



Grand Canyon National Park Baseline Noise Analysis

Additional Data and Results

Introduction

The U.S Department of Transportation's John A. Volpe National Transportation Systems Center, Environmental Measurement and Modeling Division (Volpe Center) has been assisting the NPS and FAA with the noise analysis that was conducted to support the agencies in their efforts to address the overflights issues at Grand Canyon National Park (GCNP). The document entitled, "Grand Canyon National Park Baseline Noise Analysis" (dated 3/17/06) presented the updated results of the computer modeling for the percentage of time that aircraft sound levels are audible ($\%T_{Aud}$) for the current aircraft noise conditions (i.e., baseline conditions) and the extent of achievement of substantial restoration of natural quiet at GCNP on the peak day used (August 8, 2005, the day of the highest number of air tour and air tour related operations). This document presents additional information and results of the computer modeling.

It should be emphasized that this information is preliminary and still under review. It is not at this point in time a final noise analysis. Moreover, the FAA and the NPS have not determined how this information should be interpreted or what its implications are with respect to future work of the stakeholder group through both the Alternative Dispute Resolution and NEPA processes.

Note To Working Group Members: There are several technical terms included in this report. These terms were all explained during the technical presentation at the last meeting and included in the glossary of terms you were provided. You might want to use that as a reference tool as you consider the information below.

Location Point Analysis

A location point analysis was performed for the points presented in Table 1 and Figure 1. Tables 2 through 4 present the results of this analysis for the following three metrics:

- *Time Audible ($\%T_{Aud}$)* – The percentage of time that aircraft sound levels are audible;
- *Equivalent Sound Level (L_{eq})* – A logarithmic average (i.e., on an energy basis) of the A-weighted sound levels over a 12-hour time period (7 am to 7 pm for daytime operations; 7 pm to 7 am for nighttime operations); and
- *Maximum Sound Level (L_{max})* – The maximum sound level (in A-weighted decibels) associated with the loudest aircraft event occurring during a modeling assessment.



Table 1. Location Points Modeled in INM.

Location #	Location ID	Location Point Name	LATITUDE	LONGITUDE
1	96MILE	96 Mile Camp	36-06-27.645N	112-13-30.800W
2	ADMIN	NPS Administration site	36-08-00.000N	113-31-30.000W
3	ANDRUS	Andrus Canyon	36-13-00.000N	113-25-00.000W
4	BASCMP	Bass Camp	36-14-14.091N	112-20-39.845W
5	BASIN	The Basin	36-15-42.203N	112-06-10.941W
6	BATCAV	Bat Cave	36-02-52.800N	113-48-10.200W
7	BRNTSP	Burnt Springs Canyon	35-57-58.379N	113-44-38.955W
8	BRTANG	Bright Angel Point	36-11-53.011N	112-03-06.380W
9	CAPROY	Cape Royal	36-07-23.034N	111-56-54.549W
10	CASTLE	Castle Peak	36-11-00.000N	113-34-00.000W
11	CEDRIG	Cedar Ridge	36-03-50.889N	112-05-19.856W
12	CLDWEL	Cliff Dwellers Lodge	36-44-38.400N	111-45-19.800W
13	COYCAN	Coyote Canyon	36-12-42.000N	112-46-09.000W
14	DIACRK	Diamond Creek	35-45-58.800N	113-22-14.400W
15	DOME	The Dome	36-13-00.000N	112-50-00.000W
16	GC008*	<i>Pasture Wash (pinyon-juniper)</i>	<i>36.13895975N</i>	<i>112.39498951W</i>
17	GC009*	<i>Tuweep (warm desert scrub)</i>	<i>36.2111587N</i>	<i>113.0868338W</i>
18	GC010*	<i>Tuweep (cold desert scrub)</i>	<i>36.27095453N</i>	<i>113.09667366W</i>
19	GC011*	<i>South Rim (ponderosa pine)</i>	<i>36.0268N</i>	<i>112.09366W</i>
20	GCWEST	Grand Canyon West	35-59-18.600N	113-48-35.400W
21	GRAGOR	Granite Gorge	36-02-00.000N	113-52-00.000W
22	GRNTPK	Granite Peak	35-57-53.400N	113-19-00.000W
23	GUSPLT	Gus Plateau	36-00-01.800N	113-17-22.500W
24	HAVAPT	Havasupai Point	36-18-33.059N	112-45-44.203W
25	HAVCAN	Havatagvitch Canyon	36-08-01.800N	112-34-18.000W
26	HBASIN	Hermit Basin	36-03-21.827N	112-13-22.679W
27	HFCAN	Horse Flat Canyon	35-51-41.400N	113-46-31.200W
28	KANAPT	Kanab Point	36-24-15.875N	112-39-04.927W
29	KELLPT	Kelly Point	35-50-00.000N	113-28-00.000W
30	LIPAN	Lipan Point	36-01-55.919N	111-51-12.981W
31	LITCOL	Little Colorado	36-11-25.200N	111-43-36.000W
32	LTCORV	Little Colorado River	36-11-45.230N	111-48-01.162W
33	MARBDM	Marble Canyon Dam Site	36-24-31.388N	111-52-21.588W
34	MERIWH	Meriwitca	35-46-31.800N	113-42-00.000W
35	MOHAWK	Mohawk Canyon	36-08-00.000N	112-59-00.000W
36	MOHCAN	Mohawk Canyon	36-09-52.800N	112-59-00.000W
37	MTDELL	Mt. Dellenbaugh	36-06-31.800N	113-32-24.000W
38	MTSINY	Mt. Sinyala	36-18-00.000N	112-42-19.800W
39	NANMES	Nankoweap Mesa	36-16-00.000N	111-51-28.800W
40	NANRIV	Nankoweap at River	36-18-26.819N	111-51-27.960W
41	NATCAN	National Canyon	36-09-59.400N	112-54-21.600W
42	NOCANY	North Canyon	36-37-00.000N	111-46-30.000W
43	NONAME	Jackson Canyon	35-52-00.000N	113-43-00.000W
44	PARWAS	Parashant Wash	36-05-40.200N	113-19-19.800W

* Locations GC008 through GC011 correspond to the four measurement sites where acoustic data were collected by GCNP personnel and used to characterize natural ambient sound levels for the park.



Location #	Location ID	Location Point Name	LATITUDE	LONGITUDE
45	PMPKIN	Pumpkin Springs	35-53-42.000N	113-19-00.000W
46	PROCAN	Prospect Canyon	36-09-52.800N	113-05-00.000W
47	PRSPCT	Prospect Canyon	36-07-00.000N	113-05-00.000W
48	PSCNNO	Peach Spring Canyon North	35-45-00.000N	113-20-00.000W
49	PSCNSO	Peach Spring Canyon South*	35-37-00.000N	113-25-00.000W
50	PTIMPR	Point Imperial	36-16-44.711N	111-58-39.584W
51	PTSUBL	Point Sublime	36-11-54.012N	112-14-59.113W
52	QMPNT	Quartermaster Point	35-56-30.000N	113-47-30.000W
53	RANCH	The Ranch	36-01-27.000N	112-17-54.000W
54	SADMTN	Saddle Mountain	36-18-43.800N	111-56-57.600W
55	SANUP	Sanup	36-07-17.065N	113-49-15.706W
56	SCCORV	Separation Canyon at Colorado River	35-50-00.000N	113-34-00.000W
57	SCMCIG	Spencer/Meriwhitca Canyons	35-47-00.000N	113-34-00.000W
58	SEPARC	Separation Canyon	35-49-24.232N	113-34-12.258W
59	SHWZFC	Shivwitz Fire Camp	36-07-00.000N	113-32-30.000W
60	SOCAN	South Canyon	36-30-20.000N	111-51-50.000W
61	SOSUPC	South Supai Canyon	36-00-19.200N	112-31-16.200W
62	SPENCA	Spencer Canyon	35-47-15.000N	113-38-45.000W
63	STONCK	Stone Creek	36-20-47.881N	112-27-13.878W
64	SUIPNT	Suicide Point	36-00-15.000N	113-32-09.600W
65	SUPVIL	Supai Village	36-14-12.338N	112-41-18.816W
66	TEMBUT	Temple Butte	36-10-01.200N	111-49-28.200W
67	TENMED	Ten X Meadow	35-56-03.000N	112-03-36.000W
68	THRSPR	Three Springs	35-52-30.000N	113-18-36.000W
69	TOROWP	Toroweap Overlook	36-12-48.603N	113-03-29.722W
70	TOWER	Tower of Ra	36-08-28.200N	112-12-10.200W
71	TWINPT	Twin Point	35-59-49.800N	113-37-40.200W
72	UPDRCK	Upper Deer Creek	36-23-37.457N	112-30-21.754W
73	WESEND	West End	36-07-00.000N	113-58-27.000W
74	WHTRAP	Witmore Rapids	36-08-20.357N	113-12-11.219W
75	ZUNALF	Zuni Alpha	35-58-19.800N	111-53-21.000W
76	ZUNCHR	Zuni Charlie	36-07-30.000N	111-47-35.000W

Time Audible (T_{Aud}) Summary

The document entitled, “Grand Canyon National Park Baseline Noise Analysis” (dated 3/17/06) presented the results of the computer modeling for the percentage of time that aircraft sound levels are audible 25% of the day (7 am to 7 pm) or more for the current aircraft noise conditions.[†]

* Note: Peach Spring Canyon South (PSCNSO) was not modeled, as it is located too far outside park boundaries.

[†] Substantial restoration of natural quiet has been defined by NPS to mean 50% or more of the park will achieve natural quiet (i.e., no aircraft audible) for 75 to 100% of the day, natural quiet has not been substantially restored within the areas covered by the 25% time audible contour because the criterion of no audible aircraft noise for 75 to 100% of the day has not been achieved.



Figures 2 through 17 present the time audible (T_{Aud}) contour results from 0 to 100% of the day for each modeled scenario. Note: These 2006 contours are included at the request of Grand Canyon Working Group during the January meeting and are intended for informational use only.

Equivalent Sound Level (L_{eq}) and Maximum Sound Level (L_{max}) Summary

Figures 18 through 49 present the preliminary equivalent sound level and maximum sound level contour results for each modeled scenario.

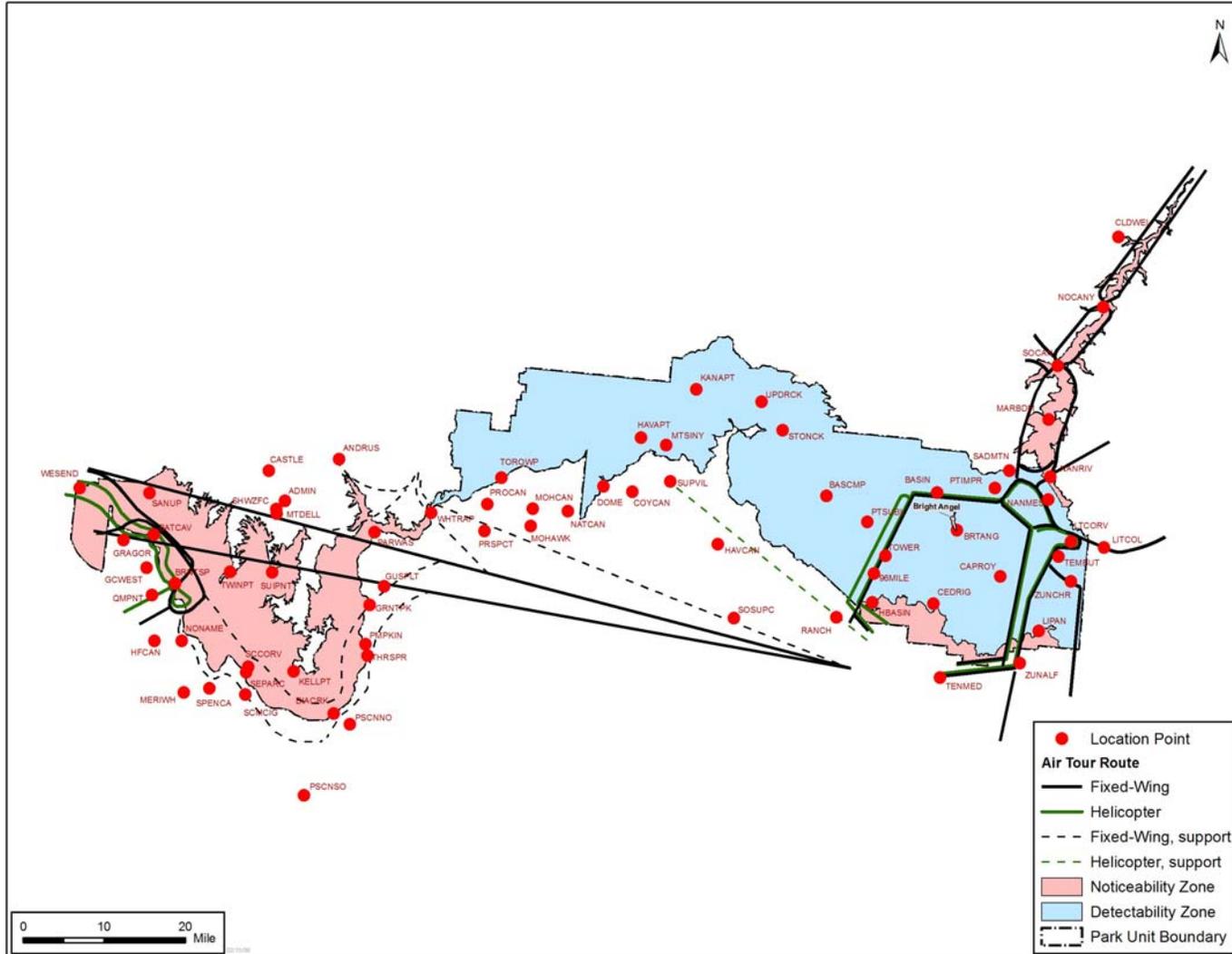


Figure 1. Location Points Modeled in INM for Grand Canyon National Park*

* Note: Peach Spring Canyon South (PSCNSO) was not modeled, as it is located too far outside park boundaries.



Table 2. Location Points Analysis Results for Daytime (7 am to 7 pm) and Nighttime (7 pm to 7 am): Time Audible (%)

Location ID	All Aircraft	Air Tour and Air Tour Related, GA, and Military	GA, Military, and Commercial		Total Air Tour and Air Tour Related	Commercial Air Tours	GC West	Transportation, Repositioning, etc.	Over the Edge	Bar10	General Aviation		Military		Commercial	
	Daytime	Daytime	Daytime	Nighttime	Daytime	Daytime	Daytime	Daytime	Daytime	Daytime	Daytime	Nighttime	Daytime	Nighttime	Daytime	Nighttime
96MILE	100.0	100.0	78.3	42.3	90.6	90.6	0.0	0.0	0.0	0.0	10.2	8.7	0.7	0.0	67.4	33.6
ADMIN	99.4	56.4	49.6	27.6	55.5	20.1	0.0	35.4	0.0	0.0	6.6	6.9	0.0	0.0	43.0	20.7
ANDRUS	83.3	31.4	58.1	35.8	26.2	7.2	0.0	19.0	0.0	0.0	6.2	7.1	0.0	0.1	51.9	28.6
BASCMP	56.9	8.1	56.9	27.0	0.0	0.0	0.0	0.0	0.0	0.0	7.7	7.8	0.4	0.0	48.8	19.2
BASIN	100.0	100.0	91.2	52.4	89.8	89.8	0.0	0.0	0.0	0.0	12.5	8.7	0.7	0.0	78.0	43.7
BATCAV	100.0	100.0	73.7	42.8	100.0	46.1	80.8	45.6	54.2	0.0	8.0	8.2	0.0	0.1	65.7	34.5
BRNTSP	100.0	92.9	59.3	29.2	100.0	20.7	44.9	30.7	39.0	0.0	7.7	6.9	0.0	0.0	51.6	22.3
BRTANG	100.0	64.0	70.6	56.3	53.7	53.7	0.0	0.0	0.0	0.0	9.5	8.9	0.8	0.0	60.3	47.4
CAPROY	100.0	86.6	79.9	62.4	76.8	76.8	0.0	0.0	0.0	0.0	8.6	9.7	1.2	0.0	70.1	52.7
CASTLE	87.6	37.5	56.4	33.8	32.8	9.8	0.0	23.0	0.0	0.0	6.3	7.3	0.0	0.1	50.1	26.4
CEDRIG	100.0	100.0	100.0	72.0	88.9	88.9	0.0	0.0	0.0	0.0	14.2	9.3	1.5	0.0	100.0	62.7
CLDWEL	34.6	8.0	31.9	20.7	2.7	2.7	0.0	0.0	0.0	0.0	5.3	5.6	0.0	0.0	26.6	15.1
COYCAN	28.8	6.0	28.8	12.9	0.0	0.0	0.0	0.0	0.0	0.0	5.6	5.0	0.4	0.0	22.8	7.9
DIACRK	53.0	6.2	53.0	31.4	0.0	0.0	0.0	0.0	0.0	0.0	6.2	6.1	0.0	0.0	46.8	25.3
DOME	26.5	5.5	26.5	12.8	0.0	0.0	0.0	0.0	0.0	0.0	5.1	4.7	0.4	0.0	21.0	8.1
GC008*	100.0	100.0	100.0	56.3	100.0	99.6	0.0	22.0	0.0	0.0	16.8	9.2	1.3	0.0	100.0	47.1
GC009*	79.9	24.9	65.0	33.5	14.9	0.0	0.0	14.9	0.0	0.0	9.6	7.4	0.4	0.0	55.0	26.1
GC010*	96.9	18.2	91.1	52.1	5.8	0.0	0.0	5.8	0.0	0.0	11.8	7.2	0.6	0.3	78.7	44.6
GC011*	46.2	9.0	43.2	53.9	3.0	3.0	0.0	0.0	0.0	0.0	4.9	8.2	1.1	0.0	37.2	45.7
GCWEST	100.0	100.0	44.6	22.3	100.0	43.5	79.4	37.1	74.5	0.0	6.0	3.8	0.0	0.0	38.6	18.5
GRAGOR	100.0	69.6	40.5	19.9	81.7	12.9	33.5	8.1	27.2	0.0	5.4	4.5	0.0	0.0	35.1	15.4
GRNTPK	38.1	5.1	38.1	19.3	0.0	0.0	0.0	0.0	0.0	0.0	5.1	6.6	0.0	0.0	33.0	12.7
GUSPLT	100.0	52.9	57.5	25.6	48.8	16.7	0.0	32.1	0.0	0.0	8.3	7.1	0.0	0.0	49.2	18.5
HAVAPT	35.8	7.0	35.8	17.6	0.0	0.0	0.0	0.0	0.0	0.0	6.6	7.0	0.4	0.0	28.8	10.6
HAVCAN	38.4	6.3	38.4	18.4	0.0	0.0	0.0	0.0	0.0	0.0	5.9	5.3	0.4	0.0	32.1	13.1
HBASIN	100.0	100.0	100.0	70.7	99.9	99.9	0.0	0.0	0.0	0.0	17.8	9.3	1.3	0.0	100.0	61.4

* Locations GC008 through GC011 correspond to the four measurement sites where acoustic data were collected by GCNP personnel and used to characterize natural ambient sound levels for the park.



Location ID	All Aircraft	Air Tour and Air Tour Related, GA, and Military	GA, Military, and Commercial		Total Air Tour and Air Tour Related	Commercial Air Tours	GC West	Transportation, Repositioning, etc.	Over the Edge	Bar10	General Aviation		Military		Commercial	
	Daytime	Daytime	Daytime	Nighttime	Daytime	Daytime	Daytime	Daytime	Daytime	Daytime	Daytime	Nighttime	Daytime	Nighttime	Daytime	Nighttime
HFCAN	54.9	7.3	53.3	24.7	1.6	0.0	1.6	0.0	0.0	0.0	5.7	3.9	0.0	0.0	47.6	20.8
KANAPT	100.0	15.4	100.0	52.3	1.2	0.0	0.0	1.2	0.0	0.0	13.5	7.6	0.7	0.3	86.6	44.4
KELLPT	85.8	9.8	85.8	73.7	0.0	0.0	0.0	0.0	0.0	0.0	9.8	7.7	0.0	0.0	76.0	66.0
LIPAN	100.0	94.6	81.6	59.6	85.5	85.5	0.0	0.0	0.0	0.0	7.3	9.0	1.8	0.0	72.5	50.6
LITCOL	34.0	5.6	33.4	19.6	0.6	0.6	0.0	0.0	0.0	0.0	4.5	7.9	0.5	0.0	28.4	11.7
LTCORV	71.7	43.4	33.4	20.6	38.3	38.3	0.0	0.0	0.0	0.0	4.6	8.1	0.5	0.0	28.3	12.5
MARBDM	26.2	3.7	26.2	18.0	0.0	0.0	0.0	0.0	0.0	0.0	3.4	7.8	0.3	0.0	22.5	10.2
MERIWH	52.4	3.0	52.4	27.8	0.0	0.0	0.0	0.0	0.0	0.0	3.0	3.4	0.0	0.0	49.4	24.4
MOHAWK	29.7	6.1	29.2	12.5	0.5	0.0	0.0	0.5	0.0	0.0	5.4	4.8	0.2	0.0	23.6	7.7
MOHCAN	29.2	5.4	29.2	13.3	0.0	0.0	0.0	0.0	0.0	0.0	5.2	4.8	0.2	0.0	23.8	8.5
MTDELL	52.1	36.5	19.7	11.5	34.4	12.0	0.0	22.4	0.0	0.0	4.1	3.8	0.0	0.0	15.6	7.7
MTSINY	92.8	16.2	92.8	46.4	0.0	0.0	0.0	0.0	0.0	0.0	15.4	8.3	0.8	0.1	76.6	38.0
NANMES	100.0	100.0	90.0	56.0	93.8	93.8	0.0	0.0	0.0	0.0	11.0	10.3	0.9	0.0	78.1	45.7
NANRIV	14.9	10.2	6.0	6.2	8.9	8.9	0.0	0.0	0.0	0.0	1.3	4.4	0.0	0.0	4.7	1.8
NATCAN	28.5	5.6	28.5	12.1	0.0	0.0	0.0	0.0	0.0	0.0	5.2	4.7	0.4	0.0	22.9	7.4
NOCANY	51.3	11.0	47.7	45.0	3.6	3.6	0.0	0.0	0.0	0.0	7.1	9.4	0.3	0.3	40.3	35.3
NONAME	74.5	28.3	51.8	24.5	23.9	9.7	2.0	12.2	0.0	0.0	5.6	4.0	0.0	0.0	46.2	20.5
PARWAS	43.4	18.7	30.3	15.6	13.4	5.2	0.0	8.2	0.0	0.0	5.6	6.9	0.0	0.0	24.7	8.7
PMPKIN	40.9	4.5	40.9	21.5	0.0	0.0	0.0	0.0	0.0	0.0	4.5	6.4	0.0	0.0	36.4	15.1
PROCAN	31.3	9.1	26.8	13.0	4.5	0.0	0.0	4.5	0.0	0.0	4.5	4.6	0.1	0.0	22.2	8.4
PRSPCT	52.3	29.3	28.3	12.8	25.0	8.4	0.0	16.6	0.0	0.0	5.3	4.9	0.0	0.0	23.0	7.9
PSCNNO	61.3	5.5	61.3	38.5	0.0	0.0	0.0	0.0	0.0	0.0	5.5	4.0	0.0	0.0	55.8	34.5
PSCNSO*	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
PTIMPR	100.0	85.2	60.1	49.4	76.3	76.3	0.0	0.0	0.0	0.0	8.2	9.4	0.7	0.0	51.2	40.0
PTSUBL	100.0	100.0	100.0	53.7	100.0	100.0	0.0	2.2	0.0	0.0	15.0	8.8	0.8	0.0	91.8	44.9
QMPNT	100.0	90.0	50.6	24.8	100.0	14.7	48.0	17.3	46.6	0.0	6.2	3.9	0.0	0.0	44.4	20.9
RANCH	100.0	100.0	85.6	42.9	100.0	99.1	0.0	21.6	0.0	0.0	10.5	7.8	0.8	0.0	74.3	35.1
SADMTN	83.9	64.9	21.2	17.5	62.7	62.7	0.0	0.0	0.0	0.0	2.2	4.8	0.0	0.0	19.0	12.7
SANUP	100.0	98.3	72.7	59.8	100.0	48.0	29.9	61.8	13.5	0.0	7.0	9.0	0.4	0.4	65.3	50.4

* Note: Peach Spring Canyon South (PSCNSO) was not modeled, as it is located too far outside park boundaries.



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	Daytime		Daytime	Daytime							Nighttime	Daytime	Daytime	Daytime	Nighttime	Daytime
SCCORV	82.9	9.8	82.9	44.4	0.0	0.0	0.0	0.0	0.0	0.0	9.8	7.2	0.0	0.0	73.1	37.2
SCMCIG	50.8	3.8	50.8	29.2	0.0	0.0	0.0	0.0	0.0	0.0	3.8	3.6	0.0	0.0	47.0	25.6
SEPARC	7.6	0.4	7.6	4.3	0.0	0.0	0.0	0.0	0.0	0.0	0.4	2.3	0.0	0.0	7.2	2.0
SHWZFC	59.7	43.9	19.9	11.3	43.1	15.8	0.0	27.3	0.0	0.0	4.1	3.8	0.0	0.0	15.8	7.5
SOCAN	49.4	8.7	47.1	48.5	2.3	2.3	0.0	0.0	0.0	0.0	6.0	9.6	0.4	0.0	40.7	38.9
SOSUPC	45.3	11.1	40.0	24.7	5.4	1.9	0.0	3.5	0.0	0.0	5.3	7.4	0.5	0.0	34.2	17.3
SPENCA	52.2	3.7	52.2	27.9	0.0	0.0	0.0	0.0	0.0	0.0	3.7	3.6	0.0	0.0	48.5	24.3
STONCK	8.0	1.6	8.0	6.4	0.0	0.0	0.0	0.0	0.0	0.0	1.6	4.4	0.0	0.0	6.4	2.0
SUIPNT	50.4	18.6	36.4	16.0	14.1	1.0	0.0	13.1	0.0	0.0	4.6	3.9	0.0	0.0	31.8	12.1
SUPVIL	30.5	5.5	30.5	15.5	0.0	0.0	0.0	0.0	0.0	0.0	5.2	6.8	0.3	0.0	25.0	8.7
TEMBUT	100.0	85.5	100.0	63.8	73.6	73.6	0.0	0.0	0.0	0.0	10.4	10.5	1.5	0.0	91.6	53.3
TENMED	76.8	36.8	45.3	22.4	31.5	31.5	0.0	0.0	0.0	0.0	5.0	4.0	0.3	0.0	40.0	18.4
THRSPR	93.7	11.5	93.6	51.6	0.1	0.0	0.0	0.1	0.0	0.0	11.4	7.8	0.0	0.0	82.2	43.8
TOROWP	29.9	5.1	29.9	16.6	0.0	0.0	0.0	0.0	0.0	0.0	5.0	6.3	0.1	0.0	24.8	10.3
TOWER	100.0	100.0	100.0	62.2	99.5	99.5	0.0	0.0	0.0	0.0	14.9	9.0	1.0	0.0	100.0	53.2
TWINPT	60.9	27.4	38.1	17.7	24.2	8.2	6.9	9.1	0.0	0.0	4.6	3.8	0.0	0.0	33.5	13.9
UPDRCK	100.0	14.7	100.0	51.9	0.0	0.0	0.0	0.0	0.0	0.0	14.2	8.4	0.5	0.3	93.2	43.2
WESEND	100.0	73.1	39.1	20.9	86.6	21.4	39.7	25.5	0.0	0.0	5.4	6.7	0.0	0.0	33.7	14.2
WHTRAP	60.1	20.7	47.2	24.1	13.2	3.6	0.0	6.8	0.0	2.8	7.8	7.7	0.0	0.0	39.4	16.4
ZUNALF	88.7	52.8	39.2	20.4	49.5	49.5	0.0	0.0	0.0	0.0	2.6	4.1	0.7	0.0	35.9	16.3
ZUNCHR	100.0	81.5	100.0	64.7	69.6	69.6	0.0	0.0	0.0	0.0	10.2	10.4	1.7	0.0	98.2	54.3



Table 3. Location Points Analysis Results for Daytime (7 am to 7 pm) and Nighttime (7 pm to 7 am): L_{eq} (dBA)

Location ID	All Aircraft	Air Tour and Air Tour Related, GA, and Military	GA, Military, and Commercial		Total Air Tour and Air Tour Related	Commercial Air Tours	GC West	Transportation, Repositioning, etc.	Over the Edge	Bar 10	General Aviation		Military		Commercial	
	Daytime	Daytime	Daytime	Nighttime	Daytime	Daytime	Daytime	Daytime	Daytime	Daytime	Daytime	Nighttime	Daytime	Nighttime	Daytime	Nighttime
96MILE	45.4	45.3	29.4	29.0	44.8	44.8	0.0	0.0	0.0	0.0	27.8	15.1	0.1	0.0	24.4	22.8
ADMIN	34.4	31.8	31.1	29.5	31.4	26.3	0.0	29.8	0.0	0.0	19.0	17.8	0.0	0.0	30.8	29.1
ANDRUS	29.7	21.8	29.4	30.3	16.7	12.0	0.0	14.9	0.0	0.0	20.2	14.3	0.0	0.0	28.8	29.9
BASCMP	28.9	26.8	28.9	27.8	6.4	6.2	0.0	0.0	0.0	0.0	26.8	16.5	0.0	0.0	24.6	20.6
BASIN	48.5	48.5	25.6	24.9	48.2	48.2	0.0	0.0	0.0	0.0	22.1	9.3	0.0	0.0	23.1	21.6
BATCAV	47.5	47.5	30.1	29.7	47.0	37.4	41.6	38.7	43.4	0.0	19.0	16.7	0.0	0.0	29.7	29.3
BRNTSP	47.1	46.9	34.1	28.2	45.0	38.7	39.2	41.7	30.1	0.0	22.3	18.9	0.0	0.0	33.8	26.9
BRTANG	31.3	30.4	26.2	25.5	24.2	24.2	0.0	0.0	0.0	0.0	22.2	10.7	0.0	0.0	23.9	22.8
CAPROY	31.4	30.3	29.9	29.2	26.1	26.1	0.0	0.0	0.0	0.0	28.2	18.9	2.3	0.0	25.1	22.5
CASTLE	29.2	23.9	27.9	30.2	18.0	13.6	0.0	16.0	0.0	0.0	17.6	12.5	0.0	0.0	27.5	29.9
CEDRIG	31.0	29.3	30.7	30.0	18.2	18.2	0.0	0.0	0.0	0.0	28.9	18.4	1.8	0.0	26.1	23.2
CLDWEL	34.1	26.2	34.1	31.2	12.7	12.7	0.0	0.0	0.0	0.0	26.0	21.4	0.0	0.0	33.3	29.7
COYCAN	31.2	28.2	31.2	28.7	0.0	0.0	0.0	0.0	0.0	0.0	28.0	19.2	15.4	0.0	28.2	20.4
DIACRK	27.9	19.6	27.8	25.2	0.0	0.0	0.0	0.0	0.0	0.0	19.2	18.9	0.0	0.0	27.2	23.9
DOME	32.5	28.8	32.4	29.1	12.6	7.2	0.0	11.1	0.0	0.0	28.5	16.1	15.8	0.0	30.0	20.5
GC008*	29.4	27.6	28.9	27.7	20.3	19.9	0.0	9.4	0.0	0.0	26.7	16.3	0.0	0.0	24.8	21.0
GC009*	33.8	23.7	33.7	26.3	14.8	10.5	0.0	12.7	0.0	0.0	23.1	17.3	0.2	0.0	33.3	23.5
GC010*	33.1	24.9	33.0	29.2	8.4	3.7	0.0	6.3	0.0	0.0	24.8	18.6	3.6	0.0	32.3	27.2
GC011*	30.7	28.4	30.3	29.1	20.5	20.5	0.0	0.0	0.0	0.0	27.6	15.7	2.4	0.0	26.9	23.7
GCWEST	46.3	46.1	33.2	29.8	39.8	28.7	32.8	24.3	38.2	0.0	22.1	19.6	0.0	0.0	32.9	28.9
GRAGOR	41.5	41.2	30.0	29.6	33.6	25.3	32.7	15.4	14.8	0.0	18.3	16.2	0.0	0.0	29.7	29.2
GRNTPK	32.1	29.4	32.1	30.0	12.5	9.2	0.0	9.8	0.0	0.0	29.3	11.8	0.0	0.0	28.8	21.9
GUSPLT	33.7	31.4	33.3	31.2	23.6	18.8	0.0	21.9	0.0	0.0	30.6	13.0	0.0	0.0	29.9	22.4
HAVAPT	33.0	23.1	33.0	25.7	0.0	0.0	0.0	0.0	0.0	0.0	22.5	16.5	14.0	0.0	32.5	22.9
HAVCAN	28.3	26.0	28.3	26.9	3.4	0.0	0.0	1.1	0.0	0.0	25.9	20.2	6.1	0.0	24.4	19.9
HBASIN	43.9	43.9	30.7	29.9	41.4	41.4	0.0	0.0	0.0	0.0	28.8	17.2	1.0	0.0	26.2	23.5

* Locations GC008 through GC011 correspond to the four measurement sites where acoustic data were collected by GCNP personnel and used to characterize natural ambient sound levels for the park.



