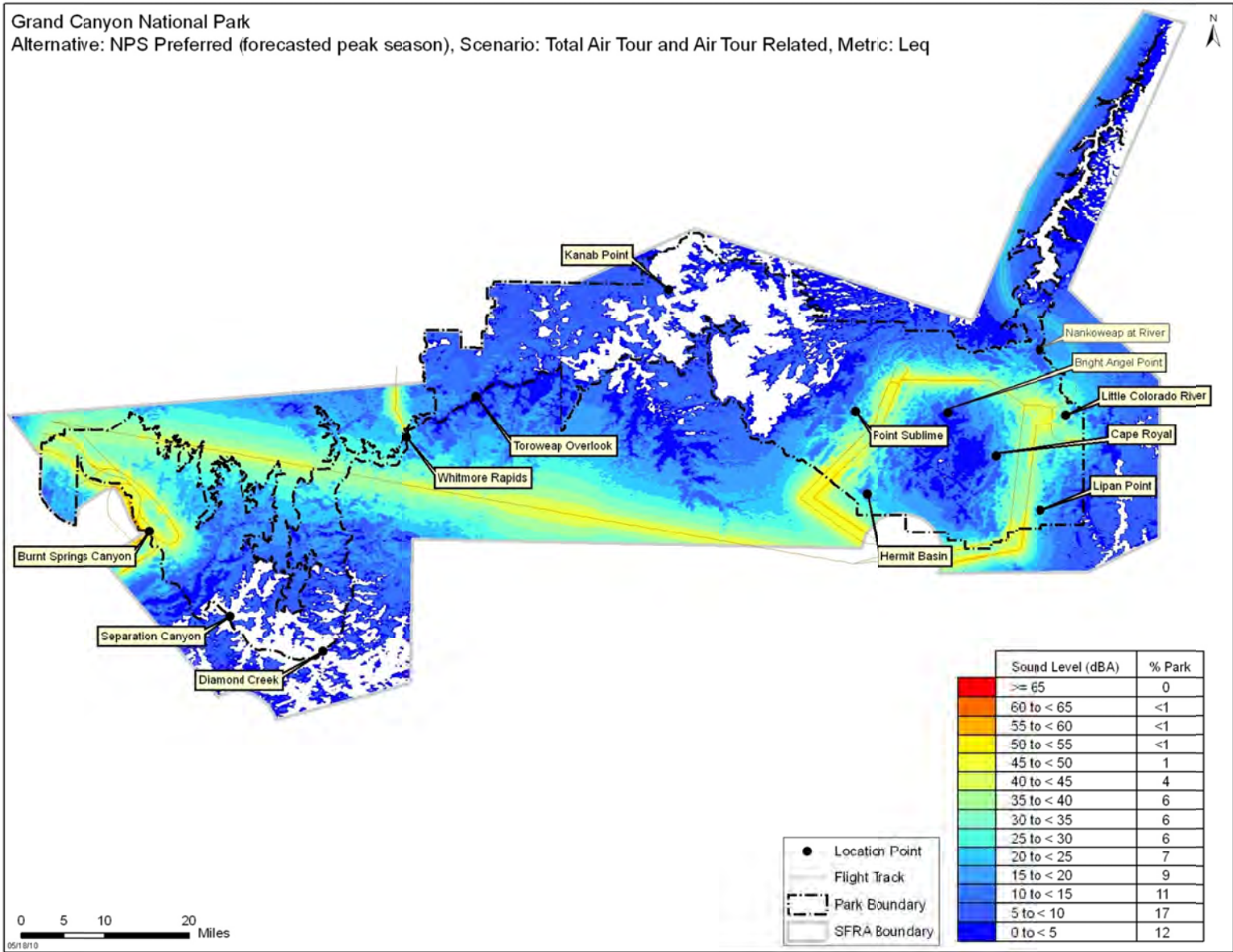




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2 **FIGURE 73 NPS PREFERRED ALTERNATIVE (TEN-YEAR FORECASTED PEAK SEASON) – L_{AEQ12} CONTOURS – AIR-TOUR AND AIR-TOUR RELATED**

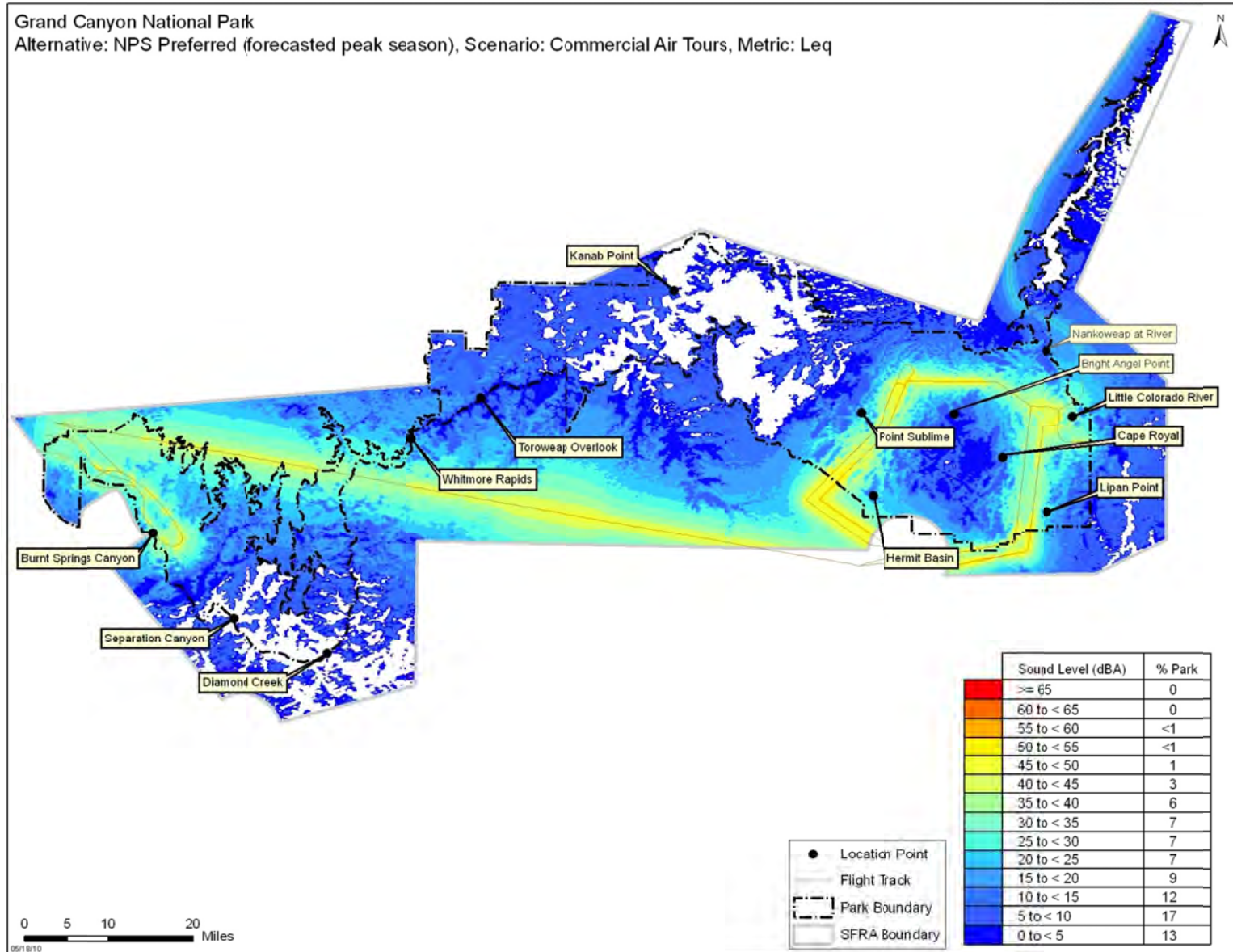


FIGURE 74 NPS PREFERRED ALTERNATIVE (TEN-YEAR FORECASTED PEAK SEASON) – L_{AEQ12} CONTOURS – COMMERCIAL AIR-TOURS

1 **TABLE 36 DETAILED CONTOUR ANALYSIS RESULTS WITHIN GCNP- NPS PREFERRED ALTERNATIVE (PEAK SEASON) FOR THE TEN-YEAR FORECAST**

Results Within GCNP		%TAUD			L _{Aeq12} (dBA)		
		All Aircraft Below 18,000 ft MSL and Within the SFRA	Air-tour and Air-tour Related	Commercial Air-tours	All Aircraft Below 18,000 ft MSL and Within the SFRA	Air-tour and Air-tour Related	Commercial Air-tours
Developed		% Of Management Zone					
	>= 65	0	0	0	0	0	0
	60 to < 65	0	0	0	0	0	0
	55 to < 60	1	1	1	0	0	0
	50 to < 55	4	4	4	1	1	1
	45 to < 50	6	6	6	2	2	2
	40 to < 45	5	4	4	3	3	3
	35 to < 40	4	5	5	4	4	4
	30 to < 35	4	3	3	2	2	2
	25 to < 30	3	3	3	7	7	7
	20 to < 25	4	4	4	16	16	16
	15 to < 20	6	6	6	53	48	48
	10 to < 15	7	6	6	10	15	15
	5 to < 10	15	11	11	2	2	2
	0 to < 5	41	20	20	0	1	1
Non-Wilderness		% Of Management Zone					
	>= 65	4	4	4	0	0	0
	60 to < 65	0	0	0	0	0	0
	55 to < 60	1	1	1	0	0	0
	50 to < 55	2	2	2	1	1	1
	45 to < 50	3	3	3	3	3	3
	40 to < 45	5	5	5	4	4	4
	35 to < 40	6	7	7	3	3	3
	30 to < 35	6	6	6	5	5	5
	25 to < 30	4	4	4	9	8	8
	20 to < 25	5	5	5	23	22	22
	15 to < 20	6	6	6	19	19	19
	10 to < 15	8	8	8	16	14	14
	5 to < 10	10	10	10	15	13	13
	0 to < 5	39	18	18	2	7	7

Results Within GCNP		%TAUD			L _{Aeq12} (dBA)		
		All Aircraft Below 18,000 ft MSL and Within the SFRA	Air-tour and Air-tour Related	Commercial Air-tours	All Aircraft Below 18,000 ft MSL and Within the SFRA	Air-tour and Air-tour Related	Commercial Air-tours
Proposed Wilderness		% Of Management Zone					
	>= 65	9	9	5	0	0	0
	60 to < 65	2	2	2	0	0	0
	55 to < 60	2	2	2	0	0	0
	50 to < 55	3	2	2	0	0	0
	45 to < 50	3	3	3	1	1	1
	40 to < 45	3	3	3	4	4	3
	35 to < 40	4	4	4	7	7	6
	30 to < 35	3	3	4	6	6	7
	25 to < 30	3	3	3	6	6	7
	20 to < 25	3	3	4	9	7	7
	15 to < 20	4	4	4	11	8	9
	10 to < 15	5	5	6	17	11	11
	5 to < 10	7	6	7	20	17	17
	0 to < 5	46	19	20	12	13	13
Entire Park		% Of GCNP					
	>= 65	9	8	5	0	0	0
	60 to < 65	2	2	2	0	0	0
	55 to < 60	2	2	2	0	0	0
	50 to < 55	3	2	2	0	0	0
	45 to < 50	3	3	3	1	1	1
	40 to < 45	3	3	3	4	4	3
	35 to < 40	4	4	4	6	6	6
	30 to < 35	4	4	4	6	6	7
	25 to < 30	3	3	4	7	6	7
	20 to < 25	3	3	4	10	7	7
	15 to < 20	4	4	4	12	9	9
	10 to < 15	6	5	6	17	11	12
	5 to < 10	7	6	7	20	17	17
	0 to < 5	46	17	18	11	12	13

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TABLE 37 DETAILED CONTOUR ANALYSIS RESULTS WITHIN THE SFRA – NPS PREFERRED ALTERNATIVE (PEAK SEASON) FOR THE TEN-YEAR FORECAST

Results Within the SFRA		%TAUD			L _{Aeq12} (dBA)		
		All Aircraft Below 18,000 ft MSL and Within the SFRA	Air-tour and Air-tour Related	Commercial Air-tours	All Aircraft Below 18,000 ft MSL and Within the SFRA	Air-tour and Air-tour Related	Commercial Air-tours
	>= 65	N/A	N/A	N/A	0	0	0
	60 to < 65	N/A	N/A	N/A	0	0	0
	55 to < 60	N/A	N/A	N/A	0	0	0
	50 to < 55	N/A	N/A	N/A	0	0	0
	45 to < 50	N/A	N/A	N/A	2	2	1
	40 to < 45	N/A	N/A	N/A	4	4	3
	35 to < 40	N/A	N/A	N/A	7	7	6
	30 to < 35	N/A	N/A	N/A	7	7	7
	25 to < 30	N/A	N/A	N/A	7	7	7
	20 to < 25	N/A	N/A	N/A	10	8	8
	15 to < 20	N/A	N/A	N/A	14	11	11
	10 to < 15	N/A	N/A	N/A	17	12	13
	5 to < 10	N/A	N/A	N/A	18	16	16
	0 to < 5	N/A	N/A	N/A	10	13	13

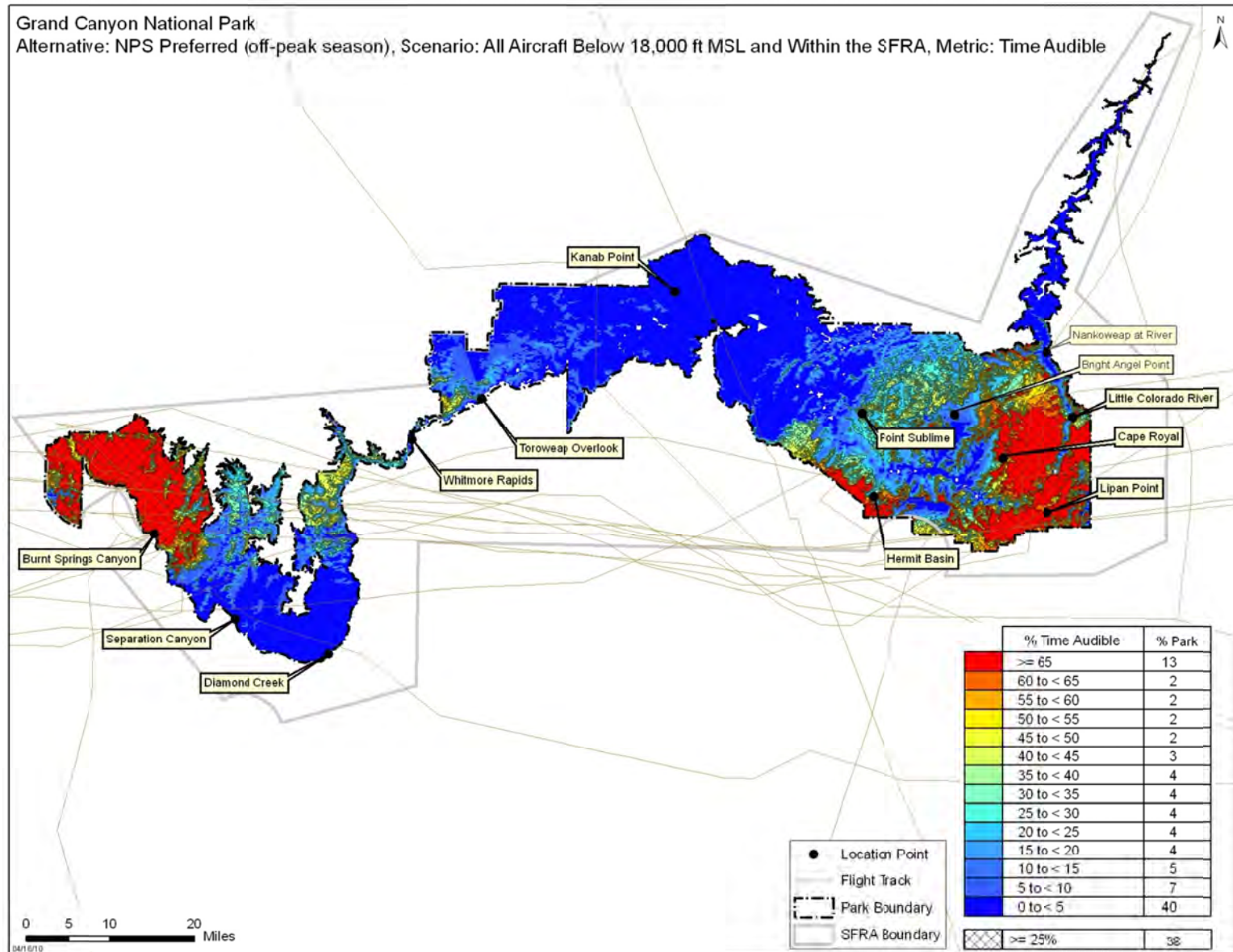


FIGURE 75 NPS PREFERRED ALTERNATIVE (OFF-PEAK SEASON) – %TAUD CONTOURS – ALL AIRCRAFT BELOW 18,000 FT MSL AND WITHIN THE SFRA

