A7	1336.9	1050	51.8	69.3	46.69	0.1217	73.3	0.000
LAMAX	LEK	DHC6	A	27	27A6	1336.9	1050	51.8	69.3	46.69	0.4258	73.3	0.000
LAMAX	LEK	C130	A	27	27A4	1604.4	1061	41.4	155.0	29.41	0.0010	73.1	0.000
LAMAX	LEK	MU3001	D	09	09D7	3060.2	2066	42.5	180.8	2168.43	0.4112	73.1	0.000
LAMAX	LEK	LEAR35	D	09	09D7	3048.6	1962	40.1	187.3	2862.59	0.0636	73.0	0.000
LAMAX	LEK	MU3001	D	09	09D7	3113.4	2064	41.5	180.6	2168.71	0.6682	72.9	0.000
LAMAX	LEK	DHC6	A	27	27A7	1422.8	1050	47.5	69.3	46.68	0.0329	72.7	0.000
LAMAX	LEK	GIIB	A	27	27A7	1336.9	1050	51.8	165.9	2604.68	0.0038	72.7	0.000
LAMAX	LEK	GIIB	A	27	27A6	1336.9	1050	51.8	165.9	2604.69	0.0133	72.7	0.000
LAMAX	LEK	LEAR35	D	09	09D7	3101.3	1959	39.2	187.1	2862.96	0.0392	72.7	0.000
LAMAX	LEK	DHC6	A	27	27A6	1434.2	1050	47.0	69.3	46.69	0.1153	72.6	0.000
LAMAX	LEK	GIIB	D	27	27D7	3937.6	2606	41.4	182.4	5293.04	0.0064	72.6	0.000
LAMAX	LEK	MU3001	D	09	09D7	3165.5	2061	40.6	180.4	2168.98	0.4112	72.6	0.000
LAMAX	LEK	BEC58P	D	09	09D1	2412.2	1936	53.4	147.5	109.71	0.0802	72.5	0.000
LAMAX	LEK	LEAR35	D	09	09D7	3152.7	1956	38.3	187.0	2863.34	0.0106	72.4	0.000
LAMAX	LEK	MU3001	D	09	09D7	3216.2	2059	39.8	180.2	2169.27	0.1114	72.4	0.000
LAMAX	LEK	BEC58P	D	09	09D1	2498.1	1934	50.7	147.4	109.74	0.2960	72.2	0.000
LAMAX	LEK	C130	A	27	27A4	1724.8	1059	37.9	155.0	29.41	0.0016	72.2	0.000
LAMAX	LEK	CNA206	D	09	09D5	2262.6	2191	75.5	97.6	2636.86	0.0043	72.1	0.000
LAMAX	LEK	CNA206	D	09	09D5	2286.6	2190	73.3	97.6	2636.95	0.0161	72.0	0.000
LAMAX	LEK	GIIB	A	27	27A7	1422.8	1050	47.5	165.9	2606.08	0.0010	71.9	0.000
LAMAX	LEK	BEC58P	D	09	09D1	2589.9	1932	48.2	147.3	109.78	0.4810	71.8	0.000
LAMAX	LEK	CNA206	D	09	09D5	2315.3	2189	71.0	97.6	2637.05	0.0261	71.8	0.000
LAMAX	LEK	DHC6	A	27	27A4	1553.1	1064	43.2	69.3	46.71	0.0082	71.8	0.000
LAMAX	LEK	CNA206	D	09	09D5	2348.9	2188	68.7	97.6	2637.16	0.0161	71.7	0.000
LAMAX	LEK	GIIB	A	27	27A6	1434.2	1050	47.0	165.9	2605.94	0.0036	71.7	0.000
LAMAX	LEK	C130	D	27	27D7	4054.9	3135	50.6	191.0	93.59	0.0017	71.5	0.000