Location ID	All Aircraft	Air Tour and Air Tour Related, GA, and Military	GA, Military, and Commercial		Total Air Tour and Air Tour Related	Commercial Air Tours	GC West	Transportation, Repositioning, etc.	Over the Edge	Bar10	General Aviation		Military		Commercial	
	Daytime	Daytime	Daytime	Nighttime	Daytime	Daytime	Daytime	Daytime	Daytime	Daytime	Daytime	Nighttime	Daytime	Nighttime	Daytime	Nighttime
HFCAN	34.9	27.4	34.3	26.7	9.1	0.0	7.8	0.0	0.0	0.0	21.3	16.8	0.0	0.0	34.1	25.2
KANAPT	34.1	24.6	34.1	28.0	7.1	1.9	0.0	5.5	0.0	0.0	24.5	18.8	5.5	0.0	33.6	25.5
KELLPT	30.3	24.3	30.3	27.4	0.0	0.0	0.0	0.0	0.0	0.0	24.3	15.1	0.0	0.0	29.0	24.4
LIPAN	36.3	35.7	30.0	28.4	35.1	35.1	0.0	0.0	0.0	0.0	27.1	13.0	6.7	0.0	26.9	22.8
LITCOL	30.7	29.3	27.3	25.7	23.8	23.8	0.0	0.0	0.0	0.0	23.5	15.2	4.8	0.0	24.9	21.5
LTCORV	44.7	44.6	26.6	25.2	44.2	44.2	0.0	0.0	0.0	0.0	22.9	13.4	3.5	0.0	24.1	21.4
MARBDM	27.3	25.6	27.3	26.7	5.4	5.4	0.0	0.0	0.0	0.0	25.5	9.0	0.0	0.0	22.6	20.8
MERIWH	31.8	21.7	31.8	25.6	0.9	0.0	0.0	0.0	0.0	0.0	21.7	12.5	0.0	0.0	31.4	23.4
MOHAWK	32.4	29.6	32.4	30.1	8.0	3.5	0.0	6.0	0.0	0.0	29.6	15.7	2.1	0.0	29.1	20.5
MOHCAN	32.7	28.5	32.7	29.2	8.2	2.9	0.0	6.6	0.0	0.0	28.4	14.7	4.0	0.0	30.6	21.3
MTDELL	42.0	41.5	31.9	29.1	41.2	35.9	0.0	39.7	0.0	0.0	20.1	19.2	0.0	0.0	31.6	28.5
MTSINY	32.8	25.8	32.8	27.2	0.0	0.0	0.0	0.0	0.0	0.0	25.6	15.8	12.2	0.0	31.8	21.9
NANMES	46.2	46.2	24.9	24.1	46.2	46.2	0.0	0.0	0.0	0.0	19.7	9.0	1.1	0.0	23.3	22.2
NANRIV	36.1	35.9	24.5	24.0	34.7	34.7	0.0	0.0	0.0	0.0	20.5	8.1	0.7	0.0	22.3	21.4
NATCAN	32.2	29.4	32.2	29.8	7.8	3.4	0.0	5.8	0.0	0.0	29.3	15.3	8.5	0.0	29.0	20.1
NOCANY	34.1	32.3	31.6	29.1	30.5	30.5	0.0	0.0	0.0	0.0	27.6	17.6	0.0	0.0	29.4	23.6
NONAME	34.1	26.2	33.9	27.5	20.7	18.8	7.1	15.7	0.0	0.0	24.1	16.3	0.0	0.0	33.4	24.9
PARWAS	36.3	33.8	33.5	27.5	32.8	27.2	0.0	31.4	0.0	0.0	25.7	17.1	0.0	0.0	32.7	22.9
PMPKIN	29.6	26.2	29.6	27.9	0.0	0.0	0.0	0.0	0.0	0.0	26.2	12.9	0.0	0.0	26.9	23.1
PROCAN	33.3	26.3	33.2	27.3	13.6	8.4	0.0	12.0	0.0	0.0	26.0	15.0	0.0	0.0	32.3	21.3
PRSPCT	33.0	29.8	32.7	29.6	21.8	16.3	0.0	20.4	0.0	0.0	29.0	15.6	0.0	0.0	30.3	20.5
PSCNNO	28.1	20.2	28.1	26.0	0.0	0.0	0.0	0.0	0.0	0.0	17.5	19.8	0.0	0.0	27.4	24.8
PSCNSO*	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
PTIMPR	40.6	40.5	24.8	24.4	37.8	37.8	0.0	0.0	0.0	0.0	20.8	8.1	0.0	0.0	22.5	22.0
PTSUBL	35.8	35.5	27.5	26.5	35.1	35.1	0.0	5.2	0.0	0.0	24.8	12.1	0.0	0.0	24.1	21.5
QMPNT	45.4	45.0	34.8	28.6	44.4	25.3	41.8	23.8	40.6	0.0	21.0	19.5	0.0	0.0	34.6	27.8
RANCH	36.7	36.2	30.5	29.4	35.3	35.2	0.0	16.6	0.0	0.0	28.1	17.7	1.9	0.0	26.7	23.6
SADMTN	36.9	36.8	24.7	24.6	36.5	36.5	0.0	0.0	0.0	0.0	21.4	8.4	0.0	0.0	21.9	21.8
SANUP	38.9	38.7	26.6	27.9	37.9	32.9	22.6	36.1	10.6	0.0	15.6	12.1	0.0	0.0	26.2	27.7

* Note: Peach Spring Canyon South (PSCNSO) was not modeled, as it is located too far outside park boundaries.



Location ID	All Aircraft	Air Tour and Air Tour Related, GA, and Military		GA, Military, and Commercial		Total Air Tour and Air Tour Related	Commercial Air Tours	GC West	Transportation, Repositioning, etc.	Over the Edge	Bar10	General Aviation		Military		Commercial	
	Daytime	Daytime	Daytime	Nighttime	Daytime	Daytime	Daytime	Daytime	Daytime	Daytime	Daytime	Daytime	Nighttime	Daytime	Nighttime	Daytime	Nighttime
SCCORV	30.6	24.9	30.6	27.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24.9	14.7	0.0	0.0	29.3	23.6
SCMCIG	29.3	21.3	29.3	25.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	21.3	14.4	0.0	0.0	25.1	23.1
SEPARC	30.2	24.2	30.2	26.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24.2	14.4	0.0	0.0	26.4	22.8
SHWZFC	38.7	37.9	31.5	29.3	37.8	32.6	0.0	36.2	0.0	0.0	0.0	19.6	18.6	0.0	0.0	19.1	17.4
SOCAN	32.8	31.8	31.0	30.2	28.0	28.0	0.0	0.0	0.0	0.0	0.0	29.5	13.8	0.0	0.0	21.8	18.6
SOSUPC	33.2	32.3	28.8	27.5	26.6	20.9	0.0	25.2	0.0	0.0	0.0	25.4	18.1	13.2	0.0	25.7	23.4
SPENCA	30.8	22.2	30.8	25.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	22.2	12.6	0.0	0.0	25.6	22.7
STONCK	31.4	27.9	31.4	28.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	27.9	18.9	0.0	0.0	21.7	18.4
SUIPNT	34.9	27.2	34.8	28.5	18.1	13.5	0.2	16.0	0.0	0.0	0.0	26.6	17.6	0.0	0.0	27.5	19.6
SUPVIL	31.2	28.5	31.2	29.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	28.4	16.8	11.6	0.0	21.8	18.8
TEMBUT	43.0	42.9	27.7	26.6	38.8	38.8	0.0	0.0	0.0	0.0	0.0	24.9	16.1	3.3	0.0	23.8	21.5
TENMED	48.4	48.4	27.9	25.4	48.4	48.4	0.0	0.0	0.0	0.0	0.0	19.7	12.2	6.2	0.0	27.0	23.9
THRSPR	29.0	24.7	29.0	27.1	1.8	0.0	0.0	0.0	0.0	0.0	0.0	24.7	14.2	0.0	0.0	25.9	23.0
TOROWP	33.9	24.6	33.8	26.8	12.9	8.4	0.0	10.8	0.0	0.0	0.0	24.3	16.9	2.3	0.0	20.4	17.9
TOWER	49.7	49.7	28.4	28.0	44.3	44.3	0.0	0.0	0.0	0.0	0.0	26.3	14.2	0.0	0.0	23.6	23.0
TWINPT	35.1	27.6	34.7	27.9	20.6	16.5	13.0	16.4	8.8	0.0	0.0	24.6	19.3	0.0	0.0	27.2	19.7
UPDRCK	32.9	24.9	32.9	26.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24.9	16.7	0.0	0.0	21.2	17.8
WESEND	39.7	39.4	28.0	25.4	39.3	33.1	36.2	33.8	0.0	0.0	0.0	13.3	13.1	0.0	0.0	23.9	20.9
WHTRAP	33.9	28.1	33.3	27.1	19.8	13.5	0.0	18.2	0.0	7.9	0.0	25.3	16.1	0.0	0.0	20.7	16.3
ZUNALF	46.9	46.8	28.1	25.7	46.8	46.8	0.0	0.0	0.0	0.0	0.0	21.9	10.3	8.8	0.0	26.6	23.3
ZUNCHR	33.6	32.9	29.8	29.1	29.9	29.9	0.0	0.0	0.0	0.0	0.0	27.8	17.2	4.5	0.0	25.1	22.4



Table 4. Location Points Analysis Results for Daytime (7 am to 7 pm) and Nighttime (7 pm to 7 am): L_{max} (dBA)

Location ID	All Aircraft	Air Tour and Air Tour Related, GA, and Military	GA, Military, and Commercial		Total Air Tour and Air Tour Related	Commercial Air Tours	GC West	Transportation, Repositioning, etc.	Over the Edge	Bar10	General Aviation		Military		Commercial	
	Daytime	Daytime	Daytime	Nighttime	Daytime	Daytime	Daytime	Daytime	Daytime	Daytime	Daytime	Nighttime	Daytime	Nighttime	Daytime	Nighttime
96MILE	53.8	53.8	44.2	63.4	53.8	53.8	0.0	5.7	0.0	0.0	44.2	63.4	25.0	7.3	43.6	44.1
ADMIN	63.8	48.0	63.8	63.9	48.0	38.7	11.1	48.0	2.5	0.5	46.0	52.1	11.9	18.7	63.8	63.9
ANDRUS	60.7	55.5	60.7	64.2	26.3	20.9	0.0	26.3	0.0	7.1	55.5	55.5	15.1	21.3	60.7	64.2
BASCMP	51.4	44.5	51.4	61.3	10.2	10.2	0.0	5.0	0.0	0.0	44.5	61.3	21.7	11.3	51.4	44.9
BASIN	65.1	65.0	47.3	55.5	65.0	65.0	0.0	6.4	0.0	0.0	40.5	55.5	23.5	9.4	47.3	44.0
BATCAV	61.6	57.9	61.6	63.9	57.9	57.9	57.2	54.6	57.2	0.0	40.9	53.6	15.8	18.8	61.6	63.9
BRNTSP	64.8	61.6	64.8	60.0	61.6	61.6	56.6	58.6	55.4	0.0	44.4	57.0	11.5	15.3	64.8	60.0
BRTANG	46.4	38.6	46.4	56.6	38.6	38.6	0.0	10.0	0.0	0.0	37.8	56.6	25.3	7.5	46.4	47.0
CAPROY	47.6	47.6	47.6	64.2	36.9	36.9	0.0	4.7	0.0	0.0	47.6	64.2	28.4	5.5	45.0	45.6
CASTLE	58.8	51.3	58.8	64.3	29.6	22.8	13.8	29.6	3.4	0.0	51.3	51.3	15.4	21.3	58.8	64.3
CEDRIG	46.3	45.9	46.3	65.0	28.5	28.5	0.0	4.5	0.0	0.0	45.9	65.0	27.4	5.2	46.3	43.9
CLDWEL	65.2	60.5	65.2	64.4	31.0	31.0	0.0	0.0	0.0	0.0	60.5	60.5	19.8	24.1	65.2	64.4
COYCAN	60.4	50.4	60.4	64.4	8.7	6.8	0.0	8.7	0.0	0.0	50.4	64.4	47.0	14.0	60.4	49.7
DIACRK	55.0	42.7	55.0	53.9	0.0	0.0	0.0	0.0	0.0	0.0	42.7	53.9	16.2	7.2	55.0	42.6
DOME	62.9	50.8	62.9	63.4	22.9	21.5	0.0	22.9	0.0	0.0	50.8	63.4	49.1	14.6	62.9	50.9
GC008*	46.7	43.4	46.7	60.4	26.6	26.6	0.0	21.7	0.0	0.0	43.4	60.4	26.9	8.7	46.7	41.1
GC009*	65.8	54.9	65.8	57.2	23.9	17.6	0.0	23.9	0.0	10.7	54.9	57.2	30.5	17.0	65.8	56.5
GC010*	64.8	60.2	64.8	60.7	17.5	10.4	0.0	17.5	0.0	11.1	60.2	60.2	34.9	19.5	64.8	60.7
GC011*	46.0	41.4	46.0	63.6	27.9	27.9	0.0	19.2	0.0	0.0	41.4	63.6	27.8	4.3	46.0	45.3
GCWEST	64.5	49.9	64.5	63.1	49.9	45.7	44.9	38.7	49.9	0.0	45.3	58.3	12.7	16.4	64.5	63.1
GRAGOR	60.7	51.0	60.7	63.8	51.0	51.0	51.0	38.0	26.2	0.0	39.8	54.8	16.8	19.1	60.7	63.8
GRNTPK	58.3	40.3	58.3	64.2	28.2	22.8	0.0	28.2	0.0	3.5	40.3	64.2	15.1	11.7	58.3	49.2
GUSPLT	60.0	41.0	60.0	65.4	37.0	29.7	9.4	37.0	0.4	9.3	41.0	65.4	14.4	11.8	60.0	49.5
HAVAPT	65.4	55.5	65.4	57.9	5.1	2.2	0.0	5.1	0.0	0.0	55.5	57.9	46.4	17.6	65.4	55.4
HAVCAN	50.3	44.0	50.3	64.2	11.6	10.5	0.0	11.6	0.0	0.0	44.0	64.2	34.4	10.0	50.3	43.5
HBASIN	51.5	51.5	46.8	64.8	51.5	51.5	0.0	8.7	0.0	0.0	43.2	64.8	25.5	5.8	46.8	44.3

* Locations GC008 through GC011 correspond to the four measurement sites where acoustic data were collected by GCNP personnel and used to characterize natural ambient sound levels for the park.

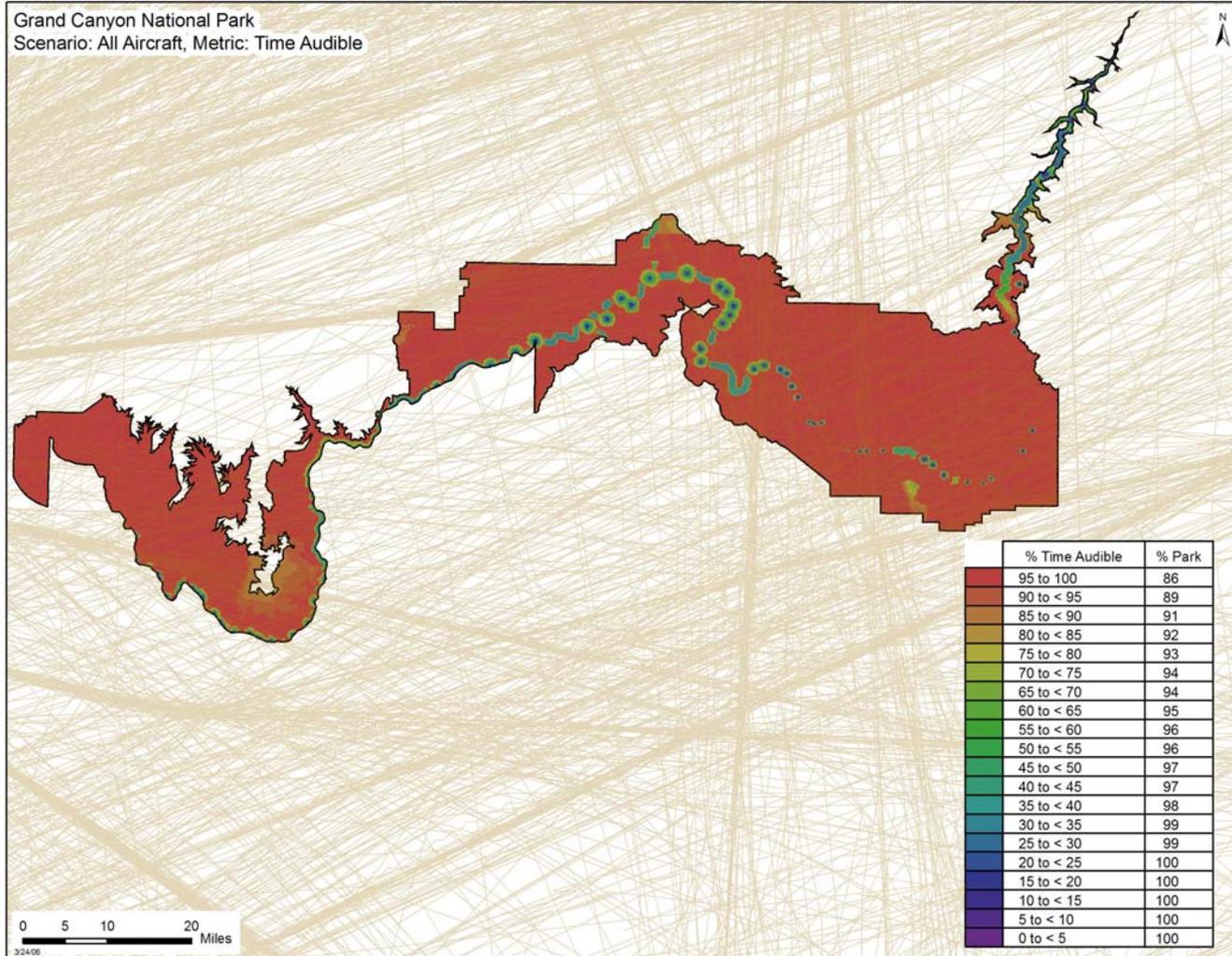


Location ID	All Aircraft	Air Tour and Air Tour Related, GA, and Military	GA, Military, and Commercial		Total Air Tour and Air Tour Related	Commercial Air Tours	GC West	Transportation, Repositioning, etc.	Over the Edge	Bar10	General Aviation		Military		Commercial	
	Daytime	Daytime	Daytime	Nighttime	Daytime	Daytime	Daytime	Daytime	Daytime	Daytime	Daytime	Nighttime	Daytime	Nighttime	Daytime	Nighttime
HFCAN	64.2	44.0	64.2	58.9	26.9	21.0	26.9	13.4	11.7	0.0	44.0	58.9	11.4	12.3	64.2	54.3
KANAPT	65.5	59.8	65.5	59.8	19.4	15.7	0.0	19.4	0.0	0.0	59.8	59.8	35.0	19.5	65.5	59.0
KELLPT	53.2	40.0	53.2	59.6	2.6	0.0	2.6	1.4	0.0	0.0	40.0	59.6	13.8	8.8	53.2	46.1
LIPAN	48.3	48.3	46.2	63.2	48.3	48.3	0.0	16.3	0.0	0.0	37.7	63.2	32.6	3.3	46.2	44.7
LITCOL	52.2	52.2	47.2	58.9	52.2	52.2	0.0	0.0	0.0	0.0	42.1	58.9	30.5	5.7	47.2	45.8
LTCORV	55.4	55.4	44.8	58.1	55.4	55.4	0.0	0.0	0.0	0.0	38.6	58.1	29.7	6.7	44.8	43.0
MARBDM	50.9	44.6	50.9	60.5	21.8	21.8	0.0	0.0	0.0	0.0	44.6	60.5	24.1	12.4	50.9	46.3
MERIWH	64.4	38.9	64.3	57.7	15.4	6.7	9.7	15.4	3.5	0.0	38.9	57.7	12.2	9.3	64.3	48.2
MOHAWK	60.9	48.8	60.9	64.4	23.9	18.5	0.0	23.9	0.0	4.8	48.8	64.4	30.3	13.5	60.9	49.7
MOHCAN	63.4	50.7	63.4	63.2	20.9	15.3	0.0	20.9	0.0	4.9	50.7	63.2	32.9	14.5	63.4	51.3
MTDELL	64.7	63.1	64.7	63.3	63.1	53.0	6.9	63.1	1.7	0.0	45.6	53.2	11.6	17.7	64.7	63.3
MTSINY	65.1	53.4	65.1	58.2	7.0	7.0	0.0	4.8	0.0	0.0	53.4	58.2	45.4	16.1	65.1	53.3
NANMES	62.2	62.2	44.8	52.0	62.2	62.2	0.0	0.0	0.0	0.0	38.6	52.0	26.9	8.3	44.8	45.9
NANRIV	55.4	55.4	45.8	53.4	55.4	55.4	0.0	0.0	0.0	0.0	40.7	53.4	26.3	9.5	45.8	42.9
NATCAN	61.1	49.5	61.1	64.3	20.2	14.3	0.0	20.2	0.0	0.9	49.5	64.3	40.0	13.6	61.1	49.8
NOCANY	62.5	56.0	62.5	62.5	56.0	56.0	0.0	0.0	0.0	0.0	52.4	62.5	21.5	18.4	62.5	56.3
NONAME	63.0	44.1	63.0	60.2	43.6	43.6	32.1	35.0	11.7	0.0	44.1	60.2	12.0	12.0	63.0	53.2
PARWAS	65.4	51.1	65.4	59.8	51.1	41.6	0.0	51.1	0.0	11.4	47.1	59.8	14.6	15.6	65.4	56.0
PMPKIN	53.8	37.7	53.8	61.1	5.7	0.0	0.0	5.7	0.0	0.0	37.7	61.1	15.5	9.9	53.8	47.8
PROCAN	65.4	51.4	65.4	60.7	26.2	21.0	0.0	26.2	0.0	12.5	51.4	60.7	26.9	15.4	65.4	53.6
PRSPCT	62.8	48.3	62.8	63.9	35.9	28.8	0.0	35.9	0.0	11.9	48.3	63.9	23.9	13.8	62.8	51.0
PSCNNO	55.0	43.9	55.0	52.0	0.0	0.0	0.0	0.0	0.0	0.0	43.9	52.0	16.9	6.4	55.0	42.8
PSCNSO*	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
PTIMPR	52.1	52.1	45.3	53.5	52.1	52.1	0.0	0.0	0.0	0.0	39.6	53.5	24.9	9.2	45.3	44.4
PTSUBL	46.7	40.5	46.7	55.9	40.0	40.0	0.0	18.9	0.0	0.0	40.5	55.9	22.7	8.9	46.7	43.8
QMPNT	65.1	57.0	65.1	59.8	57.0	48.3	57.0	39.0	53.9	0.0	44.5	55.9	11.1	15.0	65.1	59.8
RANCH	47.1	46.0	47.1	63.9	46.0	46.0	0.0	31.1	0.0	0.0	45.3	63.9	25.3	5.5	47.1	44.9
SADMTN	51.8	51.8	46.4	55.1	51.8	51.8	0.0	5.9	0.0	0.0	40.6	55.1	24.6	9.9	46.4	44.3
SANUP	57.1	57.1	55.9	61.9	57.1	47.2	40.8	57.1	27.5	0.0	46.0	46.0	20.8	22.1	55.9	61.9

* Note: Peach Spring Canyon South (PSCNSO) was not modeled, as it is located too far outside park boundaries.



Location ID	All Aircraft	Air Tour and Air Tour Related, GA, and Military	GA, Military, and Commercial		Total Air Tour and Air Tour Related	Commercial Air Tours	GC West	Transportation, Repositioning, etc.	Over the Edge	Bar10	General Aviation		Military		Commercial	
	Daytime		Daytime	Daytime							Nighttime	Daytime	Daytime	Daytime	Nighttime	Daytime
SCCORV	56.5	42.2	56.5	60.7	7.6	6.9	7.6	2.8	3.2	0.0	42.2	60.7	13.4	10.0	56.5	48.3
SCMCIG	60.4	43.3	60.4	56.7	9.6	4.5	5.1	9.6	0.8	0.0	43.3	56.7	13.3	8.4	60.4	45.9
SEPARC	57.4	42.3	57.4	59.9	7.5	6.4	7.5	1.8	3.0	0.0	42.3	59.9	13.5	9.9	57.4	48.1
SHWZFC	64.3	57.3	64.3	63.6	57.3	47.3	17.2	57.3	7.1	0.0	45.0	52.7	11.7	18.1	64.3	63.6
SOCAN	56.5	54.3	56.5	64.8	54.3	54.3	0.0	0.0	0.0	0.0	48.5	64.8	22.2	14.9	56.5	50.8
SOSUPC	49.3	49.0	49.0	61.5	48.4	39.1	0.0	48.4	0.0	0.0	49.0	61.5	48.4	6.7	46.6	45.1
SPENCA	62.5	39.4	62.5	57.9	21.8	21.8	9.6	17.1	3.4	0.0	39.4	57.9	12.8	9.3	62.5	47.8
STONCK	61.4	51.5	61.4	62.9	2.9	1.9	0.0	2.9	0.0	0.0	51.5	62.9	21.7	15.6	61.4	51.5
SUIPNT	66.3	44.8	66.3	60.4	29.2	23.0	19.3	29.2	6.8	0.0	44.8	60.4	12.3	14.0	66.3	56.1
SUPVIL	60.0	49.7	60.0	63.0	13.1	9.9	0.0	13.1	0.0	0.0	49.7	63.0	43.0	14.1	60.0	49.8
TEMBUT	56.4	54.3	44.9	60.6	54.3	54.3	0.0	0.0	0.0	0.0	42.5	60.6	30.0	6.1	44.9	43.5
TENMED	70.5	70.5	48.1	54.8	70.5	70.5	0.0	19.4	0.0	0.0	40.2	54.8	34.1	2.5	48.1	49.6
THRSPR	52.5	37.6	52.5	59.5	21.8	14.4	0.0	21.8	0.0	0.0	37.6	59.5	15.6	9.3	52.5	46.3
TOROWP	66.0	54.7	66.0	57.7	22.8	16.4	0.0	22.8	0.0	8.4	54.7	57.7	32.3	16.8	66.0	55.8
TOWER	61.7	61.7	44.3	61.4	61.7	61.7	0.0	4.1	0.0	0.0	43.8	61.4	24.3	7.4	44.3	45.7
TWINPT	66.2	46.4	66.2	59.1	35.5	35.5	32.5	27.4	20.4	0.0	46.4	59.1	11.6	14.7	66.2	58.4
UPDRCK	65.2	55.3	65.2	58.2	1.8	0.0	0.0	1.8	0.0	0.0	55.3	58.2	23.8	17.9	65.2	55.2
WESEND	57.1	52.2	57.1	57.6	52.2	52.2	46.9	50.6	8.3	0.0	46.4	46.4	26.7	24.8	57.1	57.6
WHTRAP	65.4	50.3	65.4	59.6	42.5	27.8	0.0	34.5	0.0	42.5	50.3	59.6	20.5	16.0	65.4	55.5
ZUNALF	65.3	65.3	45.4	57.4	65.3	65.3	0.0	6.3	0.0	0.0	40.2	57.4	35.9	2.4	45.4	46.6
ZUNCHR	53.1	53.1	45.1	63.8	53.1	53.1	0.0	0.0	0.0	0.0	45.0	63.8	31.4	4.9	45.1	47.1



**Figure 2. All Aircraft (daytime operations) – T_{Aud}
 (25% T_{Aud} = 99% of Park, i.e., 1% Restored)**

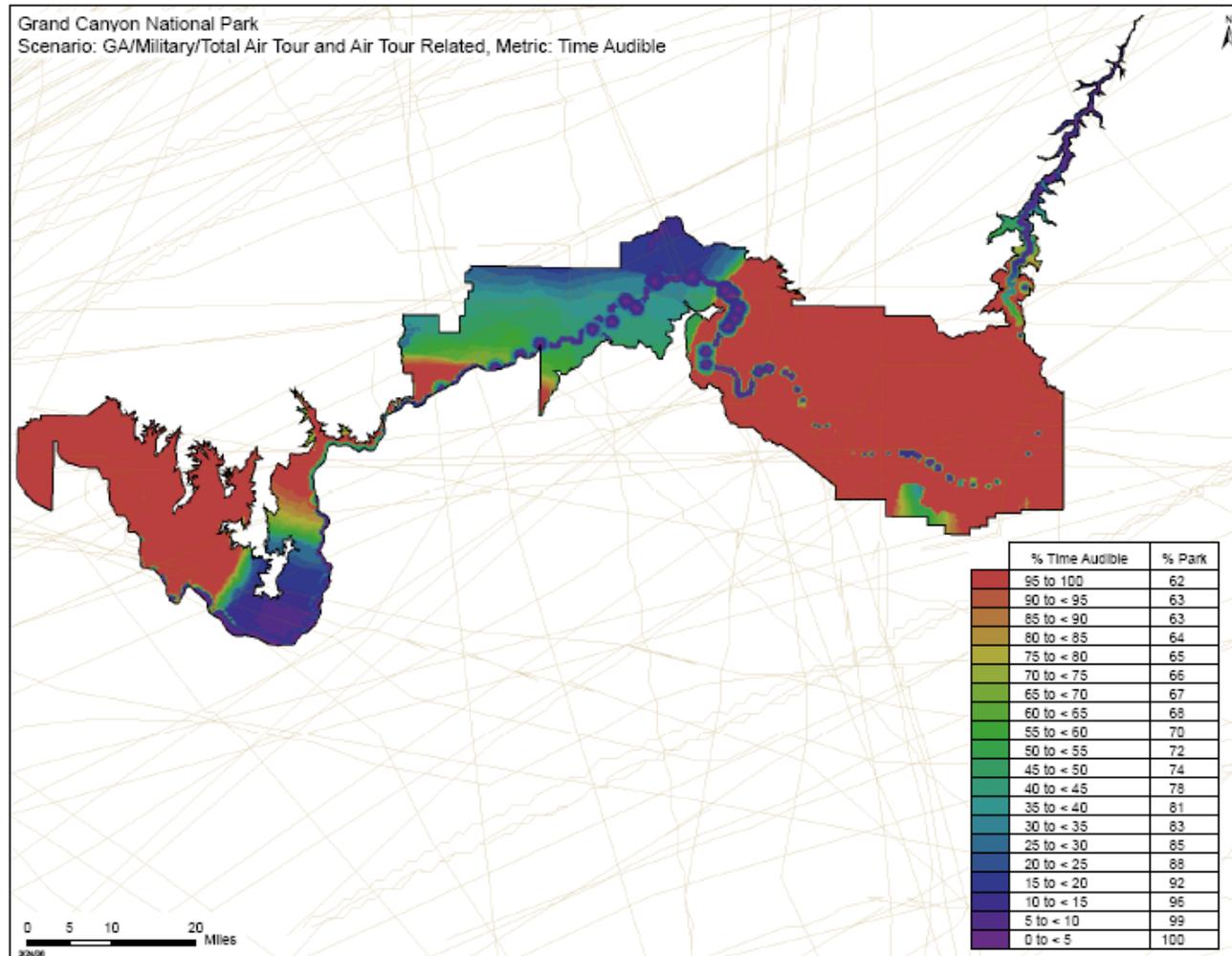


Figure 3. GA, Military, Air Tour and Air Tour Related (daytime operations) – T_{Aud}

(25% T_{Aud} = 85% of Park, i.e., 15% “Restored”) ←

Note: Notwithstanding the various scenarios modeled, the 1987 Overflights Act and the subsequent relevant court holdings require that the model account for noise from **all aircraft** to determine whether substantial restoration of natural quiet has been achieved. Moreover, NEPA requires that the agencies analyze the impacts of all noise sources cumulatively. Substantial restoration of natural quiet is achieved when the total percentage restored from **all aircraft** operations is 50% or more.

