

1 **CHAPTER 5 CONSULTATION AND COORDINATION**

3 **INTRODUCTION**

5 Chapter 5 describes consultation and coordination during preparation of this EIS. Consultation, coordination, and
6 public involvement are integral in identifying relevant issues and concerns and to ensure issues are addressed.
7 Formulation of issues was achieved through public meetings and workshops, agency meetings, individual contacts,
8 news releases, and Federal Register notices.

10 **PUBLIC SCOPING**

12 Public scoping is part of the National Environmental Policy Act (40 CFR 1501.7) requirements for preparing an
13 environmental impact statement. Scoping helps determine the range of issues and opportunities considered in
14 developing Alternatives and assessing environmental effects. The scoping process must be open to the public and
15 include state, local, and tribal governments and affected Federal agencies. According to NPS Director's Order 12,
16 Conservation Planning, Environmental Impact Analysis and Decision Making, scoping objectives are

- 17 • Involve as many interested parties as possible in the environmental review process
- 18 • Provide clear, easily understood, factual information to potentially affected parties
- 19 • Provide meaningful and timely opportunities for public input
- 20 • Identify, consider, and evaluate issues raised by interested parties to prepare the plan and EIS
- 21 • Identify, and eliminate from detailed study, insignificant issues
- 22 • Consider public comments throughout the decision-making and review process

24 The process used during public scoping, consultation, and coordination for this EIS is described below.

26 On January 25, 2006, NPS and FAA published a Notice of Intent to Prepare an Environmental Impact Statement
27 (EIS) for Actions to Substantially Restore Natural Quiet to Grand Canyon National Park and Public Scoping” in the
28 Federal Register (71 FR 4192).

30 During the ensuing 90-day public scoping period NPS and FAA mailed scoping letters and held three public scoping
31 meetings (details below). The purpose of the letter and meetings was to provide information on the project and
32 solicit public input on issues to be addressed in this EIS. Public scoping ended April 27, 2006.

34 Written responses to the scoping letter and comments from public meetings helped identify issues and concerns, a
35 suitable range of Alternatives, and environmental impacts to address in this EIS.

37 **Public Input to the Planning Process**

38 A public scoping letter dated January 25, 2006, was mailed to members of the public identified by the NPS as those
39 who normally receive notification of park NEPA actions. Federal, state, and local governmental agencies, affiliated
40 American Indian Tribes, and air-tour operators in the region also received the scoping letter.

42 A similar notice was then published in three Arizona and one Nevada newspaper February 3, 2006 to February 8,
43 2006. A news release was emailed on January 25, 2006, to an NPS list of media contacts. The same media contacts
44 were emailed a calendar announcement approximately one month later.

46 During the scoping period the NPS and FAA invited the public, agencies, and other interested parties to provide
47 comments, suggestions, and input regarding but not limited to

- 48 • The scope, issues, and concerns related to development of proposed and Alternative actions at GCNP that
49 provide for Substantial Restoration of Natural Quiet and experience of the park and protection of public health
50 and safety from significant adverse effects associated with all aircraft overflights
- 51 • Past, present, and reasonably foreseeable future actions which, when considered with any Alternatives, may
52 result in significant cumulative impacts
- 53 • Potential Alternatives

1 Comments were received in the following formats

- 2 • Oral comments to a stenographer during open house meetings
- 3 • Comments written on flip charts during open house meetings
- 4 • Comments submitted via the Docket Management System of the U.S. Department of Transportation
- 5 • Written comments accepted via comment card and email

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7 A total 1,267 responses were received from individuals, organizations, and other interested parties. These comments
8 addressed the scope, issues, and concerns related to the EIS including substantial restoration of natural quiet, visitor
9 experiences, and protection of public health and safety in GCNP. Appendix C contains a summary of comments
10 received.