TABLE H-4.1
L_{MAX} NOISE LEVELS AT SAGE GROUSE LEK #2

METRIC	GRID_I	ACFT_ID	OP_TYPE	RWY_ID	TRK_ID1	DISTANCE	ALTITUDE	ELEV_ANG	SPEED	THR_SET	OPS_EQUIV	L_{MAX}	PERCENT
LAMAX	LEK	CNA206	D	09	09D5	2387.6	2187	66.3	97.6	2637.30	0.0043	71.5	0.000
LAMAX	LEK	DHC6	A	27	27A4	1604.4	1061	41.4	69.3	46.71	0.0304	71.5	0.000
LAMAX	LEK	GIIB	D	27	27D7	4234.1	2603	37.9	182.4	5293.06	0.0104	71.5	0.000
LAMAX	LEK	BEC58P	D	09	09D1	2687.0	1930	45.9	147.3	109.82	0.2960	71.4	0.000
LAMAX	LEK	C130	A	27	27A4	1855.5	1056	34.7	155.0	29.41	0.0010	71.4	0.000
LAMAX	LEK	GIIB	D	09	09D4	7267.9	1241	9.8	178.5	8702.73	0.0005	71.4	0.000
LAMAX	LEK	GIIB	D	09	09D3	7267.9	1241	9.8	178.5	8702.73	0.0005	71.4	0.000
LAMAX	LEK	GIIB	D	09	09D2	7267.9	1241	9.8	178.5	8702.73	0.0003	71.4	0.000
LAMAX	LEK	GIIB	D	09	09D4	7302.3	1230	9.7	178.5	8702.13	0.0019	71.3	0.000
LAMAX	LEK	GIIB	D	09	09D4	7334.6	1219	9.6	178.2	8702.66	0.0030	71.3	0.000
LAMAX	LEK	GIIB	D	09	09D3	7302.3	1230	9.7	178.5	8702.13	0.0019	71.3	0.000
LAMAX	LEK	GIIB	D	09	09D3	7334.6	1219	9.6	178.2	8702.66	0.0030	71.3	0.000
LAMAX	LEK	GIIB	D	09	09D2	7302.3	1230	9.7	178.5	8702.13	0.0009	71.3	0.000
LAMAX	LEK	GIIB	D	09	09D2	7334.6	1219	9.6	178.2	8702.66	0.0015	71.3	0.000
LAMAX	LEK	GIIB	D	09	09D4	7364.4	1207	9.4	178.0	8703.20	0.0019	71.2	0.000
LAMAX	LEK	GIIB	D	09	09D3	7364.4	1207	9.4	178.0	8703.20	0.0019	71.2	0.000
LAMAX	LEK	GIIB	D	09	09D2	7364.4	1207	9.4	178.0	8703.20	0.0009	71.2	0.000
LAMAX	LEK	GIIB	D	09	09D4	7391.8	1196	9.3	177.7	8703.74	0.0005	71.1	0.000
LAMAX	LEK	GIIB	D	09	09D3	7391.8	1196	9.3	177.7	8703.74	0.0005	71.1	0.000
LAMAX	LEK	GIIB	D	09	09D2	7391.8	1196	9.3	177.7	8703.74	0.0003	71.1	0.000
LAMAX	LEK	IA1125	D	09	09D7	2529.6	1282	30.4	186.7	2991.97	0.0053	71.1	0.000
LAMAX	LEK	BEC58P	D	09	09D1	2789.2	1927	43.7	147.2	109.87	0.0802	71.0	0.000
LAMAX	LEK	C130	A	27	27A4	1969.2	1053	32.3	155.0	29.40	0.0003	70.8	0.000
LAMAX	LEK	DHC6	A	27	27A4	1724.8	1059	37.9	69.3	46.70	0.0495	70.8	0.000
LAMAX	LEK	GIV	D	09	09D5	2630.3	2548	75.6	186.0	9327.17	0.0001	70.8	0.000
LAMAX	LEK	C130	D	27	27D7	4308.0	3132	46.6	191.0	93.58	0.0064	70.7	0.000
LAMAX	LEK	GIV	D	09	09D5	2650.2	2546	73.9	186.0	9327.00	0.0005	70.7	0.000
LAMAX	LEK	IA1125	D	09	09D7	2594.0	1278	29.5	186.6	2991.99	0.0196	70.7	0.000
LAMAX	LEK	CNA206	D	09	09D1	2611.5	2179	56.5	97.6	2638.24	0.0610	70.6	0.000
LAMAX	LEK	GIIB	A	27	27A4	1553.1	1064	43.2	166.1	2581.83	0.0003	70.6	0.000
LAMAX	LEK	GIV	D	09	09D5	2674.1	2545	72.1	186.0	9326.81	0.0007	70.6	0.000
LAMAX	LEK	GIIB	D	27	27D7	4543.7	2600	34.9	182.4	5293.09	0.0064	70.5	0.000
LAMAX	LEK	GIV	D	09	09D5	2702.2	2543	70.2	186.0	9326.59	0.0005	70.5	0.000
LAMAX	LEK	GIV	D	09	09D5	2734.8	2540	68.3	186.0	9326.34	0.0001	70.4	0.000
LAMAX	LEK	CL600	D	09	09D7	3029.3	2099	43.9	202.8	5893.55	0.0035	70.3	0.000
LAMAX	LEK	IA1125	D	09	09D7	2656.7	1275	28.7	186.6	2992.01	0.0318	70.3	0.000
LAMAX	LEK	CNA206	D	09	09D1	2691.0	2177	54.0	97.6	2638.46	0.2251	70.2	0.000
LAMAX	LEK	CL600	D	09	09D7	3082.6	2096	42.8	202.6	5894.17	0.0131	70.1	0.000
LAMAX	LEK	DHC6	A	27	27A4	1855.5	1056	34.7	69.3	46.70	0.0304	70.1	0.000
LAMAX	LEK	GIIB	A	27	27A4	1604.4	1061	41.4	166.1	2586.27	0.0010	70.1	0.000
LAMAX	LEK	IA1125	D	09	09D7	2717.6	1271	27.9	186.6	2992.03	0.0196	70.0	0.000
LAMAX	LEK	C130	D	27	27D7	4579.4	3127	43.1	191.0	93.57	0.0104	69.9	0.000
LAMAX	LEK	CNA206	D	09	09D1	2776.3	2175	51.6	97.6	2638.70	0.3658	69.9	0.000