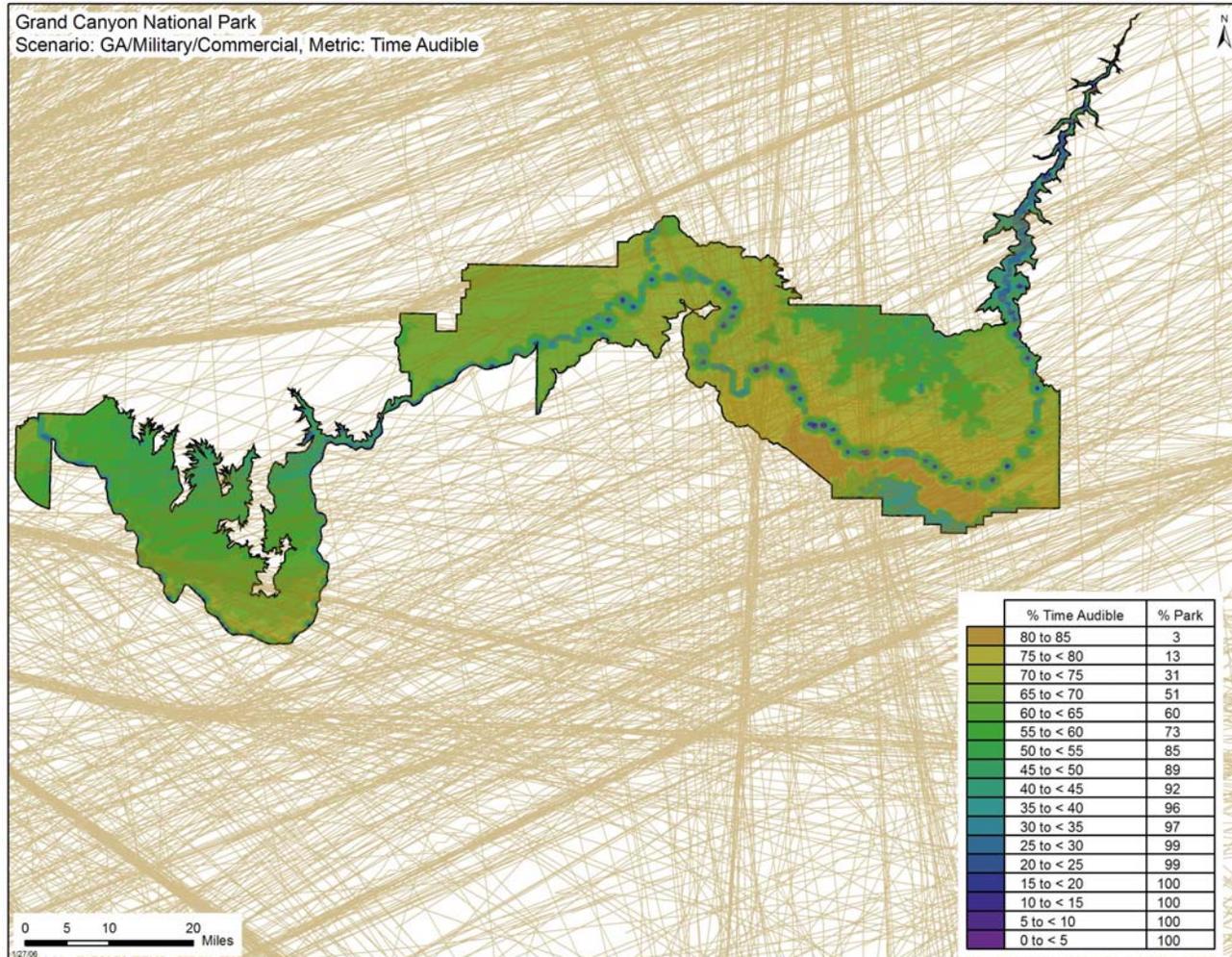


Figure 4. GA, Military, and Commercial (daytime operations) – T_{Aud}

(25% T_{Aud} = 99% of Park, i.e., 1% “Restored”) ←

Note: Notwithstanding the various scenarios modeled, the 1987 Overflights Act and the subsequent relevant court holdings require that the model account for noise from **all aircraft** to determine whether substantial restoration of natural quiet has been achieved. Moreover, NEPA requires that the agencies analyze the impacts of all noise sources cumulatively. Substantial restoration of natural quiet is achieved when the total percentage restored from **all aircraft** operations is 50% or more.

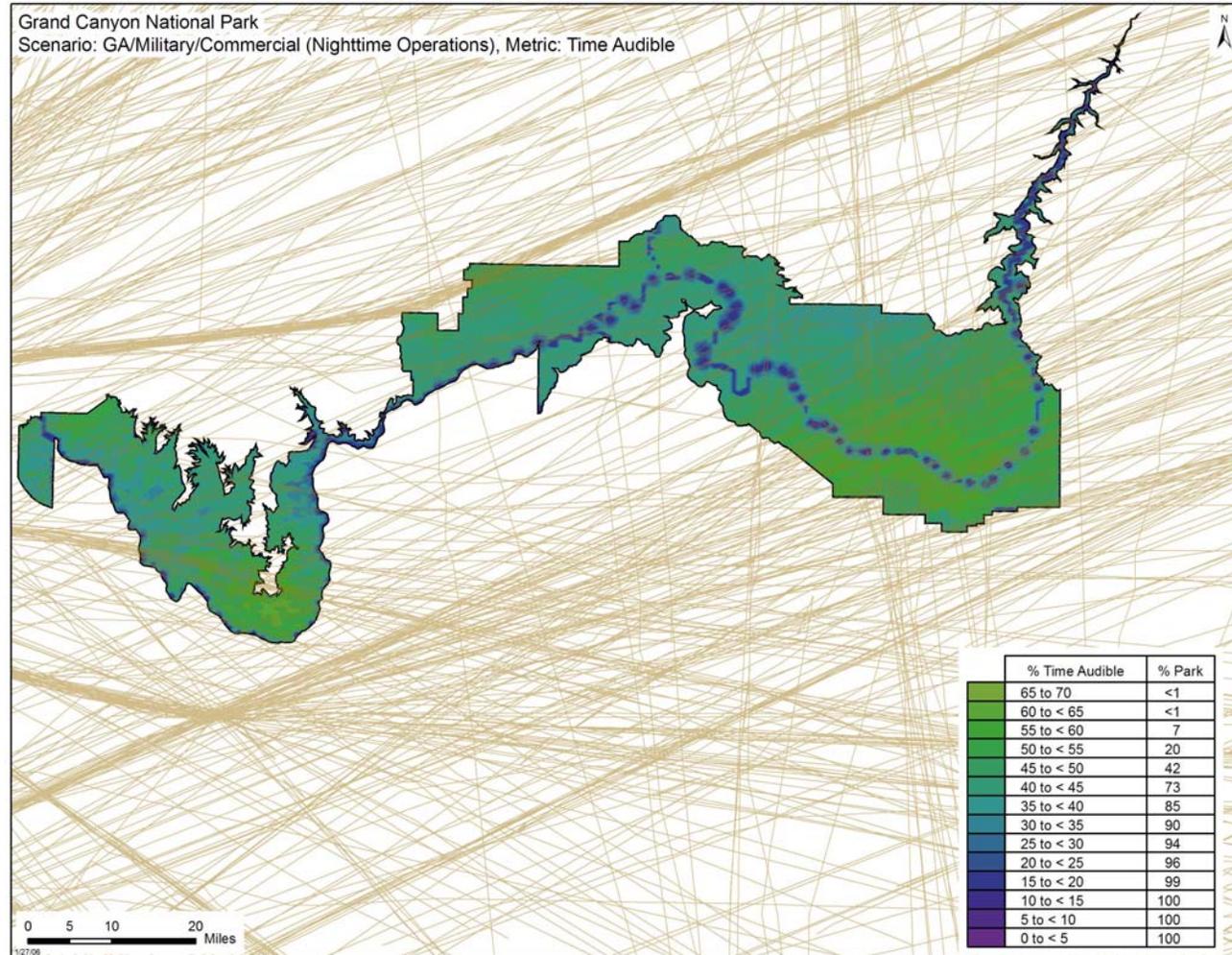


Figure 5. GA, Military, and Commercial (nighttime operations) – T_{Aud}
 (25% T_{Aud} = 94% of Park, i.e., 6% “Restored”) ←

Note: Notwithstanding the various scenarios modeled, the 1987 Overflights Act and the subsequent relevant court holdings require that the model account for noise from **all aircraft** to determine whether substantial restoration of natural quiet has been achieved. Moreover, NEPA requires that the agencies analyze the impacts of all noise sources cumulatively. Substantial restoration of natural quiet is achieved when the total percentage restored from **all aircraft** operations is 50% or more.

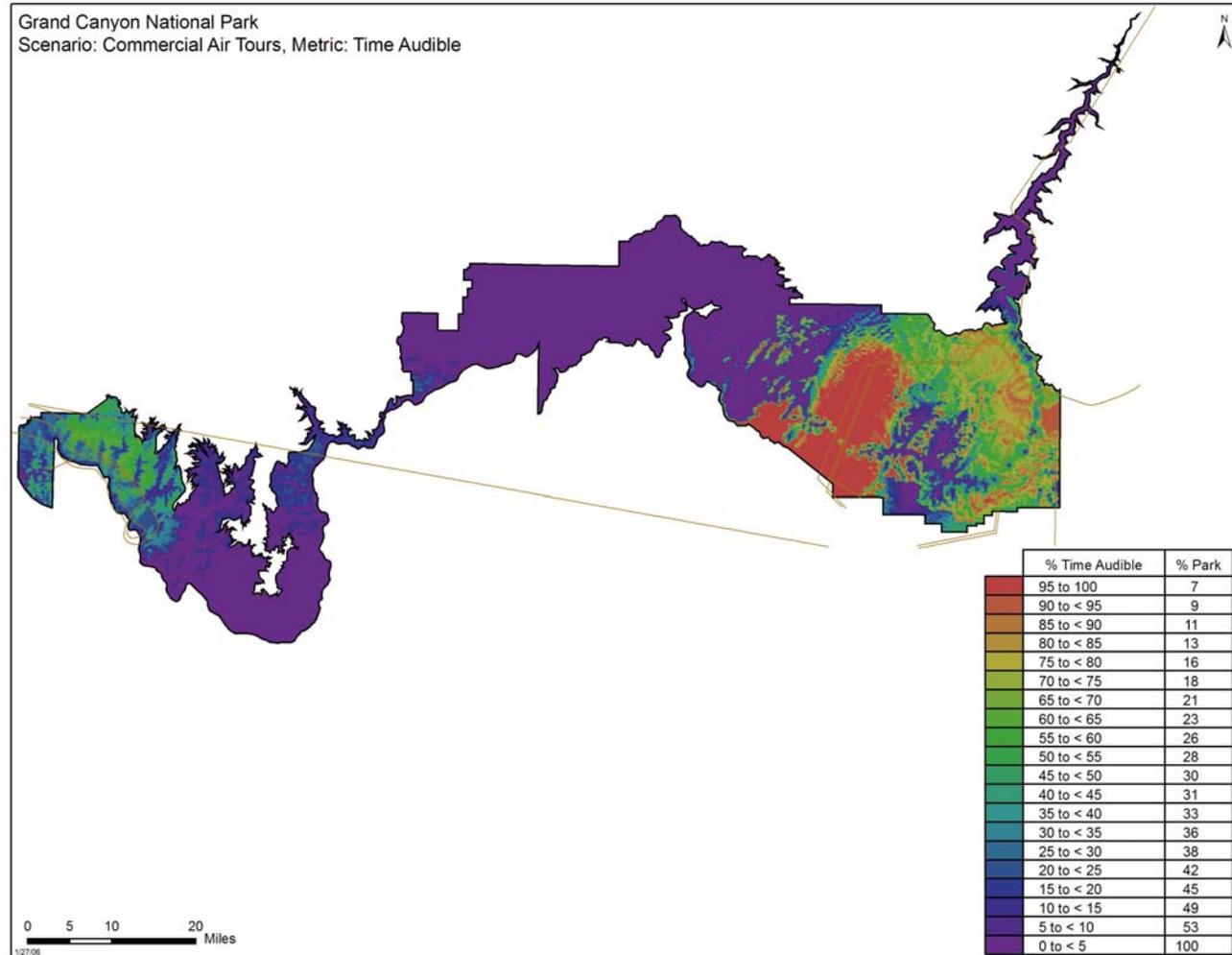


Figure 6. Commercial Air Tours – T_{Aud}
(25% T_{Aud} = 38% of Park, i.e., 62% “Restored”)

Note: Notwithstanding the various scenarios modeled, the 1987 Overflights Act and the subsequent relevant court holdings require that the model account for noise from **all aircraft** to determine whether substantial restoration of natural quiet has been achieved. Moreover, NEPA requires that the agencies analyze the impacts of all noise sources cumulatively. Substantial restoration of natural quiet is achieved when the total percentage restored from **all aircraft** operations is 50% or more.

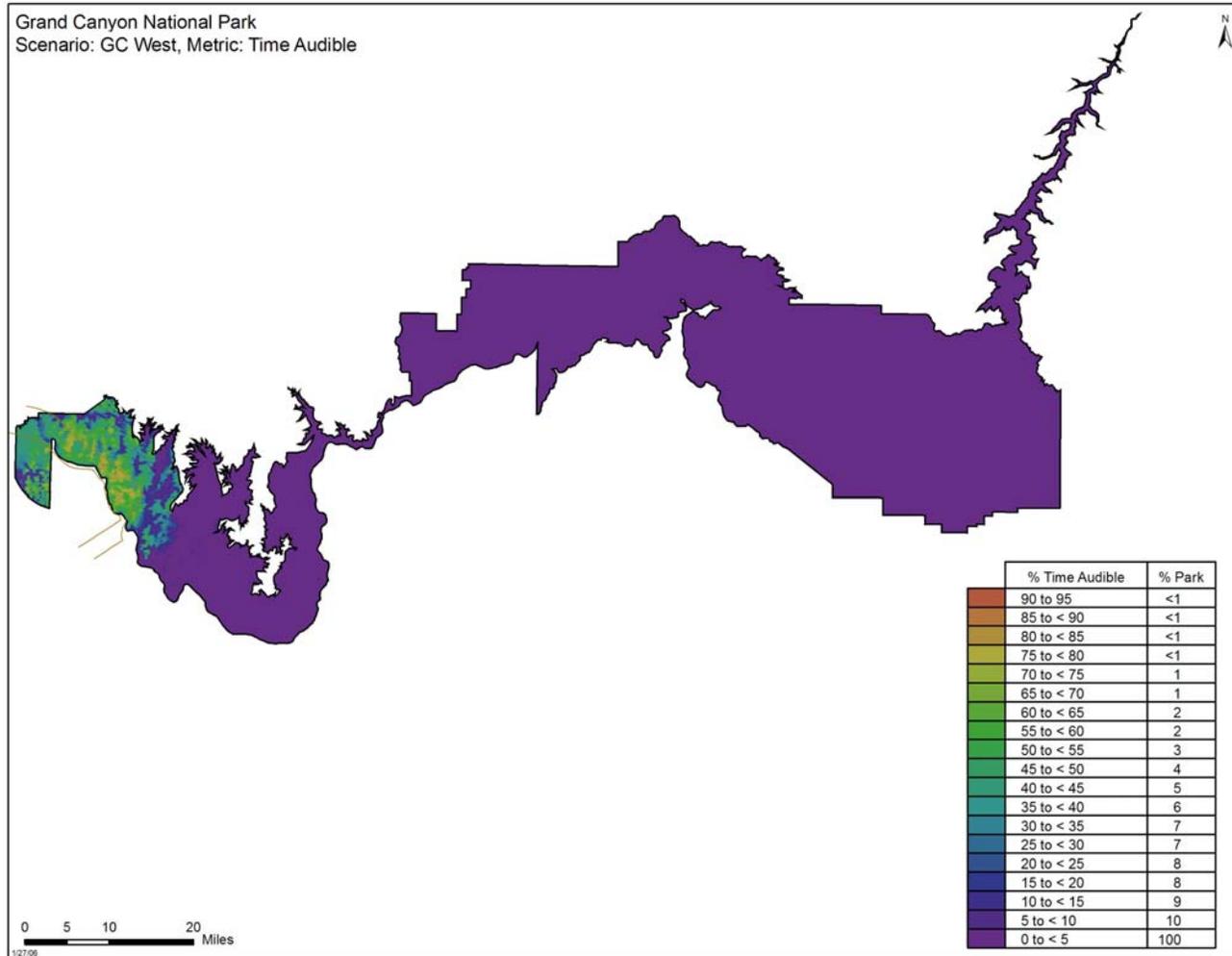


Figure 7. GC West – T_{Aud}
 (25% T_{Aud} = 7% of Park, i.e., 93% “Restored”) ←

Note: Notwithstanding the various scenarios modeled, the 1987 Overflights Act and the subsequent relevant court holdings require that the model account for noise from **all aircraft** to determine whether substantial restoration of natural quiet has been achieved. Moreover, NEPA requires that the agencies analyze the impacts of all noise sources cumulatively. Substantial restoration of natural quiet is achieved when the total percentage restored from **all aircraft** operations is 50% or more.

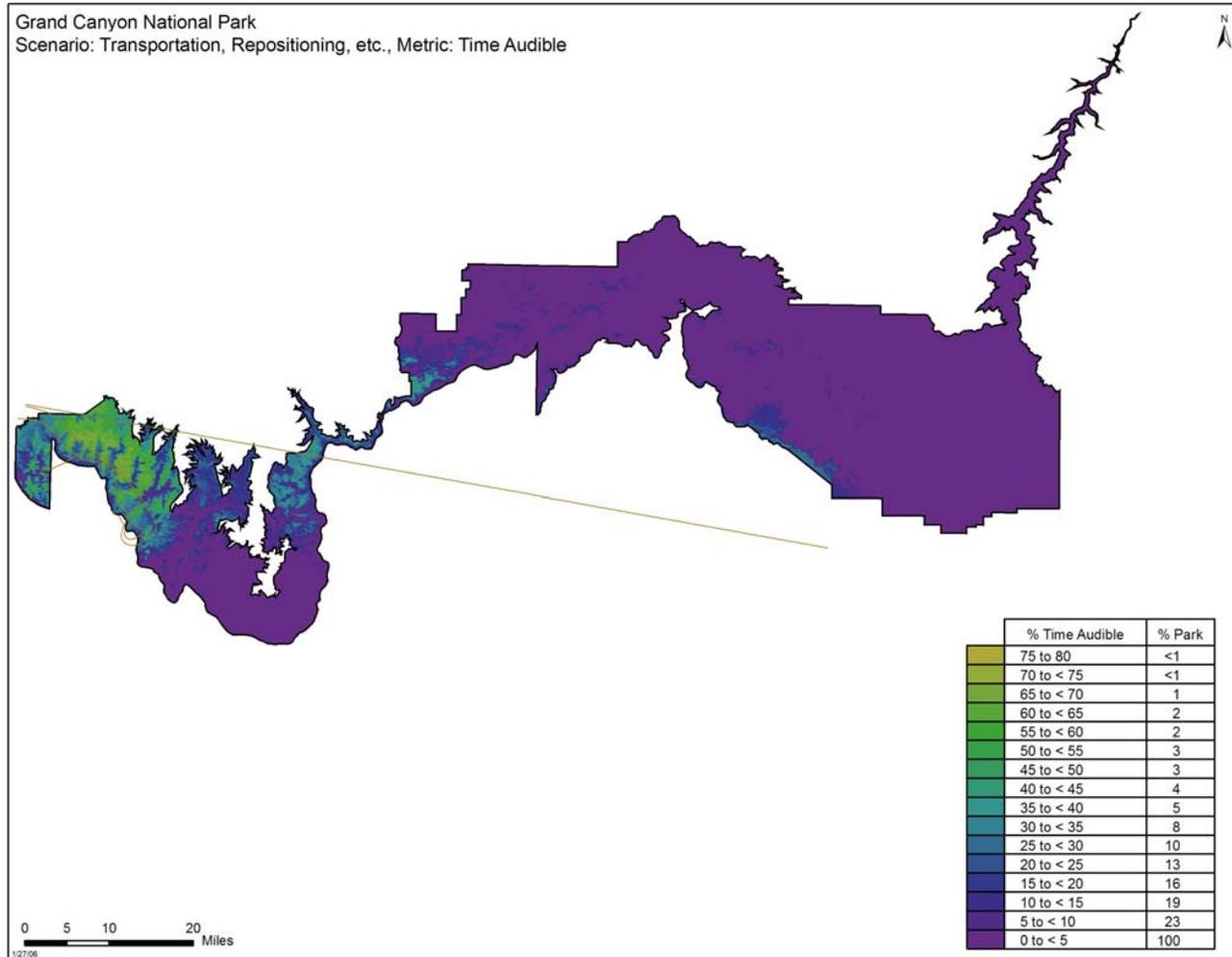


Figure 8. Transportation, Repositioning, etc – T_{Aud}

(25% T_{Aud} = 10% of Park, i.e., 90% “Restored”) ←

Note: Notwithstanding the various scenarios modeled, the 1987 Overflights Act and the subsequent relevant court holdings require that the model account for noise from **all aircraft** to determine whether substantial restoration of natural quiet has been achieved. Moreover, NEPA requires that the agencies analyze the impacts of all noise sources cumulatively. Substantial restoration of natural quiet is achieved when the total percentage restored from **all aircraft** operations is 50% or more.

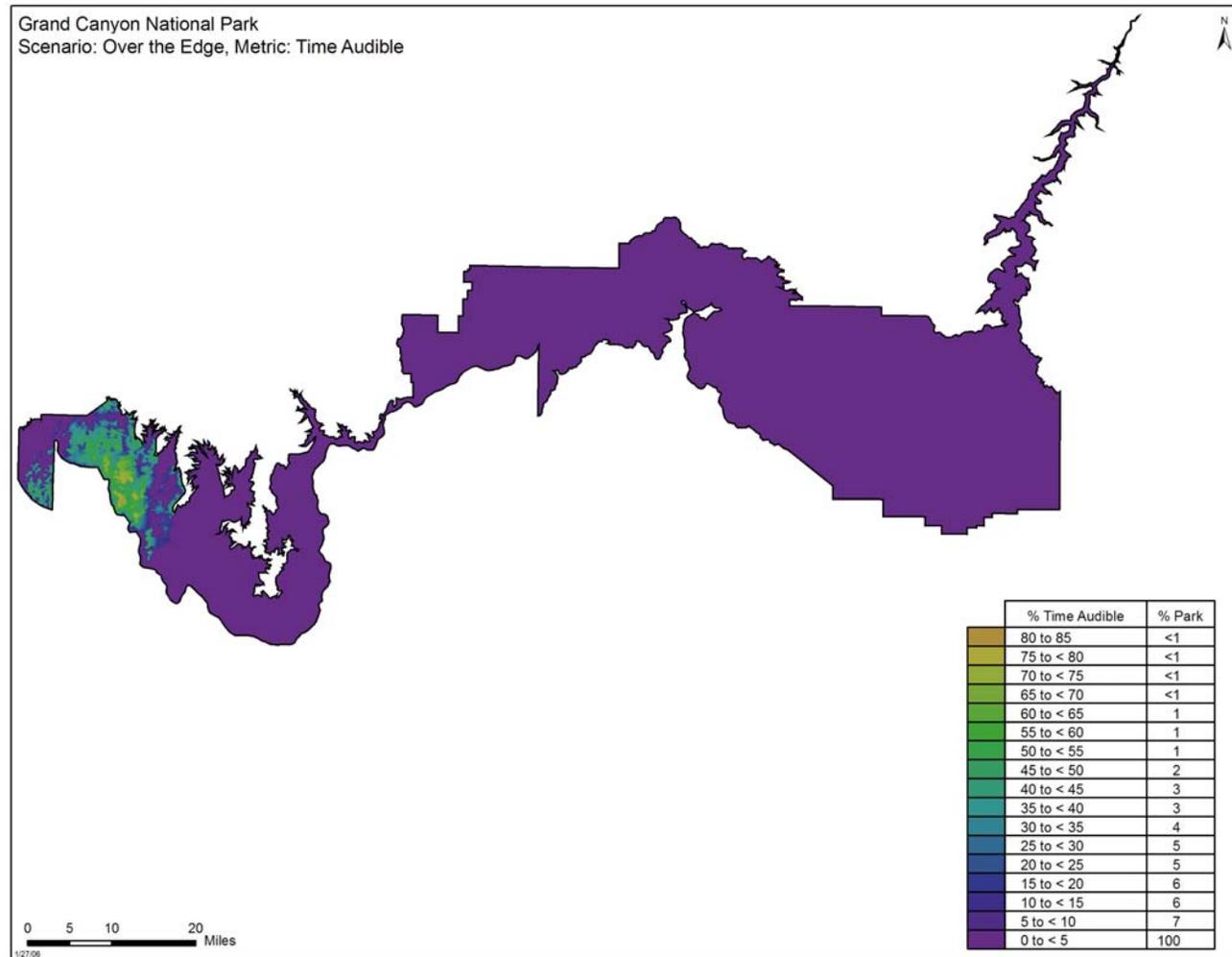


Figure 9. Over the Edge – T_{Aud}
(25% T_{Aud} = 5% of Park, i.e., 95% “Restored”)

Note: Notwithstanding the various scenarios modeled, the 1987 Overflights Act and the subsequent relevant court holdings require that the model account for noise from **all aircraft** to determine whether substantial restoration of natural quiet has been achieved. Moreover, NEPA requires that the agencies analyze the impacts of all noise sources cumulatively. Substantial restoration of natural quiet is achieved when the total percentage restored from **all aircraft** operations is 50% or more.