11 **Public Scoping Meetings**

12 NPS and FAA organized and managed a series of three scheduled public meetings, held on these dates and in these
13 communities

- 14 • February 21, 2006 Phoenix, AZ
- 15 • February 22, 2006 Flagstaff, AZ
- 16 • February 23, 2006 Las Vegas, NV

17
18 Meetings were structured as open houses. Information about the EIS process was presented through posters and
19 handouts. Attendees were invited to submit comments either in writing using a comment form or verbally via a
20 provided audio recorder.
21

22 **Review and Evaluation of Public Scoping Comments**

23 Members of the planning team read every submission, identified specific comments in each submission, and coded
24 them according to developed criteria. A coding structure was developed in a database to help sort comments as
25 substantive or nonsubstantive then separate them into general headings. CEQ regulations state that a Final EIS must
26 respond to all substantive comments on a Draft EIS. CEQ regulations and guidance do not define the term
27 substantive. National Park Service guidance⁵⁶ states a comment is considered substantive if it raises specific issues
28 or concerns regarding the project or the study process, but not if it merely expresses support for or opposition to the
29 project or a particular Alternative.
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Major issues raised during scoping

- Air-tour noise
- Natural resource impacts
- Wilderness impacts
- Economic impacts related to air tours
- Appropriate management and regulation
- Various management strategies for consideration in Alternatives
- Planning process concerns
- Ground-based visitor experience
- Air-tour visitor experience
- Cultural resource impacts
- Tribal concerns
- Air-tour safety

⁵⁶ National Park Service NEPA guidance states that substantive comments “(a) question, with reasonable basis, the accuracy of information in the EIS; (b) question, with reasonable basis, the adequacy of environmental analysis; (c) present reasonable Alternatives other than those presented in the EIS; [or] (d) cause changes or revisions in the proposal.” NPS guidance also states that “[c]omments in favor of or against the proposed action or Alternatives, or comments that only agree or disagree with NPS policy, are not considered substantive.” See NPS Director’s Order 12, Conservation Planning, Environmental Impact Analysis and Decision Making, Section 4.6, Environmental Impact Statements—The Final EIS (Jan. 8, 2001)

1 **Organizations and Agencies Consulted**

2 In addition to public scoping, during the NEPA decision-making processes Federal agencies are required to consult
3 with American Indian tribes and Federal and state agencies and entities due to jurisdictional responsibilities (40 CFR
4 1502.25).

6 **Tribal Consultations**

7 In keeping with provisions of NEPA, the National Historic Preservation Act, NPS Management Policies 2006,
8 Executive Memorandum on Government-to-Government Relations with Native American Tribal Governments;
9 Executive Orders 13007 and 13175; 512 Department of the Interior Manual 2; and Director's Order 71,
10 Relationships with American Indian Tribes, the following affiliated American Indian Tribes were consulted
11 regarding this EIS

- 12 • Havasupai Tribe
- 13 • Hopi Tribe
- 14 • Hualapai Tribe
- 15 • Kaibab Band of Paiute Indians
- 16 • Las Vegas Paiute Tribe
- 17 • Moapa Band of Paiute Indians
- 18 • Navajo Nation
- 19 • Paiute Indian Tribe of Utah
- 20 • Pueblo of Zuni
- 21 • San Juan Southern Paiute Tribe
- 22 • Yavapai-Apache Nation

23
24 Federal agencies routinely consult with tribal and other governments during NEPA and other processes. For
25 management of GCNP overflights, governmental discussions and consultations have been ongoing for many years.
26 Specific to this EIS process, the NPS and FAA issued a Consultation Plan in January 2006 outlining procedures for
27 establishing and maintaining government-to-government relationships among affiliated tribes and Federal agencies.
28 The plan stressed that consultation meetings would be scheduled to provide maximum opportunities for tribal input
29 and information sharing throughout all project phases. Opportunities were extended to all affiliated tribes and
30 Federal agencies to participate in the EIS process as cooperating agencies. The Navajo Nation and Bureau of Indian
31 Affairs expressed interest in cooperating agency status, and separate cooperating agency agreements were drafted
32 and went through several iterations of review and revision. However, the agreements were never finalized (Table
33 5.1).