TABLE H-4.1
L_{MAX} NOISE LEVELS AT SAGE GROUSE LEK #2

METRIC	GRID_I	ACFT_ID	OP_TYPE	RWY_ID	TRK_ID1	DISTANCE	ALTITUDE	ELEV_ANG	SPEED	THR_SET	OPS_EQUIV	L_{MAX}	PERCENT
LAMAX	LEK	CL600	D	09	09D7	3134.9	2093	41.9	202.4	5894.81	0.0212	69.8	0.000
LAMAX	LEK	LEAR35	A	27	27A6	1109.9	1052	71.4	145.8	921.70	0.0108	69.8	0.000
LAMAX	LEK	GASEPV	D	09	09D5	2067.3	1988	74.1	115.8	101.44	0.0075	69.7	0.000
LAMAX	LEK	LEAR35	A	27	27A7	1114.6	1052	70.7	145.8	921.71	0.0031	69.7	0.000
LAMAX	LEK	CL600	A	27	27A6	1109.9	1052	71.4	150.7	2347.40	0.0036	69.6	0.000
LAMAX	LEK	CNA206	D	09	09D1	2867.0	2173	49.3	97.6	2638.96	0.2251	69.6	0.000
LAMAX	LEK	GASEPV	D	09	09D5	2093.6	1987	71.7	115.8	101.44	0.0275	69.6	0.000
LAMAX	LEK	IA1125	D	09	09D7	2776.7	1267	27.2	186.6	2992.05	0.0053	69.6	0.000
LAMAX	LEK	CL600	D	09	09D7	3186.1	2090	41.0	202.3	5895.47	0.0131	69.5	0.000
LAMAX	LEK	CL600	A	27	27A7	1114.6	1052	70.7	150.7	2347.41	0.0010	69.5	0.000
LAMAX	LEK	DHC6	A	27	27A4	1969.2	1053	32.3	69.3	46.69	0.0082	69.5	0.000
LAMAX	LEK	GIIB	D	27	27D7	4863.6	2596	32.3	182.4	5293.12	0.0017	69.5	0.000
LAMAX	LEK	GASEPV	D	09	09D5	2124.9	1986	69.2	115.8	101.43	0.0447	69.4	0.000
LAMAX	LEK	CL600	D	09	09D7	3236.0	2087	40.2	202.1	5896.14	0.0035	69.3	0.000
LAMAX	LEK	CNA206	D	09	09D1	2962.9	2170	47.1	97.6	2639.24	0.0610	69.2	0.000
LAMAX	LEK	GASEPV	D	09	09D5	2161.4	1985	66.7	115.8	101.43	0.0275	69.2	0.000
LAMAX	LEK	C130	D	27	27D7	4865.8	3123	39.9	191.0	93.56	0.0064	69.1	0.000
LAMAX	LEK	GIIB	A	27	27A4	1724.8	1059	37.9	166.1	2590.30	0.0016	69.1	0.000
LAMAX	LEK	LEAR35	A	27	27A7	1171.3	1051	63.9	145.8	921.69	0.0114	69.1	0.000
LAMAX	LEK	LEAR35	A	27	27A6	1171.3	1051	63.9	145.8	921.69	0.0399	69.1	0.000
LAMAX	LEK	GASEPV	D	09	09D5	2203.4	1984	64.2	115.8	101.43	0.0075	69.0	0.000
LAMAX	LEK	GIV	A	27	27A7	1114.6	1052	70.7	169.4	3554.70	0.0005	69.0	0.000
LAMAX	LEK	GIV	A	27	27A6	1109.9	1052	71.4	169.4	3554.69	0.0018	69.0	0.000
LAMAX	LEK	CL600	A	27	27A7	1171.3	1051	63.9	150.7	2347.38	0.0038	68.9	0.000
LAMAX	LEK	CL600	A	27	27A6	1171.3	1051	63.9	150.7	2347.38	0.0133	68.9	0.000
LAMAX	LEK	DHC6	D	09	09D5	3160.2	3075	76.7	115.4	102.32	0.0081	68.9	0.000
LAMAX	LEK	DHC6	D	09	09D5	3176.4	3074	75.4	115.4	102.32	0.0298	68.8	0.000
LAMAX	LEK	DHC6	D	09	09D5	3218.9	3070	72.5	115.4	102.31	0.0298	68.7	0.000
LAMAX	LEK	DHC6	D	09	09D5	3195.9	3072	74.0	115.4	102.31	0.0485	68.7	0.000
LAMAX	LEK	DHC6	D	09	09D5	3245.7	3067	70.9	115.4	102.30	0.0081	68.6	0.000
LAMAX	LEK	MU3001	A	27	27A6	1109.9	1052	71.4	133.6	769.33	0.1135	68.6	0.000
LAMAX	LEK	GIV	A	27	27A7	1171.3	1051	63.9	169.4	3554.66	0.0019	68.5	0.000
LAMAX	LEK	GIV	A	27	27A6	1171.3	1051	63.9	169.4	3554.66	0.0066	68.5	0.000
LAMAX	LEK	MU3001	A	27	27A7	1114.6	1052	70.7	133.6	769.33	0.0324	68.5	0.000
LAMAX	LEK	C130	D	27	27D7	5164.3	3117	37.1	191.0	93.55	0.0017	68.4	0.000
LAMAX	LEK	LEAR35	A	27	27A7	1248.2	1051	57.4	145.8	921.68	0.0185	68.3	0.000
LAMAX	LEK	LEAR35	A	27	27A6	1248.2	1051	57.3	145.8	921.68	0.0649	68.3	0.000
LAMAX	LEK	Q400	A	27	27A10	1093.5	1053	74.4	146.4	1411.72	0.0975	68.3	0.000
LAMAX	LEK	CL600	A	27	27A7	1248.2	1051	57.4	150.7	2347.34	0.0062	68.1	0.000
LAMAX	LEK	CL600	A	27	27A6	1248.2	1051	57.3	150.7	2347.34	0.0216	68.1	0.000
LAMAX	LEK	GIIB	A	27	27A4	1855.5	1056	34.7	166.0	2594.83	0.0010	68.1	0.000
LAMAX	LEK	Q400	A	27	27A11	1109.8	1052	71.4	146.4	1411.68	0.0975	68.1	0.000
LAMAX	LEK	Q400	A	27	27A12	1114.5	1052	70.7	146.4	1411.68	0.0975	68.1	0.000