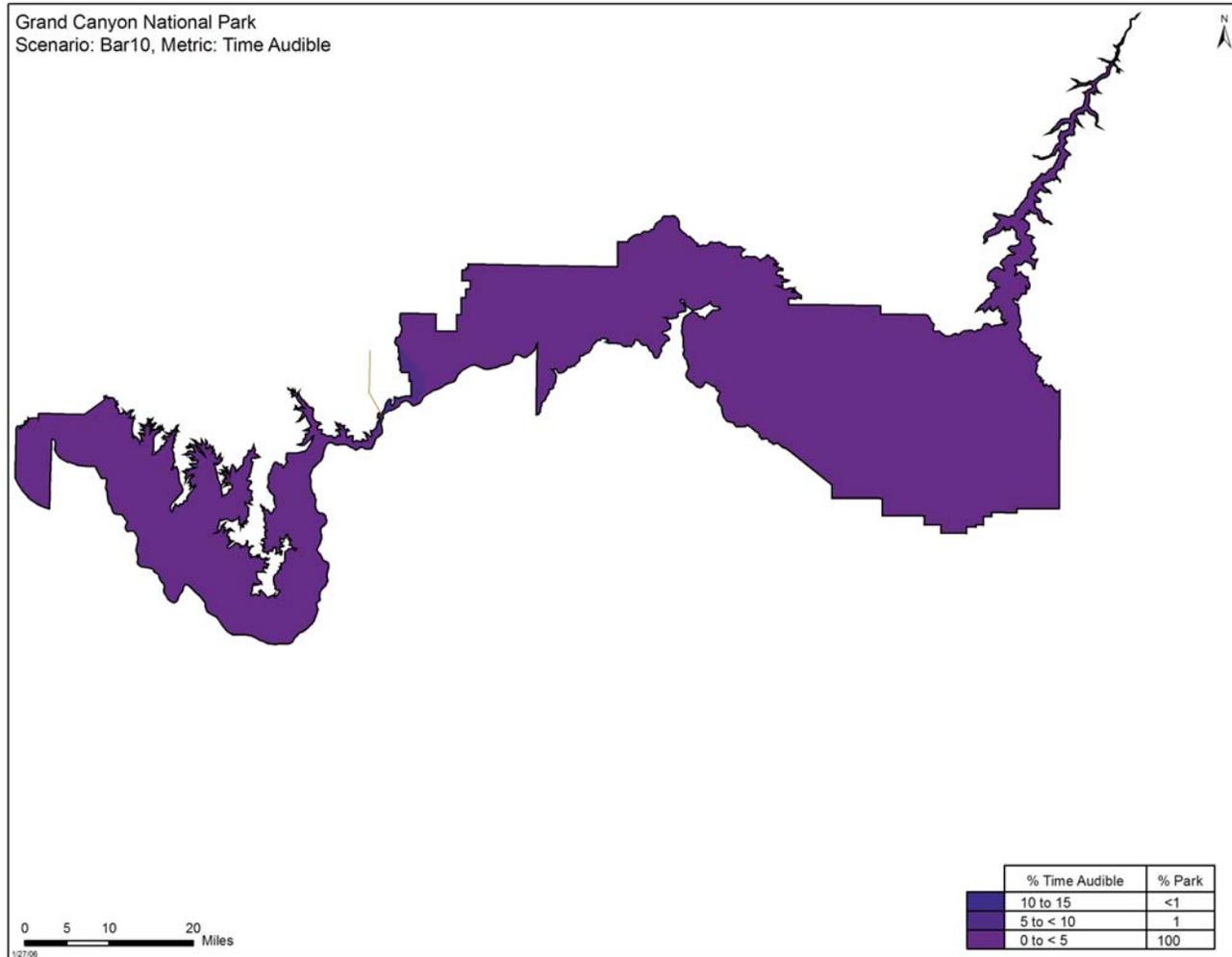


Figure 10. Bar 10 – T_{Aud}

(25% T_{Aud} = 0% of Park, i.e., 100% “Restored”) ←

Note: Notwithstanding the various scenarios modeled, the 1987 Overflights Act and the subsequent relevant court holdings require that the model account for noise from **all aircraft** to determine whether substantial restoration of natural quiet has been achieved. Moreover, NEPA requires that the agencies analyze the impacts of all noise sources cumulatively. Substantial restoration of natural quiet is achieved when the total percentage restored from **all aircraft** operations is 50% or more.

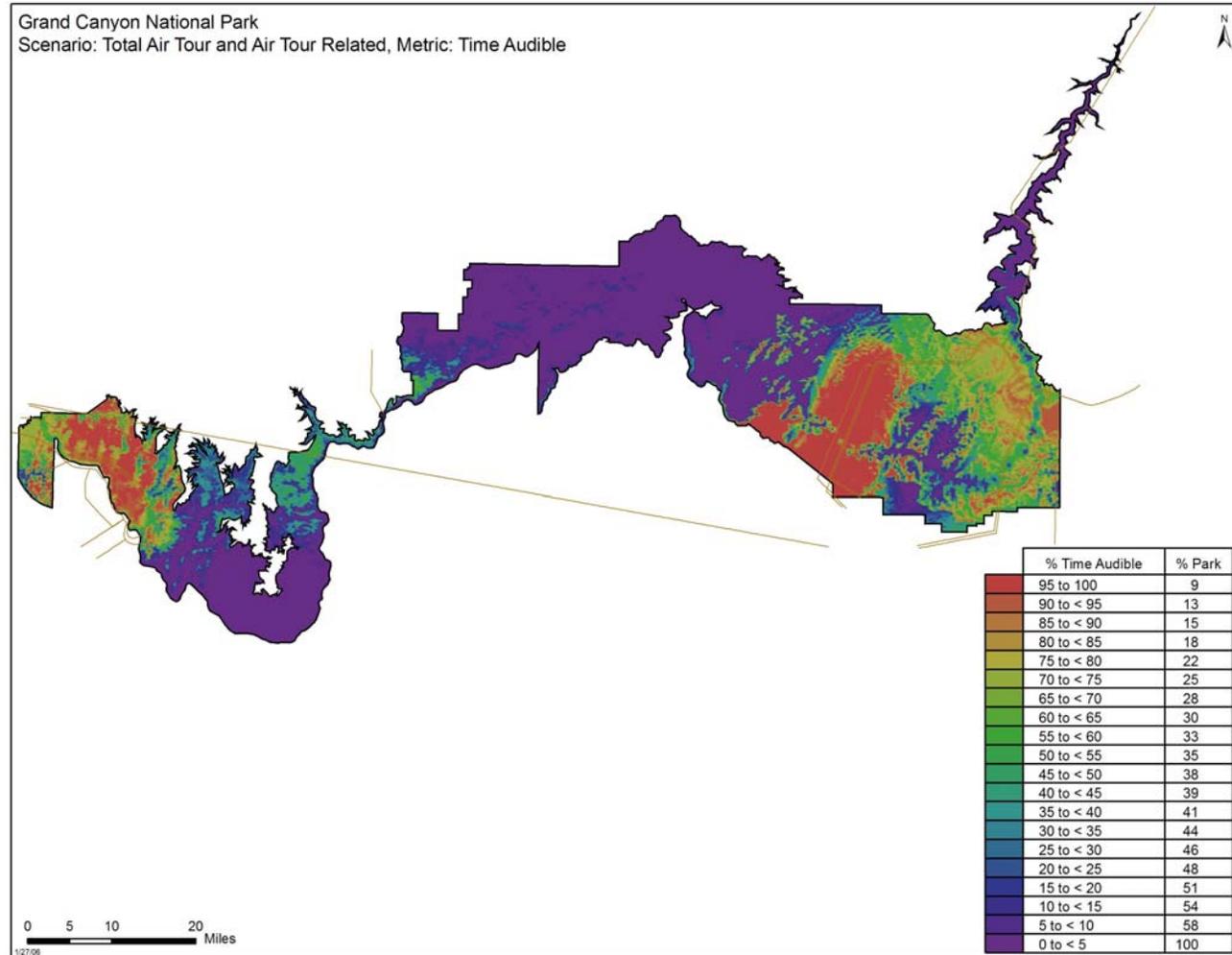


Figure 11. Total Air Tour and Air Tour Related – T_{Aud}

(25% T_{Aud} = 46% of Park, i.e., 54% “Restored”) ←

Note: Notwithstanding the various scenarios modeled, the 1987 Overflights Act and the subsequent relevant court holdings require that the model account for noise from **all aircraft** to determine whether substantial restoration of natural quiet has been achieved. Moreover, NEPA requires that the agencies analyze the impacts of all noise sources cumulatively. Substantial restoration of natural quiet is achieved when the total percentage restored from **all aircraft** operations is 50% or more.

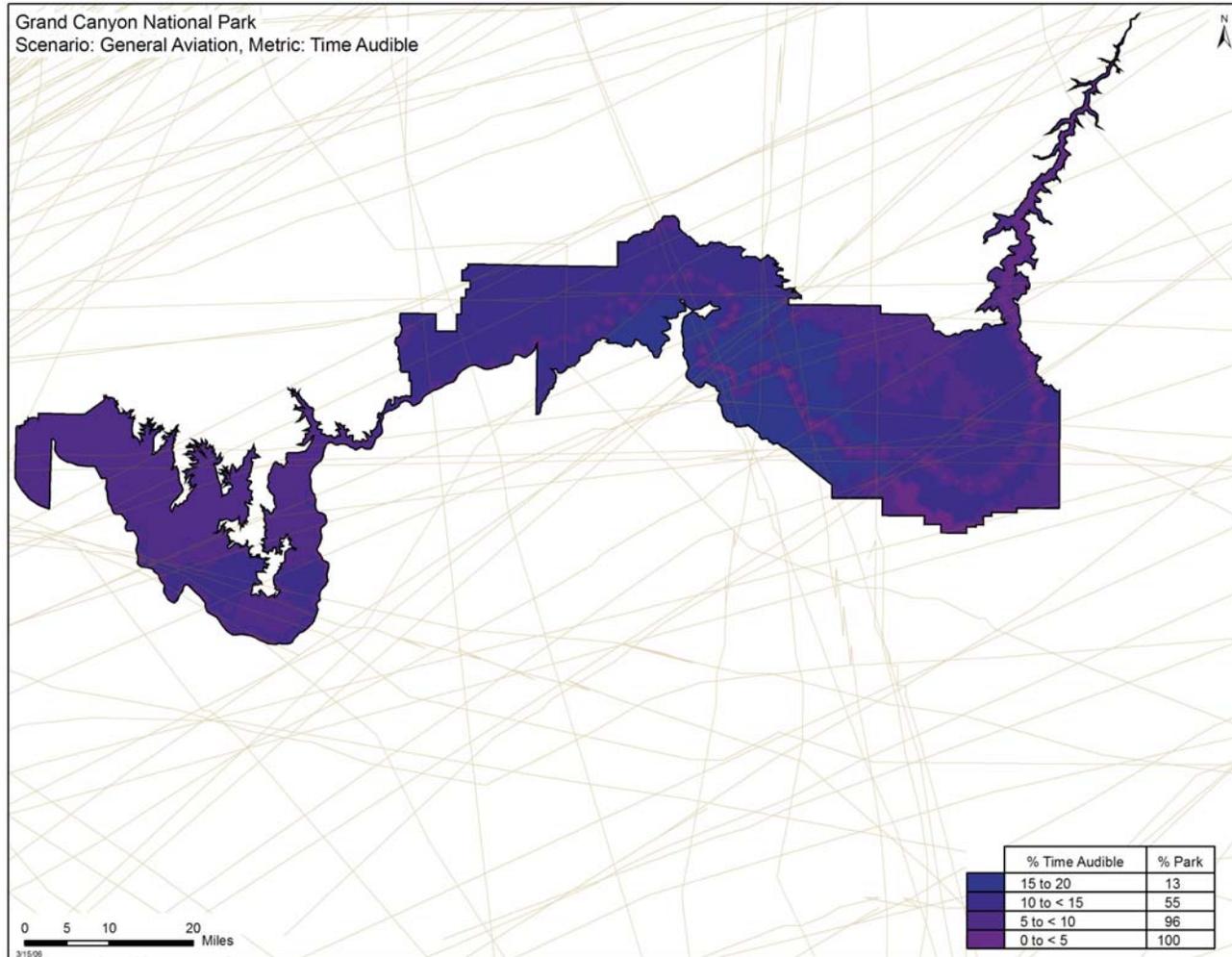


Figure 12. GA (daytime operations) – T_{Aud}
(25% T_{Aud} = 0% of Park, i.e., 100% “Restored”)

Note: Notwithstanding the various scenarios modeled, the 1987 Overflights Act and the subsequent relevant court holdings require that the model account for noise from **all aircraft** to determine whether substantial restoration of natural quiet has been achieved. Moreover, NEPA requires that the agencies analyze the impacts of all noise sources cumulatively. Substantial restoration of natural quiet is achieved when the total percentage restored from **all aircraft** operations is 50% or more.

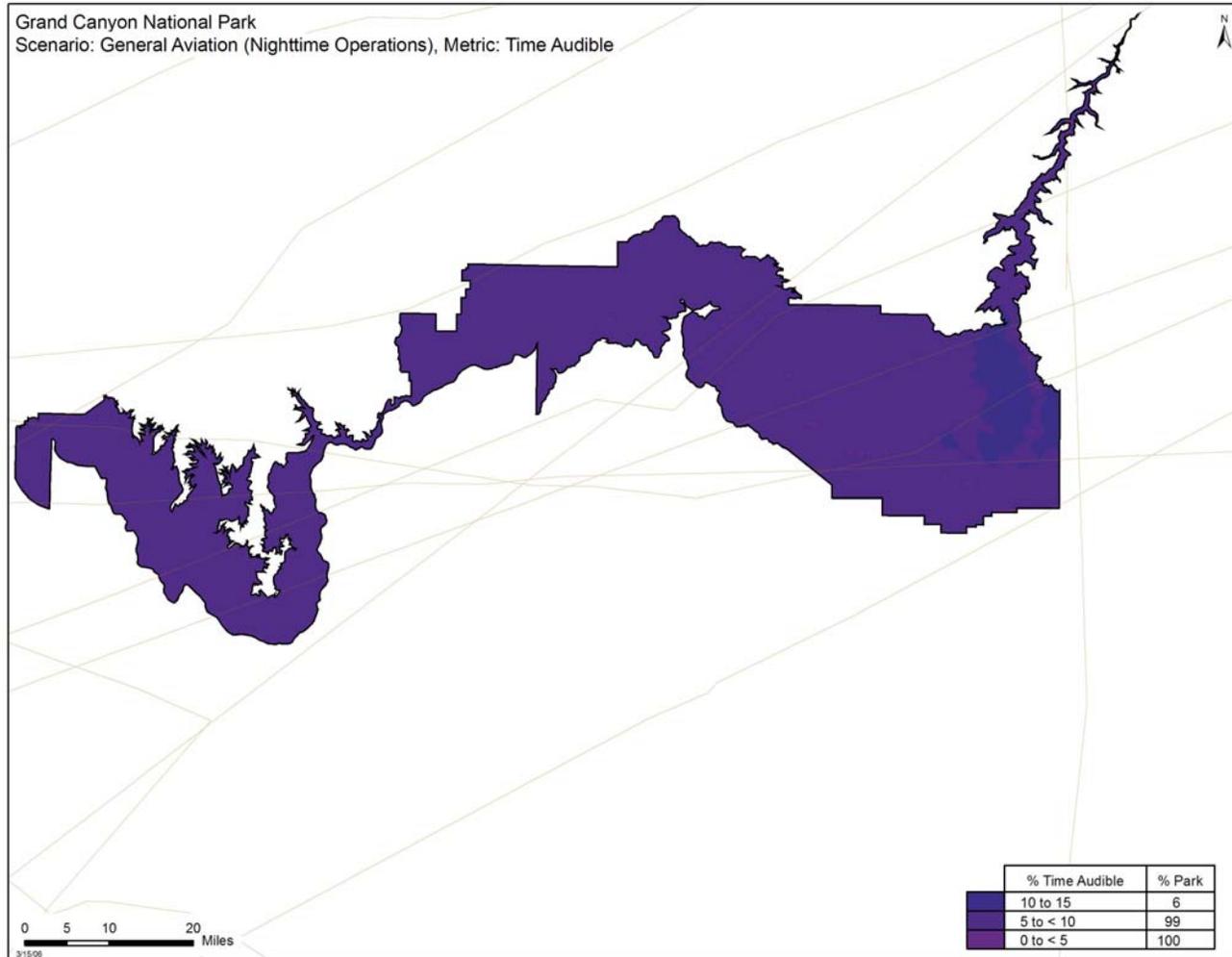


Figure 13. GA (nighttime operations) – T_{Aud}
(25% T_{Aud} = 0% of Park, i.e., 100% “Restored”) ←

Note: Notwithstanding the various scenarios modeled, the 1987 Overflights Act and the subsequent relevant court holdings require that the model account for noise from *all aircraft* to determine whether substantial restoration of natural quiet has been achieved. Moreover, NEPA requires that the agencies analyze the impacts of all noise sources cumulatively. Substantial restoration of natural quiet is achieved when the total percentage restored from *all aircraft* operations is 50% or more.

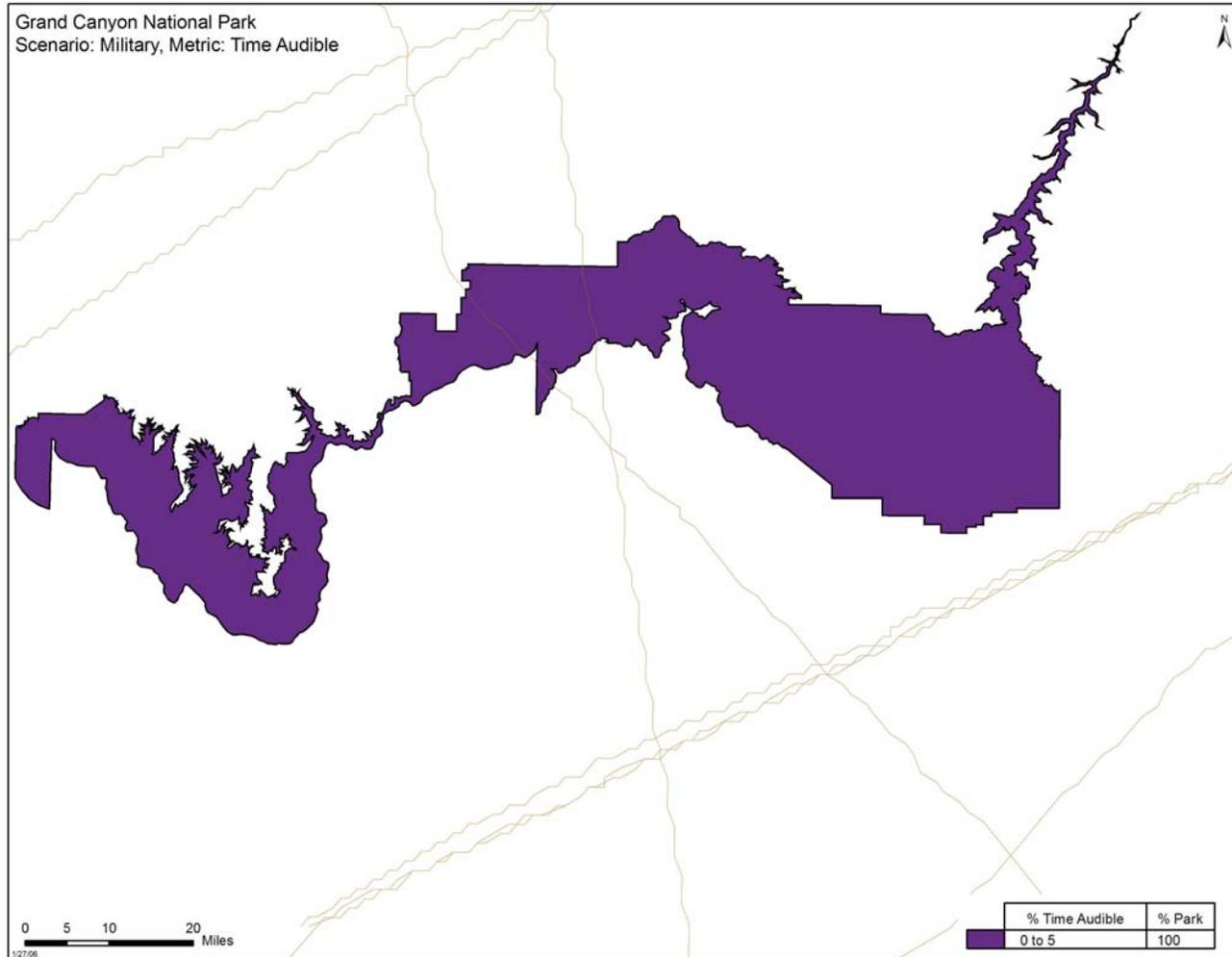


Figure 14. Military (daytime operations) – T_{Aud}

(25% T_{Aud} = 0% of Park, i.e., 100% “Restored”) ←

Note: Notwithstanding the various scenarios modeled, the 1987 Overflights Act and the subsequent relevant court holdings require that the model account for noise from **all aircraft** to determine whether substantial restoration of natural quiet has been achieved. Moreover, NEPA requires that the agencies analyze the impacts of all noise sources cumulatively. Substantial restoration of natural quiet is achieved when the total percentage restored from **all aircraft** operations is 50% or more.

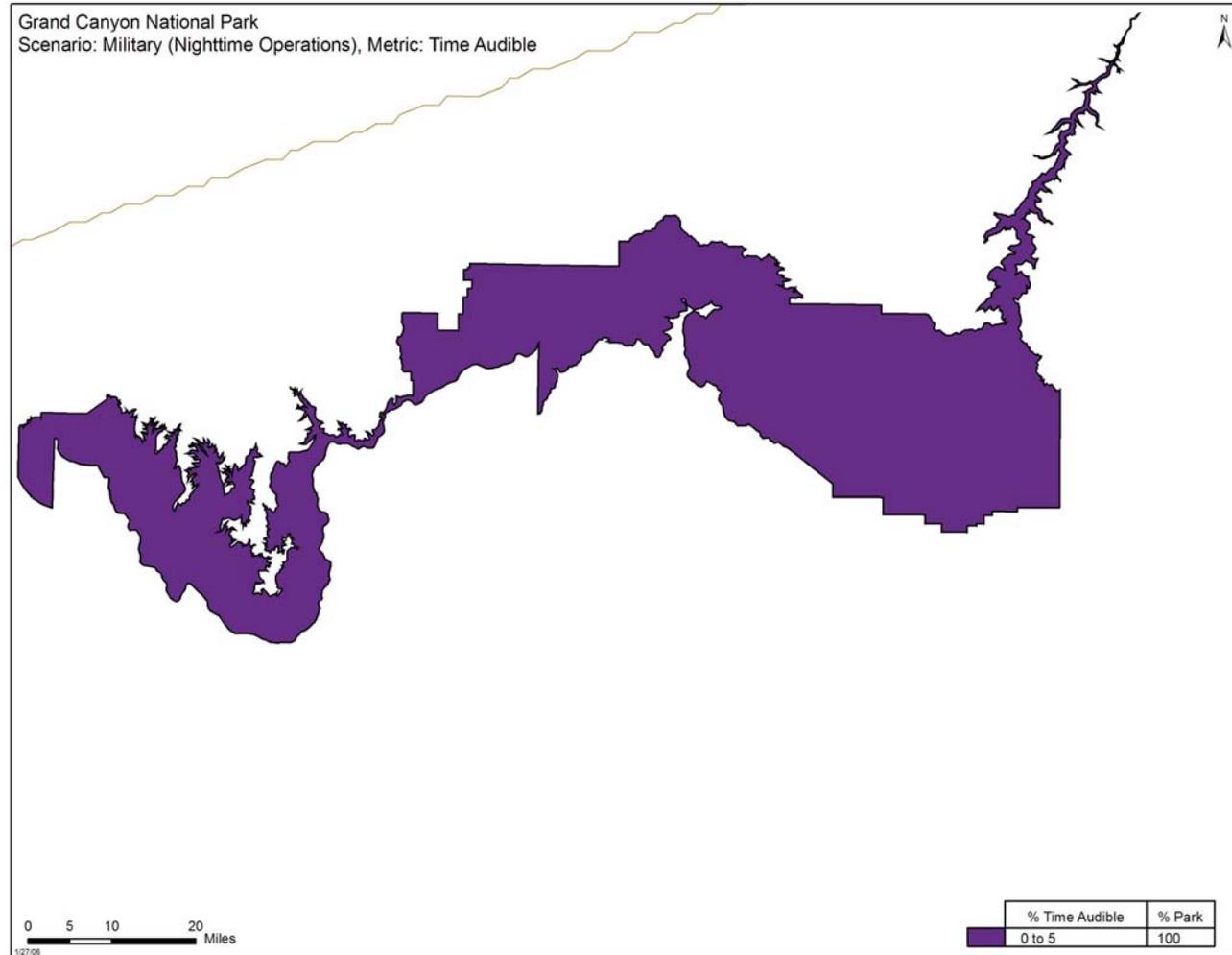


Figure 15. Military (nighttime operations) – T_{Aud}

(25% T_{Aud} = 0% of Park, i.e., 100% “Restored”) ←

Note: Notwithstanding the various scenarios modeled, the 1987 Overflights Act and the subsequent relevant court holdings require that the model account for noise from *all aircraft* to determine whether substantial restoration of natural quiet has been achieved. Moreover, NEPA requires that the agencies analyze the impacts of all noise sources cumulatively. Substantial restoration of natural quiet is achieved when the total percentage restored from *all aircraft* operations is 50% or more.

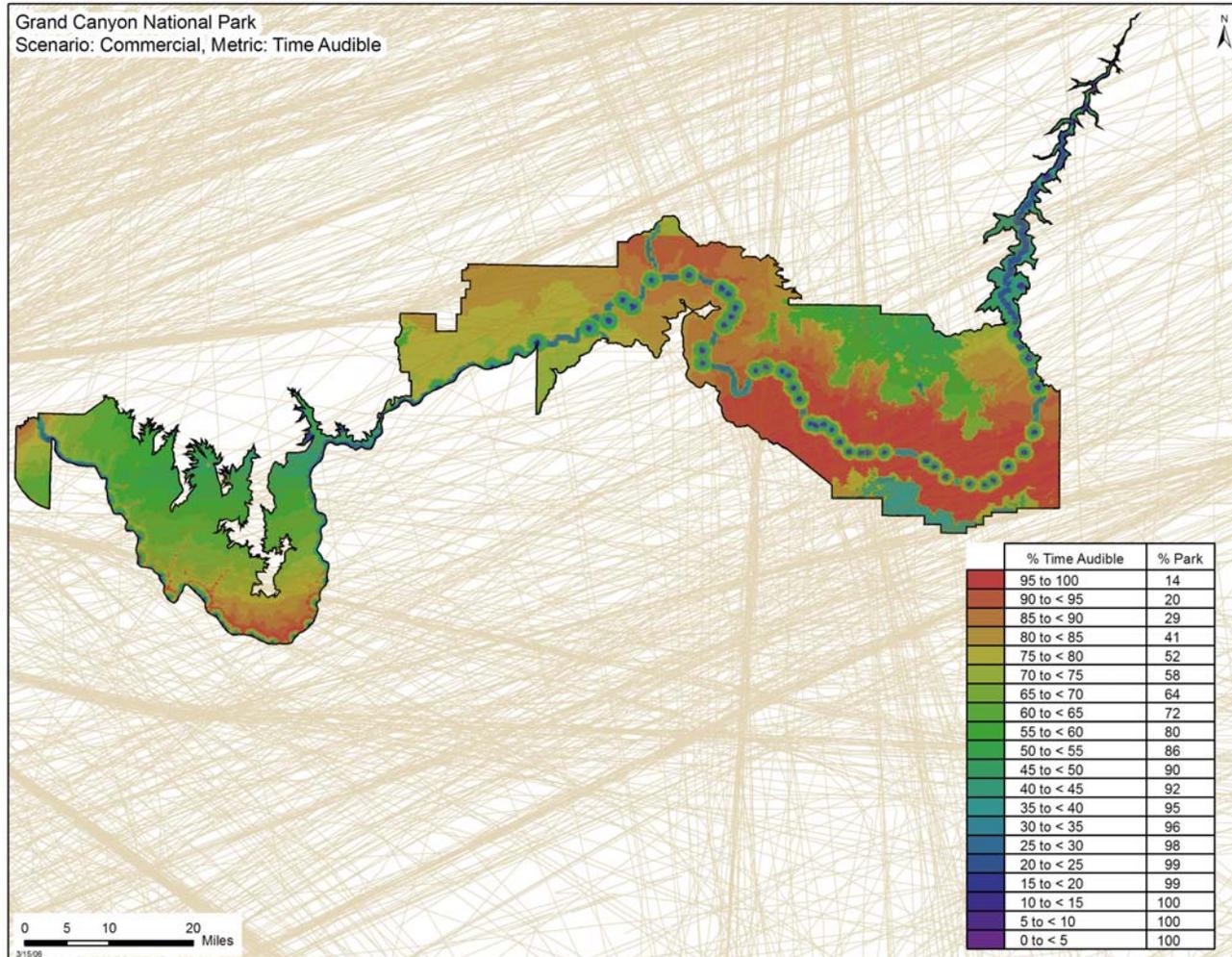


Figure 16. Commercial (daytime operations) – T_{Aud}

(25% T_{Aud} = 98% of Park, i.e., 2% “Restored”) ←

Note: Notwithstanding the various scenarios modeled, the 1987 Overflights Act and the subsequent relevant court holdings require that the model account for noise from **all aircraft** to determine whether substantial restoration of natural quiet has been achieved. Moreover, NEPA requires that the agencies analyze the impacts of all noise sources cumulatively. Substantial restoration of natural quiet is achieved when the total percentage restored from **all aircraft** operations is 50% or more.

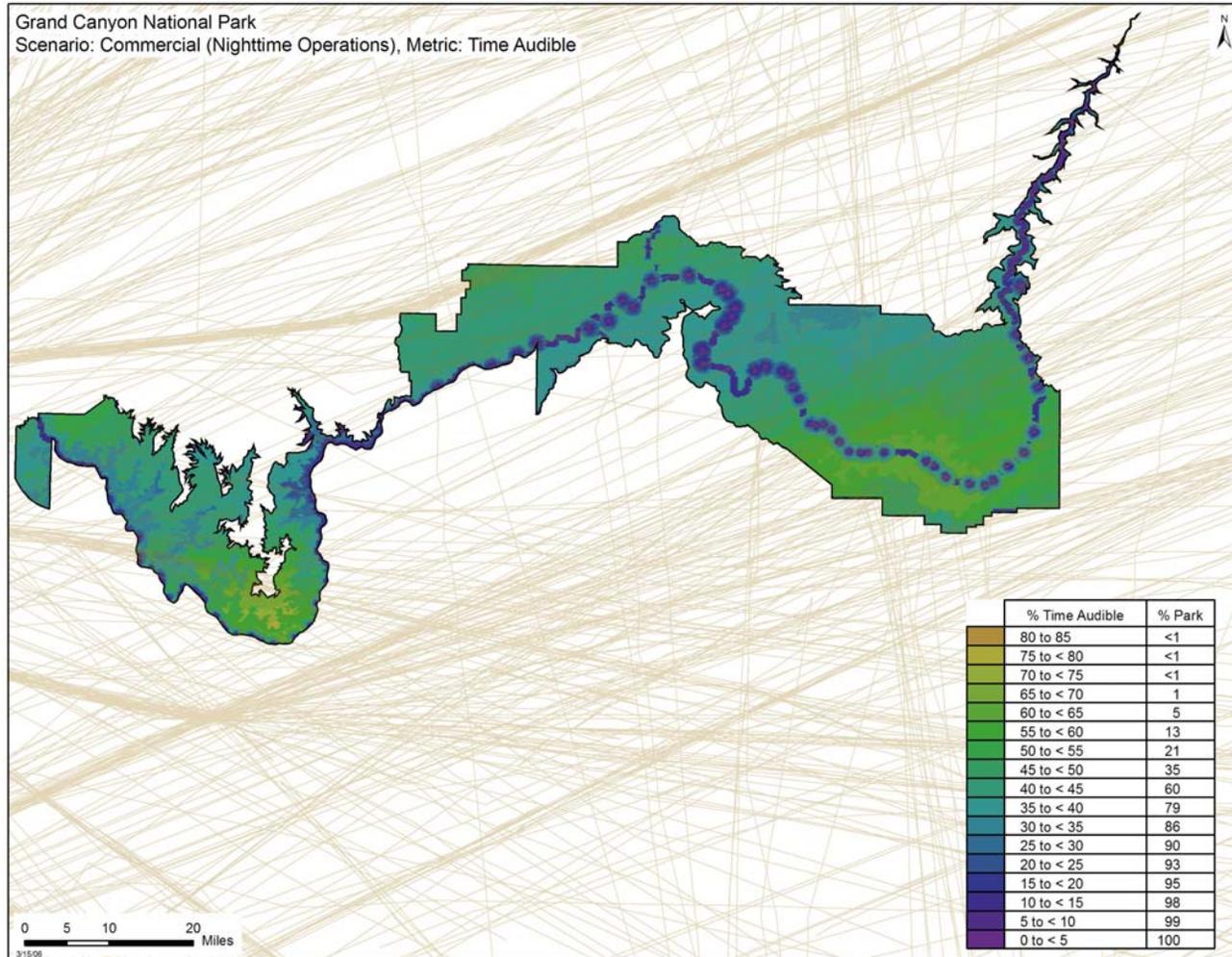


Figure 17. Commercial (nighttime operations) – T_{Aud}

(25% T_{Aud} = 90% of Park, i.e., 10% “Restored”) ←

Note: Notwithstanding the various scenarios modeled, the 1987 Overflights Act and the subsequent relevant court holdings require that the model account for noise from *all aircraft* to determine whether substantial restoration of natural quiet has been achieved. Moreover, NEPA requires that the agencies analyze the impacts of all noise sources cumulatively. Substantial restoration of natural quiet is achieved when the total percentage restored from *all aircraft* operations is 50% or more.