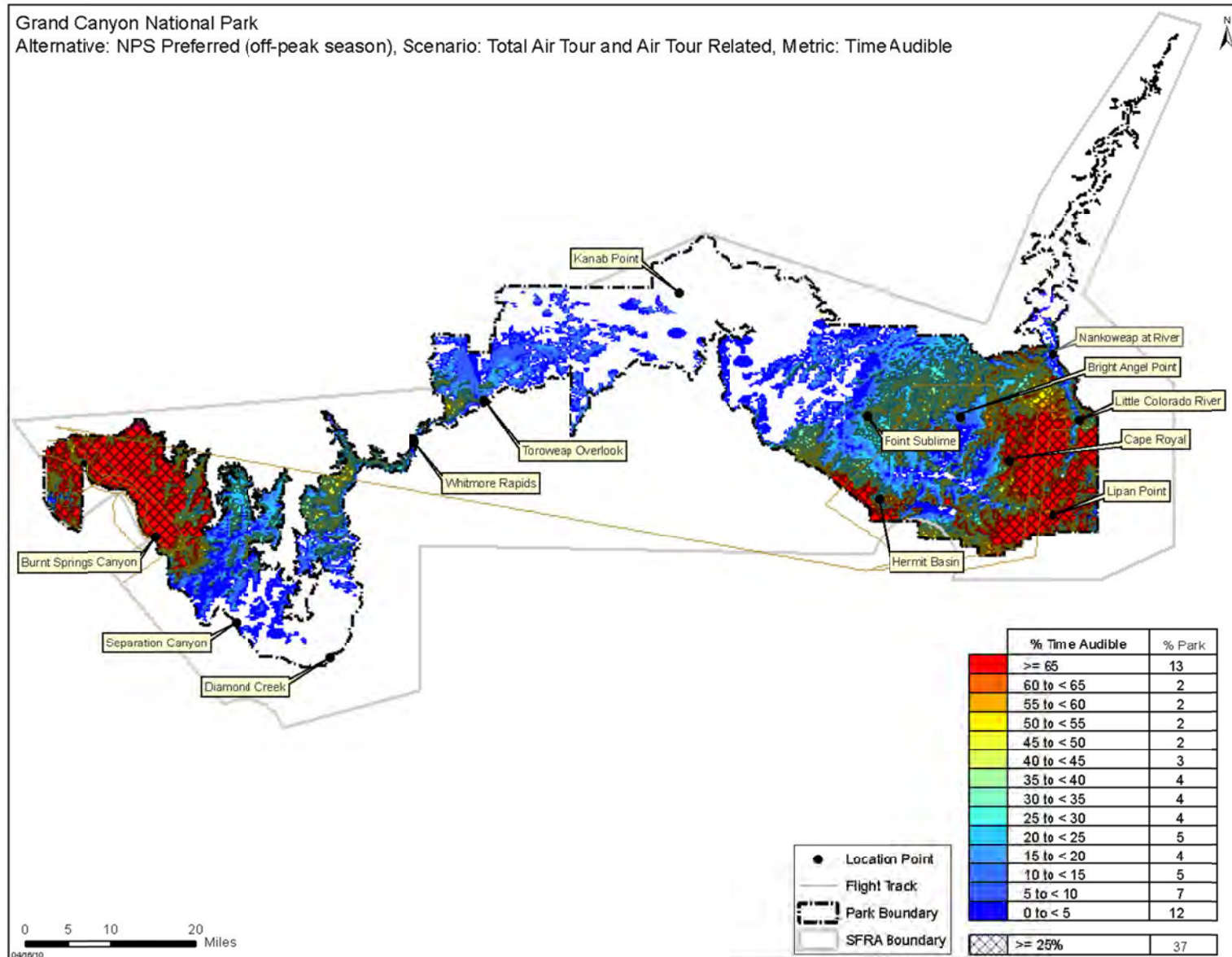


FIGURE 76 NPS PREFERRED ALTERNATIVE (OFF-PEAK SEASON) – %TAUD CONTOURS – AIR-TOUR AND AIR-TOUR RELATED

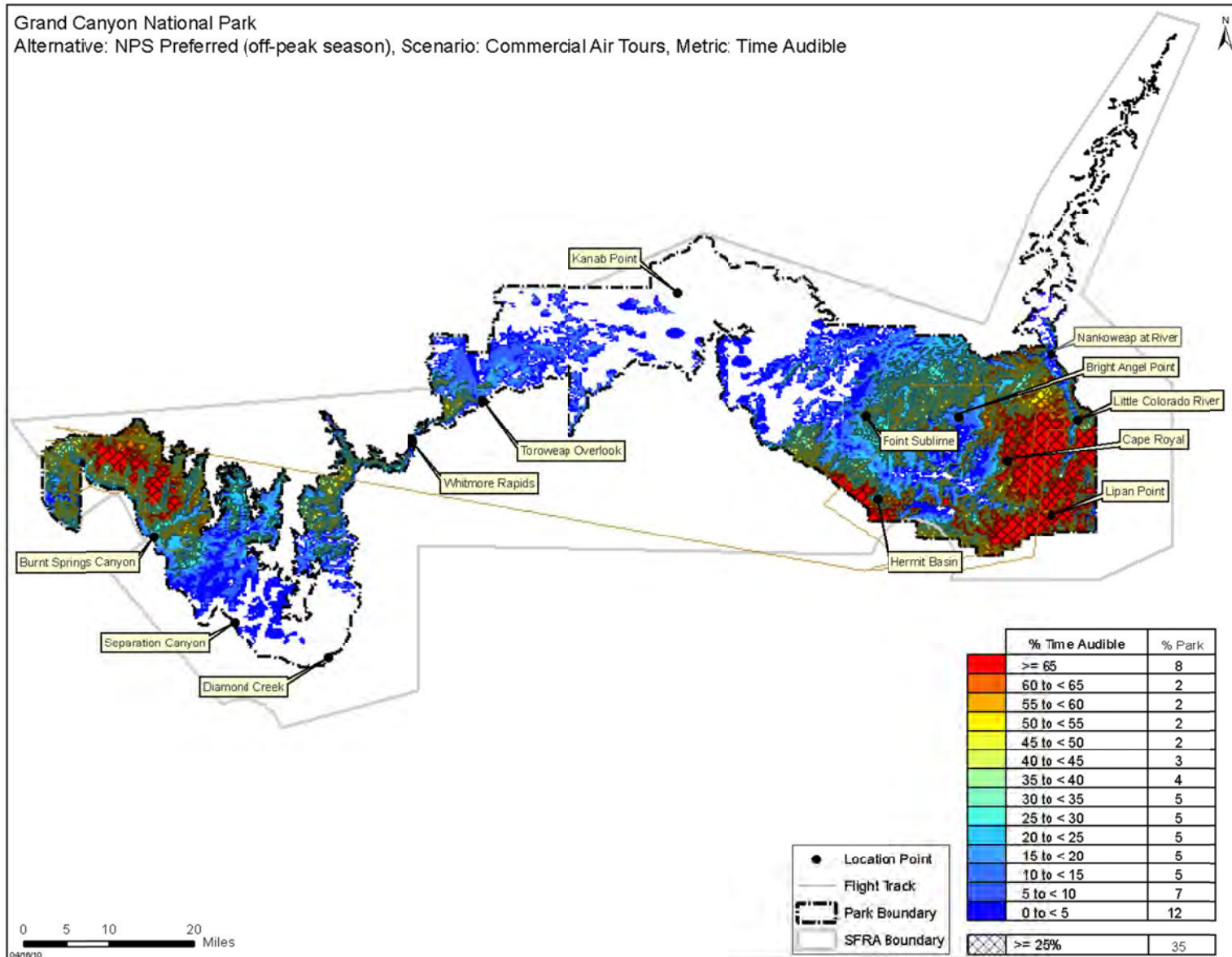


FIGURE 77 NPS PREFERRED ALTERNATIVE (OFF-PEAK SEASON) – %TAUD CONTOURS – COMMERCIAL AIR-TOURS

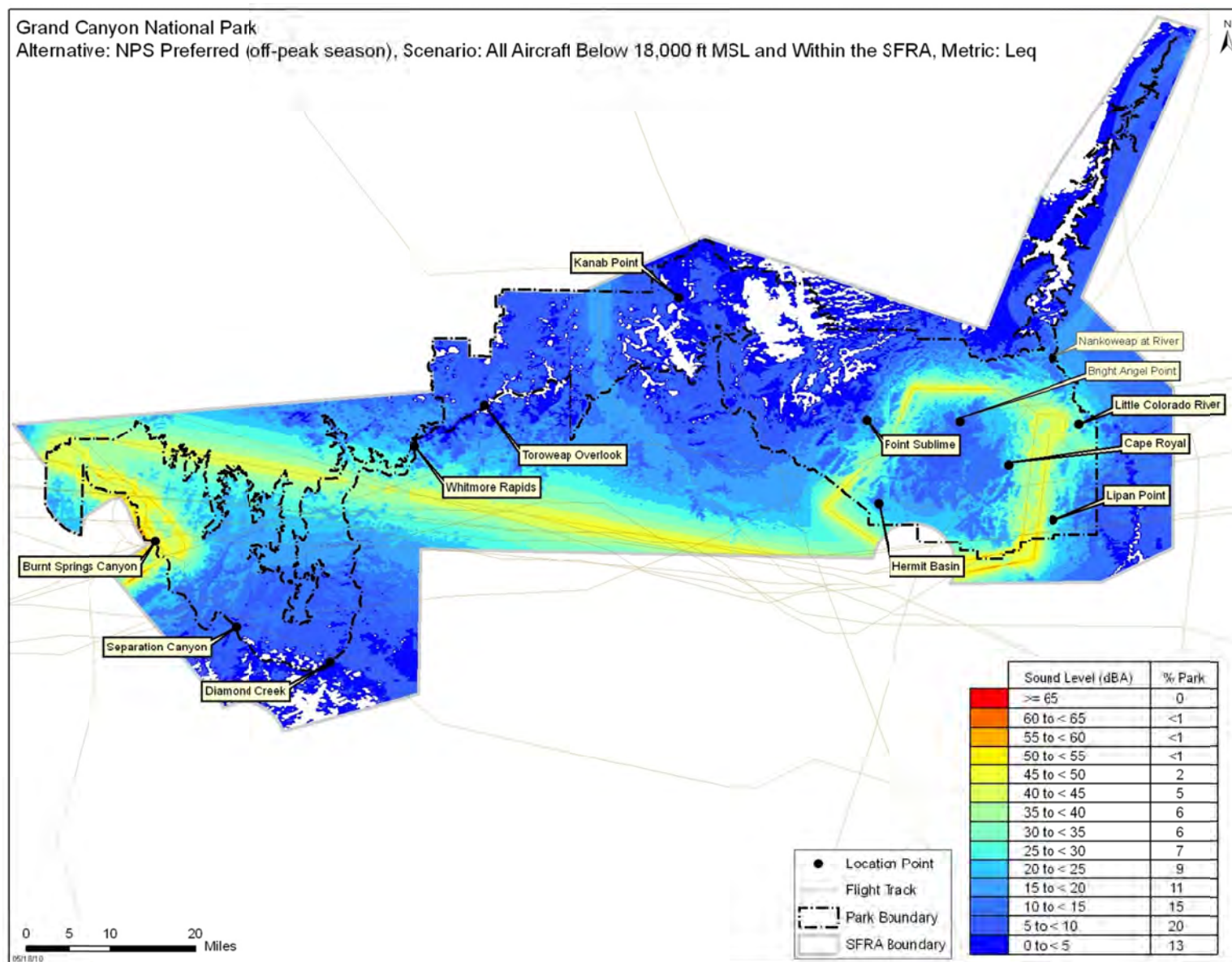


FIGURE 78 NPS PREFERRED ALTERNATIVE (OFF-PEAK SEASON) – L_{AEQ12} CONTOURS – ALL AIRCRAFT BELOW 18,000 FT MSL AND WITHIN THE SFRA

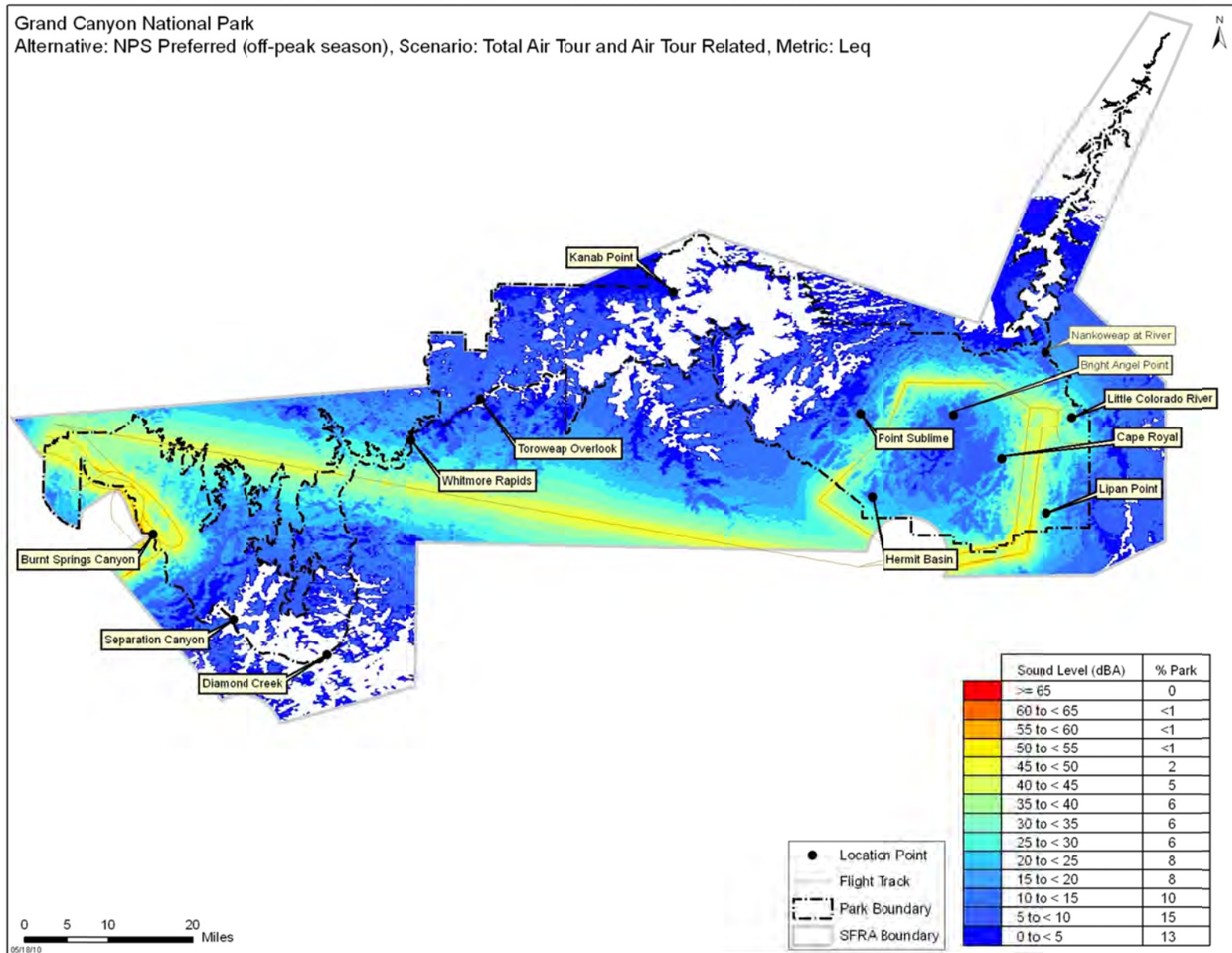


FIGURE 79 NPS PREFERRED ALTERNATIVE (OFF-PEAK SEASON) – L_{AEQ12} CONTOURS – AIR-TOUR AND AIR-TOUR RELATED

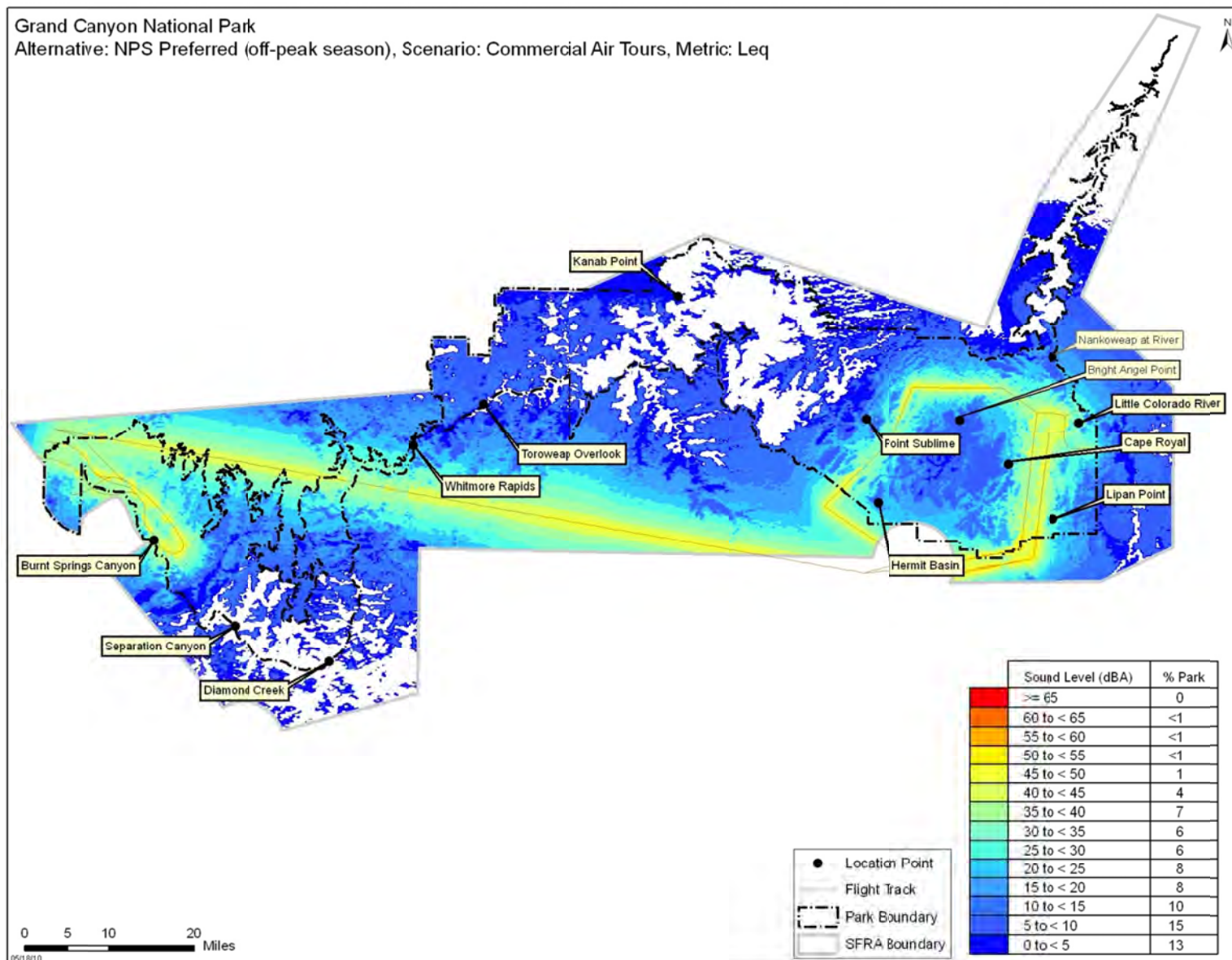


FIGURE 80 NPS PREFERRED ALTERNATIVE (OFF-PEAK SEASON) – L_{AEQ12} CONTOURS – COMMERCIAL AIR-TOURS

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TABLE 38 DETAILED CONTOUR ANALYSIS RESULTS WITHIN GCNP- NPS PREFERRED ALTERNATIVE (OFF-PEAK SEASON)

Results Within GCNP		%TAUD			L _{Aeq12} (dBA)		
		All Aircraft Below 18,000 ft MSL and Within the SFRA	Air-tour and Air-tour Related	Commercial Air-tours	All Aircraft Below 18,000 ft MSL and Within the SFRA	Air-tour and Air-tour Related	Commercial Air-tours
Developed		% Of Management Zone					
	>= 65	21	21	21	0	0	0
	60 to < 65	6	6	6	0	0	0
	55 to < 60	7	7	7	0	0	0
	50 to < 55	6	6	6	2	2	2
	45 to < 50	6	6	6	3	3	3
	40 to < 45	6	6	6	4	4	4
	35 to < 40	4	5	5	2	2	2
	30 to < 35	4	4	4	3	3	3
	25 to < 30	4	4	4	9	9	9
	20 to < 25	3	3	3	25	23	23
	15 to < 20	3	3	3	45	46	46
	10 to < 15	5	5	5	4	5	5
	5 to < 10	3	3	3	2	2	2
	0 to < 5	21	17	17	0	1	1
Non-Wilderness		% Of Management Zone					
	>= 65	19	18	18	0	0	0
	60 to < 65	6	6	6	0	0	0
	55 to < 60	6	6	6	0	0	0
	50 to < 55	5	5	5	2	2	2
	45 to < 50	6	6	6	4	4	4
	40 to < 45	6	6	6	3	3	3
	35 to < 40	7	6	6	3	3	3
	30 to < 35	6	7	7	5	5	5
	25 to < 30	5	6	6	14	14	14
	20 to < 25	5	5	5	26	24	24
	15 to < 20	4	4	4	13	14	14
	10 to < 15	5	5	5	14	12	12
	5 to < 10	5	5	5	14	13	13
	0 to < 5	15	10	9	1	4	4

Results Within GCNP		%TAUD			L _{Aeq12} (dBA)		
		All Aircraft Below 18,000 ft MSL and Within the SFRA	Air-tour and Air-tour Related	Commercial Air-tours	All Aircraft Below 18,000 ft MSL and Within the SFRA	Air-tour and Air-tour Related	Commercial Air-tours
Proposed Wilderness		% Of Management Zone					
	>= 65	13	13	8	0	0	0
	60 to < 65	2	2	2	0	0	0
	55 to < 60	2	2	2	0	0	0
	50 to < 55	2	2	2	0	0	0
	45 to < 50	2	2	2	1	1	1
	40 to < 45	3	3	3	5	5	4
	35 to < 40	3	3	4	6	6	7
	30 to < 35	4	4	5	6	6	6
	25 to < 30	4	4	5	6	6	6
	20 to < 25	4	5	5	8	7	7
	15 to < 20	4	4	5	11	7	8
	10 to < 15	5	5	5	15	10	10
	5 to < 10	8	7	7	21	15	15
	0 to < 5	42	13	14	13	13	13
Entire Park		% Of GCNP					
	>= 65	14	13	8	0	0	0
	60 to < 65	2	2	2	0	0	0
	55 to < 60	2	2	2	0	0	0
	50 to < 55	2	2	2	0	0	0
	45 to < 50	2	2	2	2	2	1
	40 to < 45	3	3	3	5	5	4
	35 to < 40	4	4	4	6	6	7
	30 to < 35	4	4	5	6	6	6
	25 to < 30	4	4	5	7	6	6
	20 to < 25	4	5	5	9	8	8
	15 to < 20	4	4	5	11	8	8
	10 to < 15	5	5	5	15	10	10
	5 to < 10	7	7	7	20	15	15
	0 to < 5	40	12	12	13	13	13

1

TABLE 39 DETAILED CONTOUR ANALYSIS RESULTS WITHIN THE SFRA - NPS PREFERRED ALTERNATIVE (OFF-PEAK SEASON)

Results Within the SFRA		%TAUD			L _{Aeq12} (dBA)		
		All Aircraft Below 18,000 ft MSL and Within the SFRA	Air-tour and Air-tour Related	Commercial Air-tours	All Aircraft Below 18,000 ft MSL and Within the SFRA	Air-tour and Air-tour Related	Commercial Air-tours
	>= 65	N/A	N/A	N/A	0	0	0
	60 to < 65	N/A	N/A	N/A	0	0	0
	55 to < 60	N/A	N/A	N/A	0	0	0
	50 to < 55	N/A	N/A	N/A	0	0	0
	45 to < 50	N/A	N/A	N/A	2	2	1
	40 to < 45	N/A	N/A	N/A	5	5	4
	35 to < 40	N/A	N/A	N/A	6	6	7
	30 to < 35	N/A	N/A	N/A	6	6	7
	25 to < 30	N/A	N/A	N/A	7	7	6
	20 to < 25	N/A	N/A	N/A	8	7	7
	15 to < 20	N/A	N/A	N/A	13	9	9
	10 to < 15	N/A	N/A	N/A	16	11	11
	5 to < 10	N/A	N/A	N/A	18	14	14
	0 to < 5	N/A	N/A	N/A	13	13	13

2

1 **TABLE 40 RESULTS FOR 127 POINT LOCATIONS - NPS PREFERRED ALTERNATIVE (OFF-PEAK SEASON) - ALL AIRCRAFT BELOW 18,000 FT MSL**
2 **AND WITHIN THE SFRA**

#	Location ID	Location Point Name	Base Year					Ten-Year Forecast				
			TAUD (%)	L _{Aeq12} (dBA)	TALA35 dBA (%)	TALA45 dBA (%)	TALA55 dBA (%)	TAUD (%)	L _{Aeq12} (dBA)	TALA35 dBA (%)	TALA45 dBA (%)	TALA55 dBA (%)
Marble Canyon												
1	CLDWEL	Cliff Dwellers Lodge	0	0	0	0	0	0	0	0	0	0
2	GRID01	Grid Location Point 1	0	3	0	0	0	0	3	0	0	0
3	GRID02	Grid Location Point 2	1	13	0	0	0	1	13	0	0	0
4	GRID03	Grid Location Point 3	1	7	0	0	0	1	7	0	0	0
5	GRID04	Grid Location Point 4	0	0	0	0	0	0	0	0	0	0
6	GRID05	Grid Location Point 5	0	0	0	0	0	0	0	0	0	0
7	MARBDM	Marble Canyon Dam Site	0	0	0	0	0	0	0	0	0	0
8	NOCANY	North Canyon	0	0	0	0	0	0	0	0	0	0
9	SOCAN	South Canyon	0	0	0	0	0	0	0	0	0	0
East End												
10	96MILE	96 Mile Camp	10	30	6	1	0	7	29	5	0	0
11	BASCMP	Bass Camp	0	1	0	0	0	0	0	0	0	0
12	BASIN	The Basin	29	40	12	4	1	19	37	12	4	0
13	BRTANG	Bright Angel Point	59	19	0	0	0	9	15	0	0	0
14	CAPROY	Cape Royal	81	29	6	0	0	54	25	0	0	0
15	CEDRIG	Cedar Ridge	60	16	0	0	0	9	13	0	0	0
16	DSRTVW	Desert View	84	29	2	0	0	51	25	0	0	0
17	ELTOVR	El Tovar	44	13	0	0	0	8	9	0	0	0
18	GC008	Pasture Wash (pinyon-juniper)	48	18	0	0	0	15	15	0	0	0
19	GC011	South Rim (ponderosa pine)	17	21	0	0	0	1	18	0	0	0
20	GC015	Rainbow Plateau (ponderosa pine)	0	2	0	0	0	0	2	0	0	0
21	GC031	Eremita Mesa	84	28	5	0	0	67	24	1	0	0
22	GC032	1.5 km SE of Moran Point	78	46	46	12	3	65	46	43	10	4