TABLE H-4.1
L_{MAX} NOISE LEVELS AT SAGE GROUSE LEK #2

METRIC	GRID_I	ACFT_ID	OP_TYPE	RWY_ID	TRK_ID1	DISTANCE	ALTITUDE	ELEV_ANG	SPEED	THR_SET	OPS_EQUIV	L_{MAX}	PERCENT
LAMAX	LEK	GASEPV	D	09	09D1	2444.1	1975	53.9	115.8	101.41	0.1044	67.9	0.000
LAMAX	LEK	MU3001	A	27	27A7	1171.3	1051	63.9	133.6	769.32	0.1198	67.9	0.000
LAMAX	LEK	MU3001	A	27	27A6	1171.3	1051	63.9	133.6	769.32	0.4192	67.9	0.000
LAMAX	LEK	Q400	A	27	27A13	1129.2	1052	68.7	146.4	1411.69	0.0975	67.9	0.000
LAMAX	LEK	GIV	A	27	27A7	1248.2	1051	57.4	169.4	3554.60	0.0031	67.8	0.000
LAMAX	LEK	GIV	A	27	27A6	1248.2	1051	57.3	169.4	3554.60	0.0108	67.8	0.000
LAMAX	LEK	LEAR25	D	09	09D4	7266.5	1231	9.8	195.7	2502.14	0.0023	67.8	0.000
LAMAX	LEK	LEAR25	D	09	09D3	7266.5	1231	9.8	195.7	2502.14	0.0023	67.8	0.000
LAMAX	LEK	LEAR25	D	09	09D2	7266.5	1231	9.8	195.7	2502.14	0.0011	67.8	0.000
LAMAX	LEK	CNA441	A	27	27A7	1114.6	1052	70.7	107.2	41.15	0.0216	67.7	0.000
LAMAX	LEK	CNA441	A	27	27A6	1109.9	1052	71.4	107.2	41.15	0.0757	67.7	0.000
LAMAX	LEK	Q400	A	27	27A10	1150.9	1052	66.1	146.4	1411.69	0.3600	67.7	0.000
LAMAX	LEK	GASEPV	D	09	09D1	2528.8	1973	51.3	115.8	101.40	0.3855	67.6	0.000
LAMAX	LEK	LEAR25	D	09	09D4	7300.5	1215	9.6	195.6	2501.84	0.0084	67.6	0.000
LAMAX	LEK	LEAR25	D	09	09D3	7300.5	1215	9.6	195.6	2501.84	0.0084	67.6	0.000
LAMAX	LEK	LEAR25	D	09	09D2	7300.5	1215	9.6	195.6	2501.84	0.0042	67.6	0.000
LAMAX	LEK	GIV	D	09	09D7	3321.1	2482	48.4	185.8	9319.70	0.0018	67.5	0.000
LAMAX	LEK	MU3001	D	27	27D7	4382.3	3551	54.1	243.3	1888.37	0.0546	67.5	0.000
LAMAX	LEK	Q400	A	27	27A12	1171.2	1051	63.9	146.4	1411.67	0.3600	67.5	0.000
LAMAX	LEK	Q400	A	27	27A11	1171.2	1051	63.9	146.4	1411.67	0.3600	67.5	0.000
LAMAX	LEK	LEAR25	D	09	09D4	7332.1	1200	9.4	195.6	2501.55	0.0137	67.4	0.000
LAMAX	LEK	LEAR25	D	09	09D3	7332.1	1200	9.4	195.6	2501.55	0.0137	67.4	0.000
LAMAX	LEK	LEAR25	D	09	09D2	7332.1	1200	9.4	195.6	2501.55	0.0068	67.4	0.000
LAMAX	LEK	Q400	A	27	27A13	1182.4	1051	62.8	146.4	1411.68	0.3600	67.4	0.000
LAMAX	LEK	GIIB	A	27	27A4	1969.2	1053	32.3	166.0	2600.12	0.0003	67.3	0.000
LAMAX	LEK	GIV	D	09	09D7	3367.6	2477	47.3	185.8	9319.08	0.0065	67.3	0.000
LAMAX	LEK	LEAR25	D	09	09D4	7361.4	1184	9.3	195.5	2501.25	0.0084	67.3	0.000
LAMAX	LEK	LEAR25	D	09	09D3	7361.4	1184	9.3	195.5	2501.25	0.0084	67.3	0.000
LAMAX	LEK	LEAR25	D	09	09D2	7361.4	1184	9.3	195.5	2501.25	0.0042	67.3	0.000
LAMAX	LEK	LEAR35	A	27	27A7	1336.9	1050	51.8	145.8	921.66	0.0114	67.3	0.000
LAMAX	LEK	LEAR35	A	27	27A6	1336.9	1050	51.8	145.8	921.66	0.0399	67.3	0.000
LAMAX	LEK	CNA441	A	27	27A7	1171.3	1051	63.9	107.2	41.15	0.0798	67.2	0.000
LAMAX	LEK	CNA441	A	27	27A6	1171.3	1051	63.9	107.2	41.15	0.2795	67.2	0.000
LAMAX	LEK	GASEPV	D	09	09D1	2619.4	1971	48.8	115.8	101.39	0.6264	67.2	0.000
LAMAX	LEK	LEAR25	D	09	09D4	7388.1	1169	9.1	195.5	2500.95	0.0023	67.2	0.000
LAMAX	LEK	LEAR25	D	09	09D3	7388.1	1169	9.1	195.5	2500.95	0.0023	67.2	0.000
LAMAX	LEK	LEAR25	D	09	09D2	7388.1	1169	9.1	195.5	2500.95	0.0011	67.2	0.000
LAMAX	LEK	DHC6	D	09	09D7	3739.8	3003	53.4	115.3	102.14	0.1131	67.1	0.000
LAMAX	LEK	CL600	A	27	27A7	1336.9	1050	51.8	150.7	2347.29	0.0038	67.0	0.000
LAMAX	LEK	CL600	A	27	27A6	1336.9	1050	51.8	150.7	2347.29	0.0133	67.0	0.000
LAMAX	LEK	DHC6	D	09	09D7	3779.9	2997	52.5	115.3	102.13	0.4177	67.0	0.000
LAMAX	LEK	GIV	D	09	09D7	3413.3	2471	46.4	185.8	9318.45	0.0106	67.0	0.000
LAMAX	LEK	GIV	A	27	27A7	1336.9	1050	51.8	169.4	3554.52	0.0019	67.0	0.000