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35 The Havasupai Tribe, Hopi Tribe, Hualapai Tribe, and Navajo Nation participated as members of the Grand Canyon
36 Working Group established to address overflight issues.

37
38 Table 5.1 below details tribal consultations that occurred 2006 through 2010, and includes consulting parties, dates,
39 nature of discussions, and meeting locations.

41 **Arizona State Historic Preservation Office**

42 NHPA requires agencies to consult with the State Historic Preservation Officer (SHPO) regarding undertakings that
43 may affect historic properties. Formal consultation regarding this EIS was initiated with SHPO on January 31, 2006.
44 Consultations are ongoing.

46 **U.S. Fish and Wildlife Service**

47 USFWS was a member of the Grand Canyon Working Group and attended all meetings. Informal consultation was
48 initiated in July 2005 with the USFWS to begin discussions regarding effects to threatened and endangered species.
49 Consultations are ongoing.

TABLE 5.1 TRIBAL CONSULTATIONS FOR SPECIAL FLIGHTS IN THE VICINITY OF GCNP

Consulting Parties	Date/Location	Topics
Cooperating Agency status for the EIS offered to all affiliated tribes associated with GCNP and to the BIA in conjunction with a Draft tribal consultation plan	2006	Navajo Nation, Hualapai Tribe, and BIA expressed interest in cooperating agency status for the EIS, but the Hualapai Tribe withdrew. A General Agreement was Drafted between the NPS, FAA, and Navajo Nation, and a separate agreement between NPS, FAA, and BIA. Multiple Drafts were reviewed, comments made and addressed, followed by a new cycle of reviews and comments. Because the project moved beyond primary tasks identified in the Draft General Agreement, the agreements were never finalized. Rather, the BIA continued as a member of the project team, and the Navajo Nation continued as a member of the Grand Canyon Working Group, as well as through government-to-government and NHPA Section 106 consultations
Havasupai Tribe Hopi Tribe Hualapai Tribe Navajo Nation as members of the Grand Canyon Working Group	Grand Canyon Working Group meetings Jul 13-14 2005 Flagstaff AZ Oct 26 - 27 2005 Tusayan AZ Jan 31-Feb 2 2006 Phoenix AZ Mar 20-22 2006 Las Vegas NV May 31-Jun 2 2006 Scottsdale AZ Jul 25-27 2006 Phoenix AZ Sep 27-28 2006 Phoenix AZ Dec 12-13 2006 Scottsdale AZ Jun 12-13 2007 Scottsdale AZ Sep 19-20 2007 Scottsdale AZ Dec 4-5 2007 Scottsdale AZ Jul 28 2009 Flagstaff AZ	Various issues, Alternatives, and topics related to overflights
All eleven tribes affiliated to GCNP	January 2006	NPS and FAA issued a Consultation Plan outlining procedures for establishing and maintaining government-to-government relationships among affiliated tribes and Federal agencies for the project. The plan stressed consultation meetings would be scheduled to provide maximum opportunities for tribal input and information sharing throughout all project phases. Opportunities were extended to affiliated tribes and Federal agencies to participate in the EIS process as cooperating agencies
Havasupai Tribe Hualapai Tribe Navajo Nation (Chapters: Window Rock and Tuba City, Cameron, Bodaway/Gap) Pueblo of Zuni Yavapai Apache Nation NPS (GCNP) FAA BIA DOI Solicitor's Office	April 19-20, 2006 Flagstaff, AZ	Pan-tribal meeting to establish protocols for consultation with affiliated tribes. Among items discussed were recommended consultation approaches among various tribes and tribal offices; opportunities for participation in the EIS process; role of consulting agencies; and area of potential effect based on noise monitoring data and analysis of noise modeling information for flight routes
Hualapai Tribe NPS (GCNP) FAA DOI Solicitor's Office	May 12, 2006 Peach Springs, AZ	Discussion included status update on EIS and Alternative flight routes; agreements for information transfer among consulting parties; defining restoration of natural quiet; retention of existing Hualapai air-tour exemptions; quiet-aircraft technology incentives; and tribal involvement opportunities