#	Location ID	Location Point Name	Base Year					Ten-Year Forecast				
			TAUD (%)	L _{Aeq12} (dBA)	TALA35 dBA (%)	TALA45 dBA (%)	TALA55 dBA (%)	TAUD (%)	L _{Aeq12} (dBA)	TALA35 dBA (%)	TALA45 dBA (%)	TALA55 dBA (%)
23	GRID06	Grid Location Point 6	23	13	0	0	0	12	8	0	0	0
24	GRID07	Grid Location Point 7	0	2	0	0	0	0	2	0	0	0
25	GRID10	Grid Location Point 10	27	17	0	0	0	4	12	0	0	0
26	GRID11	Grid Location Point 11	9	13	0	0	0	4	9	0	0	0
27	GRID12	Grid Location Point 12	2	12	0	0	0	2	12	0	0	0
28	GRID13	Grid Location Point 13	5	12	0	0	0	1	11	0	0	0
29	GRID14	Grid Location Point 14	77	41	38	11	0	68	39	40	4	0
30	GRID15	Grid Location Point 15	52	36	19	3	0	40	34	13	2	0
31	GRID16	Grid Location Point 16	22	26	3	0	0	12	21	1	0	0
32	GRID17	Grid Location Point 17	79	20	0	0	0	21	16	0	0	0
33	GRID18	Grid Location Point 18	21	10	0	0	0	8	9	0	0	0
34	GRID19	Grid Location Point 19	60	43	33	11	2	36	41	35	7	1
35	HBASIN	Hermit Basin	35	13	0	0	0	13	11	0	0	0
36	LIPAN	Lipan Point	87	34	22	0	0	65	32	7	0	0
37	LITCOL	Little Colorado	0	4	0	0	0	0	3	0	0	0
38	LTCORV	Little Colorado River	7	24	1	0	0	3	25	2	0	0
39	NANMES	Nankoweap Mesa	79	28	3	0	0	54	26	3	0	0
40	NANRIV	Nankoweap at River	0	13	0	0	0	0	13	0	0	0
41	NAVA1	Navajo 1	1	12	0	0	0	1	10	0	0	0
42	NAVA2	Navajo 2	3	10	0	0	0	4	8	0	0	0
43	PHANTM	Phantom Ranch	1	7	0	0	0	1	5	0	0	0
44	PTIMPR	Point Imperial	33	14	0	0	0	6	14	0	0	0
45	PTSUBL	Point Sublime	73	24	0	0	0	33	18	0	0	0
46	RANCH	The Ranch	58	44	14	5	2	47	42	13	5	1
47	TEMBUT	Temple Butte	63	35	9	2	0	45	35	13	2	0
48	TENMED	Ten X Meadow	66	53	31	12	5	41	52	30	14	6
49	TOWER	Tower of Ra	36	34	8	2	0	28	30	6	1	0
50	TUSAYN	Tusayan	79	34	20	0	0	54	31	10	0	0
51	ZUNALF	Zuni Alpha	57	49	34	14	5	42	47	41	15	4
52	ZUNCHR	Zuni Charlie	69	26	1	0	0	55	24	2	0	0

#	Location ID	Location Point Name	Base Year					Ten-Year Forecast				
			TAUD (%)	L _{Aeq12} (dBA)	TALA35 dBA (%)	TALA45 dBA (%)	TALA55 dBA (%)	TAUD (%)	L _{Aeq12} (dBA)	TALA35 dBA (%)	TALA45 dBA (%)	TALA55 dBA (%)
Central												
53	COYCAN	Coyote Canyon	0	16	0	0	0	0	16	0	0	0
54	DOME	The Dome	1	15	0	0	0	1	16	0	0	0
55	GC009	Tuweep (warm desert scrub)	13	14	0	0	0	1	15	0	0	0
56	GC010	Tuweep (cold desert scrub)	8	10	0	0	0	13	11	0	0	0
57	GC016	Hancock Knolls (pinyon-juniper)	2	9	0	0	0	2	9	0	0	0
58	GC017	1 km W of Kanab Point (cold desert scrub)	2	7	0	0	0	2	9	0	0	0
59	GC033	Fossil Canyon	1	9	0	0	0	1	9	0	0	0
60	GRID08	Grid Location Point 8	4	8	0	0	0	1	7	0	0	0
61	GRID09	Grid Location Point 9	1	3	0	0	0	1	3	0	0	0
62	GRID20	Grid Location Point 20	0	4	0	0	0	0	4	0	0	0
63	GRID21	Grid Location Point 21	2	14	0	0	0	2	14	0	0	0
64	GRID22	Grid Location Point 22	14	11	0	0	0	21	12	0	0	0
65	GRID23	Grid Location Point 23	2	9	0	0	0	2	10	0	0	0
66	GRID24	Grid Location Point 24	2	6	0	0	0	2	8	0	0	0
67	GRID25	Grid Location Point 25	8	9	0	0	0	11	10	0	0	0
68	GRID26	Grid Location Point 26	1	9	0	0	0	1	10	0	0	0
69	GRID35	Grid Location Point 35	0	2	0	0	0	0	3	0	0	0
70	GRID36	Grid Location Point 36	0	0	0	0	0	0	0	0	0	0
71	HAVAPT	Havasupai Point	0	0	0	0	0	0	0	0	0	0
72	HAVCAN	Havataagvitch Canyon	1	7	0	0	0	1	7	0	0	0
73	KANAPT	Kanab Point	1	5	0	0	0	1	5	0	0	0
74	MOHAWK	Mohawk Canyon	1	11	0	0	0	0	12	0	0	0
75	MOHCAN	Mohawk Canyon	1	10	0	0	0	2	11	0	0	0
76	MTSINY	Mt. Sinyala	1	0	0	0	0	1	0	0	0	0
77	NATCAN	National Canyon	2	12	0	0	0	3	14	0	0	0
78	PROCAN	Prospect Canyon	5	14	0	0	0	0	14	0	0	0

#	Location ID	Location Point Name	Base Year					Ten-Year Forecast				
			TAUD (%)	L _{Aeq12} (dBA)	TALA35 dBA (%)	TALA45 dBA (%)	TALA55 dBA (%)	TAUD (%)	L _{Aeq12} (dBA)	TALA35 dBA (%)	TALA45 dBA (%)	TALA55 dBA (%)
79	PRSPCT	Prospect Canyon	22	22	1	0	0	23	21	0	0	0
80	SOSUPC	South Supai Canyon	6	28	4	0	0	7	26	4	0	0
81	STONCK	Stone Creek	0	0	0	0	0	0	0	0	0	0
82	SUPVIL	Supai Village	0	5	0	0	0	0	5	0	0	0
83	SURPVA	Surprise Valley	1	0	0	0	0	1	0	0	0	0
84	TOROWP	Toroweap Overlook	0	12	0	0	0	0	13	0	0	0
85	TWPRS	Tuweep Ranger Station	1	2	0	0	0	1	4	0	0	0
86	UPDRCK	Upper Deer Creek	1	0	0	0	0	1	0	0	0	0
West End												
87	ADMIN	NPS Administration site	43	32	10	1	0	44	31	11	0	0
88	ANDRUS	Andrus Canyon	22	16	0	0	0	18	17	0	0	0
89	BATCAV	Bat Cave	92	49	78	31	8	86	48	75	27	6
90	BRNTSP	Burnt Springs Canyon	69	47	67	25	4	64	44	65	19	1
91	CASTLE	Castle Peak	28	18	0	0	0	23	19	0	0	0
92	DIACRK	Diamond Creek	0	0	0	0	0	0	0	0	0	0
93	GC018	Separation Canyon (warm desert scrub)	0	9	0	0	0	1	9	0	0	0
94	GCWEST	Grand Canyon West	93	32	10	0	0	77	30	5	0	0
95	GRAGOR	Granite Gorge	56	33	9	1	0	48	32	10	0	0
96	GRID27	Grid Location Point 27	21	26	3	0	0	21	26	1	0	0
97	GRID28	Grid Location Point 28	13	17	0	0	0	7	18	0	0	0
98	GRID29	Grid Location Point 29	8	12	0	0	0	6	13	0	0	0
99	GRID30	Grid Location Point 30	55	33	7	1	0	22	32	5	1	0
100	GRID31	Grid Location Point 31	36	43	23	8	1	37	41	32	11	0
101	GRID32	Grid Location Point 32	43	27	3	0	0	44	27	1	0	0
102	GRID33	Grid Location Point 33	88	42	36	9	1	77	38	35	4	0
103	GRID34	Grid Location Point 34	0	1	0	0	0	0	1	0	0	0
104	GRNTPK	Granite Peak	2	17	0	0	0	2	18	0	0	0
105	GUSPLT	Gus Plateau	40	25	2	0	0	41	25	1	0	0
106	HFCAN	Horse Flat Canyon	3	13	0	0	0	1	12	0	0	0
107	KELLPT	Kelly Point	1	10	0	0	0	1	10	0	0	0

#	Location ID	Location Point Name	Base Year					Ten-Year Forecast				
			TAUD (%)	L _{Aeq12} (dBA)	TALA35 dBA (%)	TALA45 dBA (%)	TALA55 dBA (%)	TAUD (%)	L _{Aeq12} (dBA)	TALA35 dBA (%)	TALA45 dBA (%)	TALA55 dBA (%)
108	MERIWH	Meriwhitca	0	7	0	0	0	1	7	0	0	0
109	MTDELL	Mt. Dellenbaugh	29	42	20	7	1	28	40	28	9	0
110	NONAME	Jackson Canyon	19	22	1	0	0	6	22	2	0	0
111	PARWAS	Parashant Wash	12	34	12	2	0	13	31	14	0	0
112	PMPKIN	Pumpkin Springs	0	7	0	0	0	0	8	0	0	0
113	PSCNNO	Peach Spring Canyon North	0	4	0	0	0	0	4	0	0	0
114	PSCNSO	Peach Spring Canyon South	NA	0	0	0	0	NA	0	0	0	0
115	QMPNT	Quartermaster Point	64	41	22	8	0	59	42	20	9	0
116	SADMTN	Saddle Mountain	18	18	0	0	0	6	18	0	0	0
117	SANUP	Sanup	80	39	22	4	0	63	37	28	3	0
118	SCCORV	Separation Canyon, 1km N of Colorado River	1	8	0	0	0	1	8	0	0	0
119	SCMCIG	Spencer/Meriwhitca Canyons	0	4	0	0	0	0	4	0	0	0
120	SEPARC	Separation Canyon at Colorado River	0	7	0	0	0	0	7	0	0	0
121	SHWZFC	Shivwitz Fire Camp	35	39	21	4	1	36	37	28	3	0
122	SPENCA	Spencer Canyon	0	7	0	0	0	0	7	0	0	0
123	SUIPNT	Suicide Point	19	22	1	0	0	12	23	1	0	0
124	THRSPR	Three Springs	1	8	0	0	0	2	9	0	0	0
125	TWINPT	Twin Point	35	24	1	0	0	9	24	1	0	0
126	WESEND	West End	60	41	46	10	0	43	37	37	1	0
127	WHTRAP	Whitmore Rapids	9	20	0	0	0	10	18	0	0	0

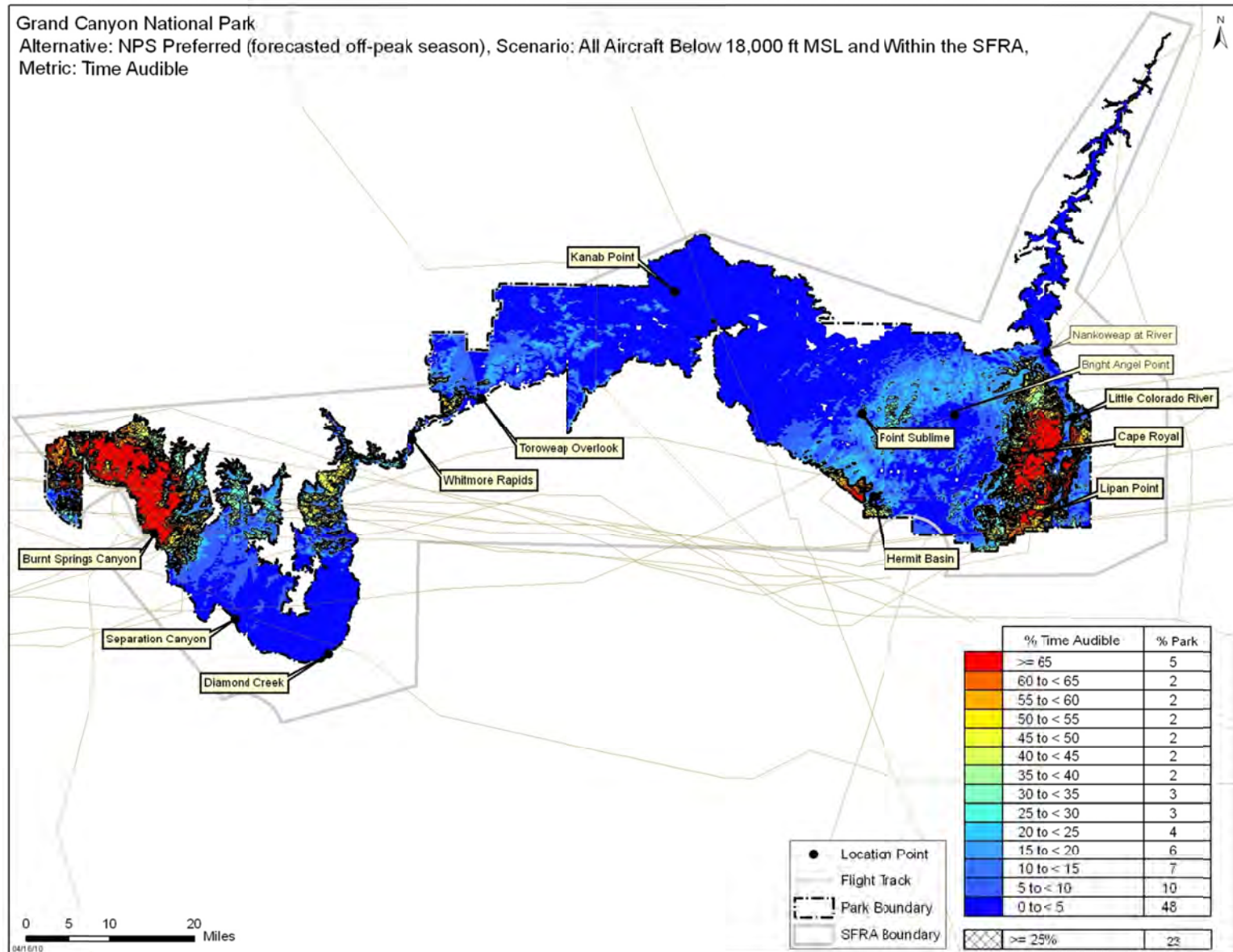


FIGURE 81 NPS PREFERRED ALTERNATIVE (TEN-YEAR FORECASTED OFF-PEAK SEASON) – %TAUD CONTOURS – ALL AIRCRAFT BELOW 18,000 FT MSL AND WITHIN THE SFRA

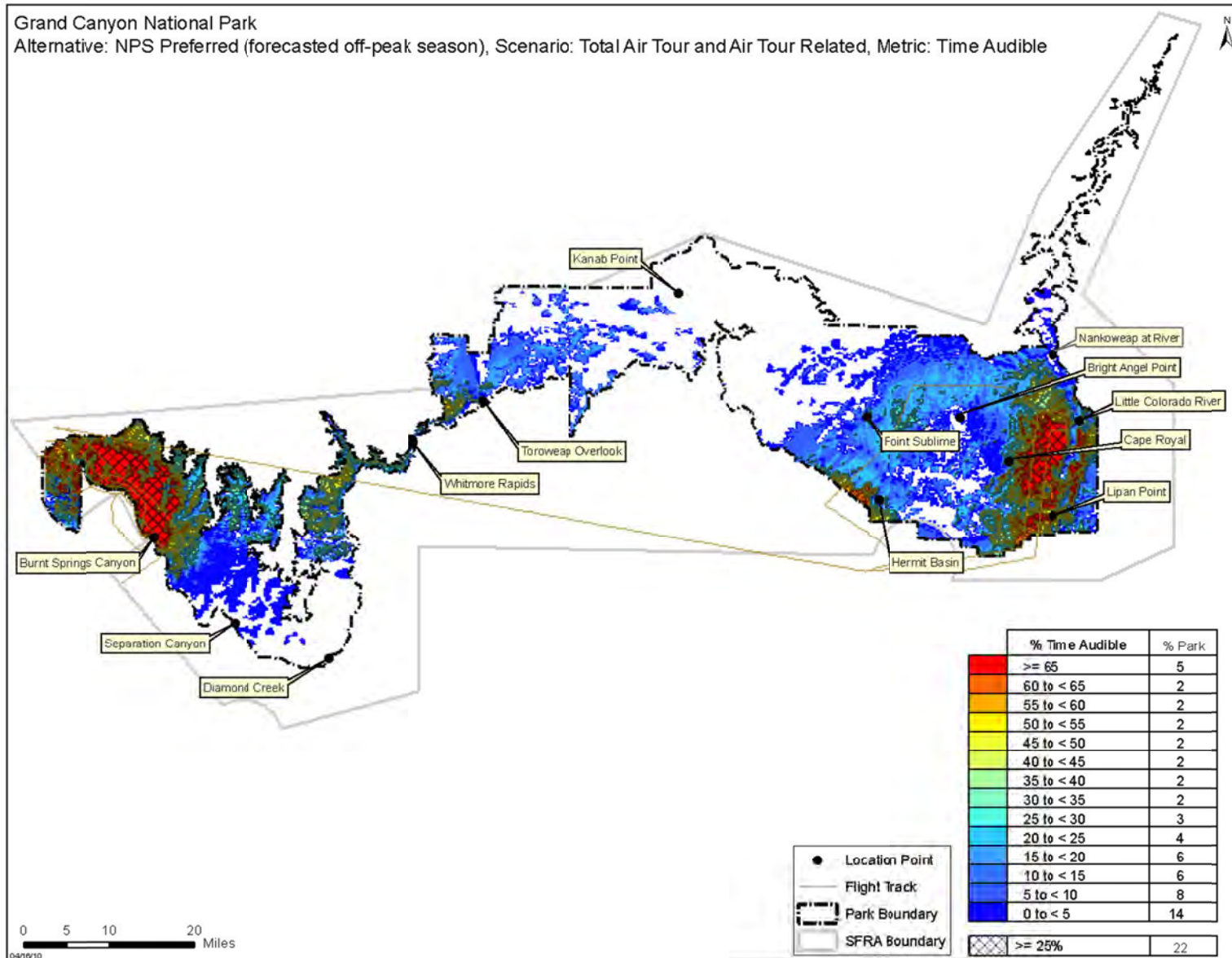
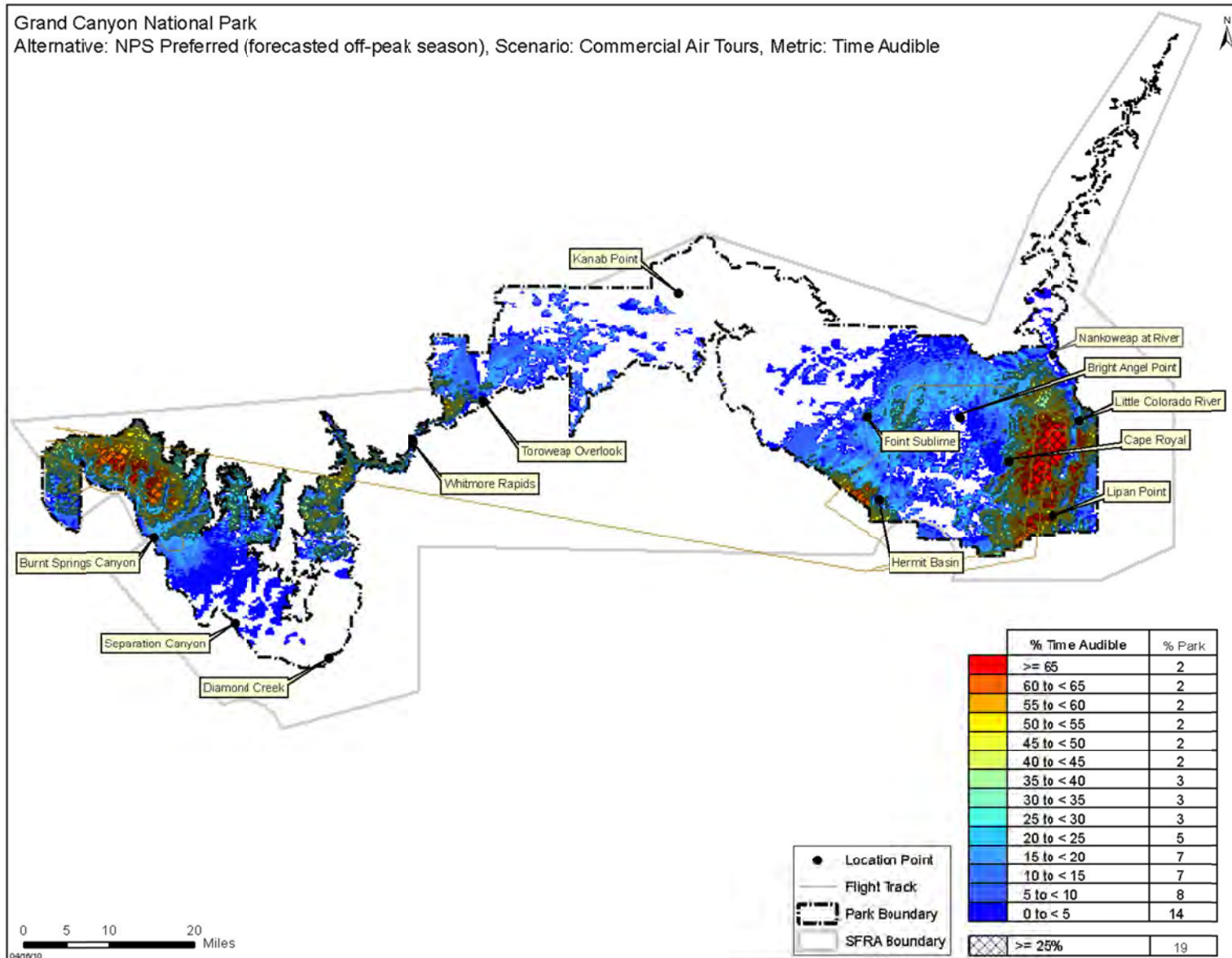