TABLE H-4.1
L_{MAX} NOISE LEVELS AT SAGE GROUSE LEK #2

METRIC	GRID_I	ACFT_ID	OP_TYPE	RWY_ID	TRK_ID1	DISTANCE	ALTITUDE	ELEV_ANG	SPEED	THR_SET	OPS_EQUIV	L_{MAX}	PERCENT
LAMAX	LEK	GIV	A	27	27A6	1336.9	1050	51.8	169.4	3554.52	0.0066	67.0	0.000
LAMAX	LEK	MU3001	A	27	27A7	1248.2	1051	57.4	133.6	769.31	0.1946	67.0	0.000
LAMAX	LEK	MU3001	A	27	27A6	1248.2	1051	57.3	133.6	769.31	0.6812	67.0	0.000
LAMAX	LEK	DHC6	D	09	09D7	3819.5	2991	51.5	115.3	102.11	0.6788	66.9	0.000
LAMAX	LEK	BEC58P	A	27	27A1	1517.6	1048	43.7	113.0	51.55	0.1727	66.8	0.000
LAMAX	LEK	DHC6	D	09	09D7	3858.3	2985	50.7	115.3	102.10	0.4177	66.8	0.000
LAMAX	LEK	GASEPV	D	09	09D1	2715.4	1968	46.4	115.8	101.39	0.3855	66.8	0.000
LAMAX	LEK	GIV	D	09	09D7	3458.1	2465	45.5	185.7	9317.79	0.0065	66.8	0.000
LAMAX	LEK	Q400	A	27	27A12	1248.1	1051	57.4	146.4	1411.66	0.5850	66.8	0.000
LAMAX	LEK	Q400	A	27	27A13	1248.2	1051	57.4	146.4	1411.66	0.5850	66.8	0.000
LAMAX	LEK	Q400	A	27	27A11	1248.2	1051	57.3	146.4	1411.66	0.5850	66.8	0.000
LAMAX	LEK	Q400	A	27	27A10	1248.2	1051	57.4	146.4	1411.66	0.5850	66.8	0.000
LAMAX	LEK	DHC6	D	09	09D7	3896.2	2978	49.9	115.3	102.08	0.1131	66.7	0.000
LAMAX	LEK	PA31	D	09	09D5	2021.6	1940	73.7	113.6	2400.00	0.0004	66.7	0.000
LAMAX	LEK	BEC58P	A	27	27A4	1553.1	1064	43.2	113.0	51.58	0.0123	66.6	0.000
LAMAX	LEK	CNA441	A	27	27A7	1248.2	1051	57.4	107.2	41.15	0.1298	66.6	0.000
LAMAX	LEK	CNA441	A	27	27A6	1248.2	1051	57.3	107.2	41.15	0.4541	66.6	0.000
LAMAX	LEK	GIV	D	09	09D7	3501.9	2459	44.6	185.7	9317.11	0.0018	66.6	0.000
LAMAX	LEK	MU3001	D	27	27D7	4617.8	3548	50.2	243.2	1888.49	0.2016	66.6	0.000
LAMAX	LEK	GASEPV	D	09	09D1	2816.4	1965	44.3	115.8	101.38	0.1044	66.5	0.000
LAMAX	LEK	PA31	D	09	09D5	2048.5	1940	71.2	113.6	2400.00	0.0013	66.5	0.000
LAMAX	LEK	PA31	D	09	09D5	2080.4	1939	68.7	113.6	2400.00	0.0021	66.4	0.000
LAMAX	LEK	BEC58P	A	27	27A4	1604.4	1061	41.4	113.0	51.57	0.0456	66.3	0.000
LAMAX	LEK	LEAR35	A	27	27A7	1422.8	1050	47.5	145.8	921.63	0.0031	66.3	0.000
LAMAX	LEK	GASEPF	D	09	09D5	1521.8	1421	69.0	89.4	106.96	0.0010	66.2	0.000
LAMAX	LEK	GIV	A	27	27A7	1422.8	1050	47.5	169.4	3554.41	0.0005	66.2	0.000
LAMAX	LEK	LEAR35	A	27	27A6	1434.2	1050	47.0	145.8	921.63	0.0108	66.2	0.000
LAMAX	LEK	PA31	D	09	09D5	2117.7	1938	66.2	113.6	2400.00	0.0013	66.2	0.000
LAMAX	LEK	Q400	A	27	27A13	1324.9	1050	52.4	146.4	1411.65	0.3600	66.2	0.000
LAMAX	LEK	CL600	A	27	27A7	1422.8	1050	47.5	150.7	2347.22	0.0010	66.1	0.000
LAMAX	LEK	GIV	A	27	27A6	1434.2	1050	47.0	169.4	3554.42	0.0018	66.1	0.000
LAMAX	LEK	IA1125	A	27	27A6	1109.9	1052	71.4	150.7	1066.21	0.0054	66.1	0.000
LAMAX	LEK	Q400	A	27	27A11	1336.8	1050	51.8	146.4	1411.65	0.3600	66.1	0.000
LAMAX	LEK	Q400	A	27	27A12	1336.9	1050	51.8	146.4	1411.65	0.3600	66.1	0.000
LAMAX	LEK	CL600	A	27	27A6	1434.2	1050	47.0	150.7	2347.22	0.0036	66.0	0.000
LAMAX	LEK	GASEPF	D	09	09D5	1558.0	1420	65.7	89.4	106.99	0.0035	66.0	0.000
LAMAX	LEK	IA1125	D	27	27D7	3724.4	2696	46.4	220.1	2595.31	0.0026	66.0	0.000
LAMAX	LEK	IA1125	A	27	27A7	1114.6	1052	70.7	150.7	1066.21	0.0015	66.0	0.000
LAMAX	LEK	MU3001	A	27	27A7	1336.9	1050	51.8	133.6	769.29	0.1198	66.0	0.000
LAMAX	LEK	MU3001	A	27	27A6	1336.9	1050	51.8	133.6	769.29	0.4192	66.0	0.000
LAMAX	LEK	PA31	D	09	09D5	2160.6	1936	63.7	113.6	2400.00	0.0004	66.0	0.000
LAMAX	LEK	CNA441	A	27	27A7	1336.9	1050	51.8	107.2	41.15	0.0798	65.9	0.000
LAMAX	LEK	CNA441	A	27	27A6	1336.9	1050	51.8	107.2	41.15	0.2795	65.9	0.000