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Consulting Parties	Date/Location	Topics
Havasupai Tribe NPS (GCNP) FAA DOI Solicitor's Office.	May 13, 2006 Supai, AZ	Tribal representatives expressed concern for low-flying planes observed over tribal lands in Grand Canyon. FAA provided contact information to report incidents of suspected unauthorized low-flying aircraft. Tribal members expressed desire to relocate air-tour routes that enter Supai, and possible seasonal restrictions on Dragon Corridor use
Navajo Nation NPS (GCNP) FAA	August 29, 2006 Flagstaff, AZ	The preliminary range of EIS reviewed. Air-tour corridors discussed and potential modifications to routes (including seasonal limitations) that could affect Alternatives and associated impacts. Tribal representatives indicated supported for flights into the Navajo Nation provided tour operators commit to eventual phased adoption of quiet technology
Hopi Tribe NPS (GCNP) FAA	August 29, 2006 Flagstaff, AZ	Discussion included history of Grand Canyon overflights; continuing opportunities for Hopi involvement in EIS process; role of Grand Canyon Working Group; range of preliminary Alternatives; consideration of high-altitude flights; and definitions of natural quiet restoration. Hopi representative emphasized tribal desire to provide input into EIS process and development of Alternatives
Navajo Nation NPS (GCNP) FAA Parsons Corporation (Denver)	September 5, 2007 Window Rock, AZ	Consultation meeting; project-area maps presented showing existing air-tour routes and representative culturally sensitive areas where noise impacts may be of concern. EIS Alternatives maps of proposed flight routes and SFRA boundary also presented. Navajo representatives expressed concern over Alternative C (the Navajo Alternative proposed by the Cameron Chapter of the Navajo Nation) which they indicated was not proposed or fully analyzed/endorsed by the Navajo Nation. They did not favor air-tour flights over the Little Colorado River, noting sacred sites and traditional use areas located at the Colorado and Little Colorado Rivers confluence. Noise from low-flying helicopters and other aircraft destroy the canyon's integrity and disrupt offerings and other traditional activities carried out year-round. FAA representatives noted air tour routes could be modified to avoid going over the confluence area, and elements of various Alternatives could be modified or combined in the Preferred Alternative selection process
Hualapai Tribe NPS (GCNP) FAA	September 6, 2007 Peach Springs, AZ	Meeting held as part of the Hualapai Tribal Council's regular scheduled meeting. Project-area maps presented by the NPS and FAA showing EIS Alternatives, existing flight routes, flight free zones, and representative culturally sensitive areas. It was explained that no Preferred Alternative had been selected, and further analysis (including metrics for modeling aircraft noise) was underway to assist the Grand Canyon Working Group with recommending elements of a Preferred Alternative. NPS and FAA representatives reaffirmed Hualapai tribal interests and the air-space exemption at the West End of the Study Area