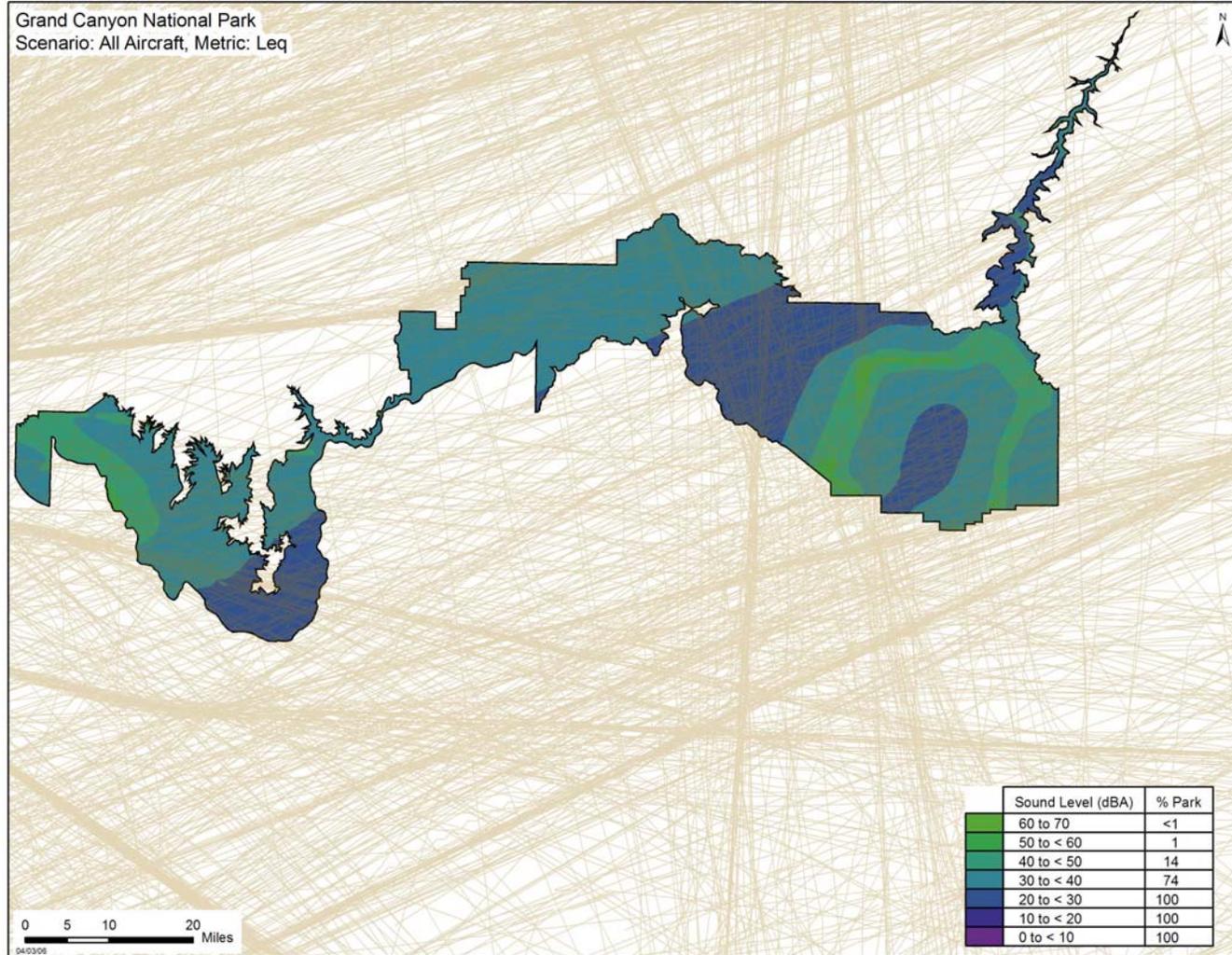


Figure 18. All Aircraft (daytime operations) – L_{eq}

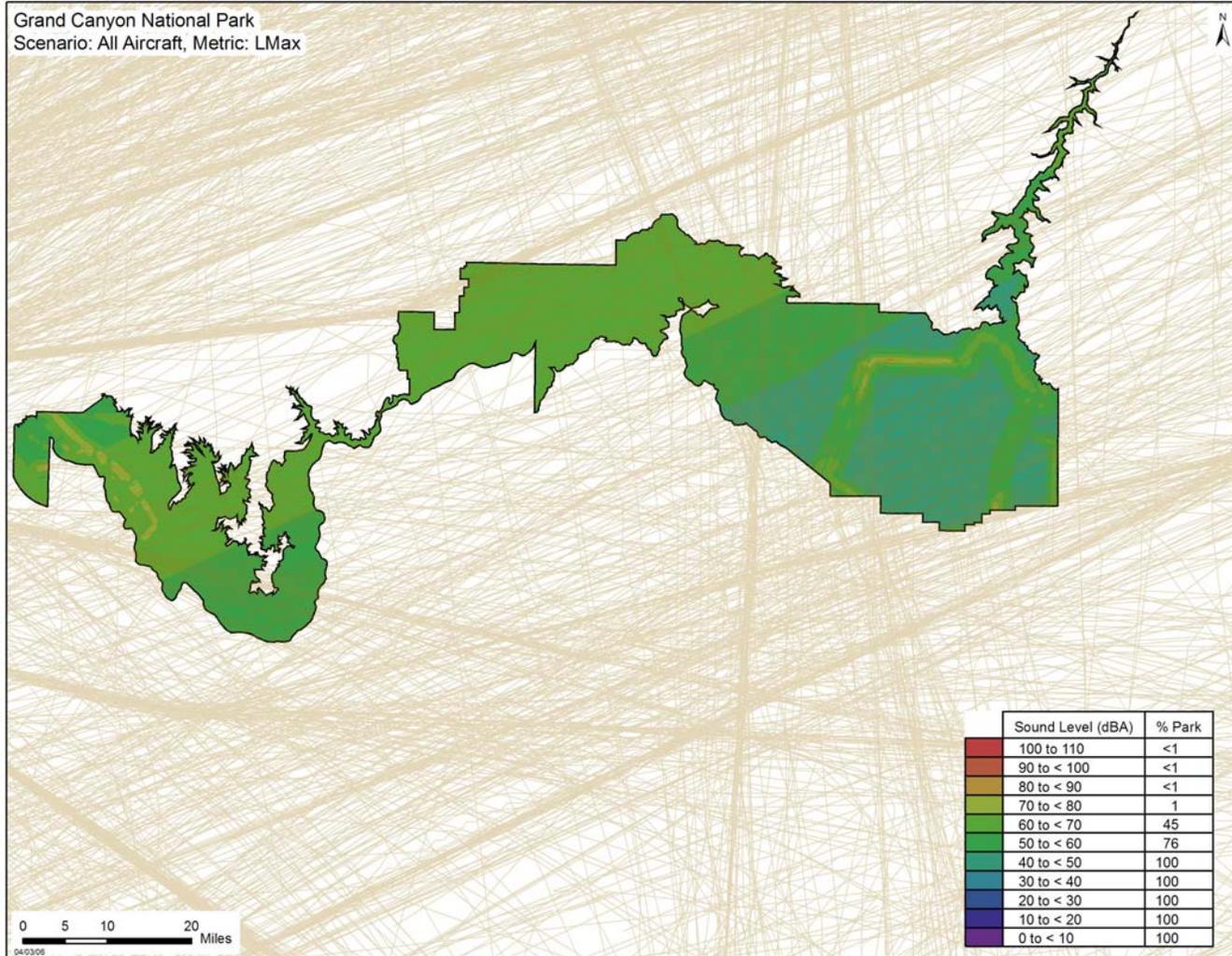


Figure 19. All Aircraft (daytime operations) – L_{max}

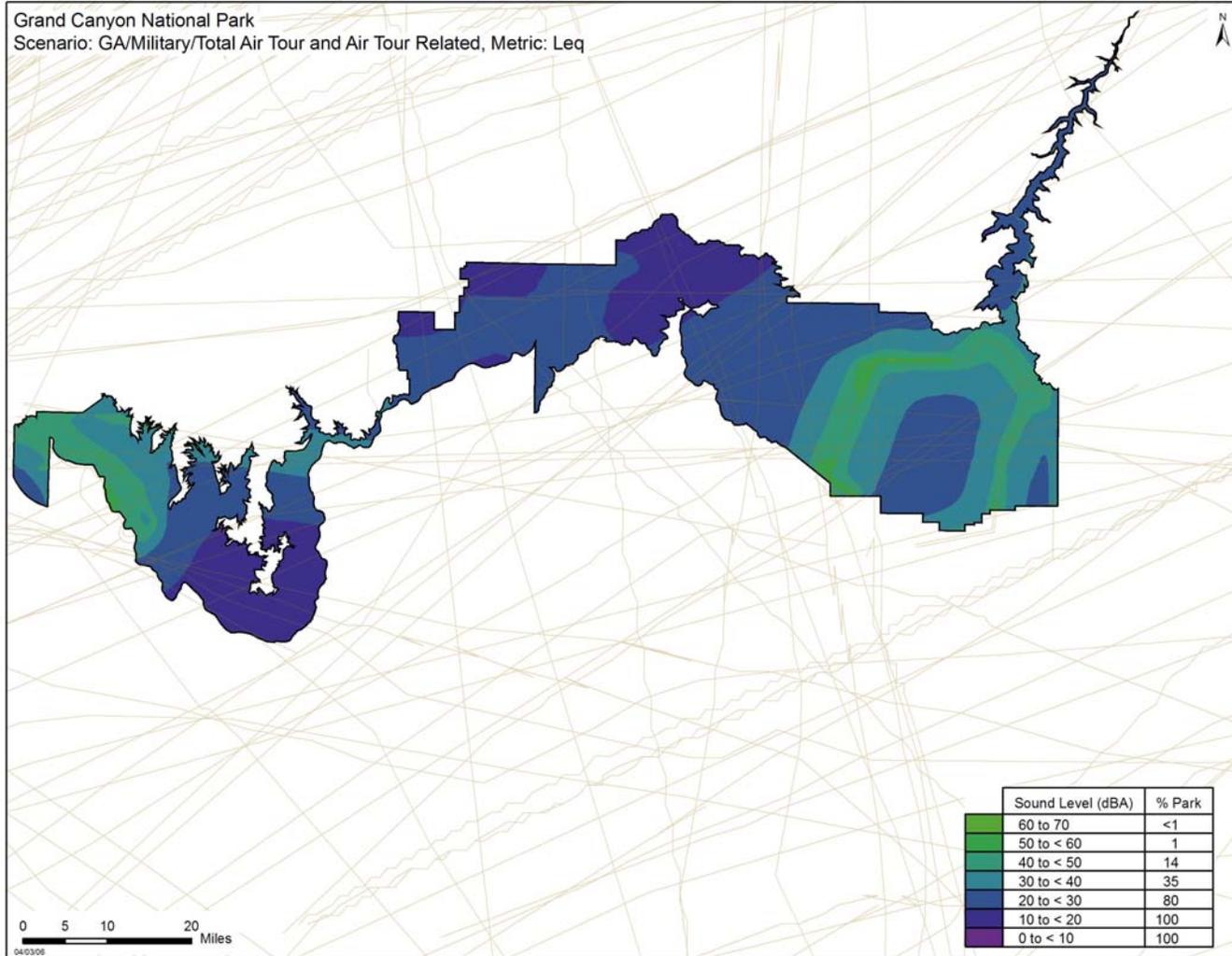


Figure 20. GA, Military, Air Tour and Air Tour Related (daytime operations) – Leq

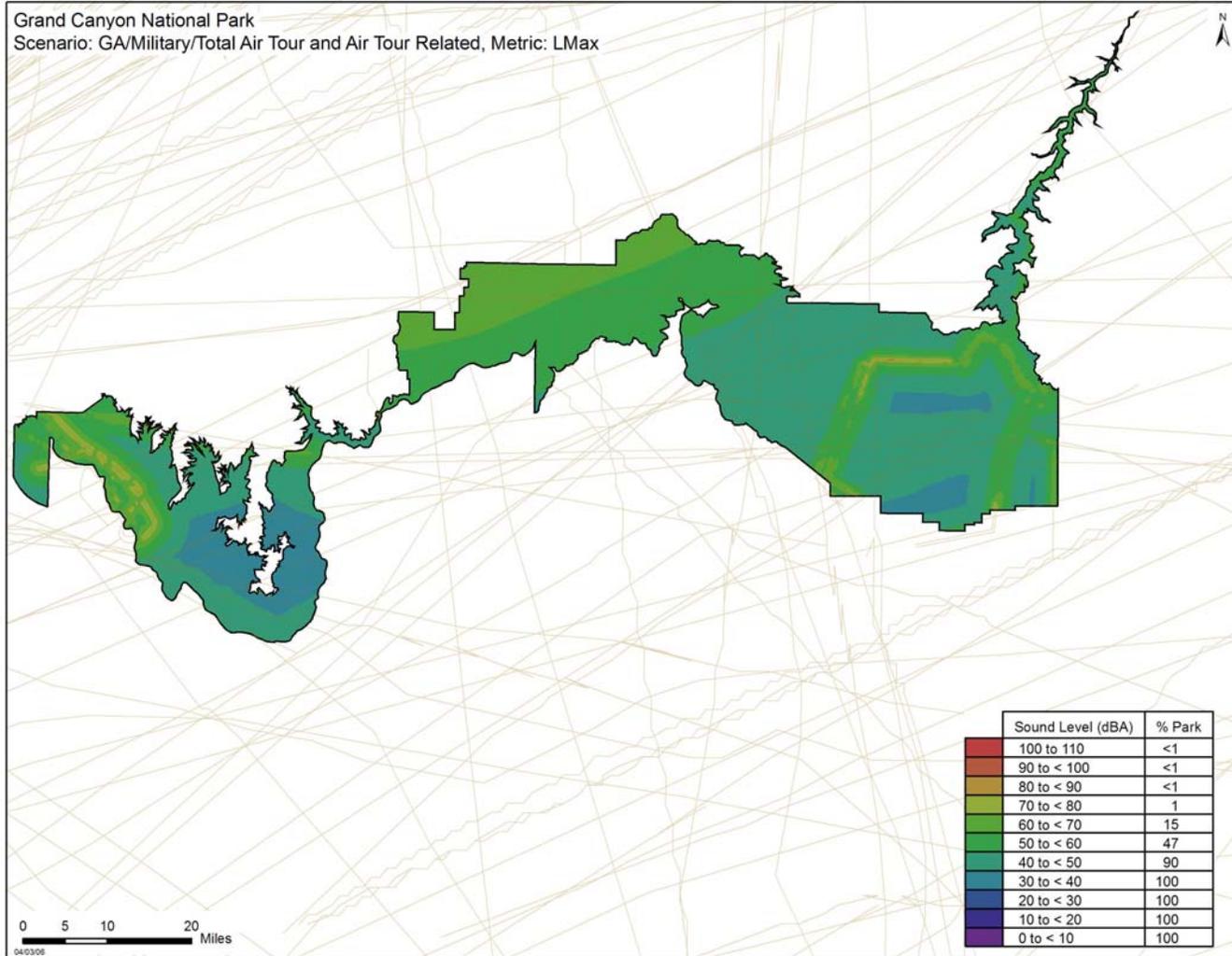


Figure 21. GA, Military, Air Tour and Air Tour Related (daytime operations) – L_{max}