TABLE H-4.1
L_{MAX} NOISE LEVELS AT SAGE GROUSE LEK #2

METRIC	GRID_I	ACFT_ID	OP_TYPE	RWY_ID	TRK_ID1	DISTANCE	ALTITUDE	ELEV_ANG	SPEED	THR_SET	OPS_EQUIV	L_{MAX}	PERCENT
LAMAX	LEK	GASEPF	D	09	09D5	1600.7	1420	62.5	89.4	107.02	0.0057	65.7	0.000
LAMAX	LEK	LEAR35	D	27	27D7	4560.6	3766	55.7	227.0	2520.03	0.0052	65.7	0.000
LAMAX	LEK	MU3001	D	27	27D7	4872.4	3545	46.7	243.1	1888.63	0.3276	65.7	0.000
LAMAX	LEK	Q400	A	27	27A10	1389.1	1049	49.1	146.4	1411.62	0.3600	65.7	0.000
LAMAX	LEK	BEC58P	A	27	27A4	1724.8	1059	37.9	113.0	51.57	0.0740	65.6	0.000
LAMAX	LEK	Q400	A	27	27A13	1411.3	1049	48.0	146.4	1411.63	0.0975	65.5	0.000
LAMAX	LEK	BEC58P	A	27	27A1	1758.4	1046	36.5	113.0	51.54	0.6378	65.4	0.000
LAMAX	LEK	GASEPF	D	09	09D5	1649.9	1419	59.4	89.3	107.07	0.0035	65.4	0.000
LAMAX	LEK	IA1125	A	27	27A7	1171.3	1051	63.9	150.7	1066.20	0.0057	65.4	0.000
LAMAX	LEK	IA1125	A	27	27A6	1171.3	1051	63.9	150.7	1066.20	0.0200	65.4	0.000
LAMAX	LEK	Q400	A	27	27A12	1422.7	1050	47.5	146.4	1411.63	0.0975	65.4	0.000
LAMAX	LEK	CNA441	A	27	27A7	1422.8	1050	47.5	107.2	41.15	0.0216	65.3	0.000
LAMAX	LEK	Q400	A	27	27A11	1434.1	1050	47.0	146.4	1411.63	0.0975	65.3	0.000
LAMAX	LEK	CNA441	A	27	27A6	1434.2	1050	47.0	107.2	41.15	0.0757	65.2	0.000
LAMAX	LEK	GASEPV	A	27	27A1	1517.6	1048	43.7	75.3	60.04	0.2249	65.2	0.000
LAMAX	LEK	CNA441	D	09	09D5	2465.7	2382	75.0	163.2	104.81	0.0053	65.1	0.000
LAMAX	LEK	GASEPF	D	09	09D5	1705.6	1419	56.3	89.3	107.11	0.0010	65.1	0.000
LAMAX	LEK	GIV	A	27	27A4	1553.1	1064	43.2	169.6	3556.30	0.0001	65.1	0.000
LAMAX	LEK	CNA441	D	09	09D5	2487.0	2381	73.2	163.2	104.80	0.0196	65.0	0.000
LAMAX	LEK	GASEPV	A	27	27A4	1553.1	1064	43.2	75.3	60.07	0.0161	65.0	0.000
LAMAX	LEK	IA1125	D	27	27D7	3998.7	2692	42.3	220.1	2595.37	0.0096	65.0	0.000
LAMAX	LEK	LEAR35	A	27	27A4	1553.1	1064	43.2	145.9	922.12	0.0008	65.0	0.000
LAMAX	LEK	MU3001	A	27	27A7	1422.8	1050	47.5	133.6	769.27	0.0324	65.0	0.000
LAMAX	LEK	BEC58P	A	27	27A4	1855.5	1056	34.7	113.0	51.56	0.0456	64.9	0.000
LAMAX	LEK	CNA441	D	09	09D5	2512.6	2379	71.2	163.2	104.80	0.0318	64.9	0.000
LAMAX	LEK	CL600	A	27	27A4	1553.1	1064	43.2	150.8	2348.47	0.0003	64.8	0.000
LAMAX	LEK	CNA441	D	09	09D5	2542.7	2377	69.2	163.2	104.79	0.0196	64.8	0.000
LAMAX	LEK	MU3001	D	27	27D7	5142.8	3541	43.5	242.9	1888.78	0.2016	64.8	0.000
LAMAX	LEK	MU3001	A	27	27A6	1434.2	1050	47.0	133.6	769.27	0.1135	64.8	0.000
LAMAX	LEK	PA31	D	09	09D1	2405.6	1927	53.2	113.6	2400.00	0.0050	64.8	0.000
LAMAX	LEK	CNA441	D	09	09D5	2577.4	2375	67.1	163.1	104.79	0.0053	64.7	0.000
LAMAX	LEK	GASEPV	A	27	27A4	1604.4	1061	41.4	75.3	60.07	0.0593	64.7	0.000
LAMAX	LEK	LEAR35	D	27	27D7	4787.0	3763	51.8	226.9	2520.13	0.0192	64.7	0.000
LAMAX	LEK	GIV	A	27	27A4	1604.4	1061	41.4	169.6	3555.96	0.0005	64.6	0.000
LAMAX	LEK	IA1125	A	27	27A7	1248.2	1051	57.4	150.7	1066.18	0.0093	64.6	0.000
LAMAX	LEK	IA1125	A	27	27A6	1248.2	1051	57.3	150.7	1066.18	0.0324	64.6	0.000
LAMAX	LEK	LEAR35	A	27	27A4	1604.4	1061	41.4	145.9	922.03	0.0029	64.5	0.000
LAMAX	LEK	CNA441	A	27	27A4	1553.1	1064	43.2	107.2	41.17	0.0054	64.4	0.000
LAMAX	LEK	PA31	D	09	09D1	2491.6	1925	50.6	113.6	2400.00	0.0185	64.4	0.000
LAMAX	LEK	BEC58P	A	27	27A4	1969.2	1053	32.3	113.0	51.56	0.0123	64.3	0.000
LAMAX	LEK	CL600	A	27	27A4	1604.4	1061	41.4	150.8	2348.24	0.0010	64.3	0.000
LAMAX	LEK	Q400	A	27	27A10	1571.6	1047	41.8	146.4	1411.58	0.0975	64.3	0.000
LAMAX	LEK	BEC58P	D	27	27D1	4055.2	3140	50.7	153.3	92.99	0.1727	64.2	0.000