FIGURE 82 NPS PREFERRED ALTERNATIVE (TEN-YEAR FORECASTED OFF-PEAK SEASON) – %TAUD CONTOURS – AIR-TOUR AND AIR-TOUR RELATED



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FIGURE 83 NPS PREFERRED ALTERNATIVE (TEN-YEAR FORECASTED OFF-PEAK SEASON) – %TAUD CONTOURS – COMMERCIAL AIR-TOURS

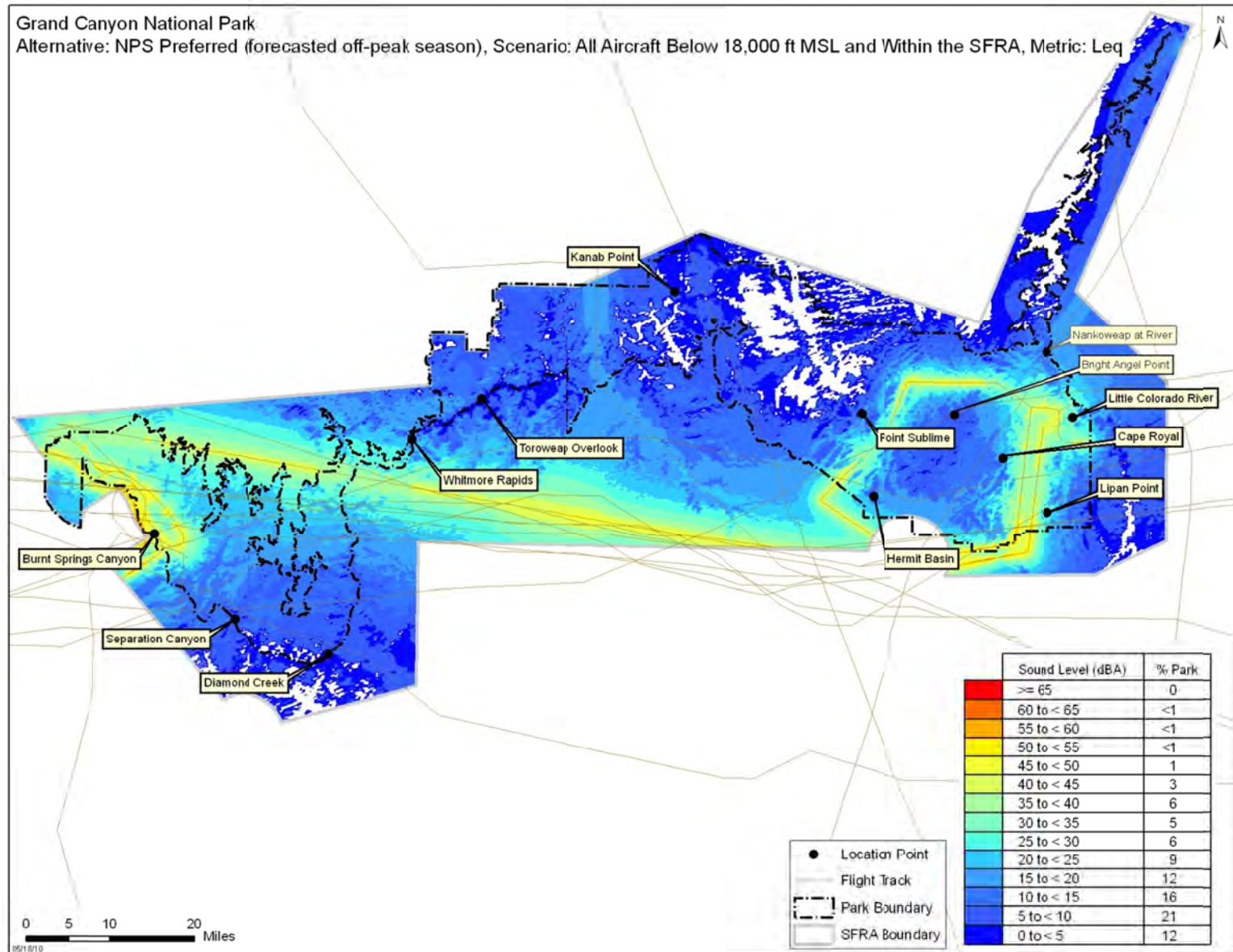


FIGURE 84 NPS PREFERRED ALTERNATIVE F (TEN-YEAR FORECASTED OFF-PEAK SEASON) – L_{AEQ12} CONTOURS – ALL AIRCRAFT BELOW 18,000 FT MSL AND WITHIN THE SFRA

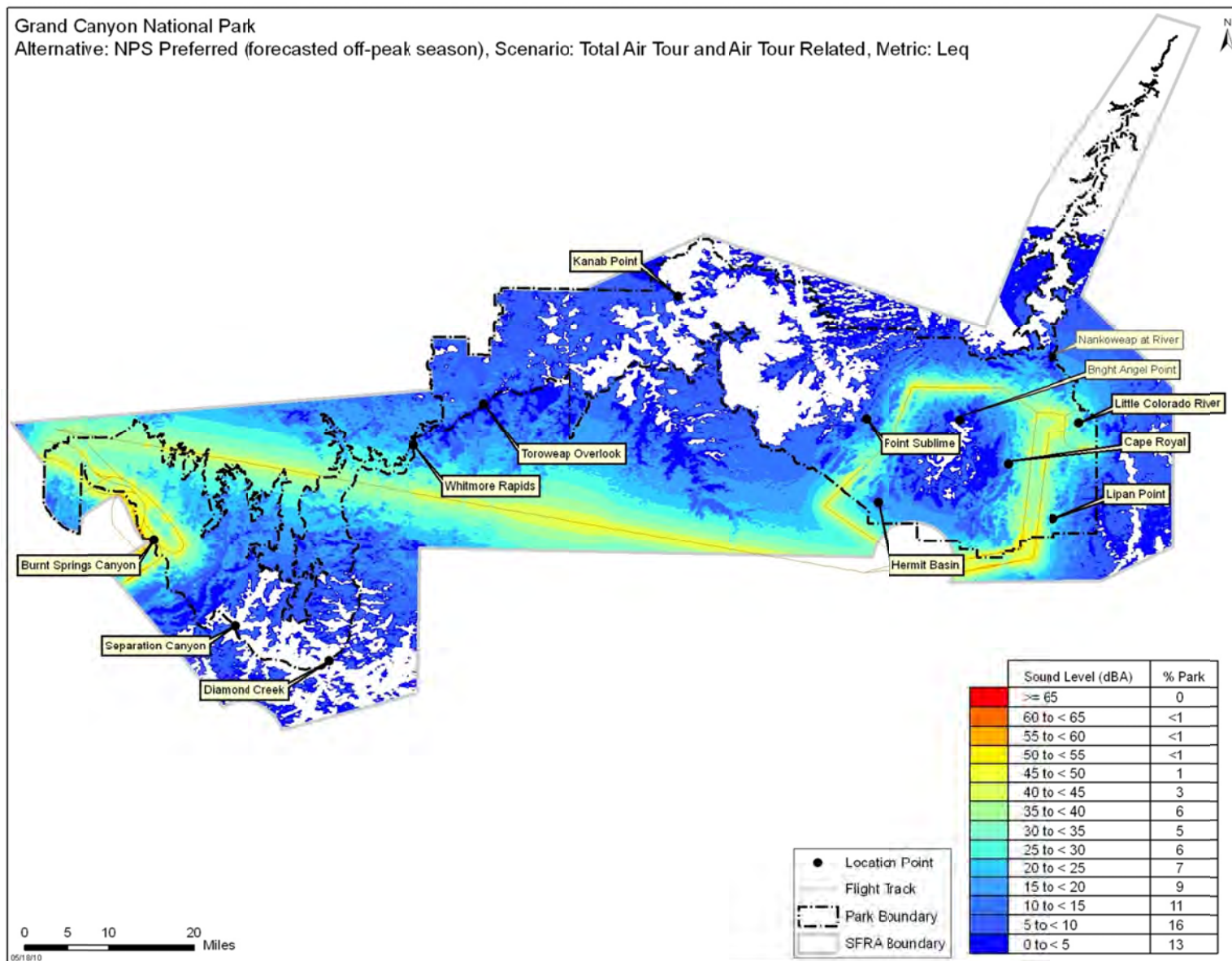


FIGURE 85 NPS PREFERRED ALTERNATIVE (TEN-YEAR FORECASTED OFF-PEAK SEASON) – L_{AEQ12} CONTOURS – AIR-TOUR AND AIR-TOUR RELATED

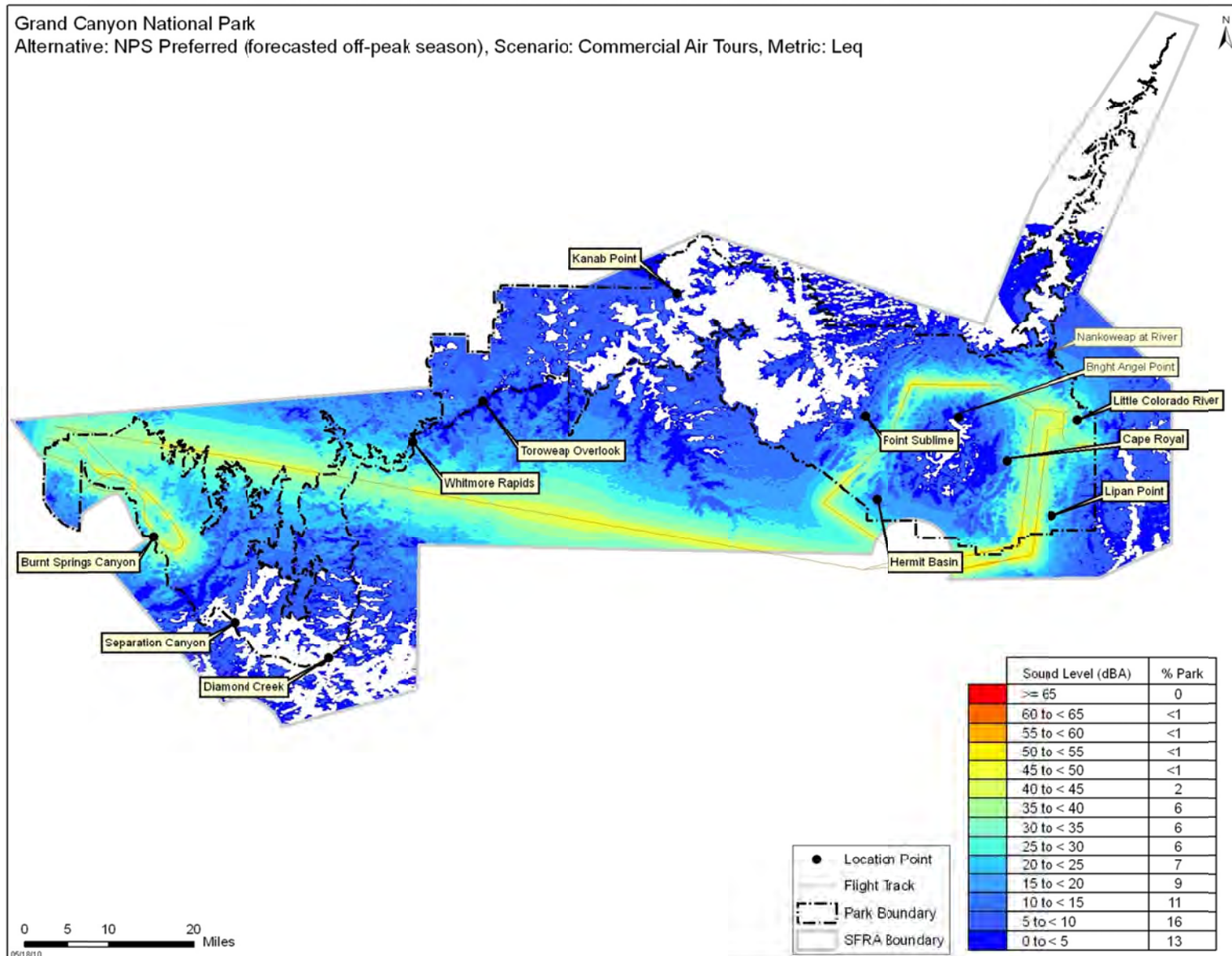


FIGURE 86 NPS PREFERRED ALTERNATIVE (TEN-YEAR FORECASTED OFF-PEAK SEASON) – L_{AEQ12} CONTOURS – COMMERCIAL AIR-TOURS

1 TABLE 41 DETAILED CONTOUR ANALYSIS RESULTS WITHIN GCNP- NPS PREFERRED ALTERNATIVE (OFF-PEAK SEASON) FOR THE TEN-YEAR FORECAST

Results Within GCNP		%TAUD			L _{Aeq12} (dBA)		
		All Aircraft Below 18,000 ft MSL and Within the SFRA	Air-tour and Air-tour Related	Commercial Air-tours	All Aircraft Below 18,000 ft MSL and Within the SFRA	Air-tour and Air-tour Related	Commercial Air-tours
Developed		% Of Management Zone					
	>= 65	0	0	0	0	0	0
	60 to < 65	4	3	3	0	0	0
	55 to < 60	4	4	4	0	0	0
	50 to < 55	3	3	3	2	2	2
	45 to < 50	1	2	2	3	3	3
	40 to < 45	1	1	1	4	4	4
	35 to < 40	1	1	1	2	2	2
	30 to < 35	3	3	3	2	2	2
	25 to < 30	3	3	3	4	4	4
	20 to < 25	3	3	3	12	10	10
	15 to < 20	5	5	5	47	33	33
	10 to < 15	9	8	8	21	32	32
	5 to < 10	16	13	12	3	7	7
	0 to < 5	45	24	24	0	1	1
Non-Wilderness		% Of Management Zone					
	>= 65	0	0	0	0	0	0
	60 to < 65	2	2	2	0	0	0
	55 to < 60	1	1	1	0	0	0
	50 to < 55	2	2	2	2	2	2
	45 to < 50	3	3	3	3	3	3
	40 to < 45	3	3	3	3	3	3
	35 to < 40	2	2	2	3	3	3
	30 to < 35	3	3	3	3	3	3
	25 to < 30	3	3	3	6	6	6
	20 to < 25	6	5	5	18	16	16
	15 to < 20	11	10	10	25	23	23
	10 to < 15	11	11	11	11	12	12
	5 to < 10	13	13	13	21	14	14
	0 to < 5	40	18	18	3	10	10

Results Within GCNP		%TAUD			L _{Aeq12} (dBA)		
		All Aircraft Below 18,000 ft MSL and Within the SFRA	Air-tour and Air-tour Related	Commercial Air-tours	All Aircraft Below 18,000 ft MSL and Within the SFRA	Air-tour and Air-tour Related	Commercial Air-tours
Proposed Wilderness		% Of Management Zone					
	>= 65	5	5	2	0	0	0
	60 to < 65	2	2	2	0	0	0
	55 to < 60	2	2	2	0	0	0
	50 to < 55	2	2	2	0	0	0
	45 to < 50	2	2	2	1	1	0
	40 to < 45	2	2	2	3	3	2
	35 to < 40	2	2	3	6	6	6
	30 to < 35	3	2	3	6	6	6
	25 to < 30	3	3	3	6	6	6
	20 to < 25	4	4	5	9	6	6
	15 to < 20	6	6	7	11	8	8
	10 to < 15	6	6	7	16	11	11
	5 to < 10	10	8	8	21	16	16
	0 to < 5	48	15	16	13	13	13
Entire Park		% Of GCNP					
	>= 65	5	5	2	0	0	0
	60 to < 65	2	2	2	0	0	0
	55 to < 60	2	2	2	0	0	0
	50 to < 55	2	2	2	0	0	0
	45 to < 50	2	2	2	1	1	0
	40 to < 45	2	2	2	3	3	2
	35 to < 40	2	2	3	6	6	6
	30 to < 35	3	2	3	5	5	6
	25 to < 30	3	3	3	6	6	6
	20 to < 25	4	4	5	9	7	7
	15 to < 20	6	6	7	12	9	9
	10 to < 15	7	6	7	16	11	11
	5 to < 10	10	8	8	21	16	16
	0 to < 5	48	14	14	12	13	13

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2**TABLE 42 DETAILED CONTOUR ANALYSIS RESULTS WITHIN THE SFRA - NPS PREFERRED ALTERNATIVE (OFF-PEAK SEASON) FOR THE TEN-YEAR FORECAST**

Results Within the SFRA		%TAUD			L _{Aeq12} (dBA)		
		All Aircraft Below 18,000 ft MSL and Within the SFRA	Air-tour and Air-tour Related	Commercial Air-tours	All Aircraft Below 18,000 ft MSL and Within the SFRA	Air-tour and Air-tour Related	Commercial Air-tours
	>= 65	N/A	N/A	N/A	0	0	0
	60 to < 65	N/A	N/A	N/A	0	0	0
	55 to < 60	N/A	N/A	N/A	0	0	0
	50 to < 55	N/A	N/A	N/A	0	0	0
	45 to < 50	N/A	N/A	N/A	1	1	1
	40 to < 45	N/A	N/A	N/A	4	3	3
	35 to < 40	N/A	N/A	N/A	6	6	6
	30 to < 35	N/A	N/A	N/A	7	7	7
	25 to < 30	N/A	N/A	N/A	7	7	7
	20 to < 25	N/A	N/A	N/A	9	7	7
	15 to < 20	N/A	N/A	N/A	13	9	9
	10 to < 15	N/A	N/A	N/A	15	11	11
	5 to < 10	N/A	N/A	N/A	18	15	15
	0 to < 5	N/A	N/A	N/A	13	13	13

Cumulative Effects Noise Maps

Cumulative noise and soundscape analysis evaluates past, present, and reasonably foreseeable future activities that have, or could, contribute additional sound in GCNP and areas outside park boundaries, but within the SFRA. Sound sources from some past activities were only temporary in nature (e.g., noise associated with construction projects); therefore, they currently do not contribute to cumulative impacts. Future contributions to the sound environment in the Study Area are expected to be construction and restoration activities that may result in short-term direct adverse impacts. Other sources of sound, such as sound from highway traffic, motorized boats, aircraft activity, and facilities at GCNP may increase over time with increased human use.

Note that this analysis was limited to aircraft activity only. The analyses performed were

- Cumulative Percent Time Audible (%TAUD)

Note: The results presented in this section should not be confused with the results presented for %TAUD in figures and tables above, which provide a measure of audibility of aircraft below 18,000 feet MSL and within the SFRA by themselves

- Determine %TAUD contributions from 1) all aircraft operations below 18,000 feet MSL and outside the SFRA; and 2) all aircraft operations 18,000 feet MSL and above; and 3) computing a cumulative %TAUD due to all aircraft noise within the Study Area

- Cumulative Equivalent (Average) Sound Level (L_{Aeq12})

Note: The results presented in this section should not be confused with results presented for L_{Aeq12} in figures and tables above, which provide a measure of sound levels emitted by aircraft below 18,000 feet MSL and within the SFRA by themselves.

- Determine L_{Aeq12} contributions from 1) all aircraft operations below 18,000 feet MSL and outside the SFRA; and 2) all aircraft operations 18,000 feet MSL and above; and 3) compare natural ambient and dual-zone ambient to existing ambient with all aircraft for all Alternatives. This was performed by computing a cumulative L_{Aeq12} by logarithmically adding the dual-zone ambient to the L_{Aeq12} due to all aircraft noise within the Study Area

To forecast future airspace activity through the planning time frame (ten years), multiple years were analyzed (2005 and 2015, Base Year and Ten-Year Forecast) as part of all Alternatives and scenarios (page 6 and Tables 1 and 2).

Noise contour maps and tabular data used to support the cumulative analysis in Chapter 4, Soundscape are provided. Maps are organized by Alternative and then by metric. A noise contour is a color gradient plot that presents equal levels of noise exposure. Contour figures present flight tracks and key GCNP features. In the legend, each color in the contour represents a different range and what percent of park area each range covers. For example, the 5 to < 10 range in a %TAUD contour indicates area of the park with audible events that occur at least 5%, but less than 10% of the time; in an L_{Aeq12} contour, this indicates the area of the park where the L_{Aeq12} is at least 5 dBA, but less than 10 dBA.¹³

Because limited ambient data were available outside GCNP, contours for %TAUD were computed only within GCNP boundaries; L_{Aeq12} contours were computed within the entire SFRA. Within GCNP boundaries, contours were further analyzed by three GCNP Management Zones: Developed, Non-Wilderness, and Wilderness. Zones and their definitions do not change by Alternative, although the impact assessment may differ between Zones.