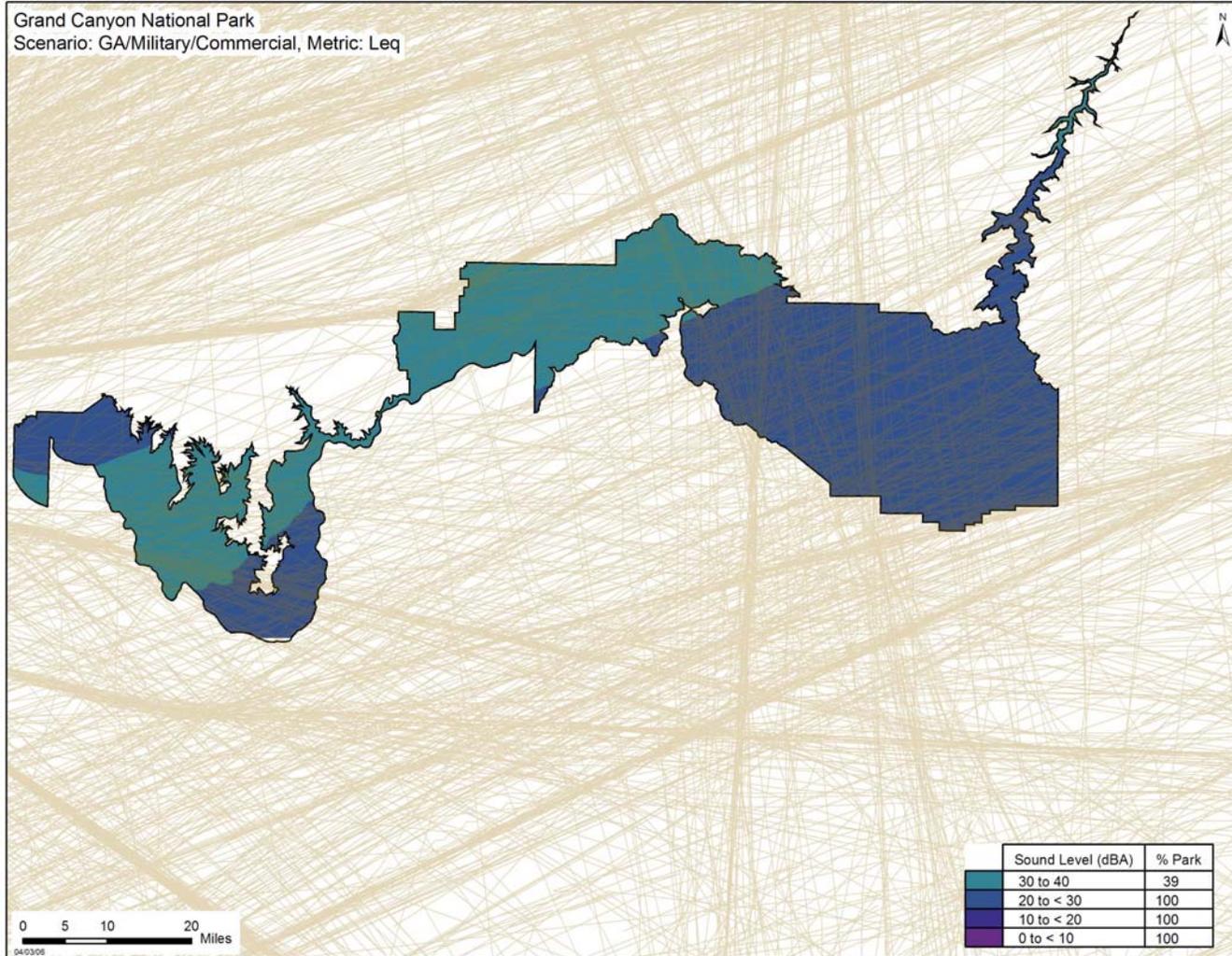


Figure 22. GA, Military, and Commercial (daytime operations) – L_{eq}

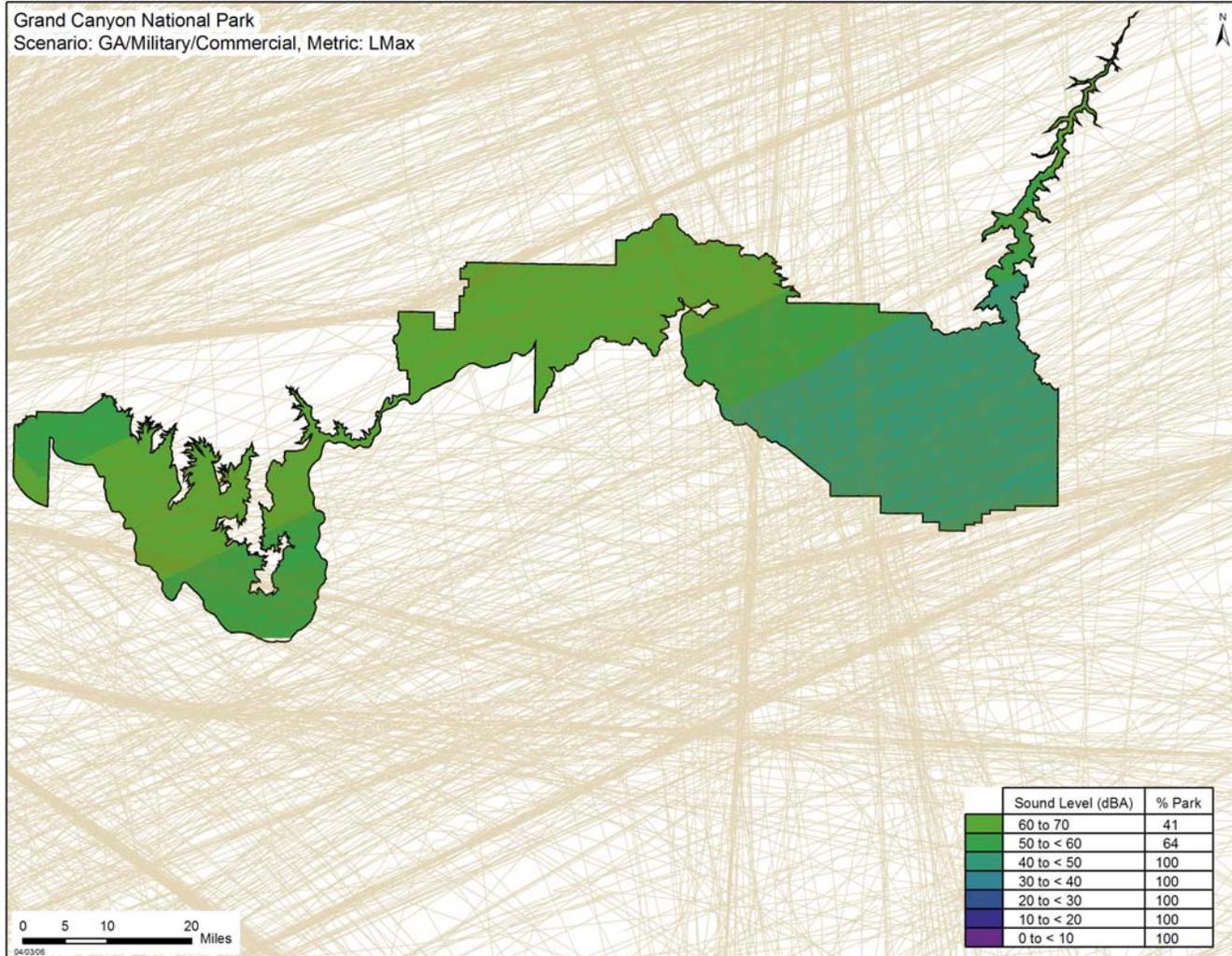


Figure 23. GA, Military, and Commercial (daytime operations) – L_{max}

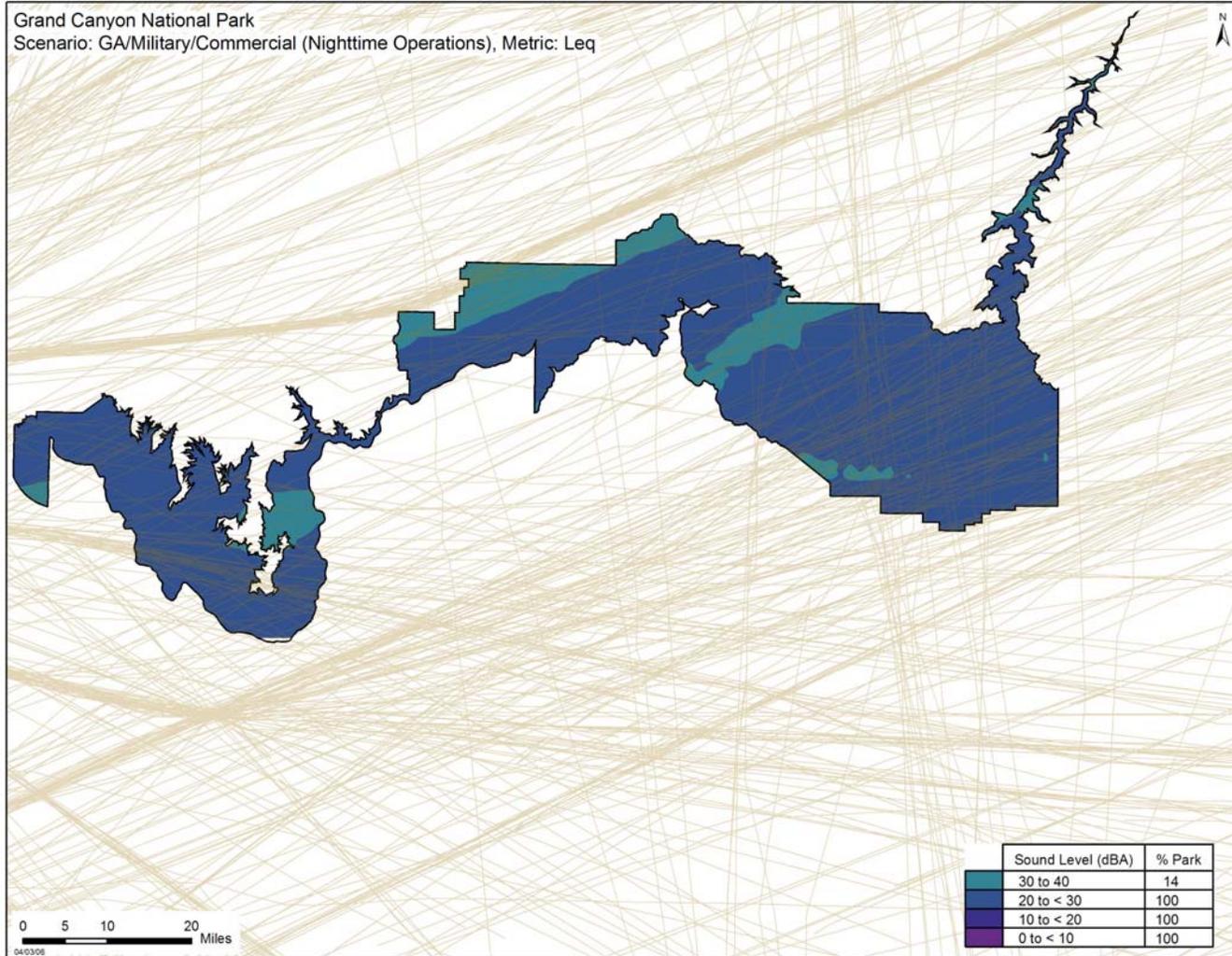


Figure 24. GA, Military, and Commercial (nighttime operations) – Leq

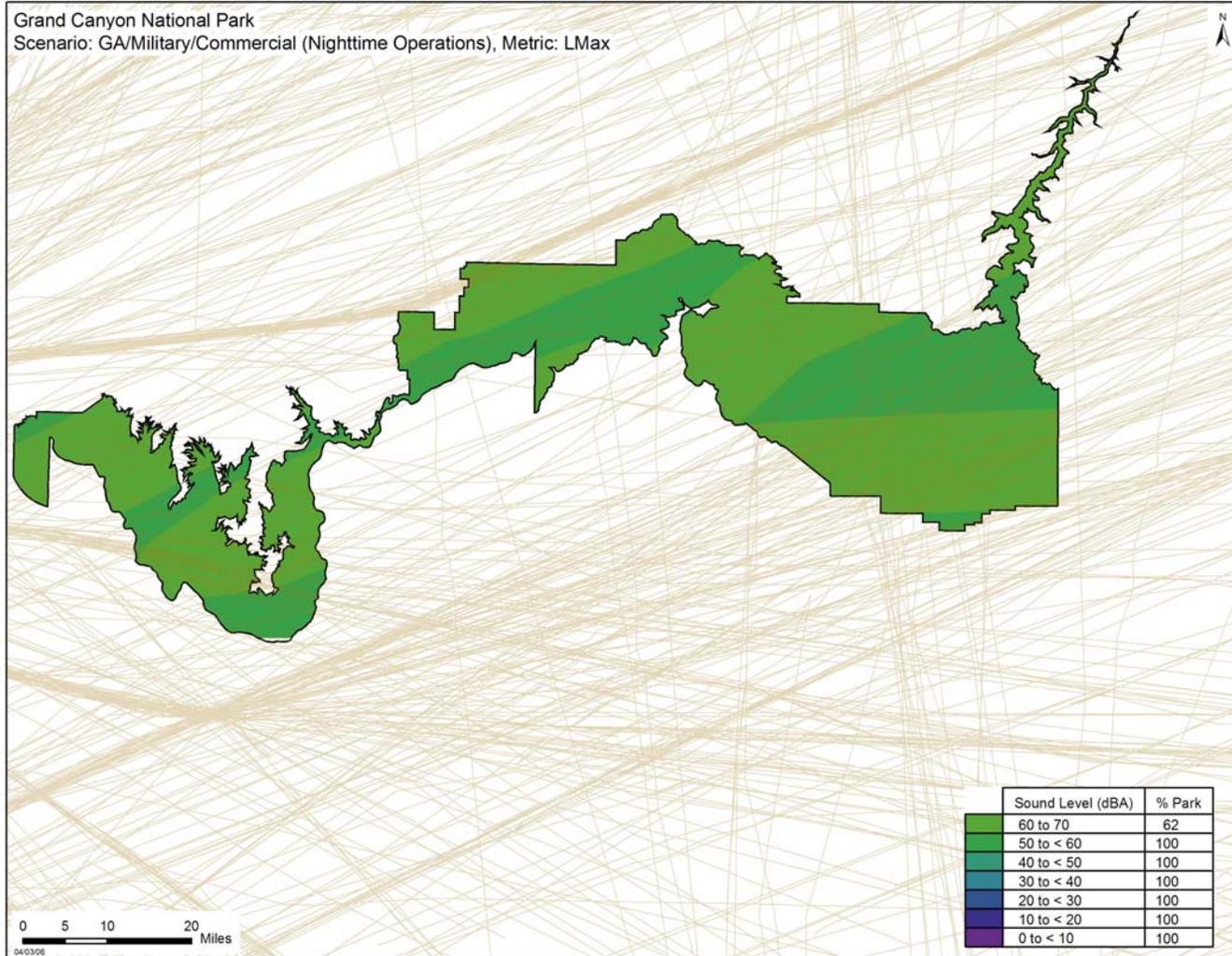


Figure 25. GA, Military, and Commercial (nighttime operations) – L_{max}

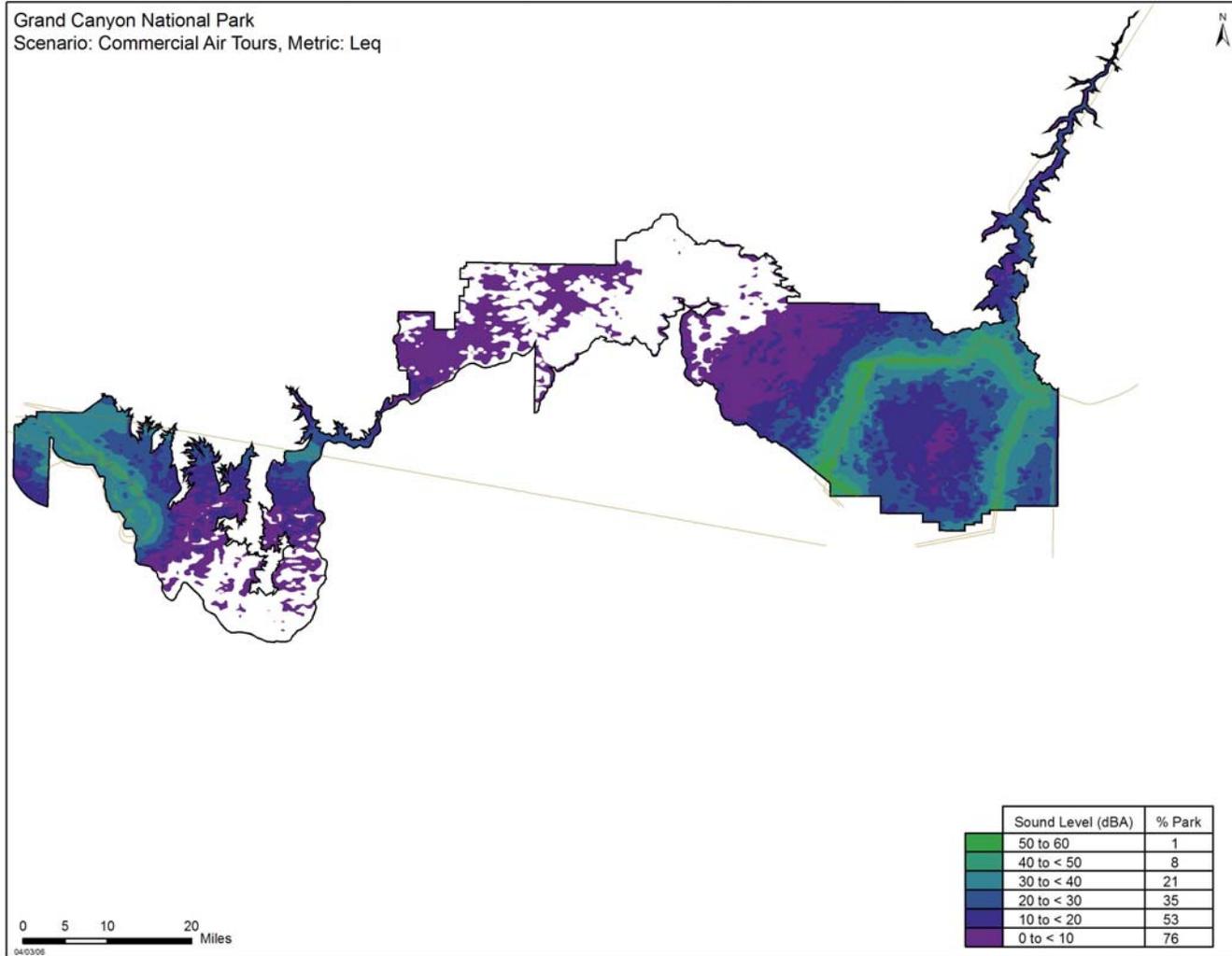


Figure 26. Commercial Air Tours – L_{eq}^*

* Areas within the Park without contours shown (i.e., blank areas) indicate the results were equal to or below zero.

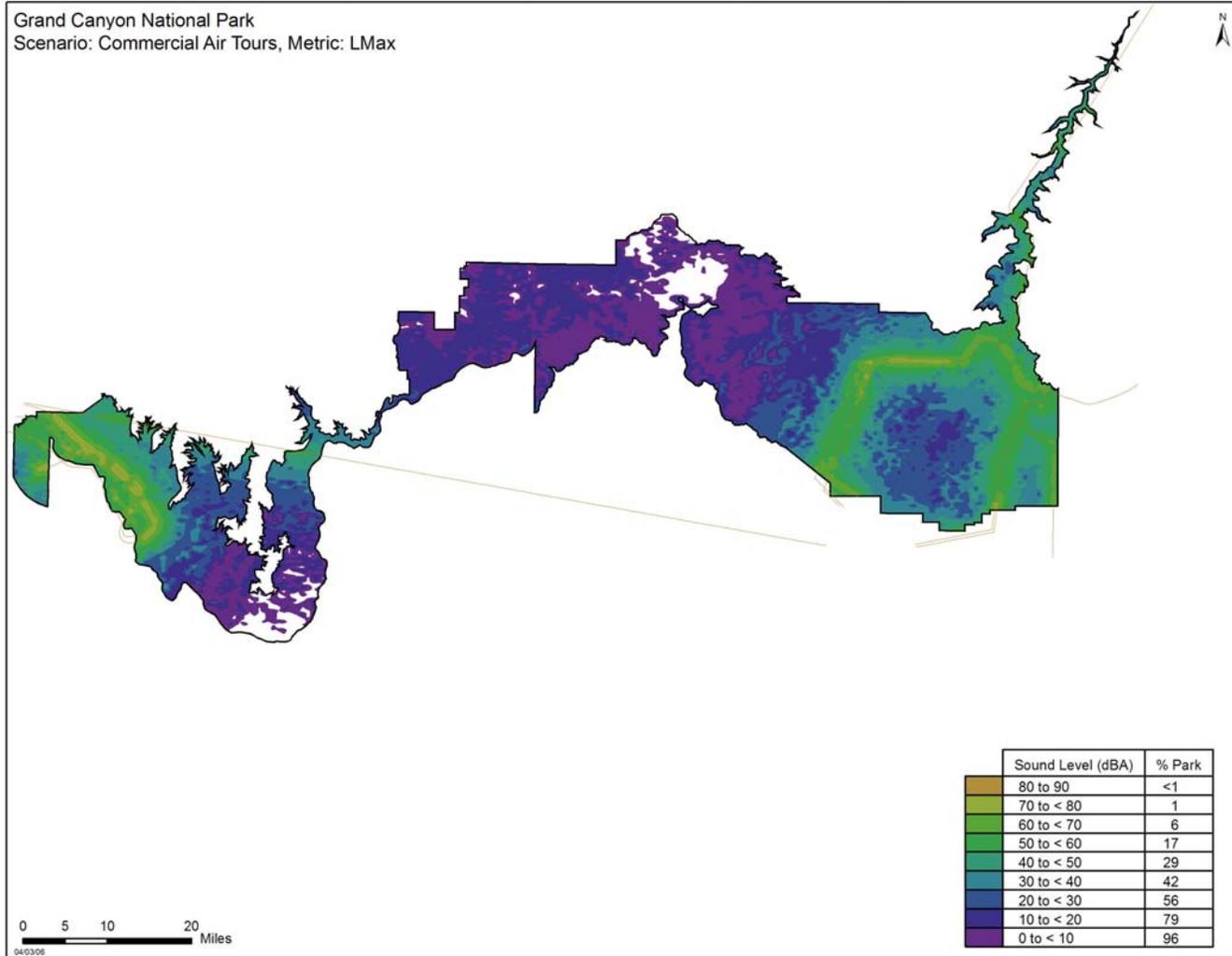


Figure 27. Commercial Air Tours – L_{max}*

* Areas within the Park without contours shown (i.e., blank areas) indicate the results were equal to or below zero.

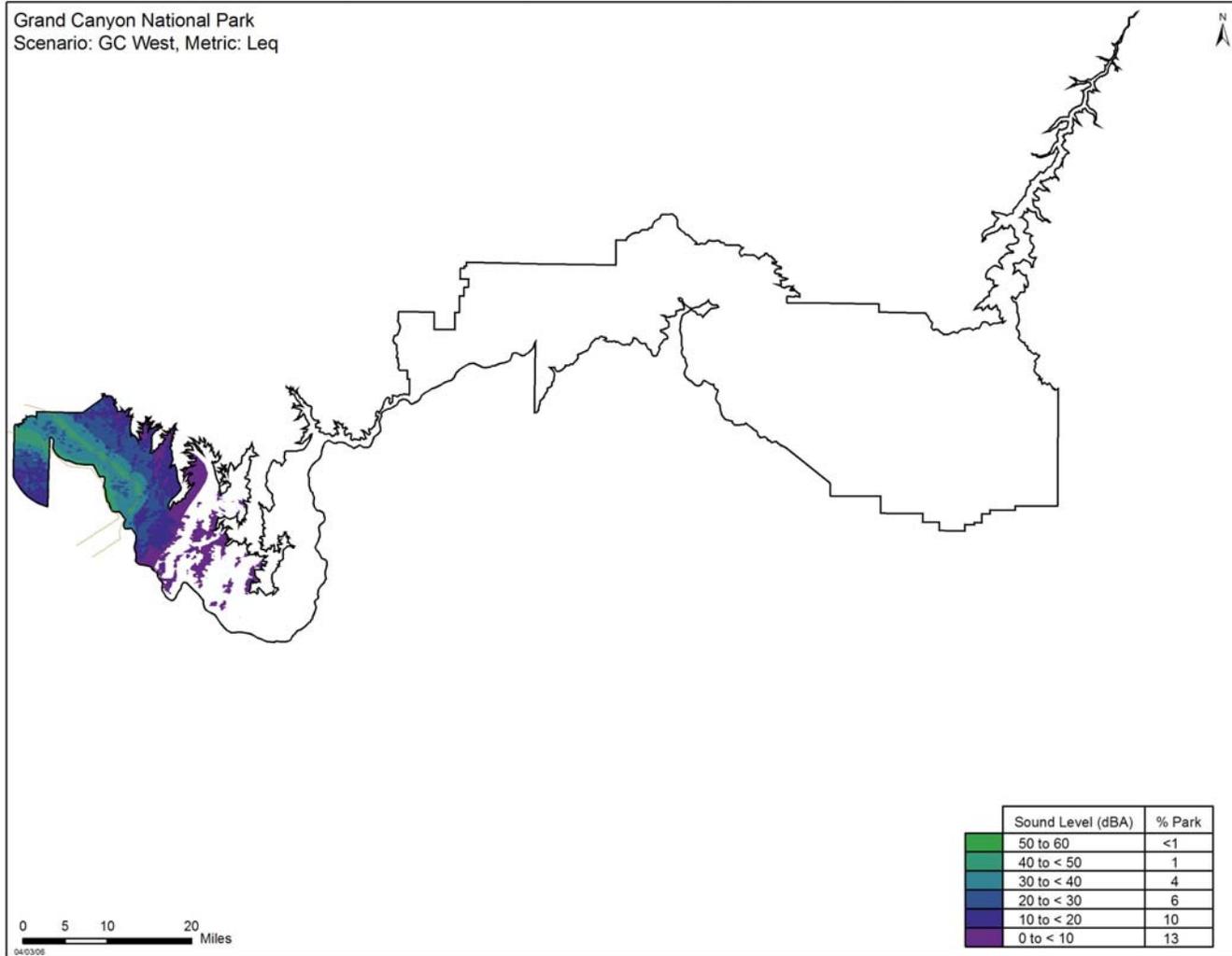


Figure 28. GC West – Leq*

* Areas within the Park without contours shown (i.e., blank areas) indicate the results were equal to or below zero.

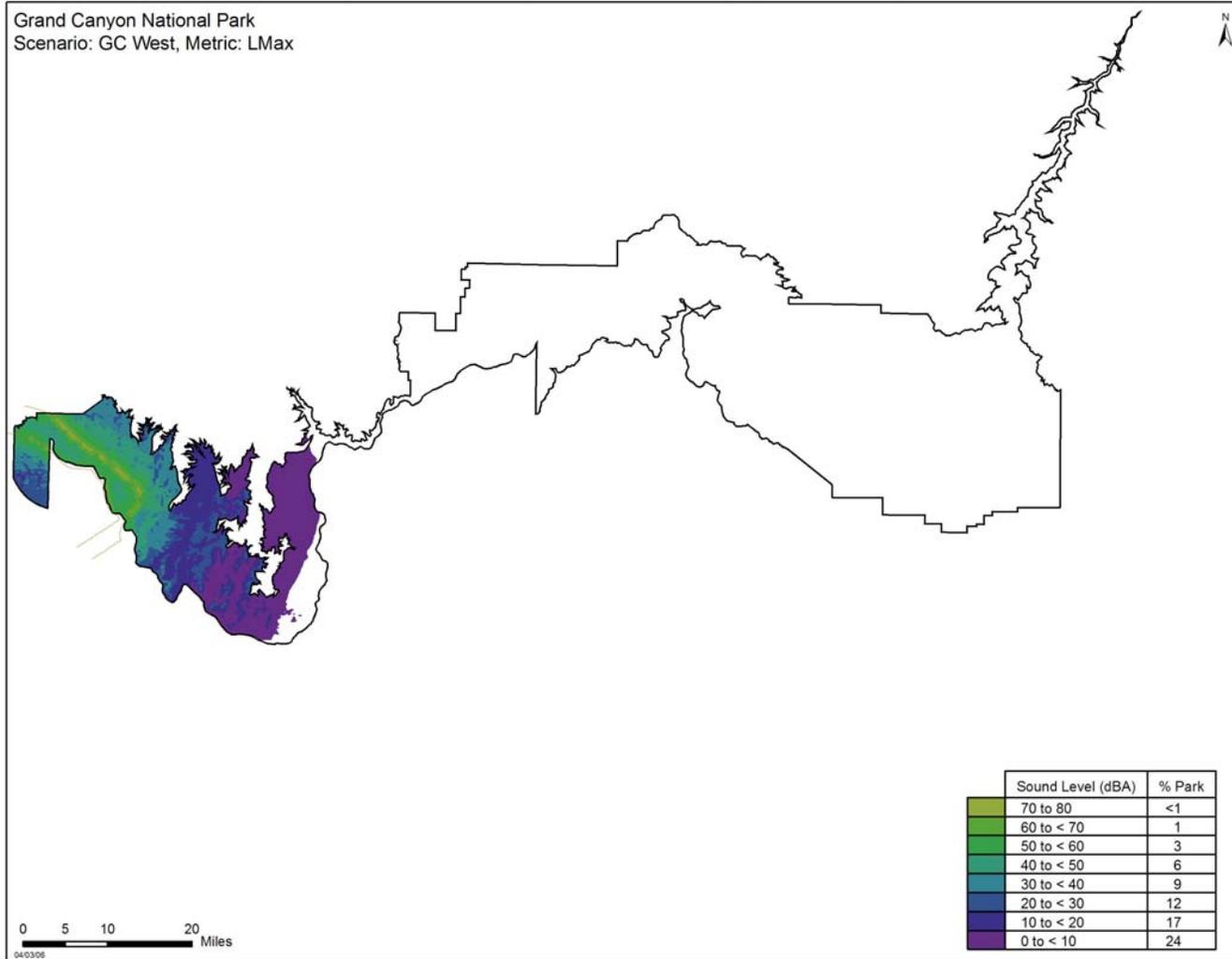


Figure 29. GC West – L_{max}*

* Areas within the Park without contours shown (i.e., blank areas) indicate the results were equal to or below zero.

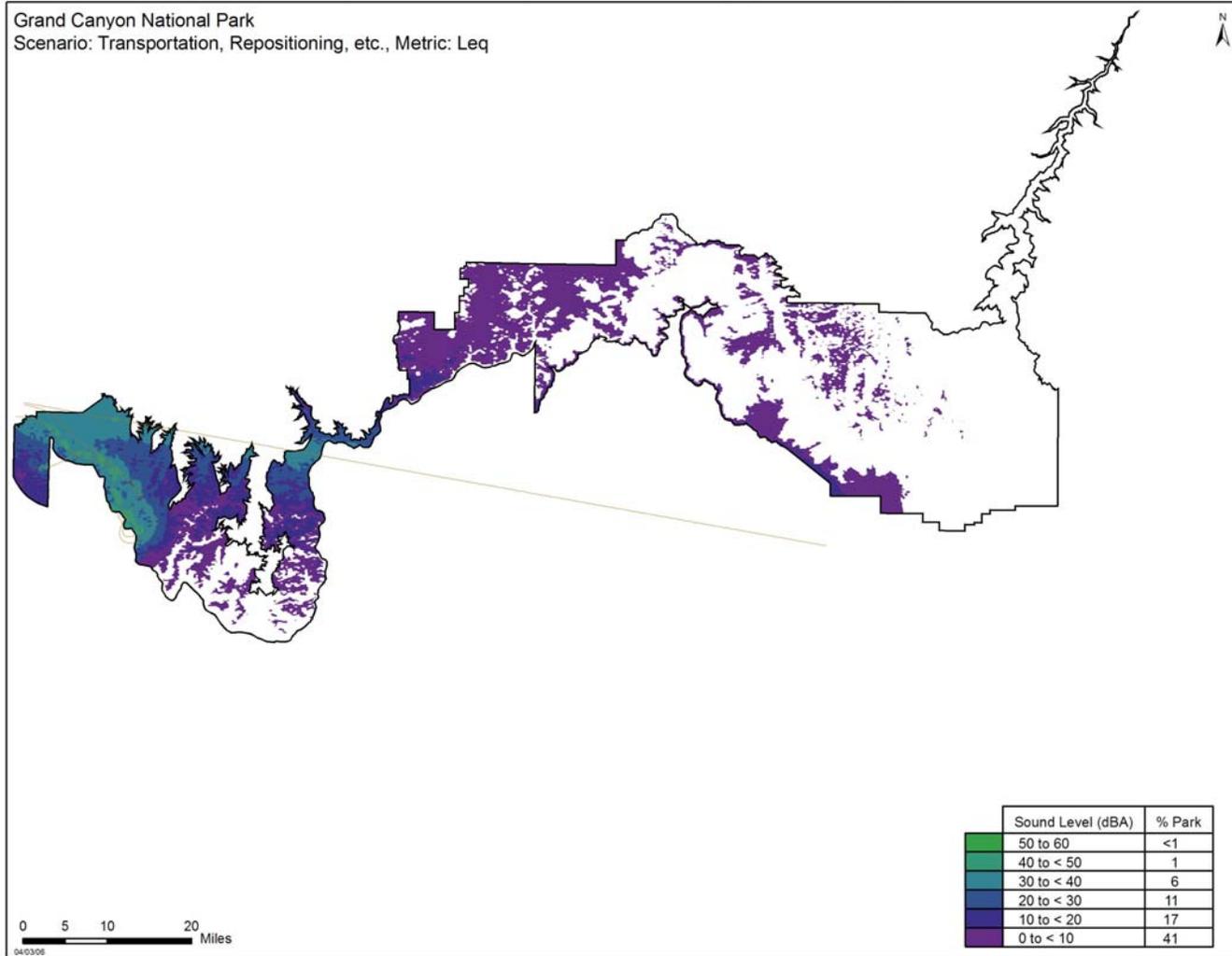


Figure 30. Transportation, Repositioning, etc – L_{eq} *

* Areas within the Park without contours shown (i.e., blank areas) indicate the results were equal to or below zero.

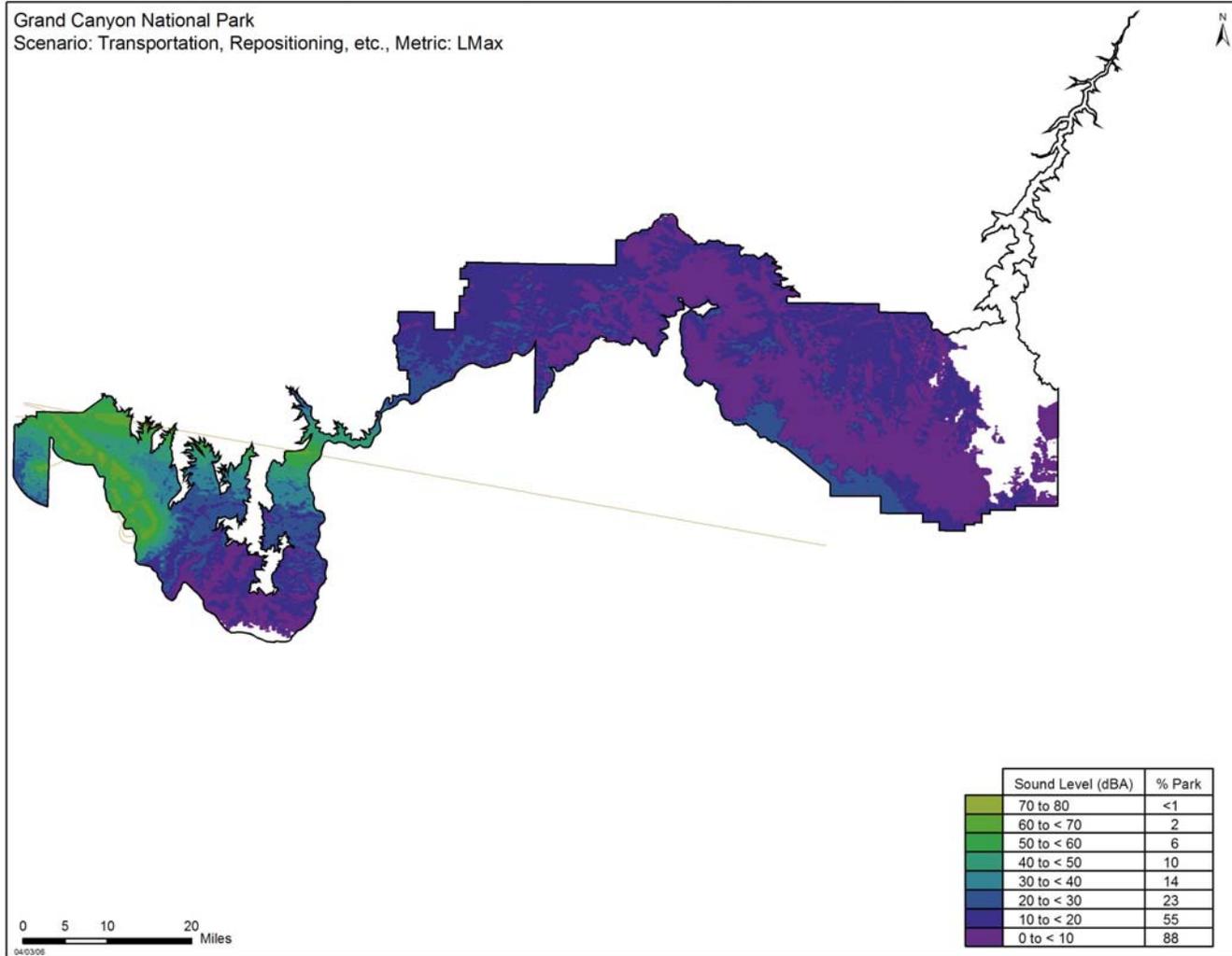


Figure 31. Transportation, Repositioning, etc – L_{max}*

* Areas within the Park without contours shown (i.e., blank areas) indicate the results were equal to or below zero.

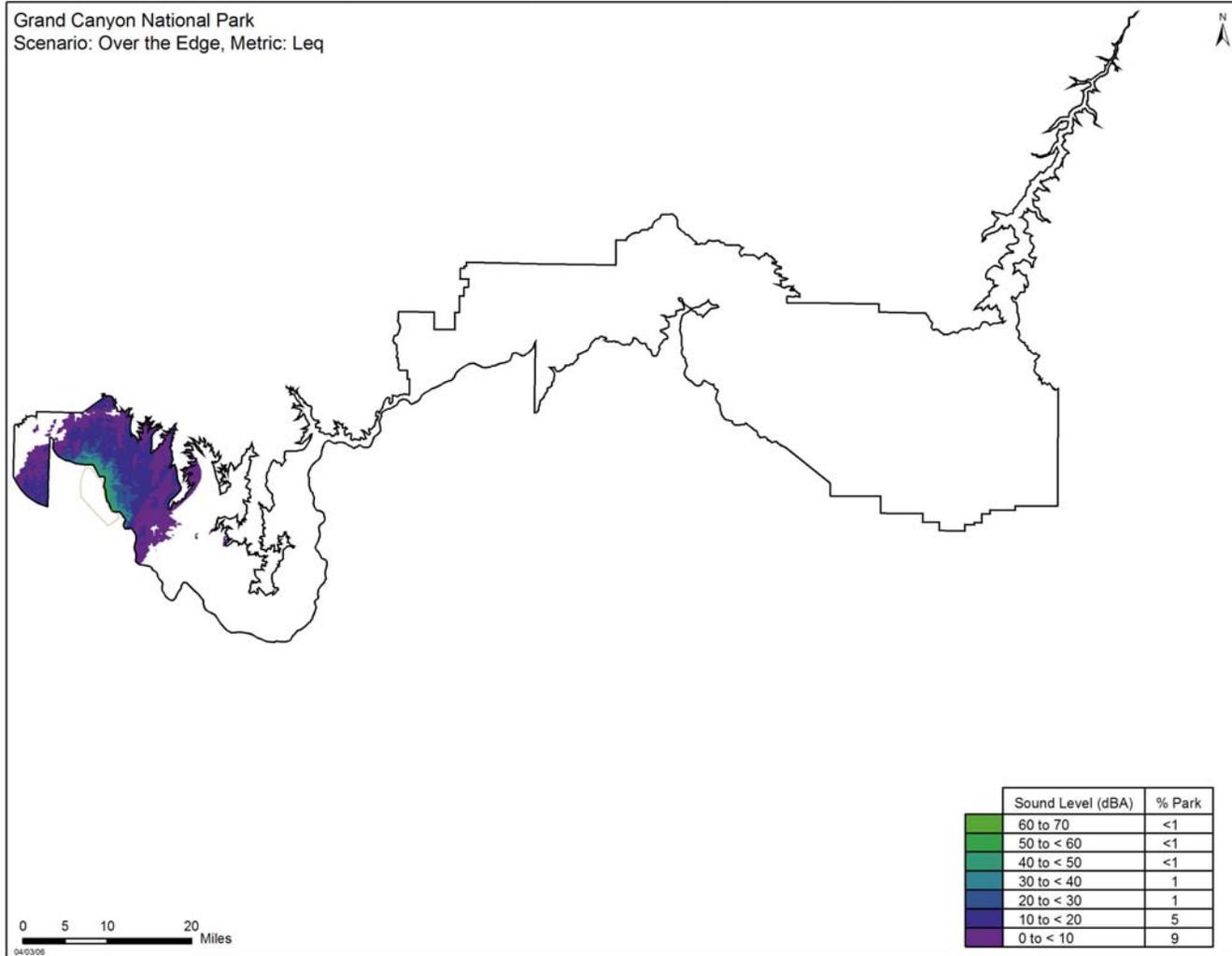


Figure 32. Over the Edge – L_{eq}^*

* Areas within the Park without contours shown (i.e., blank areas) indicate the results were equal to or below zero.

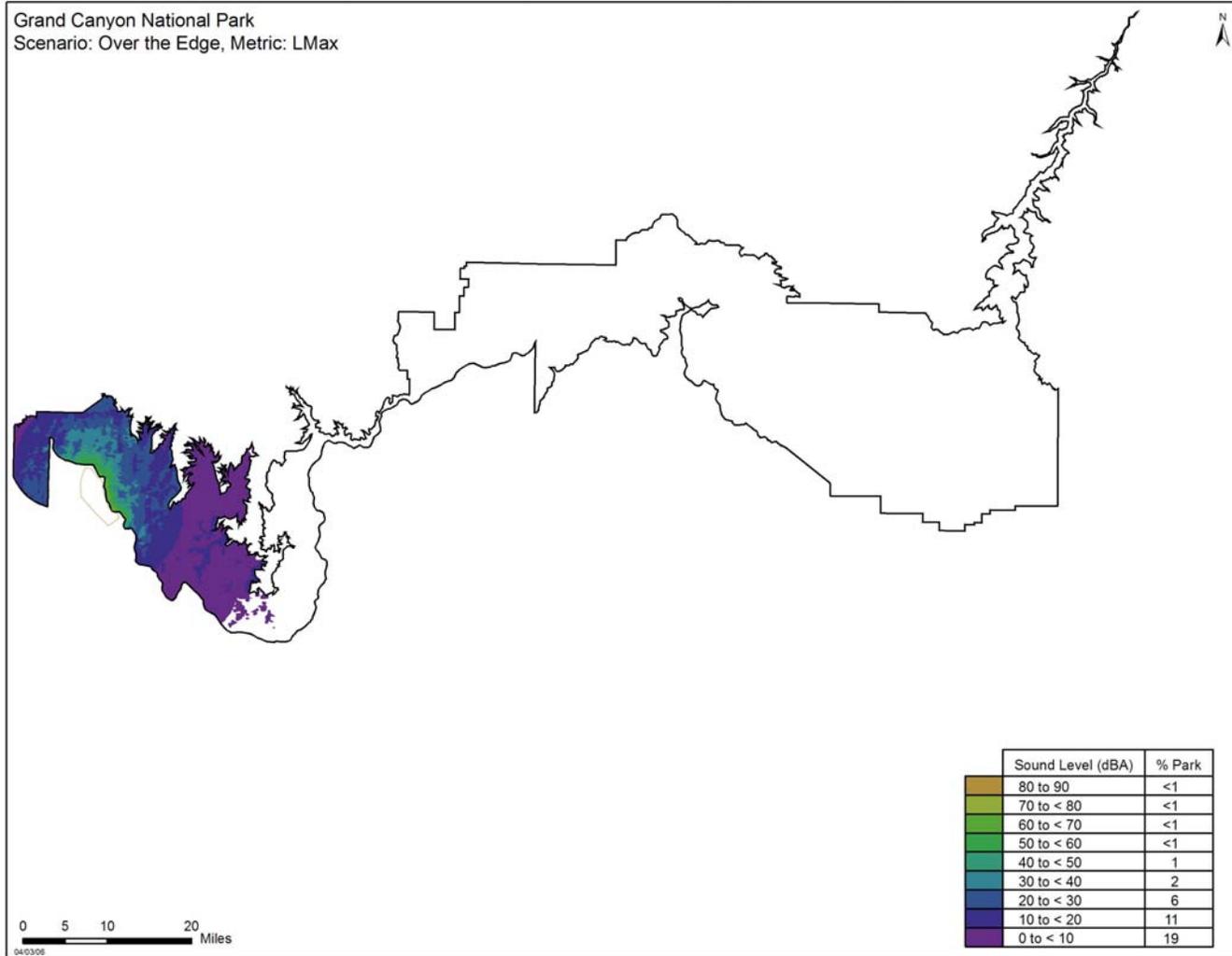


Figure 33. Over the Edge – L_{max}*

* Areas within the Park without contours shown (i.e., blank areas) indicate the results were equal to or below zero.