TABLE H-4.1
L_{MAX} NOISE LEVELS AT SAGE GROUSE LEK #2

METRIC	GRID_I	ACFT_ID	OP_TYPE	RWY_ID	TRK_ID1	DISTANCE	ALTITUDE	ELEV_ANG	SPEED	THR_SET	OPS_EQUIV	L_{MAX}	PERCENT
LAMAX	LEK	BEC58P	A	27	27A1	2010.9	1043	31.2	113.0	51.54	1.0365	64.1	0.000
LAMAX	LEK	CNA441	A	27	27A4	1604.4	1061	41.4	107.2	41.16	0.0200	64.1	0.000
LAMAX	LEK	IA1125	D	27	27D7	4290.0	2687	38.8	220.1	2597.35	0.0156	64.0	0.000
LAMAX	LEK	PA31	D	09	09D1	2583.5	1923	48.1	113.6	2400.00	0.0301	64.0	0.000
LAMAX	LEK	GASEPV	A	27	27A4	1724.8	1059	37.9	75.3	60.06	0.0964	63.9	0.000
LAMAX	LEK	MU3001	D	27	27D7	5426.6	3537	40.7	242.8	1888.95	0.0546	63.9	0.000
LAMAX	LEK	GASEPV	A	27	27A1	1758.4	1046	36.5	75.3	60.03	0.8305	63.8	0.000
LAMAX	LEK	GIV	A	27	27A4	1724.8	1059	37.9	169.5	3555.64	0.0008	63.7	0.000
LAMAX	LEK	LEAR35	D	27	27D7	5032.6	3759	48.3	226.8	2520.24	0.0312	63.7	0.000
LAMAX	LEK	GASEPF	D	09	09D1	2013.5	1416	44.7	89.0	107.46	0.0134	63.6	0.000
LAMAX	LEK	MU3001	A	27	27A4	1553.1	1064	43.2	133.6	769.68	0.0081	63.6	0.000
LAMAX	LEK	PA31	D	09	09D1	2680.7	1920	45.7	113.6	2400.00	0.0185	63.6	0.000
LAMAX	LEK	BEC58P	D	27	27D1	4308.9	3137	46.7	153.3	92.98	0.6378	63.5	0.000
LAMAX	LEK	IA1125	A	27	27A7	1336.9	1050	51.8	150.7	1066.15	0.0057	63.5	0.000
LAMAX	LEK	IA1125	A	27	27A6	1336.9	1050	51.8	150.7	1066.15	0.0200	63.5	0.000
LAMAX	LEK	CNA441	A	27	27A4	1724.8	1059	37.9	107.2	41.16	0.0324	63.4	0.000
LAMAX	LEK	LEAR35	A	27	27A4	1724.8	1059	37.9	145.8	921.95	0.0046	63.4	0.000
LAMAX	LEK	GIV	D	27	27D7	5094.9	4394	59.6	227.8	9264.23	0.0009	63.3	0.000
LAMAX	LEK	CL600	D	27	27D7	4641.1	3863	56.3	255.0	5234.03	0.0017	63.2	0.000
LAMAX	LEK	GASEPV	A	27	27A4	1855.5	1056	34.7	75.3	60.06	0.0593	63.2	0.000
LAMAX	LEK	PA31	D	09	09D1	2783.0	1917	43.5	113.6	2400.00	0.0050	63.2	0.000
LAMAX	LEK	CL600	A	27	27A4	1724.8	1059	37.9	150.8	2348.03	0.0016	63.1	0.000
LAMAX	LEK	GASEPF	D	09	09D1	2117.0	1415	41.9	88.9	107.54	0.0493	63.1	0.000
LAMAX	LEK	MU3001	A	27	27A4	1604.4	1061	41.4	133.6	769.60	0.0300	63.1	0.000
LAMAX	LEK	C130	D	09	09D4	7304.6	1441	11.4	153.5	128.37	0.0005	63.0	0.000
LAMAX	LEK	C130	D	09	09D3	7304.6	1441	11.4	153.5	128.37	0.0005	63.0	0.000
LAMAX	LEK	C130	D	09	09D2	7304.6	1441	11.4	153.5	128.37	0.0003	63.0	0.000
LAMAX	LEK	IA1125	D	27	27D7	4594.6	2682	35.7	220.1	2615.00	0.0096	63.0	0.000
LAMAX	LEK	C130	D	09	09D4	7338.7	1429	11.2	153.3	128.50	0.0019	62.9	0.000
LAMAX	LEK	C130	D	09	09D3	7338.7	1429	11.2	153.3	128.50	0.0019	62.9	0.000
LAMAX	LEK	C130	D	09	09D2	7338.7	1429	11.2	153.3	128.50	0.0009	62.9	0.000
LAMAX	LEK	BEC58P	D	27	27D1	4580.9	3134	43.2	153.3	92.97	1.0365	62.8	0.000
LAMAX	LEK	C130	D	09	09D4	7370.5	1417	11.1	153.1	128.63	0.0030	62.8	0.000
LAMAX	LEK	C130	D	09	09D3	7370.5	1417	11.1	153.1	128.63	0.0030	62.8	0.000
LAMAX	LEK	C130	D	09	09D2	7370.5	1417	11.1	153.1	128.63	0.0015	62.8	0.000
LAMAX	LEK	GIV	A	27	27A4	1855.5	1056	34.7	169.5	3555.29	0.0005	62.8	0.000
LAMAX	LEK	C130	D	09	09D4	7399.9	1406	10.9	152.8	128.76	0.0019	62.7	0.000
LAMAX	LEK	C130	D	09	09D3	7399.9	1406	10.9	152.8	128.76	0.0019	62.7	0.000
LAMAX	LEK	C130	D	09	09D2	7399.9	1406	10.9	152.8	128.76	0.0009	62.7	0.000
LAMAX	LEK	CNA441	A	27	27A4	1855.5	1056	34.7	107.2	41.16	0.0200	62.7	0.000
LAMAX	LEK	GASEPV	A	27	27A4	1969.2	1053	32.3	75.3	60.05	0.0161	62.7	0.000
LAMAX	LEK	LEAR35	D	27	27D7	5294.4	3755	45.2	226.7	2520.37	0.0192	62.7	0.000
LAMAX	LEK	C130	D	09	09D4	7426.8	1394	10.8	152.6	128.88	0.0005	62.6	0.000

TABLE H-4.1
L_{MAX} NOISE LEVELS AT SAGE GROUSE LEK #2

METRIC	GRID_I	ACFT_ID	OP_TYPE	RWY_ID	TRK_ID1	DISTANCE	ALTITUDE	ELEV_ANG	SPEED	THR_SET	OPS_EQUIV	L_{MAX}	PERCENT
LAMAX	LEK	C130	D	09	09D3	7426.8	1394	10.8	152.6	128.88	0.0005	62.6	0.000
LAMAX	LEK	C130	D	09	09D2	7426.8	1394	10.8	152.6	128.88	0.0003	62.6	0.000
LAMAX	LEK	CNA441	D	09	09D7	3197.0	2318	46.5	163.0	104.65	0.0742	62.6	0.000
LAMAX	LEK	GASEPF	D	09	09D1	2225.9	1414	39.4	88.8	107.62	0.0801	62.6	0.000
LAMAX	LEK	GIV	D	27	27D7	5297.9	4390	56.0	227.7	9264.75	0.0032	62.6	0.000
LAMAX	LEK	IA1125	A	27	27A7	1422.8	1050	47.5	150.7	1066.12	0.0015	62.5	0.000
LAMAX	LEK	CNA441	D	09	09D7	3245.6	2313	45.4	163.0	104.64	0.2742	62.4	0.000
LAMAX	LEK	GASEPV	D	27	27D1	4420.6	3594	54.4	118.8	105.39	0.2249	62.4	0.000
LAMAX	LEK	GASEPV	A	27	27A1	2010.9	1043	31.2	75.3	60.03	1.3496	62.4	0.000
LAMAX	LEK	IA1125	A	27	27A6	1434.2	1050	47.0	150.7	1066.13	0.0054	62.4	0.000
LAMAX	LEK	CL600	D	27	27D7	4863.6	3859	52.5	254.9	5234.25	0.0064	62.3	0.000
LAMAX	LEK	CNA441	D	09	09D7	3293.4	2307	44.5	163.0	104.63	0.4455	62.3	0.000
LAMAX	LEK	LEAR35	A	27	27A4	1855.5	1056	34.7	145.8	921.86	0.0029	62.2	0.000
LAMAX	LEK	BEC58P	D	27	27D1	4867.7	3130	40.0	153.3	92.96	0.6378	62.1	0.000
LAMAX	LEK	CNA206	A	27	27A1	1517.6	1048	43.7	86.8	2400.00	0.1314	62.1	0.000
LAMAX	LEK	CNA441	D	09	09D7	3340.2	2302	43.6	163.0	104.62	0.2742	62.1	0.000
LAMAX	LEK	CNA441	A	27	27A4	1969.2	1053	32.3	107.2	41.15	0.0054	62.1	0.000
LAMAX	LEK	GASEPF	D	09	09D1	2339.6	1413	37.2	88.8	107.72	0.0493	62.1	0.000
LAMAX	LEK	BEC58P	A	27	27A1	2270.4	1040	27.2	113.0	51.53	0.6378	62.0	0.000
LAMAX	LEK	CL600	A	27	27A4	1855.5	1056	34.7	150.7	2347.80	0.0010	62.0	0.000
LAMAX	LEK	CNA441	D	09	09D7	3385.8	2296	42.7	162.9	104.60	0.0742	62.0	0.000
LAMAX	LEK	GIV	D	27	27D7	5520.1	4386	52.6	227.5	9265.34	0.0052	62.0	0.000
LAMAX	LEK	GIV	A	27	27A4	1969.2	1053	32.3	169.5	3554.88	0.0001	62.0	0.000
LAMAX	LEK	IA1125	D	27	27D7	4910.0	2676	33.0	220.1	2634.58	0.0026	62.0	0.000
LAMAX	LEK	MU3001	A	27	27A4	1724.8	1059	37.9	133.6	769.53	0.0487	62.0	0.000
LAMAX	LEK	PA31	A	27	27A1	1517.6	1048	43.7	139.2	2350.00	0.0108	62.0	0.000
LAMAX	LEK	CNA206	A	27	27A4	1553.1	1064	43.2	87.5	2400.00	0.0094	61.9	0.000
LAMAX	LEK	GASEPV	D	27	27D1	4653.6	3591	50.5	118.8	105.38	0.8305	61.8	0.000
LAMAX	LEK	LEAR35	D	27	27D7	5569.9	3751	42.3	226.6	2520.51	0.0052	61.8	0.000
LAMAX	LEK	PA31	A	27	27A4	1553.1	1064	43.2	139.7	2350.00	0.0008	61.8	0.000
LAMAX	LEK	CNA206	A	27	27A4	1604.4	1061	41.4	87.4	2400.00	0.0347	61.6	0.000
LAMAX	LEK	GASEPF	D	09	09D1	2457.7	1412	35.1	88.7	107.82	0.0134	61.6	0.000
LAMAX	LEK	CL600	D	27	27D7	5105.4	3856	49.0	254.7	5234.49	0.0104	61.5	0.000
LAMAX	LEK	PA31	A	27	27A4	1604.4	1061	41.4	139.6	2350.00	0.0029	61.5	0.000
LAMAX	LEK	Q400	D	09	09D13	3244.4	2398	47.7	165.2	2806.43	0.0975	61.5	0.000