¹³ Blank areas in a contour indicate noise exposure was not audible for %TAUD or below 0 dBA for L_{Aeq12} metrics. Thus, figure legends and tabular columns showing percent park area do not always sum to 100%

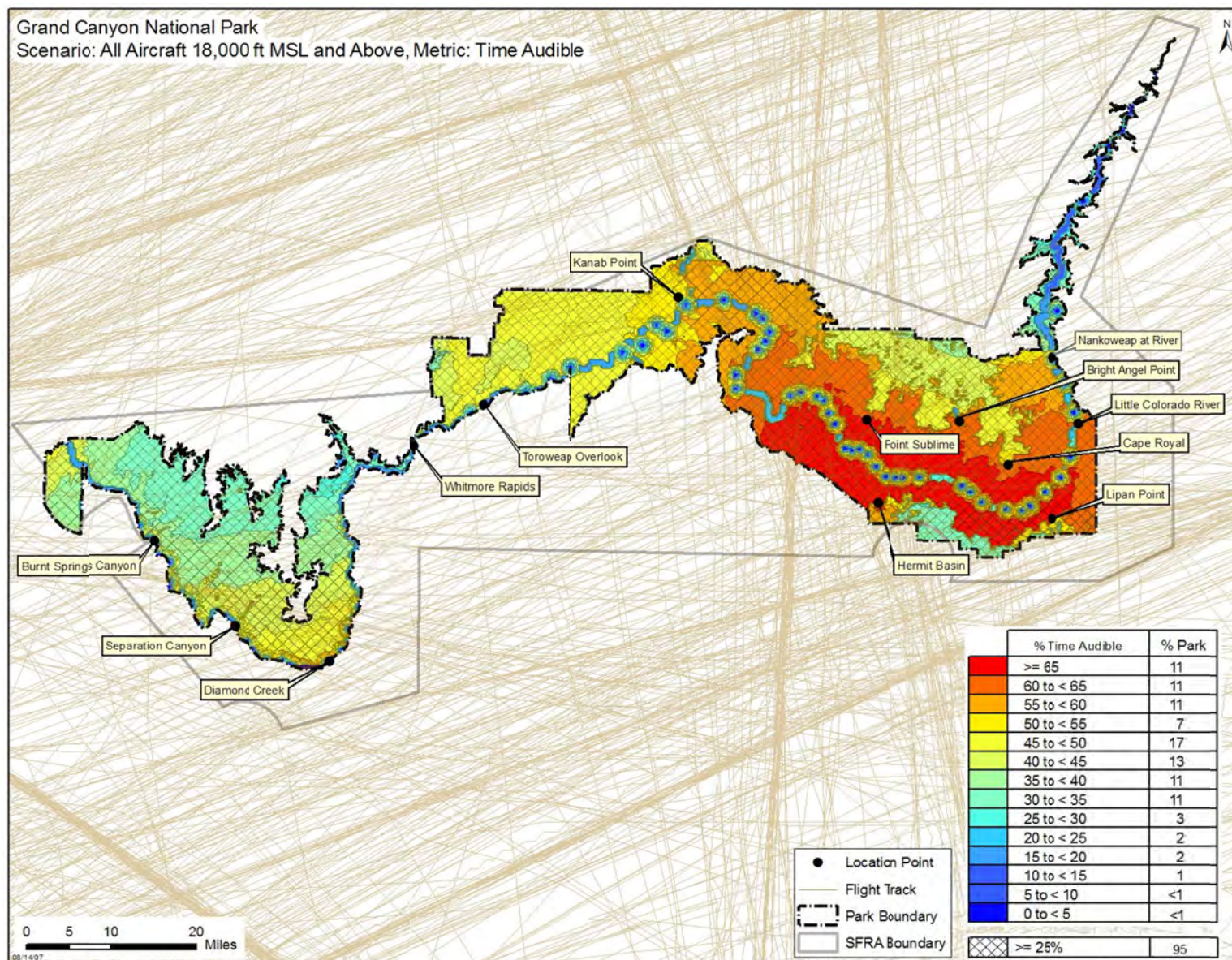


FIGURE 87 COMMON TO ALL ALTERNATIVES - %TAUD CONTOURS – ALL AIRCRAFT 18,000 FT MSL AND ABOVE

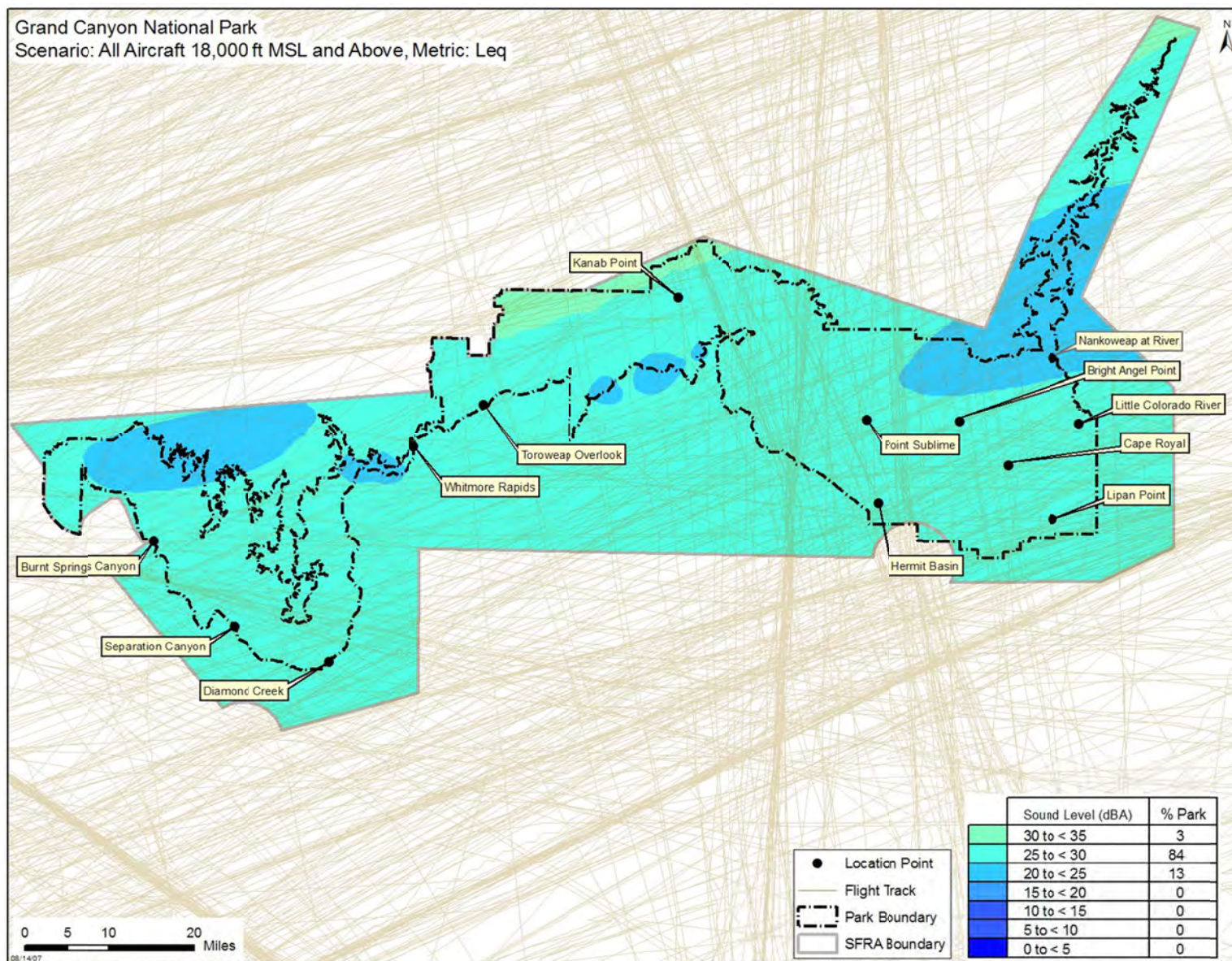


FIGURE 88 COMMON TO ALL ALTERNATIVES - L_{AEQ12} CONTOURS – ALL AIRCRAFT 18,000 FT MSL AND ABOVE

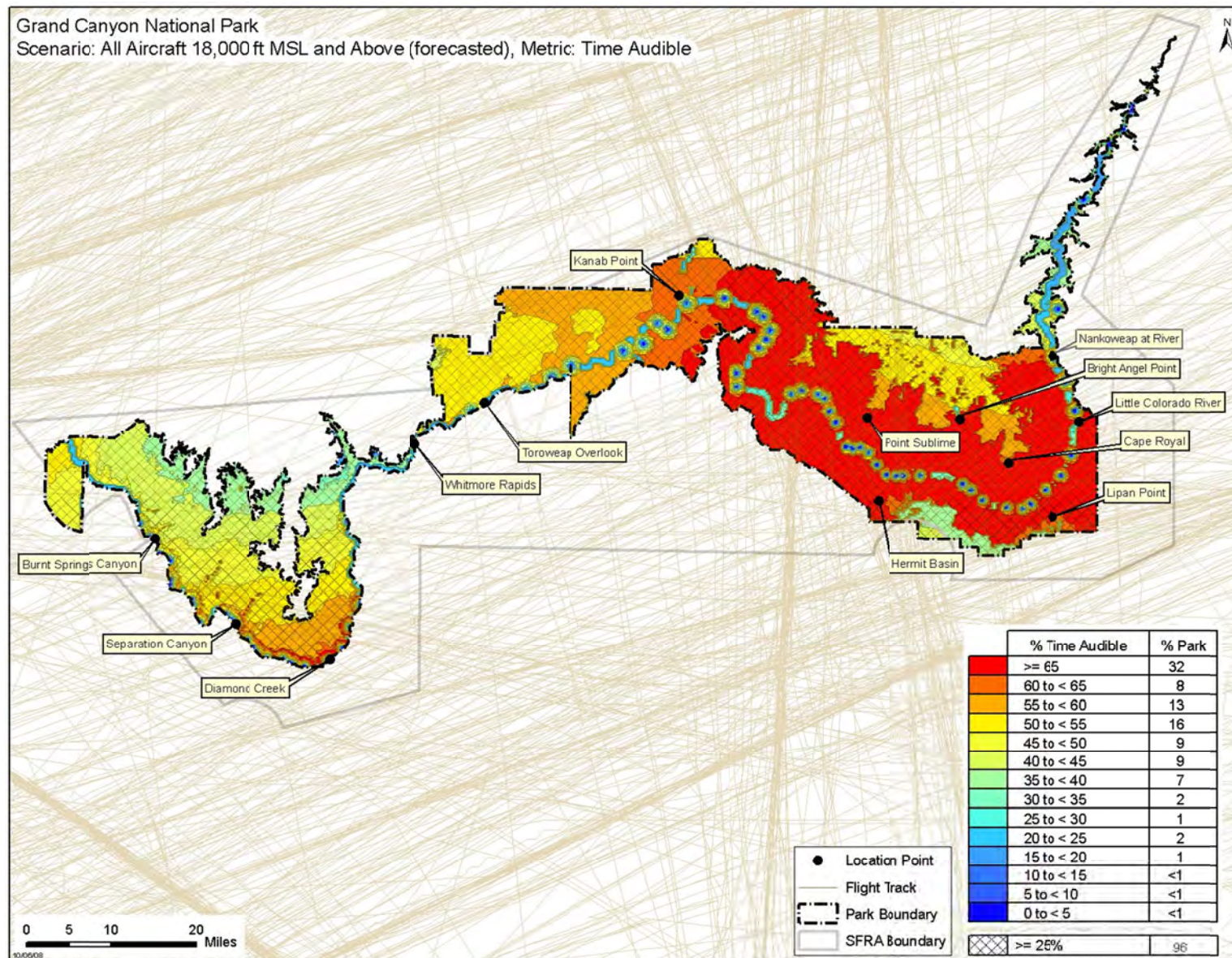


FIGURE 89 COMMON TO ALL ALTERNATIVES (TEN-YEAR FORECASTED) - %TAUD CONTOURS – ALL AIRCRAFT 18,000 FT MSL AND ABOVE

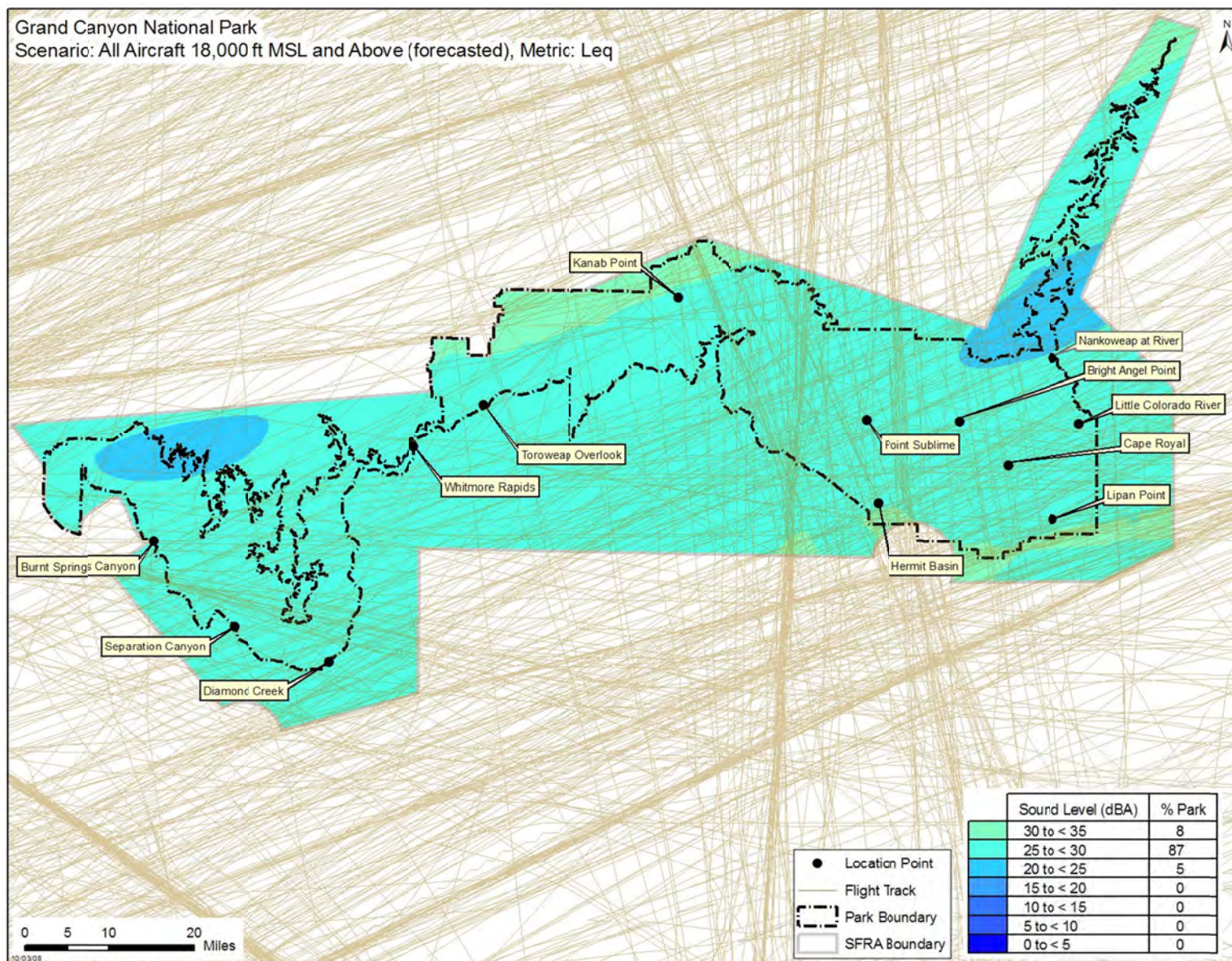


FIGURE 90 COMMON TO ALL ALTERNATIVES (TEN-YEAR FORECASTED) - L_{AEQ12} CONTOURS – ALL AIRCRAFT 18,000 FT MSL AND ABOVE

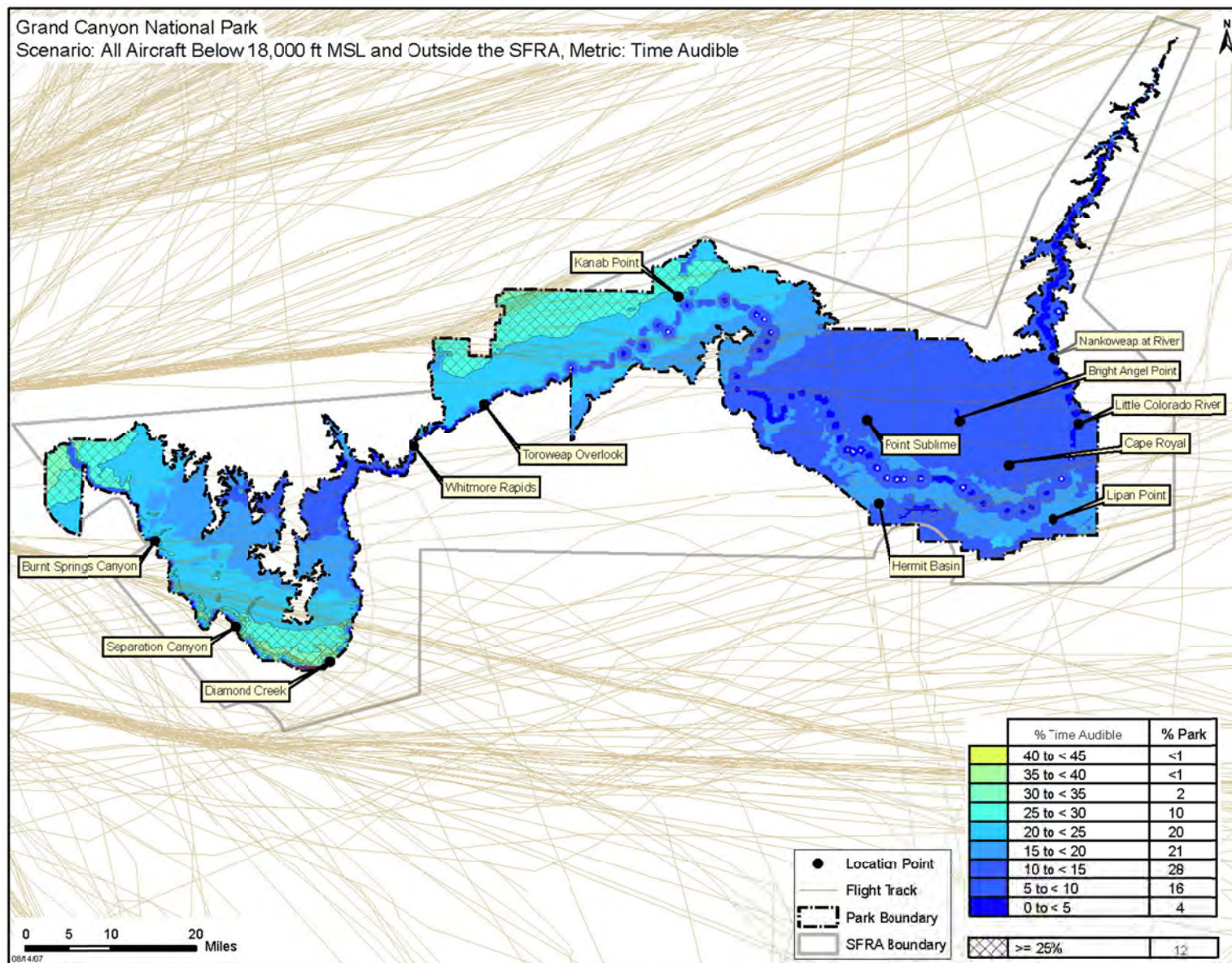


FIGURE 91 COMMON TO ALL ALTERNATIVES - %TAUD CONTOURS – ALL AIRCRAFT BELOW 18,000 FT MSL AND OUTSIDE THE SFRA

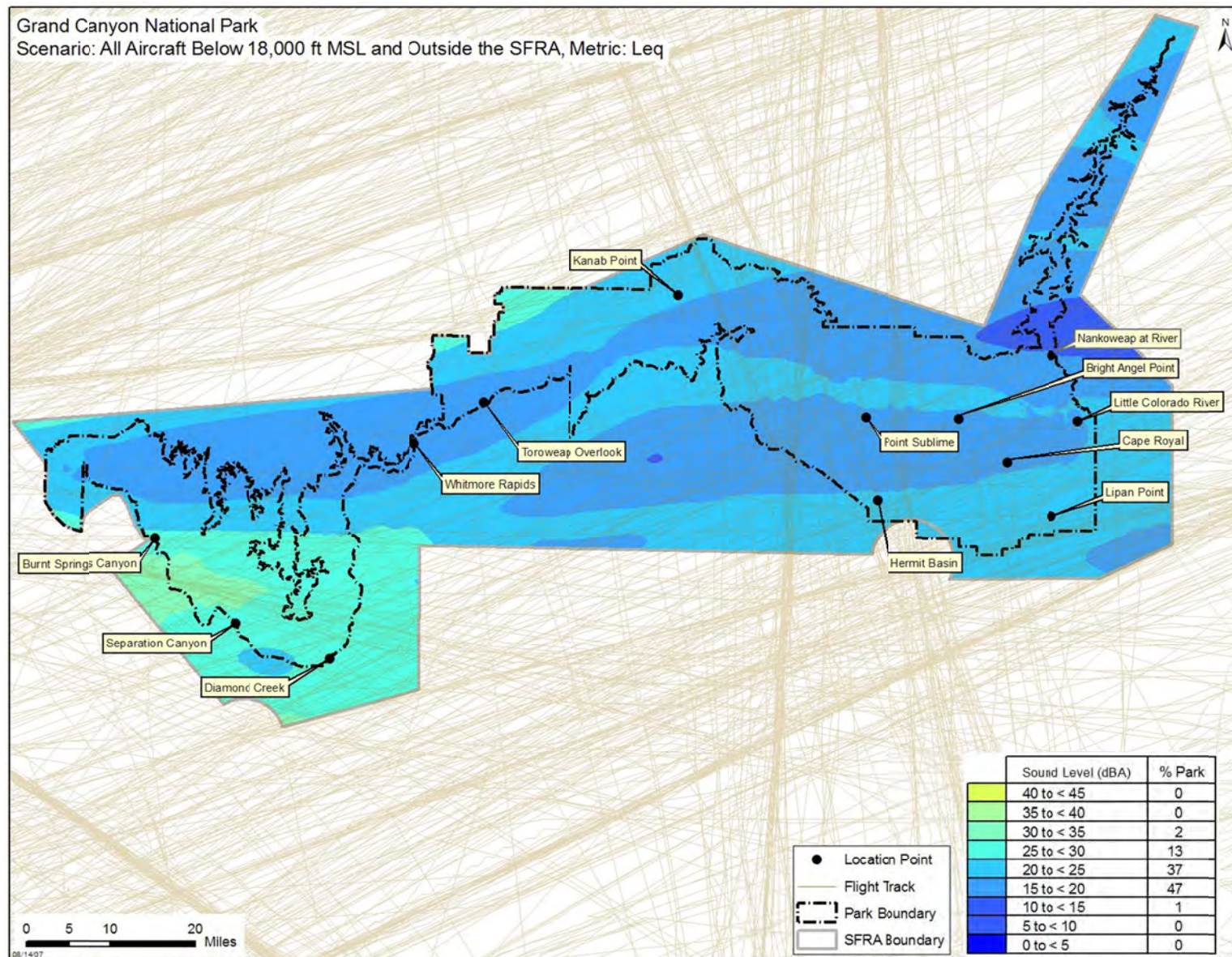


FIGURE 92 COMMON TO ALL ALTERNATIVES – L_{Aeq12} CONTOURS – ALL AIRCRAFT BELOW 18,000 FT MSL AND OUTSIDE THE SFRA

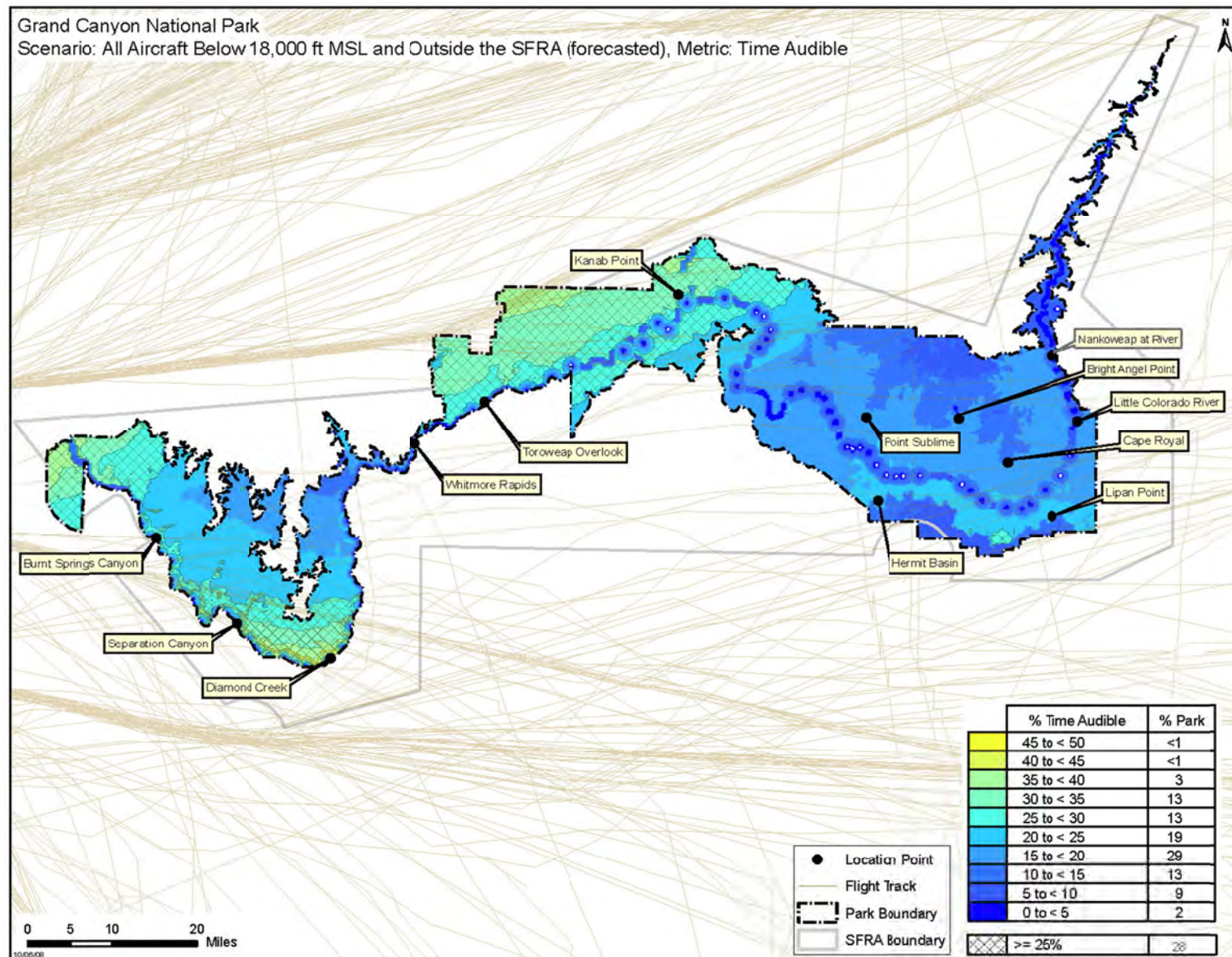


FIGURE 93 COMMON TO ALL ALTERNATIVES (TEN-YEAR FORECASTED) - %TAUD CONTOURS – ALL AIRCRAFT BELOW 18,000 FT MSL AND OUTSIDE THE SFRA

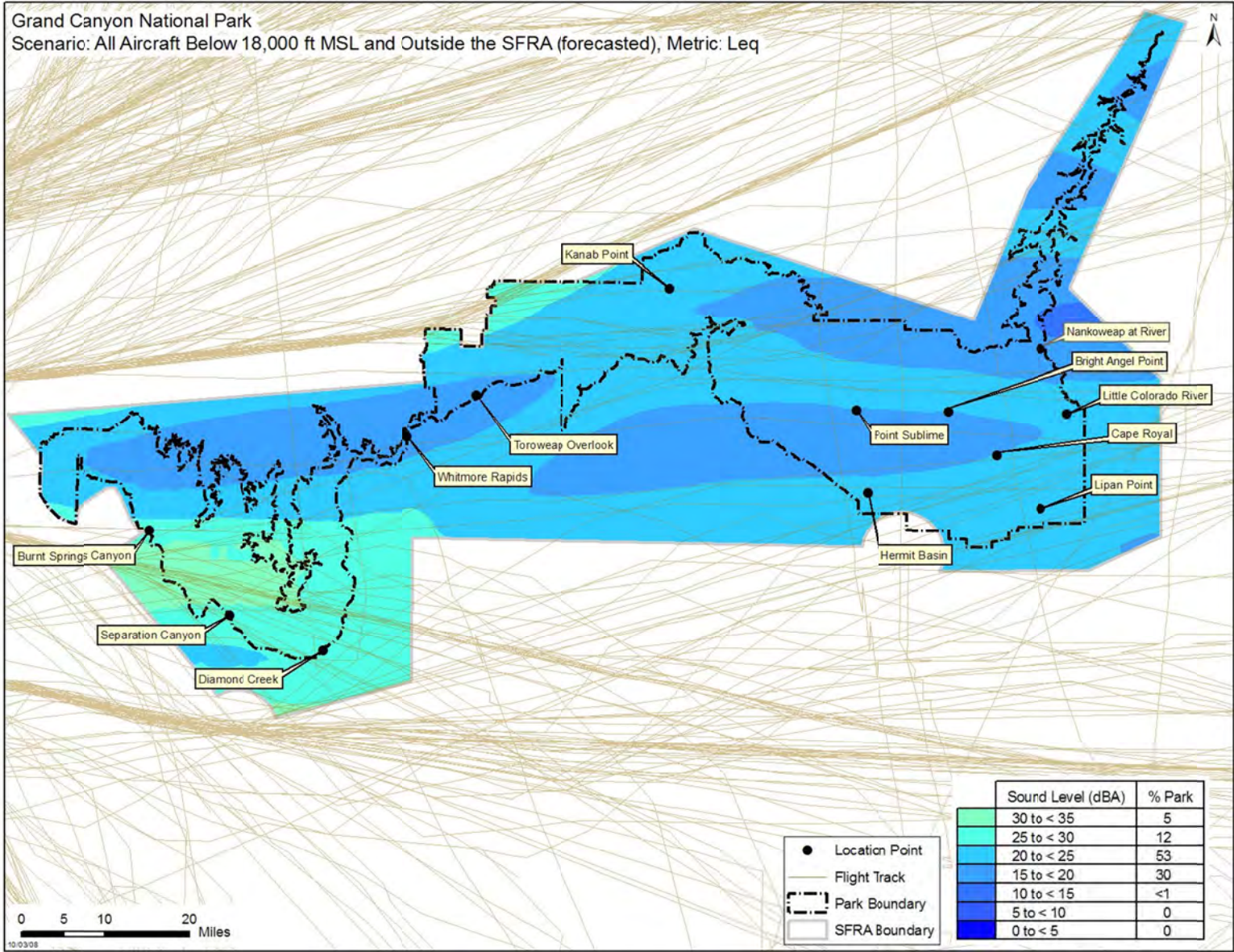


FIGURE 94 COMMON TO ALL ALTERNATIVES (TEN-YEAR FORECASTED) – L_{AEQ12} CONTOURS – ALL AIRCRAFT BELOW 18,000 FT MSL AND OUTSIDE THE SFRA