TABLE 5.1 TRIBAL CONSULTATIONS FOR SPECIAL FLIGHTS IN THE VICINITY OF GCNP

Consulting Parties	Date/Location	Topics
Hopi Tribe NPS (GCNP) FAA	September 6, 2007 Flagstaff, AZ	Project-area maps presented by the NPS and FAA showing EIS Alternatives, existing flight routes, flight free zones, and representative culturally sensitive areas. The Hopi representative expressed cultural concern for the river confluence area, Salt Mines/pilgrimage trail, and Sipapuni (origin place). NPS and FAA representatives affirmed recognition that the area (identified as a traditional cultural property) is culturally sensitive, and discussed efforts underway through the EIS process to evaluate and control air-tour noise impacts
Havasupai Tribe Hualapai Tribe Hopi Tribe Navajo Nation Kaibab Band of Paiute Indians BIA DOI NPS (GCNP) FAA	January 10-11, 2008 GCNP	Various options and elements of the Preferred Alternative reviewed. Tribal representatives and agency staff flew certain Grand Canyon air-tour routes. Hualapai representative expressed concern with proximity of routes near traditional cultural properties. GCNP staff suggested changes proposed by Navajo representative to Alternative C would best be incorporated into the Preferred Alternative
Letter from Tim Begay Navajo Nation, Traditional Culture Program to GCNP	March 26, 2008 Letter	Mr. Begay referred to the air tour along Zuni Point Corridor tribal representatives flew during January 10 /11, 2008, consultation meetings. Mr. Begay again expressed Navajo Nation desire to have air-tour routes relocated west of the Colorado River/Little Colorado River confluence. Re-locating routes away from the confluence area would avoid impacts to traditional cultural properties significant to the Navajo, Hopi, and other tribes, and would restore quiet to the sacred area
Navajo Nation NPS (GCNP) FAA	May 30, 2008 Window Rock, AZ	Meeting part of a tribal consultation to clarify Nation's preference for a new air-tour route for helicopters connecting with the Green-1 route to the east to provide a connection between tours over the park and proposed tours of the Navajo Nation (especially in the vicinity of the Little Colorado River gorge)
Recipients Timothy Begay and Tony Joe , Navajo Nation	December 19, 2008 Letter	GCNP requested input on routes to be modeled for Alternative G from Tusayan and Cameron, with detailed maps attached
Navajo Nation Havasupai Tribe Hualapai Tribe Kaibab Band of Paiutes Moapa Band of Paiutes NPS (GCNP) FAA	January 28, 2009 Flagstaff, AZ	Government-to-government tribal meeting with goal to get tribal feedback on overflights. Presentation of Alternative G. Tribes were provided opportunity to meet with park management individually
Recipients Tribal representatives present at January, 28, 2009 meeting	February 2009 Letter	Correspondence included text of NPS Preferred Alternative, Alternative G, and notes from Jan 28 meeting
Navajo Nation NPS (GCNP) FAA	March 2, 2009 Gap, AZ	Discussion on Navajo Nation economic development initiatives adjacent to GCNP and Alternative G
Kaibab Band of Paiute Indians NPS (GCNP)	September 2009 Fredonia, AZ	Review NPS Alternatives and EIS schedule. Tribe appreciated latest maps and were pleased with avoidance of particularly sensitive cultural areas
Zuni Tribe NPS (GCNP)	October 2009 Pueblo of Zuni	Review NPS Alternatives and EIS schedule. Zuni asked questions and reiterated interest in flights being pulled away from the confluence

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Consulting Parties	Date/Location	Topics
Navajo Nation NPS (GCNP)	October 2009 Window Rock, AZ	Review NPS Alternatives and EIS schedule. Large scale maps and supporting information provided. Navajo Nation expressed overarching interest in economic development; not wanting efforts on overflights to impede it
Hopi Tribe NPS (GCNP)	November 2009 Hopi Reservation, AZ	Review NPS Draft Preferred Alternative and EIS schedule. A Hopi follow-up letter (November 24, 2009) stated they intend to support the Preferred Alternative given it adequately addresses Hopi concerns
Hualapai Tribe NPS (GCNP)	November 2009 Peach Springs, AZ	Meeting with full Tribal Council to review NPS Draft Preferred Alternative and EIS schedule. Tribe expressed concerns about traditional cultural properties, and NPS committed to continue to work with Hualapai to re-identify and minimize impacts to important cultural site locations
Recipients Las Vegas Tribe of Paiute Indians Paiute Indian Tribe of Utah San Juan Southern Paiute Tribe Havasupai Tribe Moapa Band of Paiute Indians	December 2009 Letter	Formal GCNP correspondence letter providing tribes who had not recently met with the park opportunity to do so prior to EIS publication
Recipient Tim Begay, Navajo Nation Historic Preservation Department	January 4, 2010 Visit	Janet Cohen hand delivered two large-scale maps to Tim Begay of the NNHPD while he was at the Flagstaff Coconino GCNP Offices on other business. He was going to give one of the two maps to Ray Russell at Navajo Nation Parks and Recreation
Navajo Nation NPS (GCNP) FAA	March 8, 2010 GCNP	Discuss Draft NPS Preferred Alternative. A large-scale map and other supporting information provided to Navajo Nation
Havasupai Tribe NPS (GCNP)	March 15, 2010 Supai Village, AZ	Provided an overflights status report on Alternatives and EIS timeline