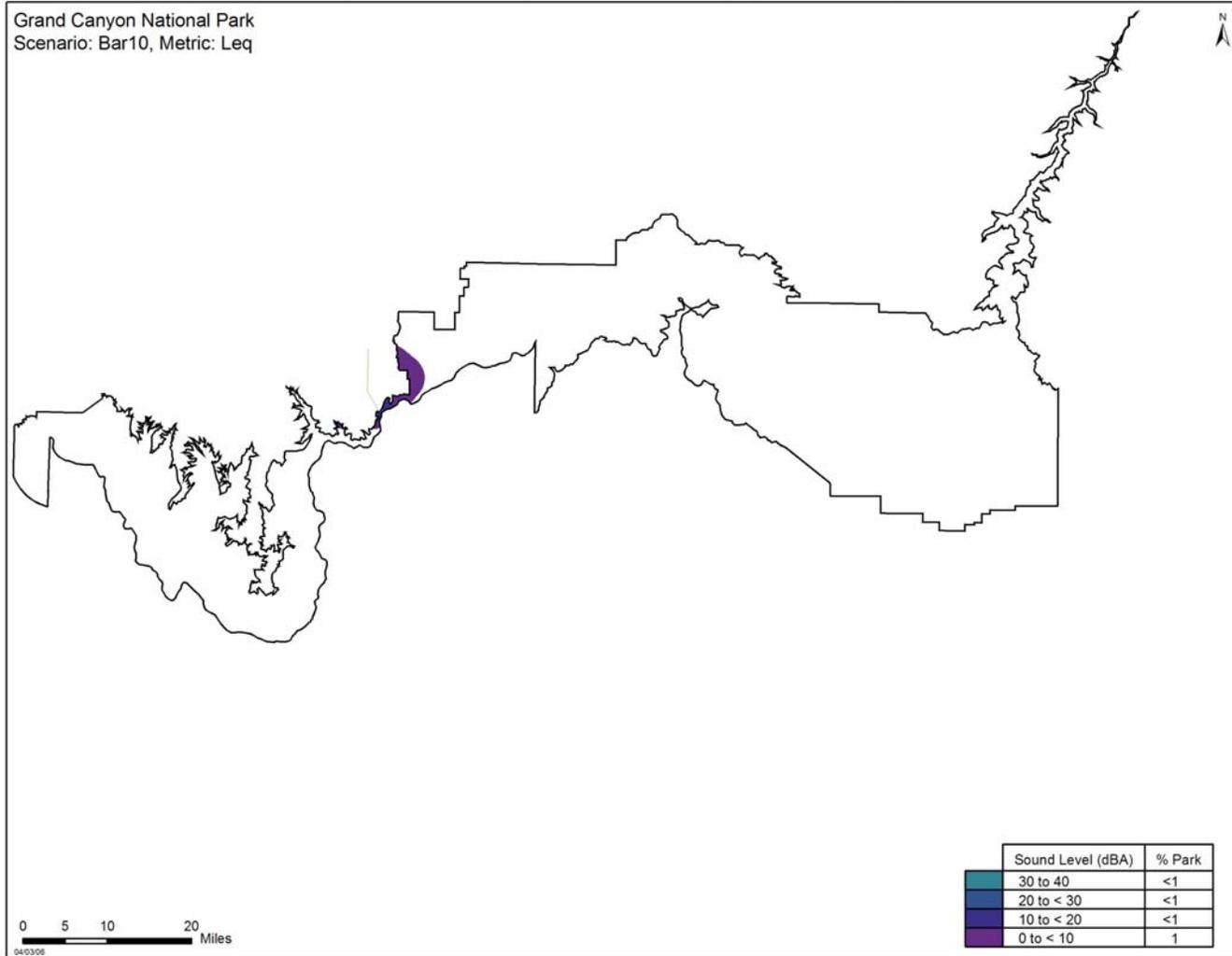


Figure 34. Bar 10 – L_{eq} *

* Areas within the Park without contours shown (i.e., blank areas) indicate the results were equal to or below zero.

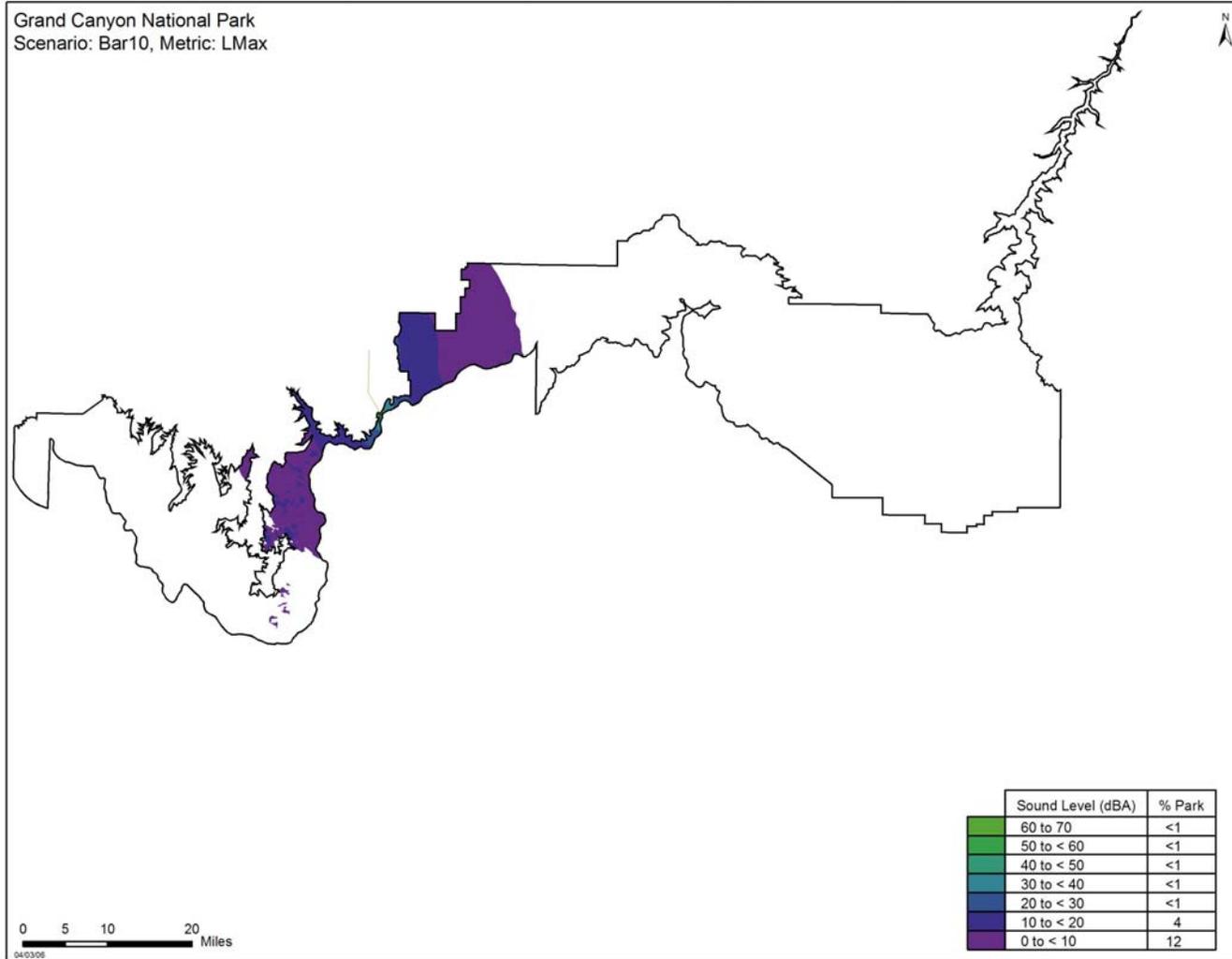


Figure 35. Bar 10 – L_{max}*

* Areas within the Park without contours shown (i.e., blank areas) indicate the results were equal to or below zero.

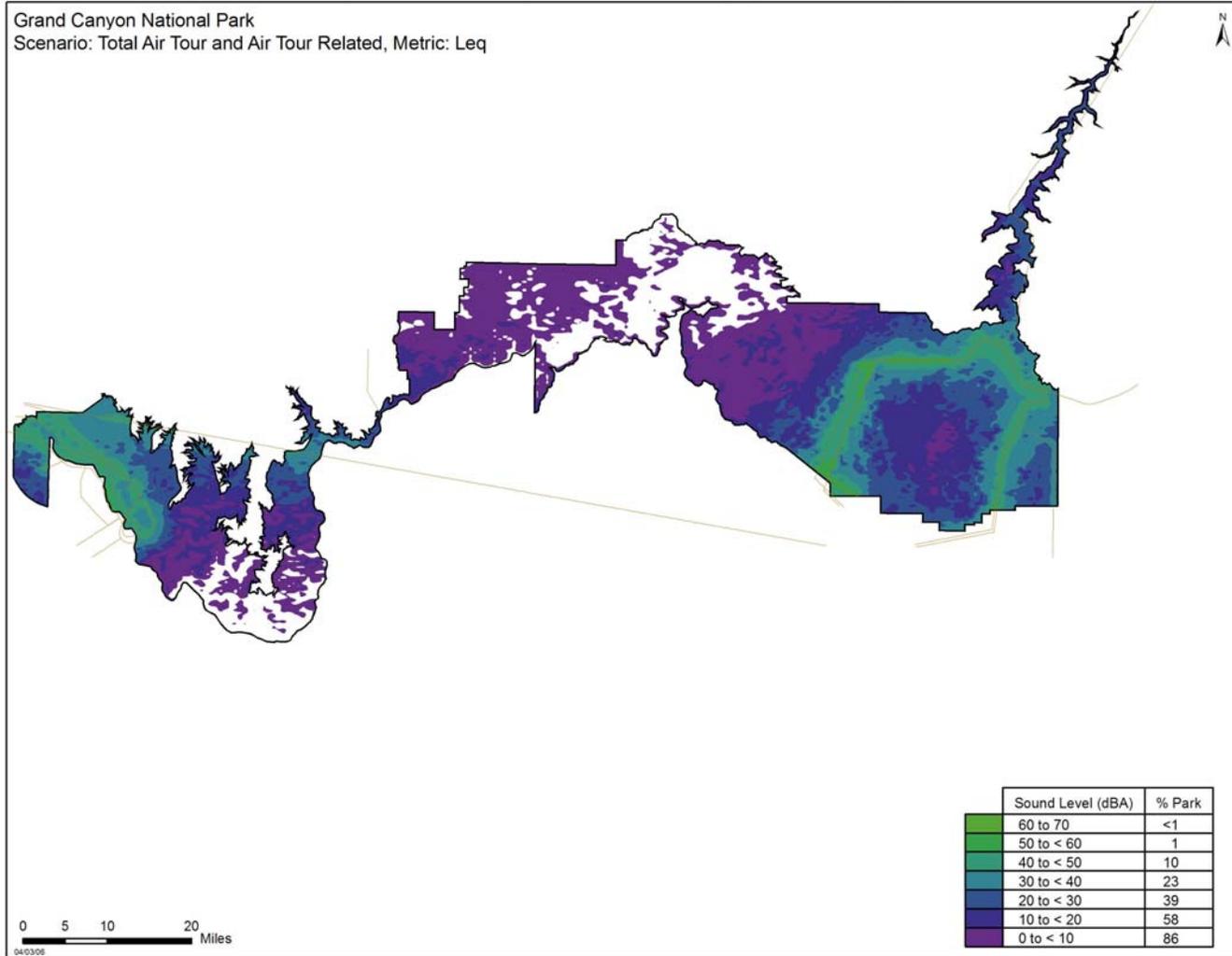


Figure 36. Total Air Tour and Air Tour Related – L_{eq}^*

* Areas within the Park without contours shown (i.e., blank areas) indicate the results were equal to or below zero.

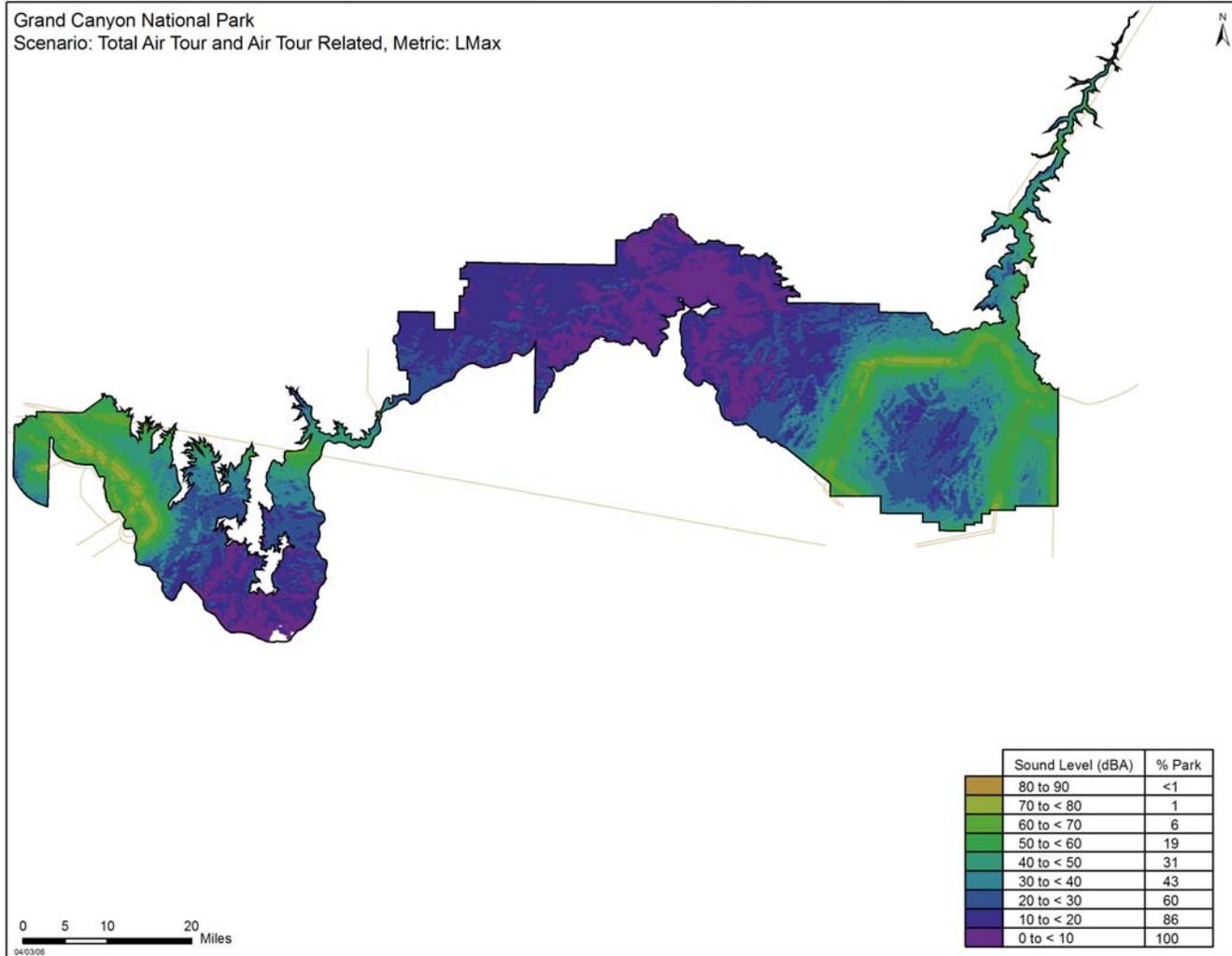


Figure 37. Total Air Tour and Air Tour Related – L_{max}

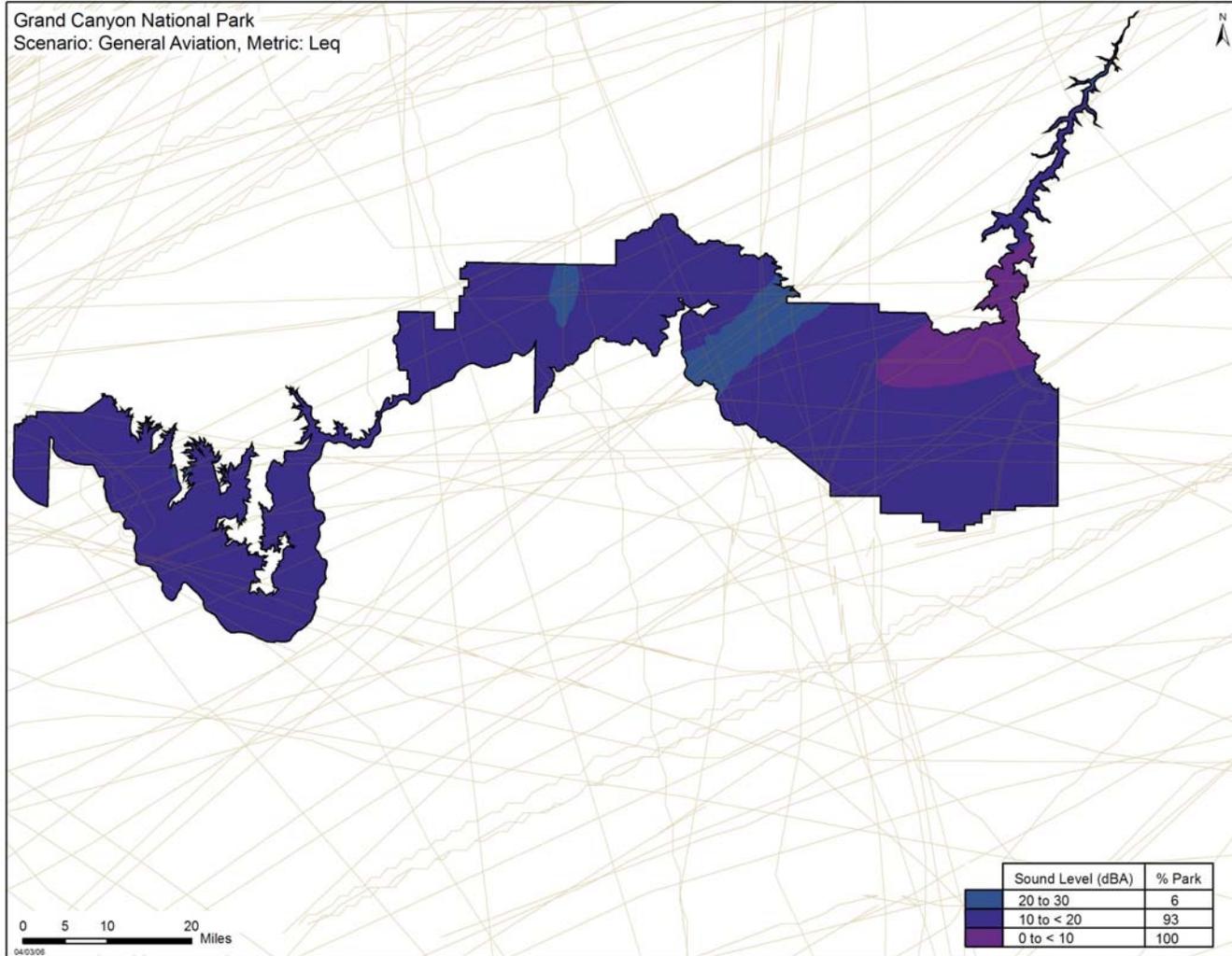


Figure 38. GA (daytime operations) – Leq

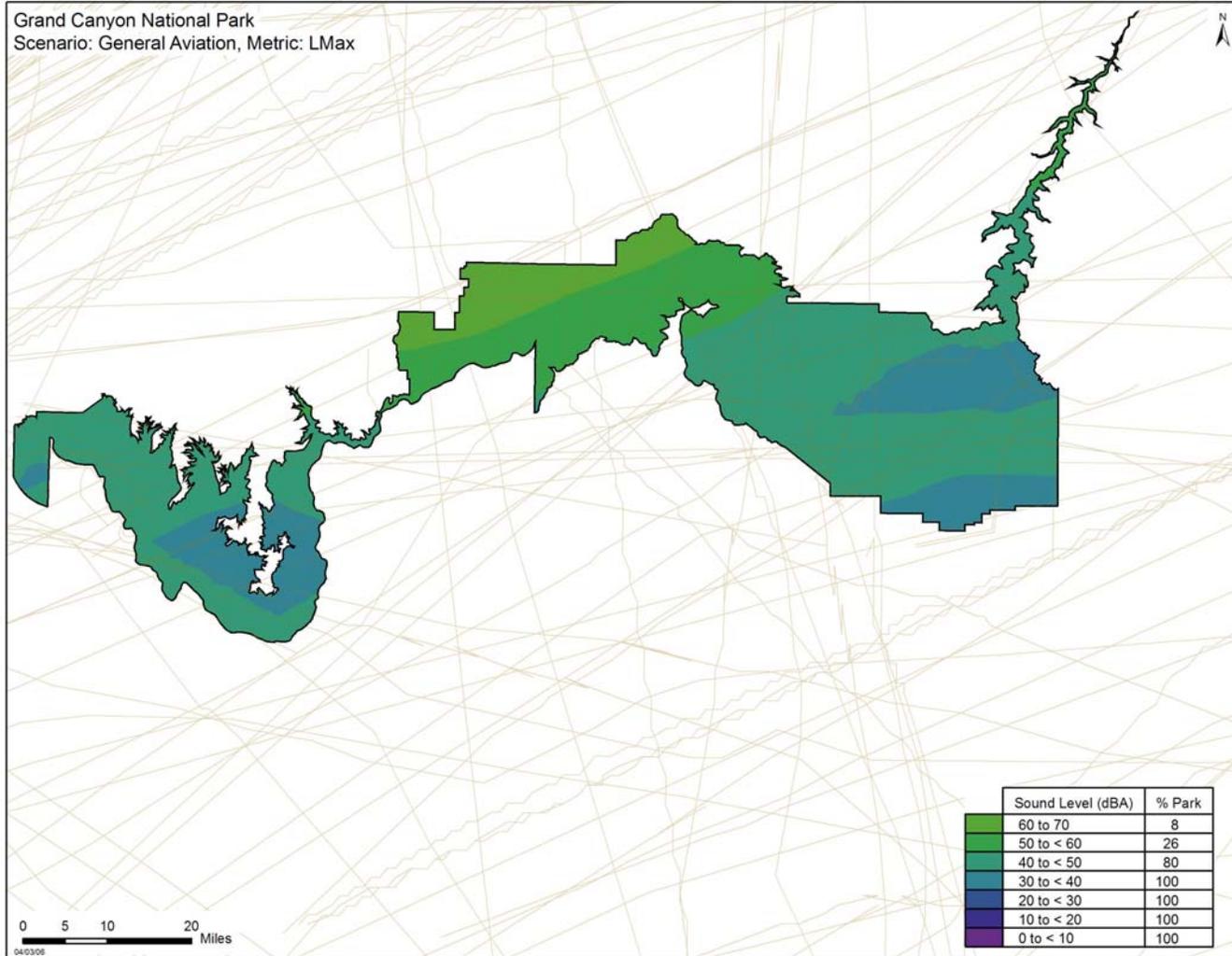


Figure 39. GA (daytime operations) – L_{max}

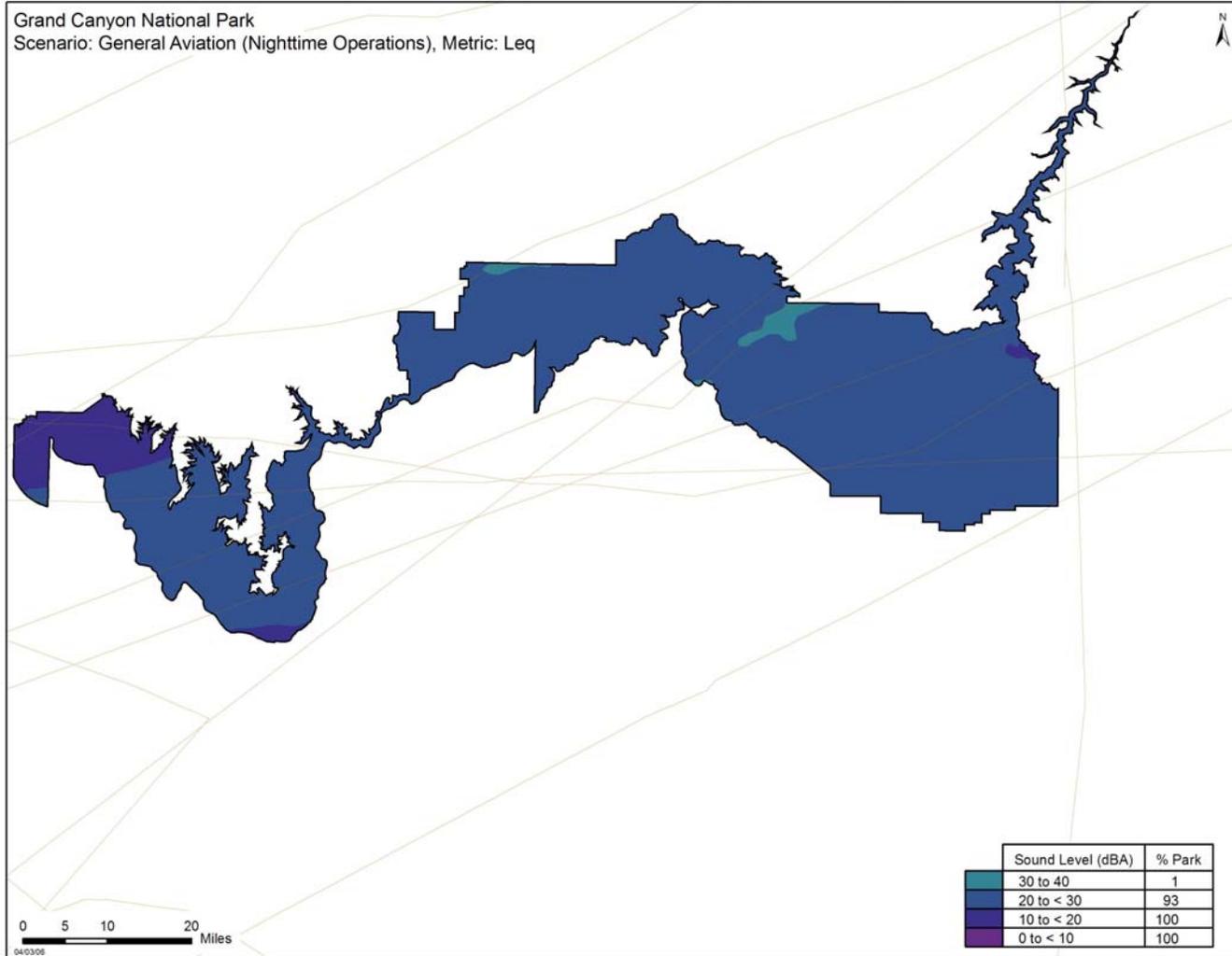


Figure 40. GA (nighttime operations) – Leq

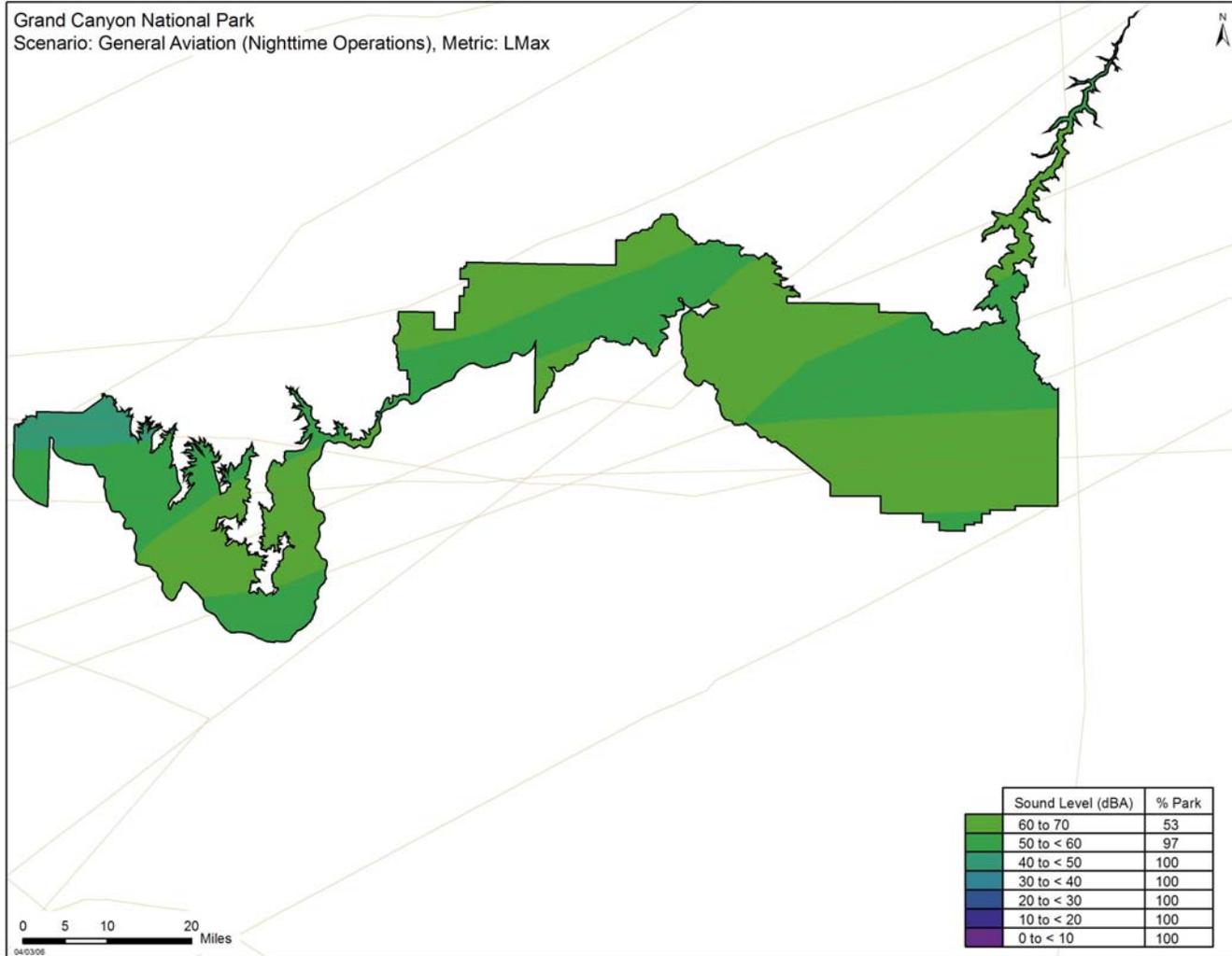


Figure 41. GA (nighttime operations) – L_{max}

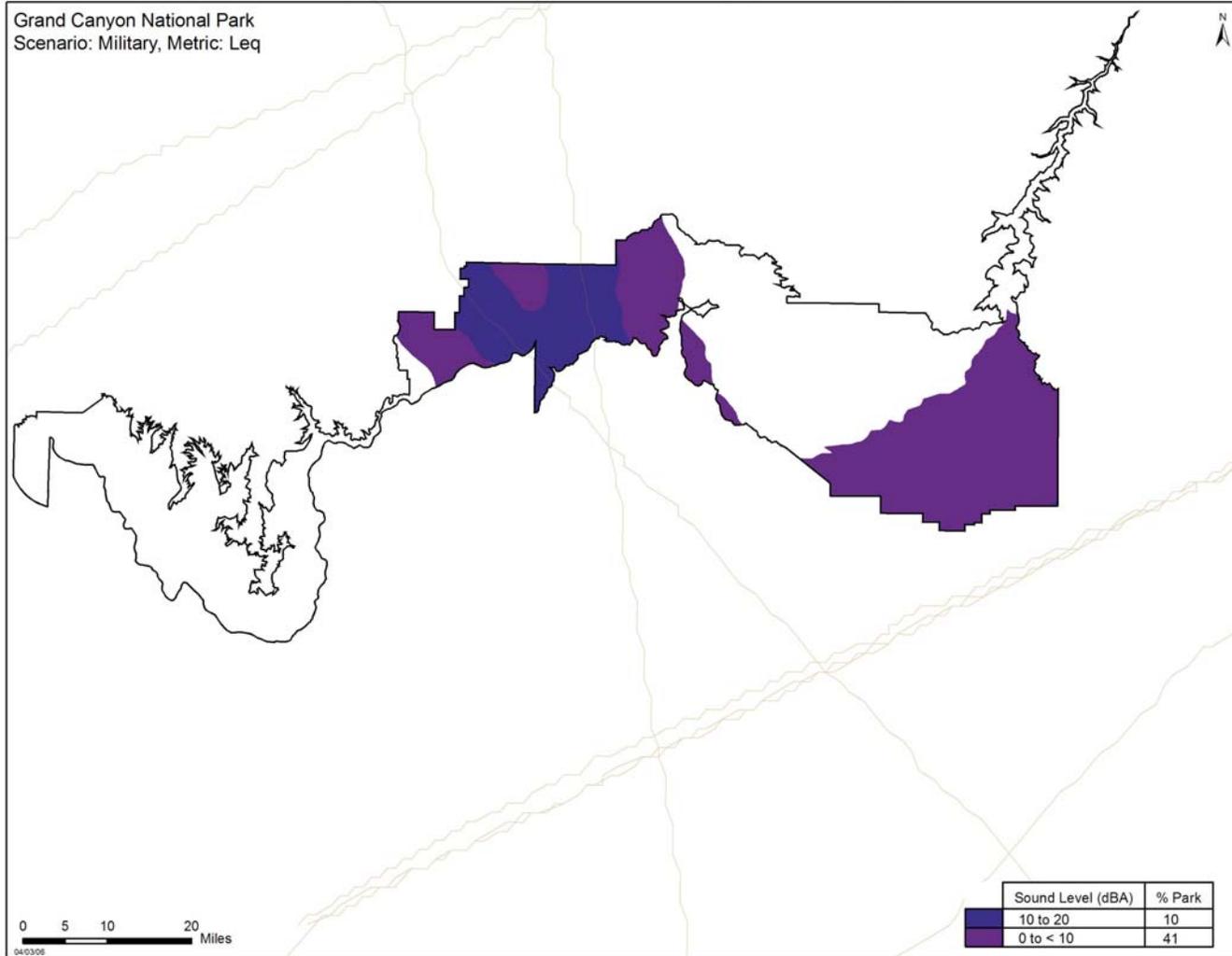


Figure 42. Military (daytime operations) – L_{eq} *

* Areas within the Park without contours shown (i.e., blank areas) indicate the results were equal to or below zero.