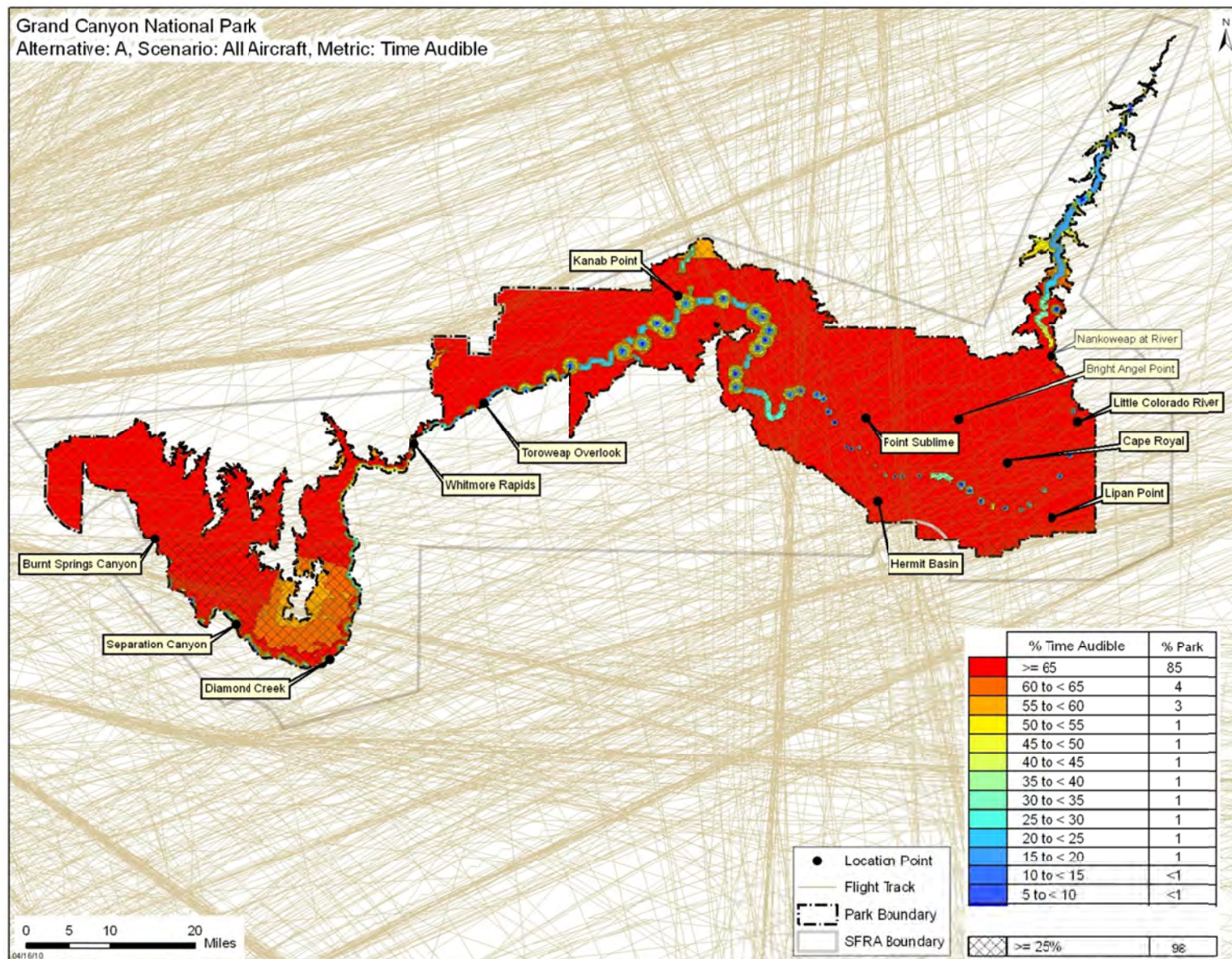


FIGURE 95 ALTERNATIVE A – CUMULATIVE %TAUD CONTOURS – ALL AIRCRAFT

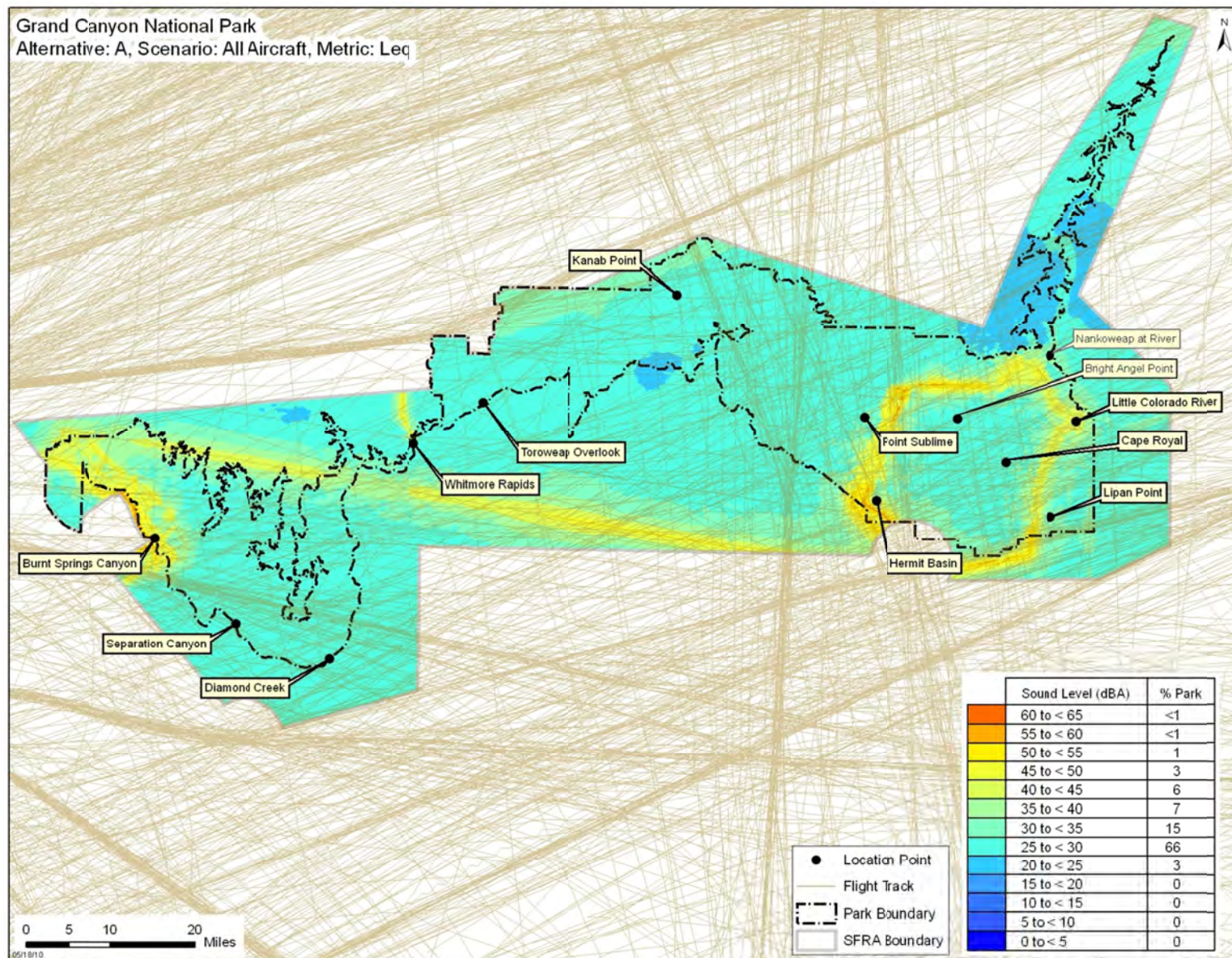


FIGURE 96 ALTERNATIVE A – CUMULATIVE L_{AEQ12} CONTOURS – ALL AIRCRAFT

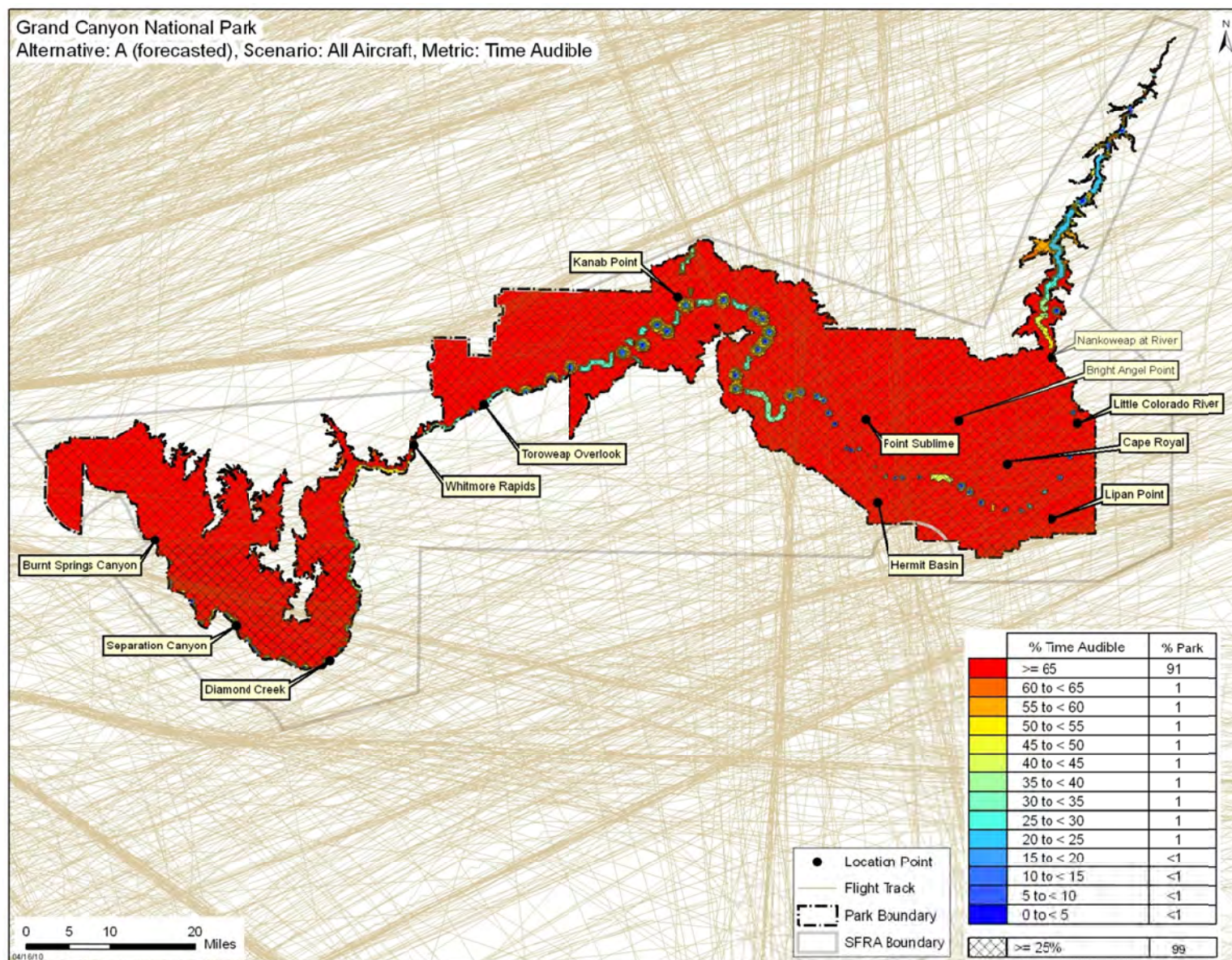


FIGURE 97 ALTERNATIVE A (TEN-YEAR FORECASTED) – CUMULATIVE %TAUD CONTOURS – ALL AIRCRAFT

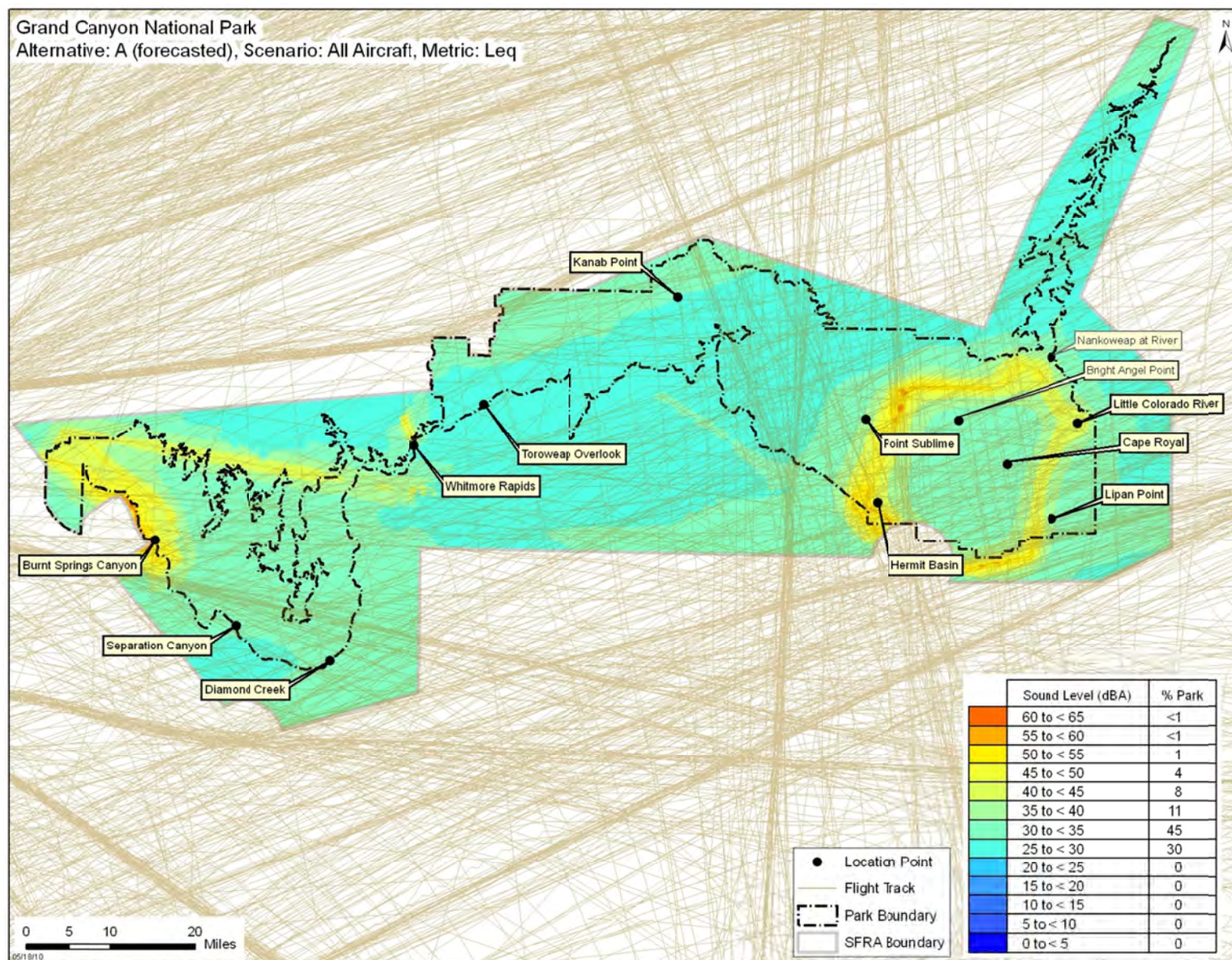


FIGURE 98 ALTERNATIVE A (TEN-YEAR FORECASTED) – CUMULATIVE L_{AEQ12} CONTOURS – ALL AIRCRAFT

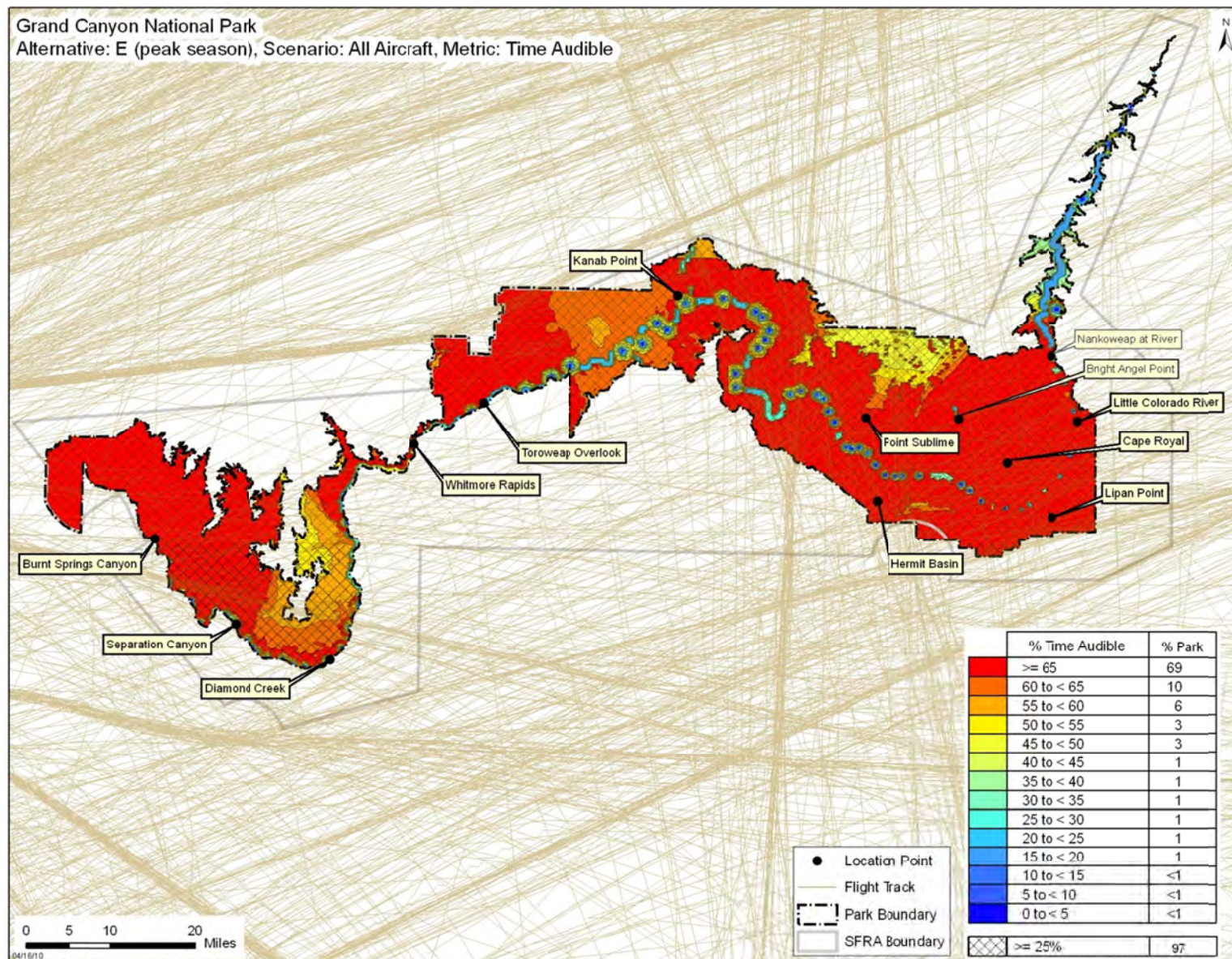


FIGURE 99 ALTERNATIVE E (PEAK SEASON) – CUMULATIVE %TAUD CONTOURS – ALL AIRCRAFT

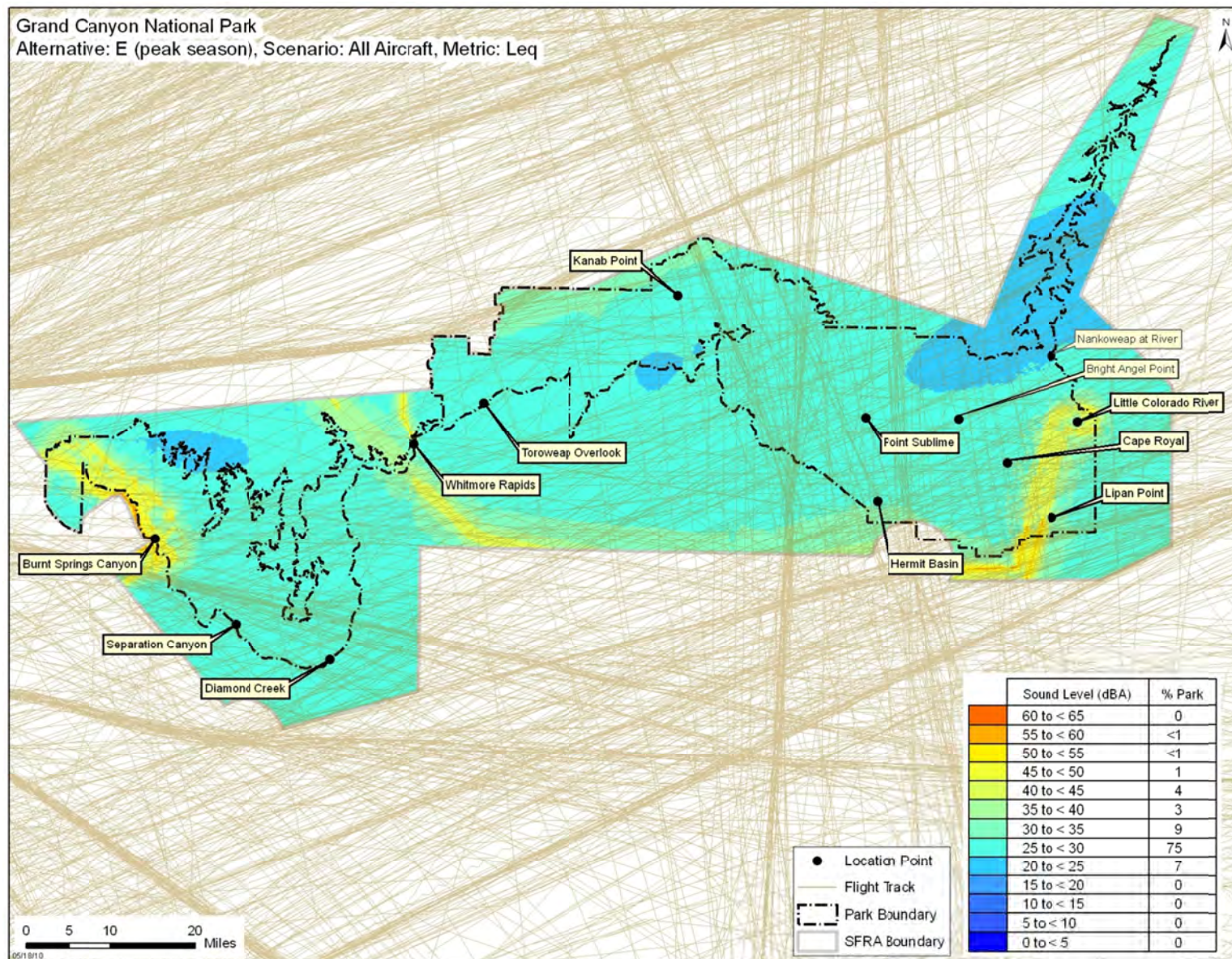