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Grand Canyon Working Group

The Grand Canyon Working Group was established in 2005 as a subgroup within the National Parks Overflights Advisory Group (NPOAG) to provide advice and recommendations to NPS and FAA regarding implementation of the 1987 Overflights Act with respect to Grand Canyon. The Grand Canyon Working Group consisted of co-chairs from the NPS and FAA and representatives from air-tour operators, environmental groups, American Indian Tribes, commercial and general-aviation interests, recreational interests, and other Federal agencies. Information about the Grand Canyon Working Group is available online at http://www.faa.gov/about/office_org/headquarters_offices/arc/programs/grand_canyon_overflights/.

Meeting dates include

- July 13-14, 2005, Flagstaff, AZ
- October 26 - 27, 2005, Tusayan, AZ
- January 31-February 2, 2006, Phoenix, AZ
- March 20-22, 2006, Las Vegas, NV
- May 31-June 2, 2006, Scottsdale, AZ
- July 25-27, 2006, Phoenix, AZ
- September 27-28, 2006, Phoenix, AZ
- December 12-13, 2006, Scottsdale, AZ
- June 12-13, 2007, Scottsdale, AZ
- September 19-20, 2007, Scottsdale, AZ
- December 4-5, 2007, Scottsdale, AZ
- July 28, 2009, Flagstaff, AZ

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1 **LIST OF RECIPIENTS**

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3 This EIS will be posted on the internet where it can be downloaded from the NPS Planning Environment and Public
4 Comment (PEPC) website at <http://parkplanning.nps.gov/grca>

5

6 DVDs and/or paper copies of this EIS or a notice of its availability for review and comment may also be sent to

FEDERAL AGENCIES**Advisory Council on Historic Preservation****Department of Agriculture**

Coconino National Forest

Kaibab National Forest

Department of the Interior

Bureau of Indian Affairs

Bureau of Land Management Arizona Strip

Bureau of Reclamation

Fish and Wildlife Service

Geological Survey

National Park Service

Bryce Canyon National Park

Canyonlands National Park

Flagstaff Area Parks

Hawaii Volcanoes National Park (NPS peer review)

Glen Canyon National Recreation Area

Grand Canyon-Parashant National Monument

Grand Teton National Park (NPS peer review)

Intermountain Regional Office

Lake Mead National Recreation Area

Natural Sounds Program

Pipe Springs National Monument

Zion National Park

Department of Transportation

Federal Aviation Administration

U.S. Environmental Protection Agency**STATE AND LOCAL AGENCIES****State of Arizona**

Attorney General

Office of the Governor

State Historic Preservation Office

Department of Environmental Quality

Department of Transportation and Planning

Game and Fish Department

State Land Department

City Government

City of Flagstaff (AZ)

City of Fredonia (AZ)

City of Kanab (UT)

City of Las Vegas (NV)

City of Page (AZ)

City of Phoenix (AZ)

City of Tusayan (AZ)