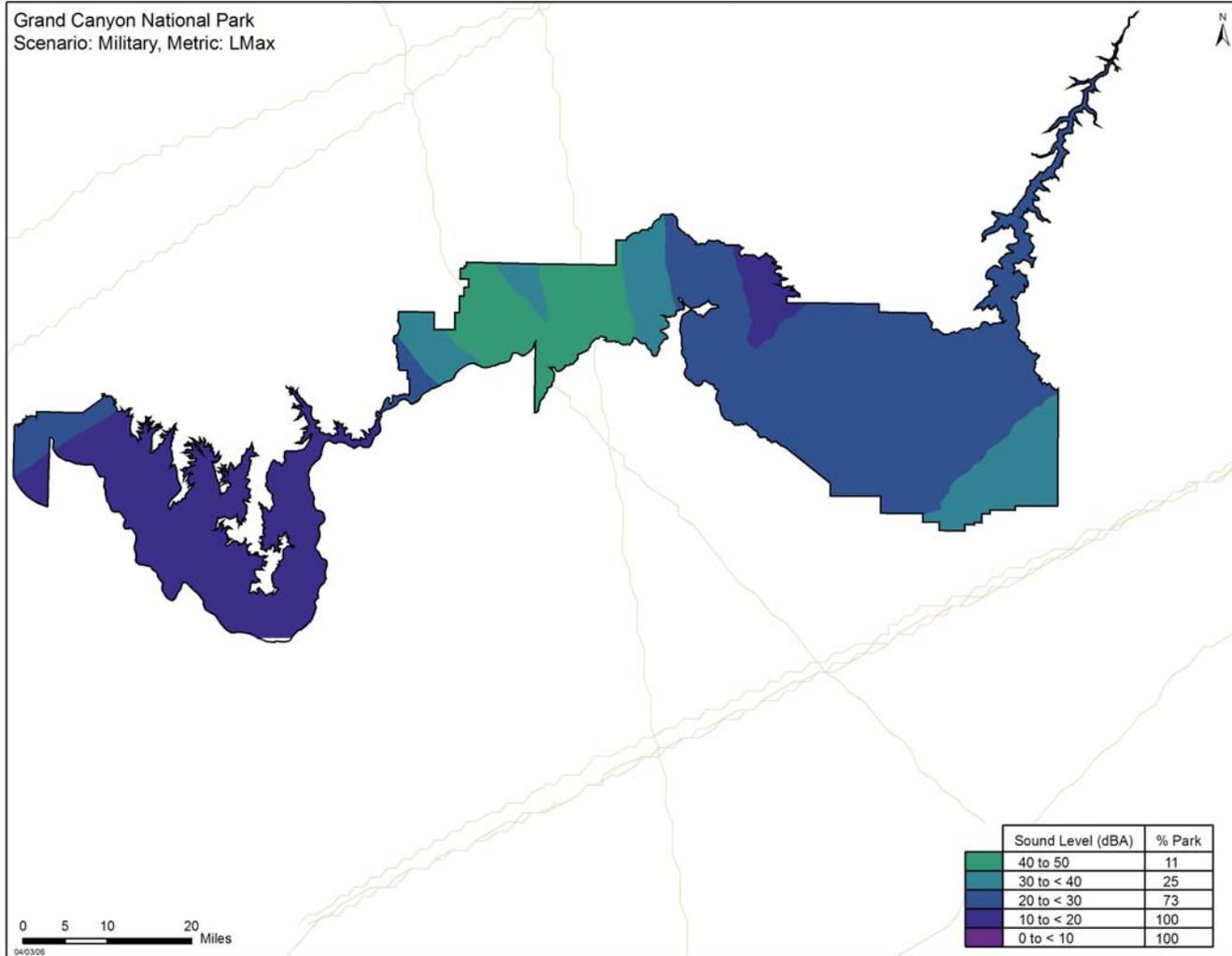


Figure 43. Military (daytime operations) – L_{max}

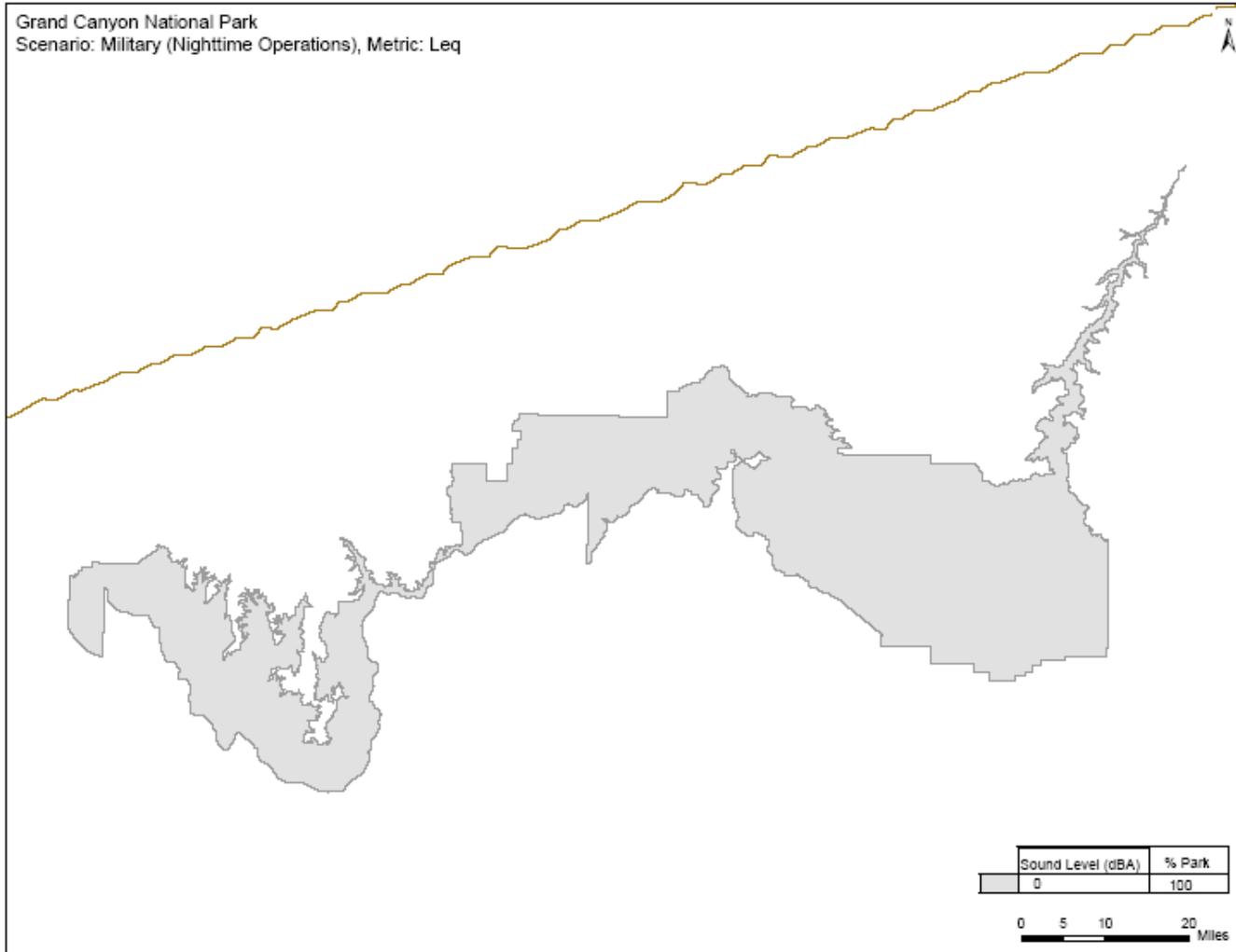


Figure 44. Military (nighttime operations) – L_{eq} *

* Areas within the Park without contours shown (i.e., blank areas) indicate the results were equal to or below zero.

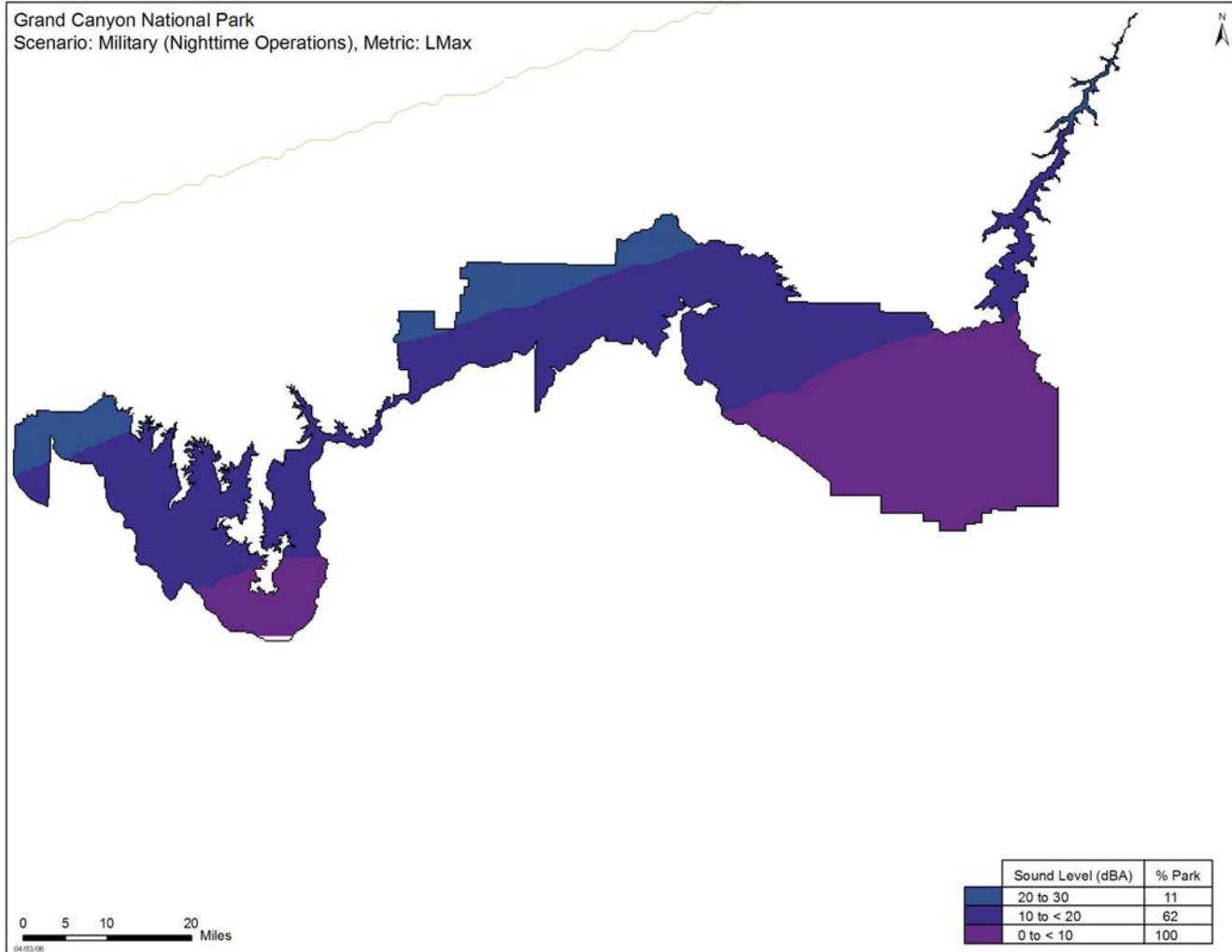


Figure 45. Military (nighttime operations) – L_{max}

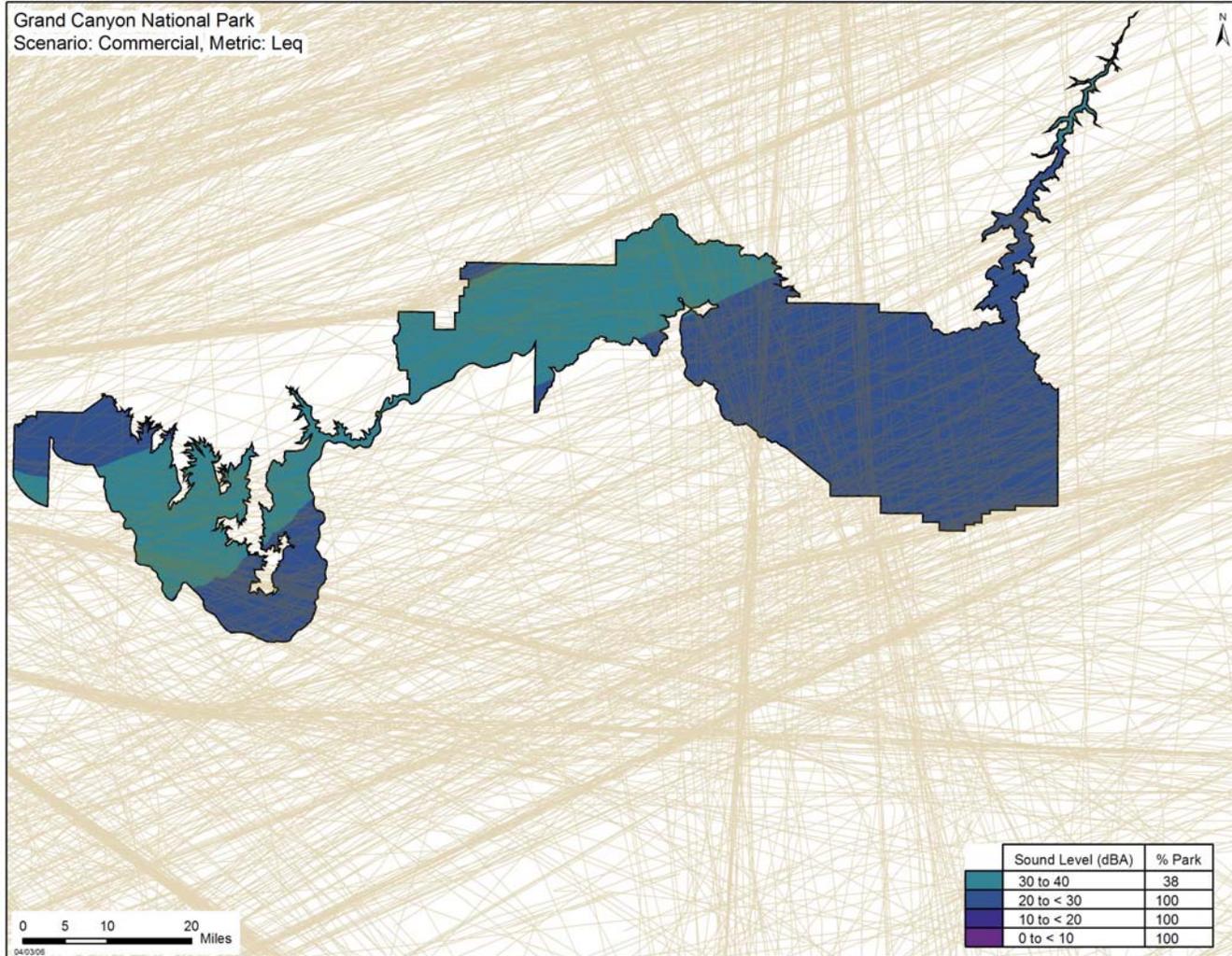


Figure 46. Commercial (daytime operations) – L_{eq}

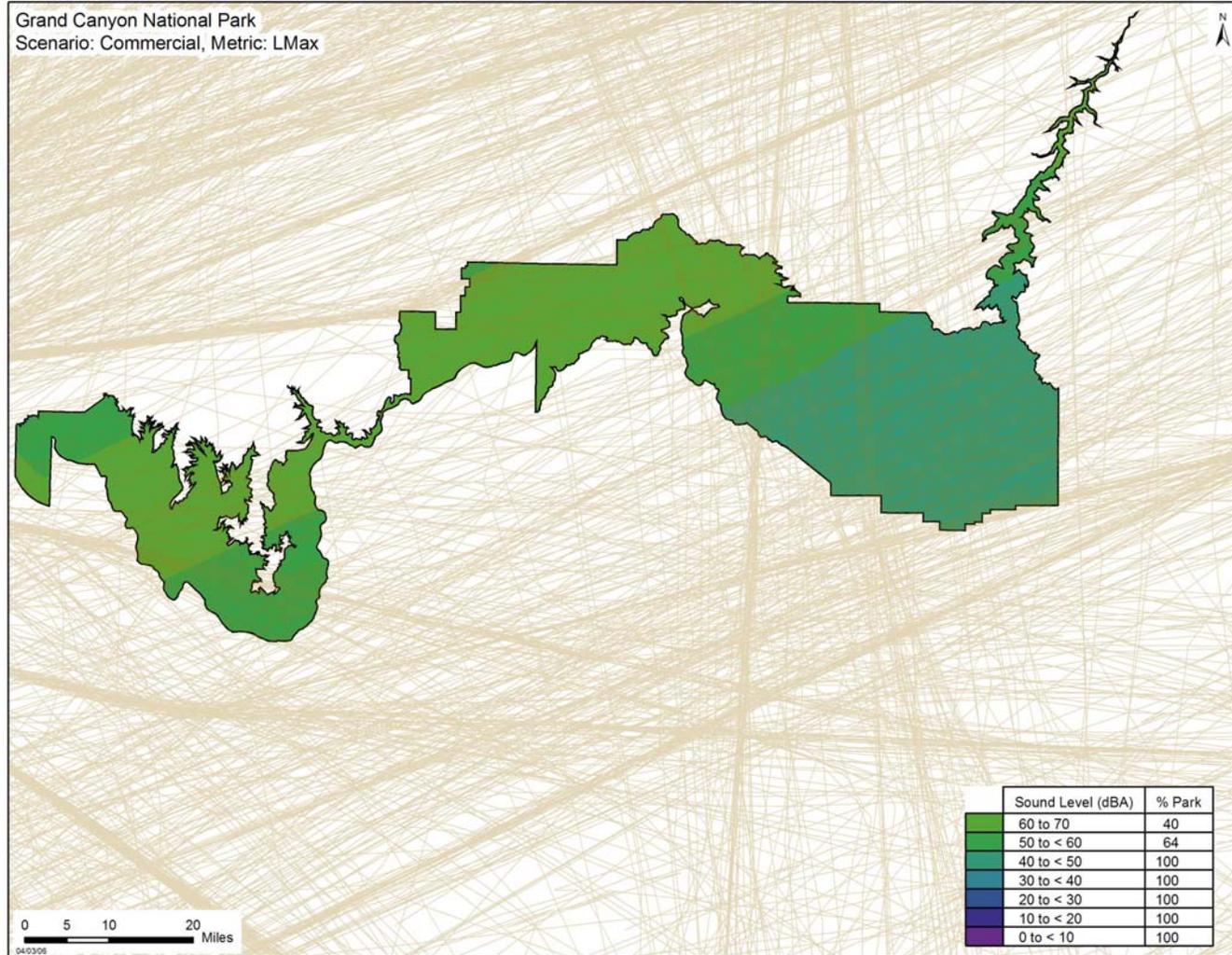


Figure 47. Commercial (daytime operations) – L_{max}

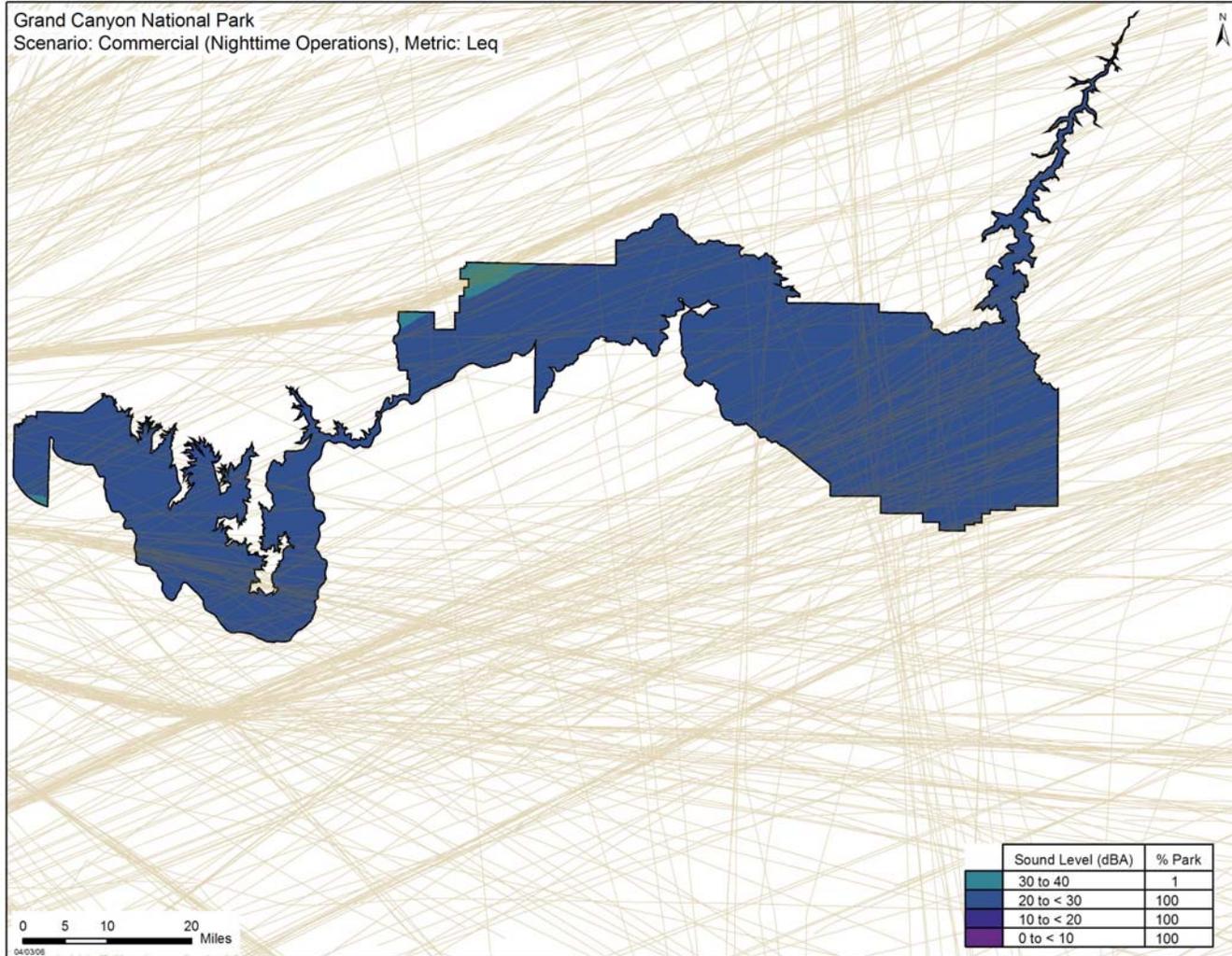


Figure 48. Commercial (nighttime operations) – L_{eq}

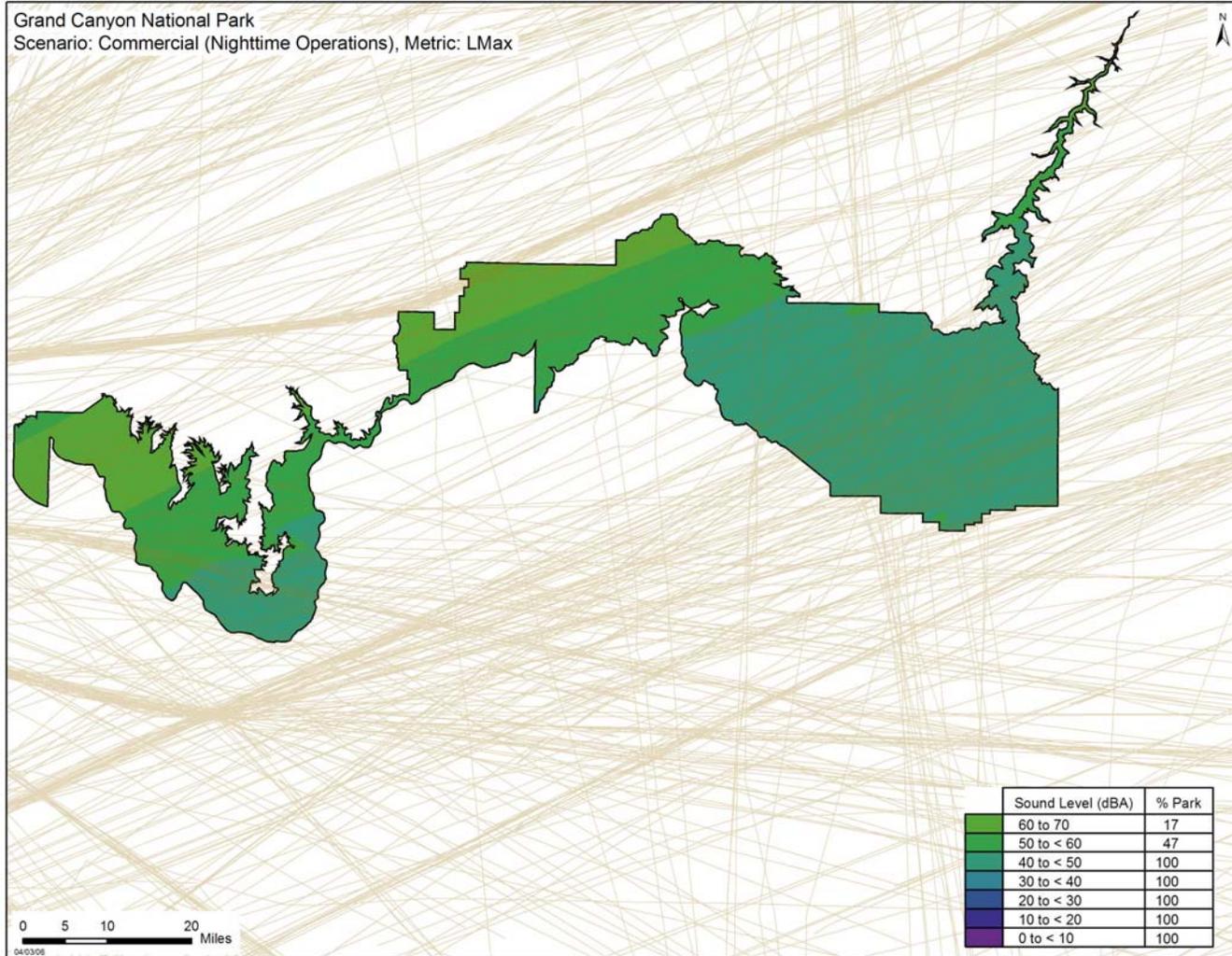


Figure 49. Commercial (nighttime operations) – L_{max}