FIGURE 100 ALTERNATIVE E (PEAK SEASON) – CUMULATIVE L_{AEQ12} CONTOURS – ALL AIRCRAFT

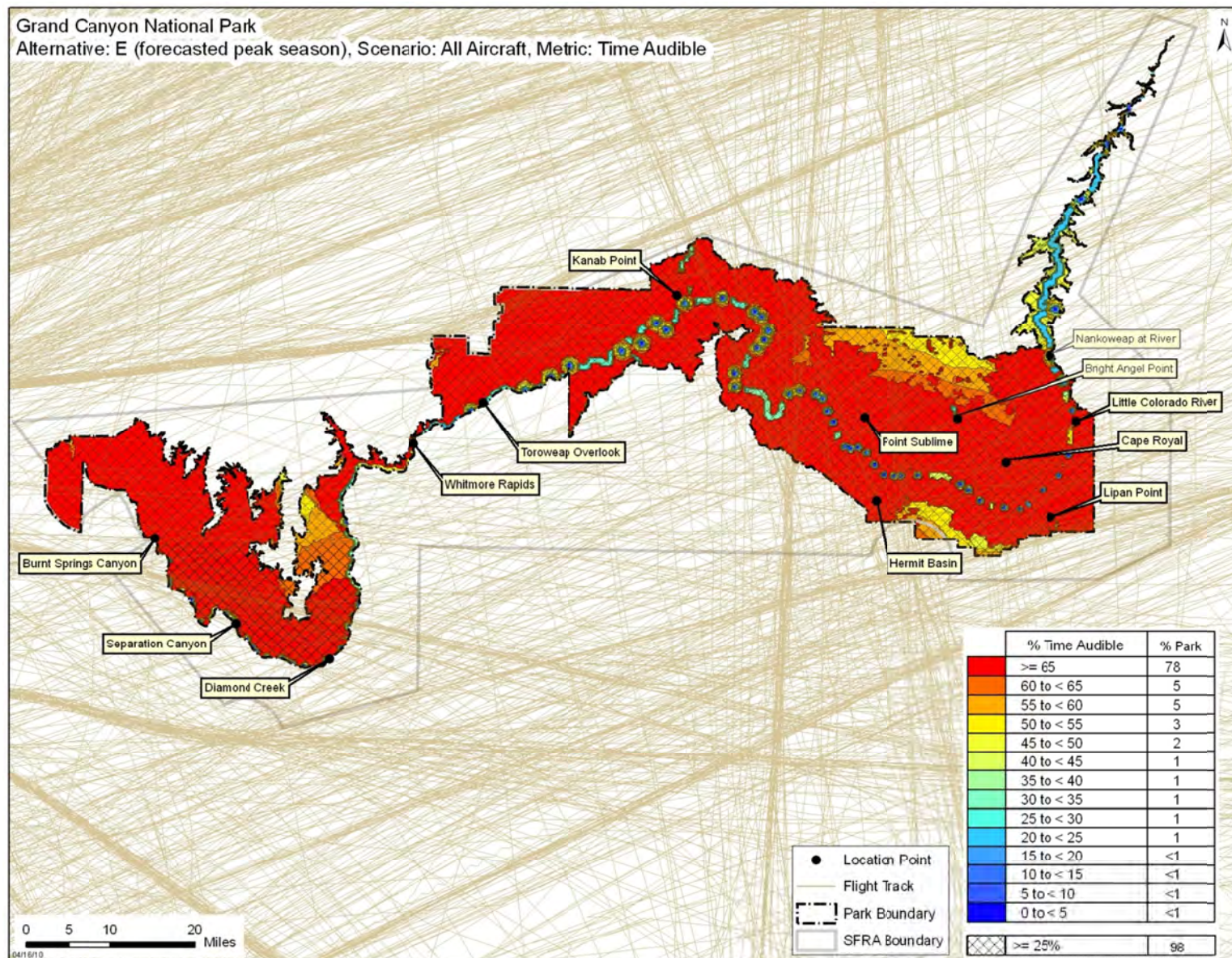


FIGURE 101 ALTERNATIVE E (TEN-YEAR FORECASTED PEAK SEASON) – CUMULATIVE %TAUD CONTOURS – ALL AIRCRAFT

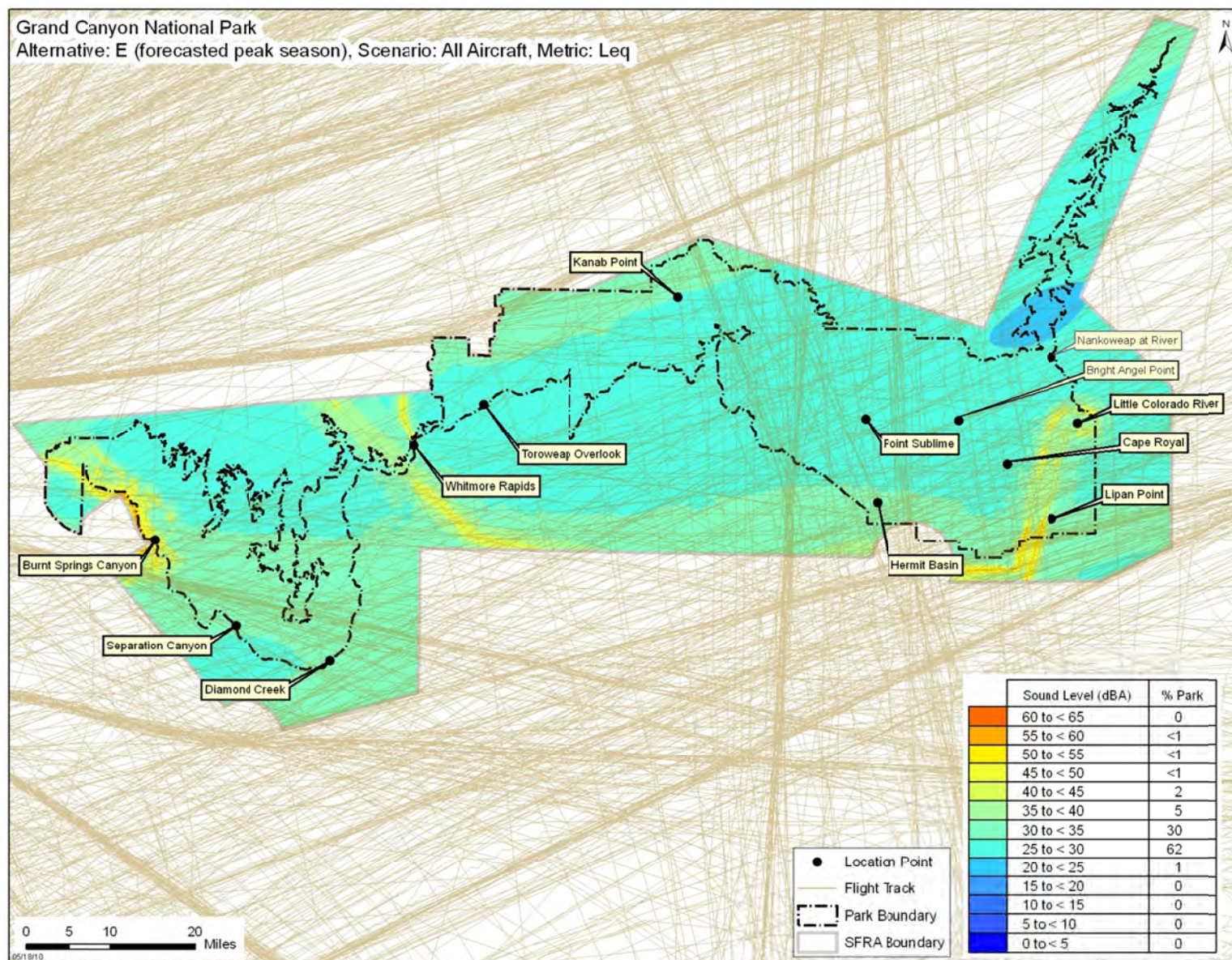


FIGURE 102 ALTERNATIVE E (TEN-YEAR FORECASTED PEAK SEASON) – CUMULATIVE L_{AEQ12} CONTOURS – ALL AIRCRAFT

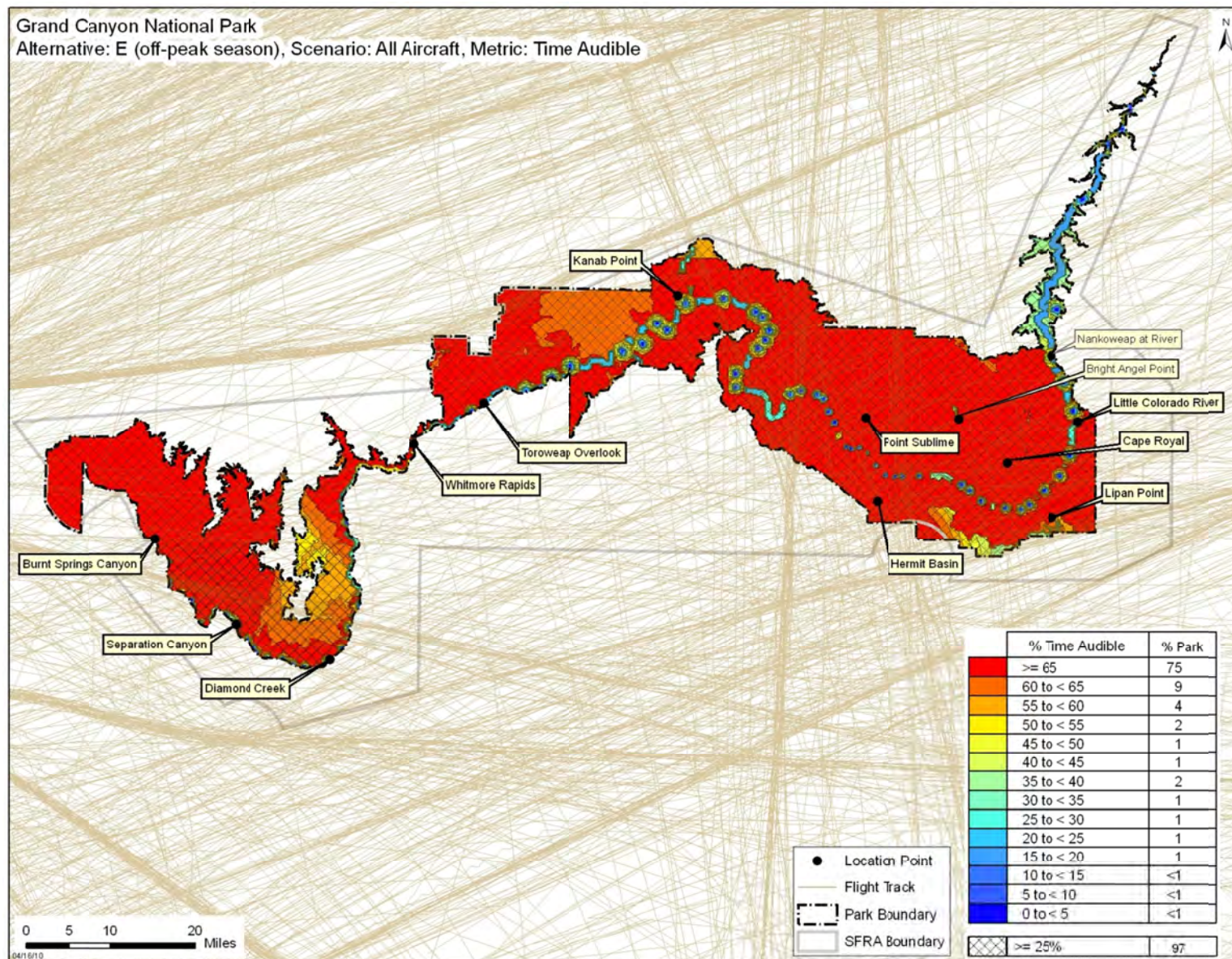


FIGURE 103 ALTERNATIVE E (OFF-PEAK SEASON) – CUMULATIVE %TAUD CONTOURS – ALL AIRCRAFT

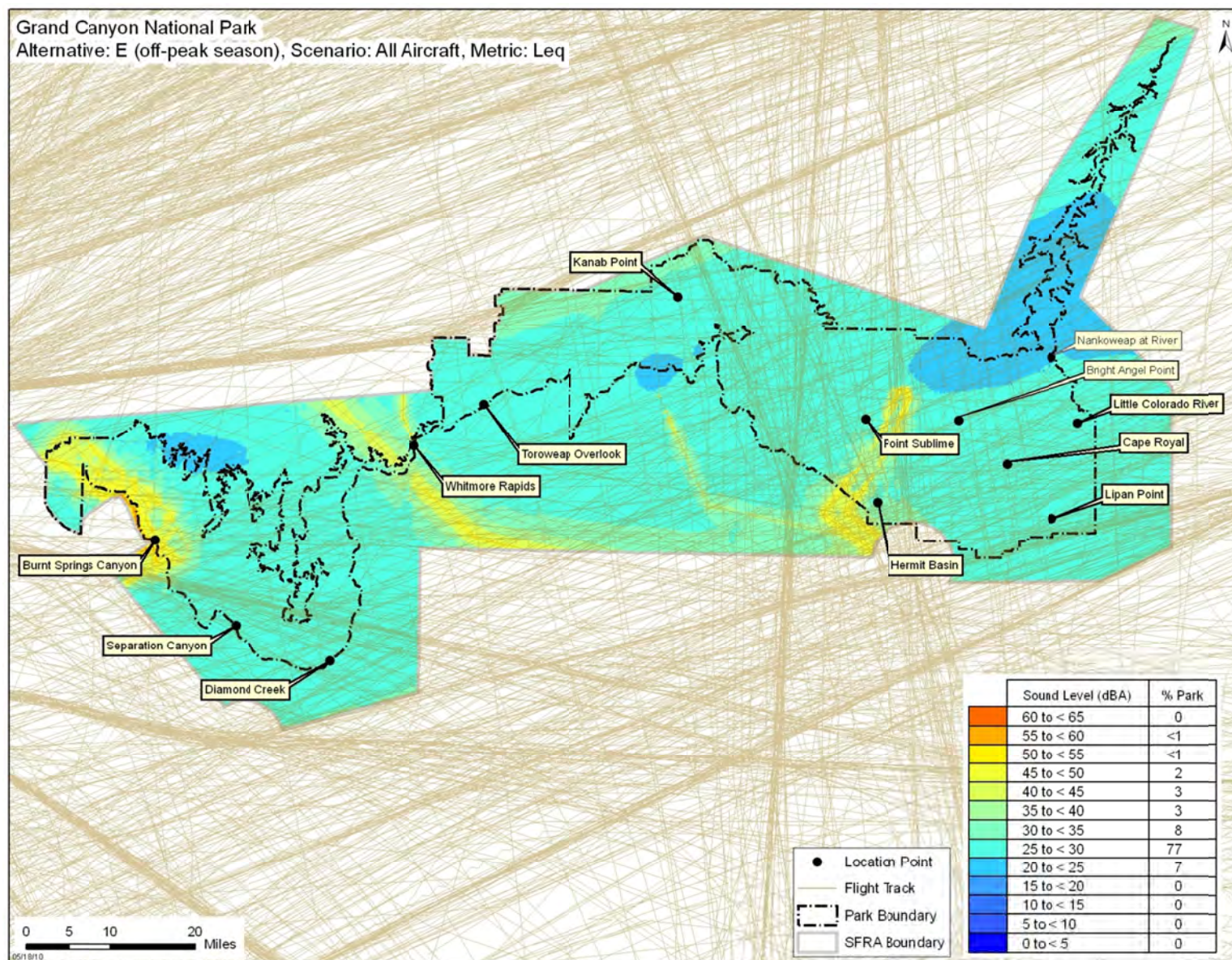


FIGURE 104 ALTERNATIVE E (OFF-PEAK SEASON) – CUMULATIVE L_{AEQ12} CONTOURS – ALL AIRCRAFT

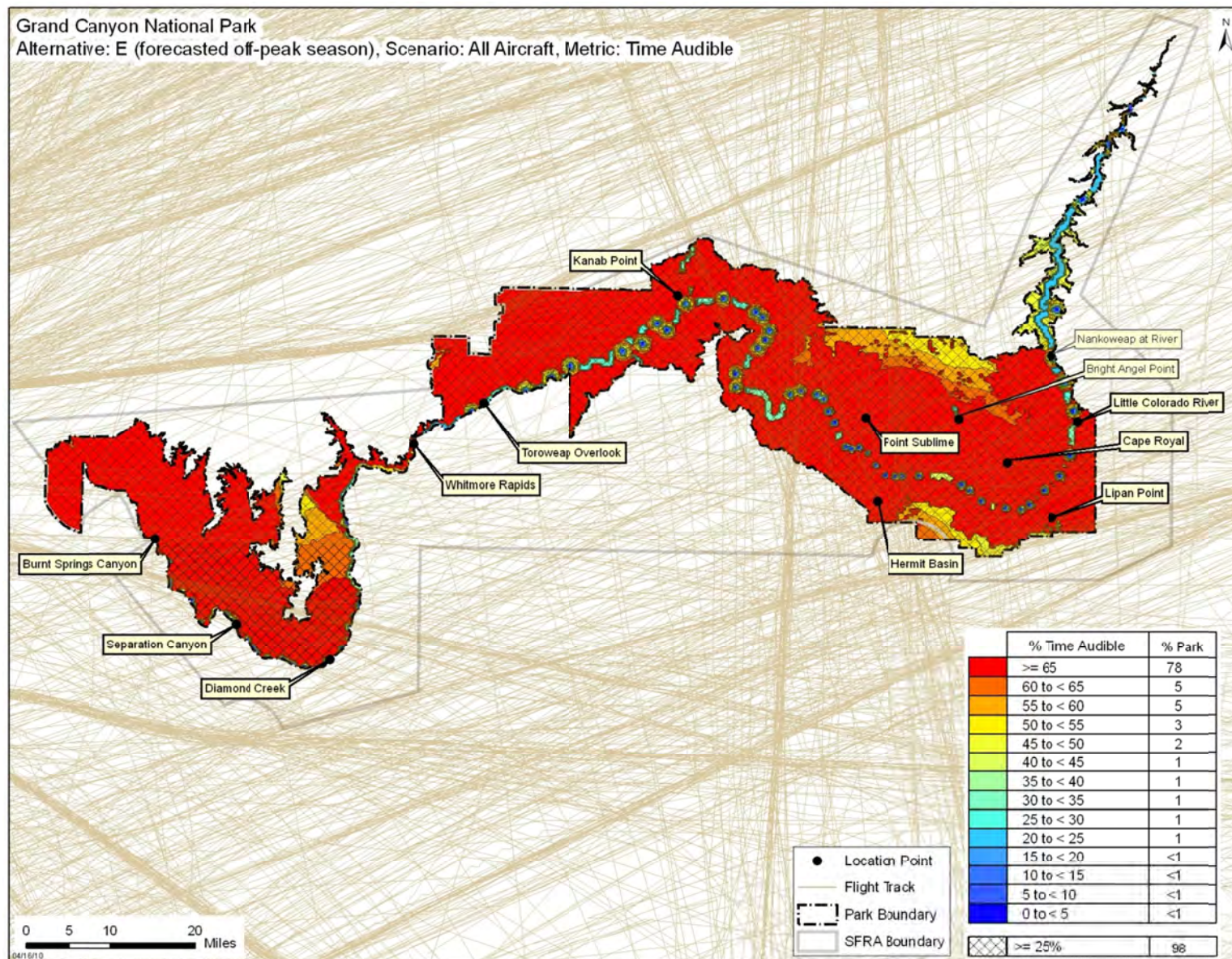