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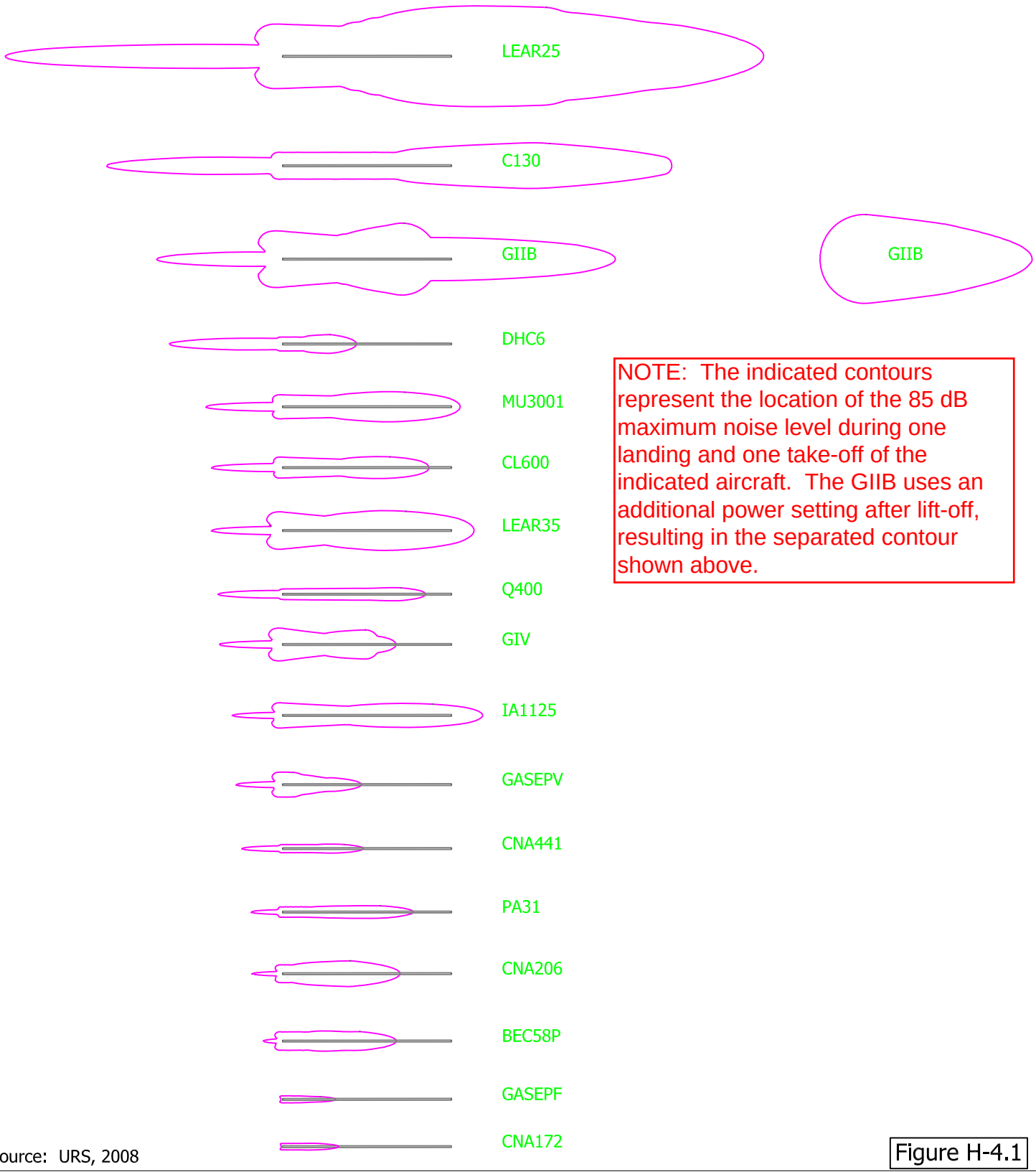
Lmax 85dB Contours of Aircraft Operating at MMH



NOTE: The indicated contours represent the location of the 85 dB maximum noise level during one landing and one take-off of the indicated aircraft. The GIIB uses an additional power setting after lift-off, resulting in the separated contour shown above.

Source: URS, 2008

Figure H-4.1