FIGURE 105 ALTERNATIVE E (TEN-YEAR FORECASTED OFF-PEAK SEASON) – CUMULATIVE %TAUD CONTOURS – ALL AIRCRAFT

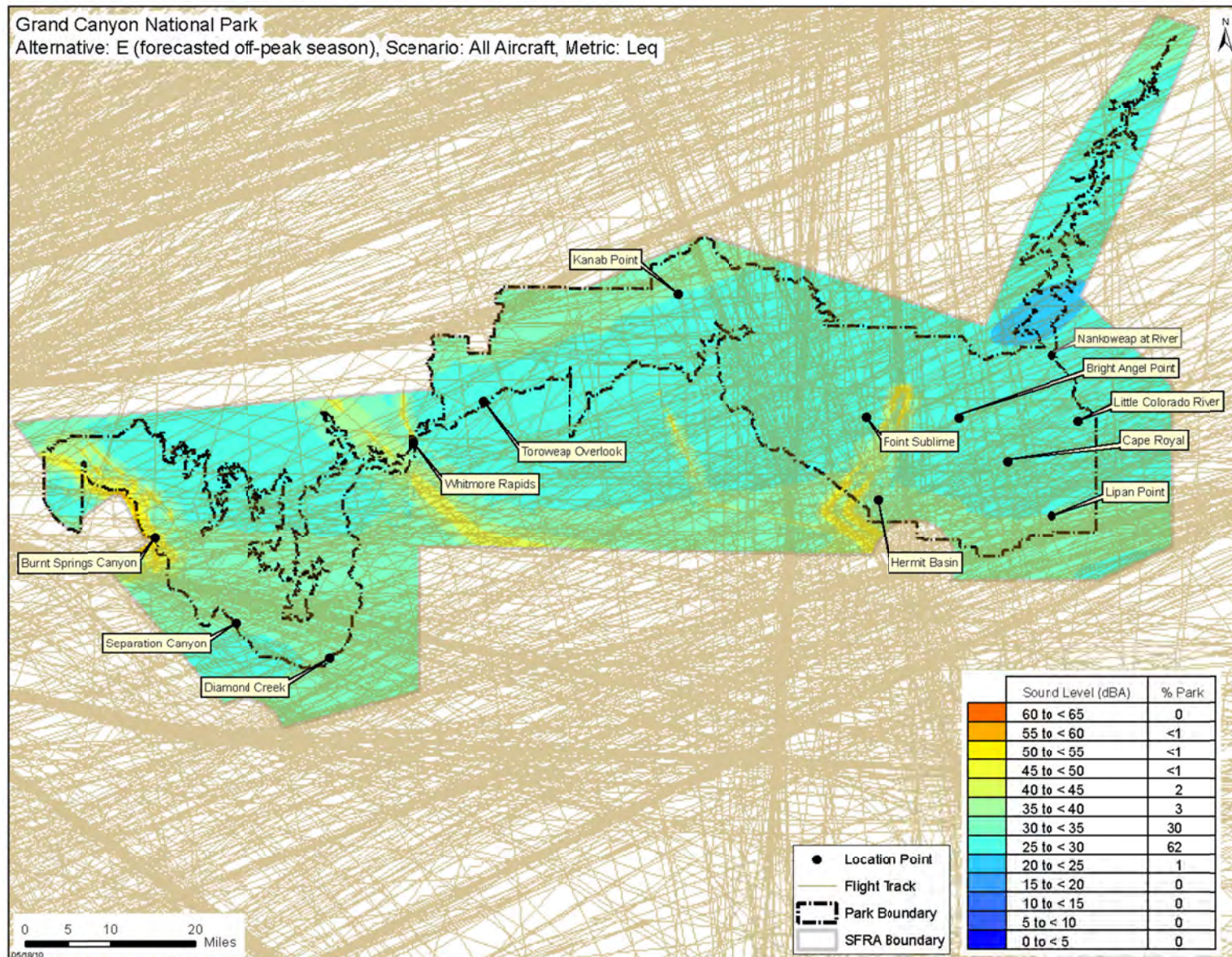


FIGURE 106 ALTERNATIVE E (TEN-YEAR FORECASTED OFF-PEAK SEASON) – CUMULATIVE L_{AEQ12} CONTOURS – ALL AIRCRAFT

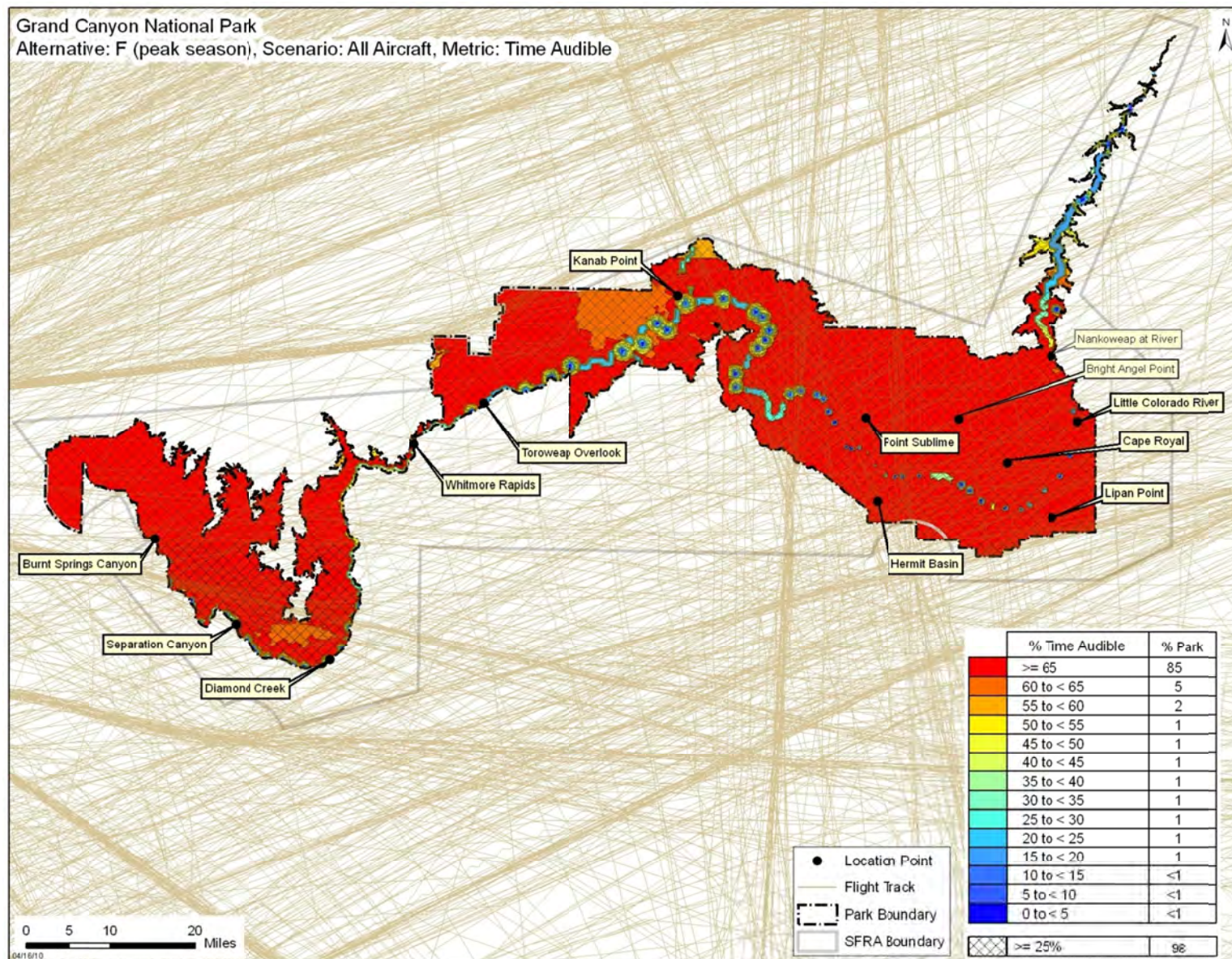


FIGURE 107 ALTERNATIVE F (PEAK SEASON) – CUMULATIVE %TAUD CONTOURS – ALL AIRCRAFT

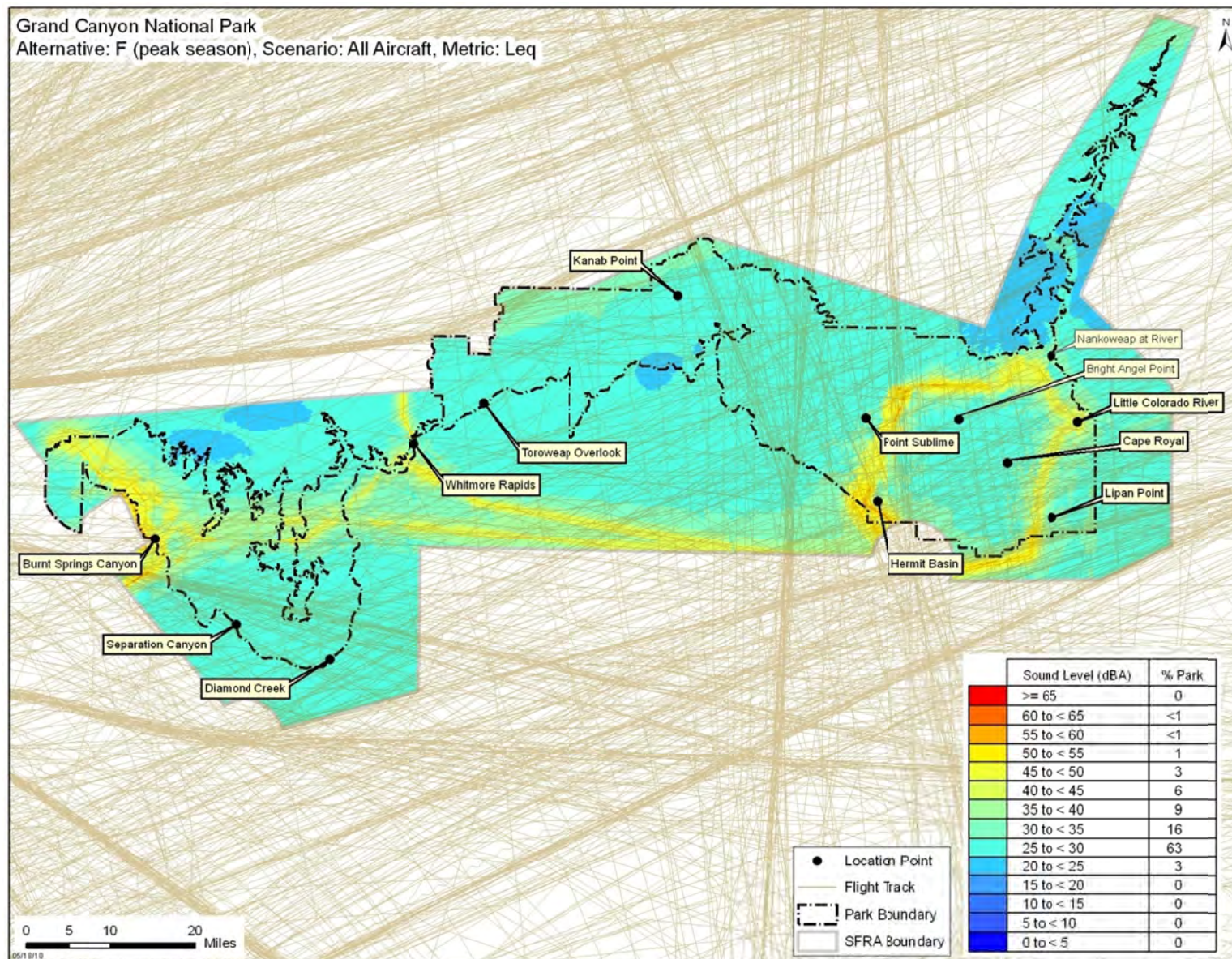


FIGURE 108 ALTERNATIVE F (PEAK SEASON) – CUMULATIVE L_{AEQ12} CONTOURS – ALL AIRCRAFT

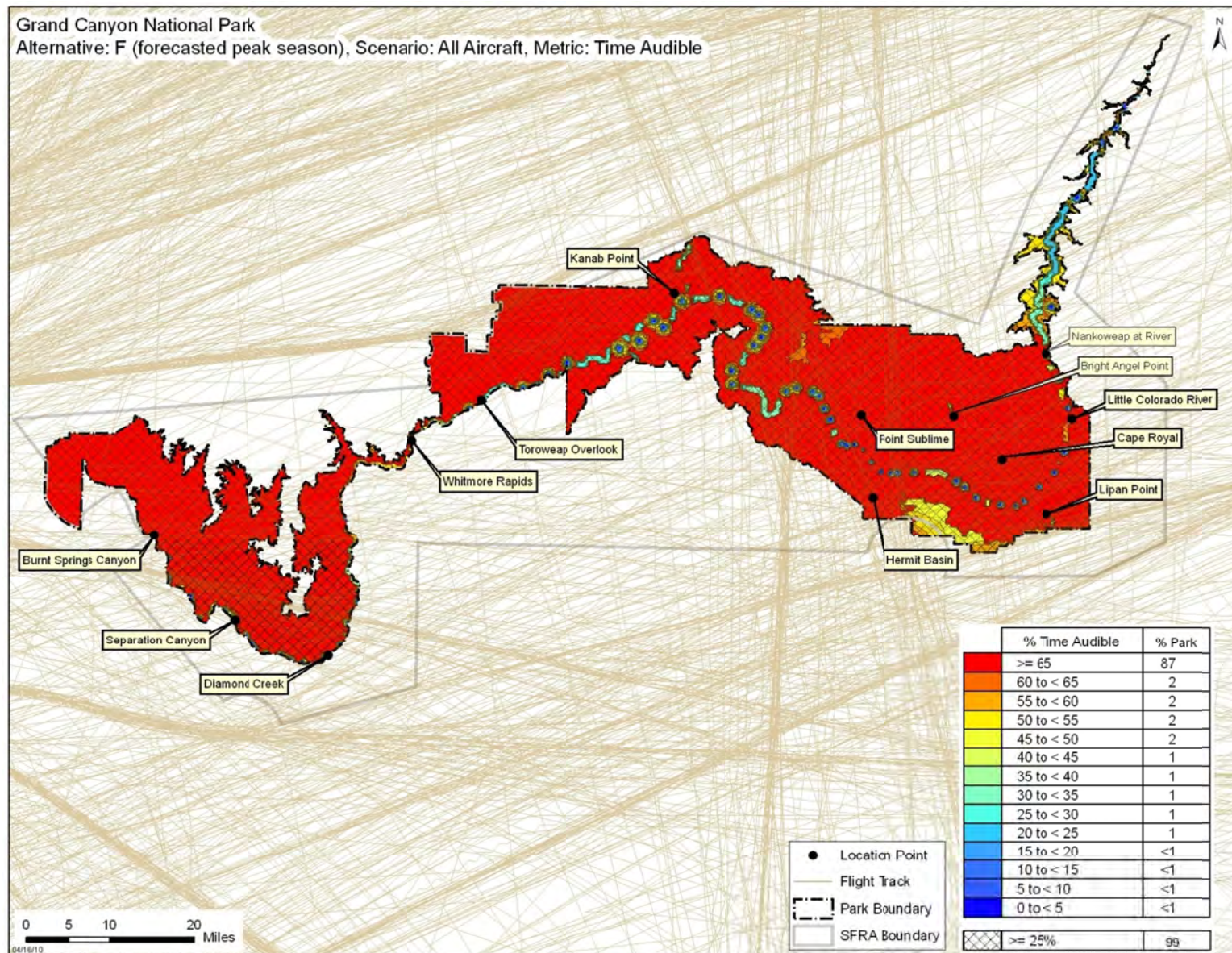


FIGURE 109 ALTERNATIVE F (TEN-YEAR FORECASTED PEAK SEASON) – CUMULATIVE %TAUD CONTOURS – ALL AIRCRAFT