City of Williams (AZ)

County

Clark County Department of Aviation (NV)

Coconino County Board of Supervisors (AZ)

Mohave County (AZ)

Local Libraries

Flagstaff, AZ

Las Vegas, NV

Phoenix, AZ

Northern Arizona University, AZ

CONGRESSIONAL DELEGATIONS**Arizona**

Office of Representative Jeff Flake

Office of Representative Trent Franks

Office of Representative Gabrielle Giffords

Office of Representative Paul Gosar

Office of Representative Raul Grijalva

Office of Representative Ed Pastor

Office of Representative Ben Quayle

Office of Representative David Schweikert

Office of Senator John Kyl

Office of Senator John McCain

Nevada

Office of Representative Shelley Berkley

Office of Representative Joe Heck

Office of Representative Dean Heller

Office of Senator Harry Reid

Office of Senator John Ensign

TRIBAL GOVERNMENTS

Havasupai Tribe

Hopi Tribe

Hualapai Tribe

Kaibab Band of Paiute Indians

Las Vegas Paiute Tribe

Moapa Band of Paiute Indians

Navajo Nation

Paiute Indian Tribe of Utah

Pueblo of Zuni

San Juan Southern Paiute Tribe

Yavapai-Apache Nation

ORGANIZATIONS AND BUSINESSES

A.V.I. Inc. dba Air Vegas	Grand Canyon River Outfitters Association
Air Bridge, Inc.	Grand Canyon Trust
Air Grand Canyon	Grand Canyon Wildlands Council
Air Star Helicopters	Heli USA Airways Inc.
Air Transport Association of America	Helicopter Association International
Aircraft Owners and Pilots Association	King Airlines, Inc.
Airports Council International – North America	Las Vegas Helicopters, Inc.
American Association of Airport Executives	Marble Canyon Outfitters
Arizona Pilots Association	Maverick Helicopter Tours
Arizona Raft Adventures	National Business Aviation Association, Inc.
Arizona Wilderness Coalition	National Parks Conservation Association
Aviation Ventures, Inc. dba Vision Air	National Parks Visitors Alliance
Deer Valley Pilot Association	Papillon Airways, Inc. dba Papillon Grand Canyon Helicopters
Delaware North Parks Services	Paul Revere Transportation
Eagle Canyon Airlines, Inc. dba Scenic Airlines	Sierra Club
Environmental and International Programs, Air Transport Association of America	Sky Harbor Center, Embry-Riddle Aeronautical University
Grand Canyon Airlines	Southern Utah Wilderness Alliance
Grand Canyon Airport	Sundance Helicopters, Inc.
Grand Canyon Association	The Nature Conservancy
Grand Canyon Field Institute	The Wilderness Society
Grand Canyon Helicopters	US Air Tour Association
Grand Canyon Hikers and Backpackers Association	Vista Helicopters, Inc.
Grand Canyon Private Boaters Association	Western River Expeditions
Grand Canyon Resort Corporation	Westwind Aviation, Inc.
Grand Canyon River Guides Association	Xanterra Parks & Resorts

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Individuals

List on file at the Office of Planning and Compliance, Grand Canyon National Park

PREPARERS AND CONTRIBUTORS

All individuals who helped prepare this Draft Environmental Impact Statement or who contributed to its preparation are listed below (Table 5.2).

National Park Service team members with experience in Grand Canyon National Park resources met frequently throughout Overflights EIS development. The Federal Aviation Administration's team, which included experienced aviation safety members, also met frequently with the NPS throughout EIS development. The National Park Service's Denver Service Center was designated in 2005 as a contractor for EIS preparation.

Parsons Corporation was hired as a subcontractor by NPS, Denver Service Center, to prepare the EIS. The Department of Transportation's Volpe Transportation Systems Center was contracted to perform modeling and to assist with EIS sections. Harvey Economics was hired by the subcontractor, Parsons Corporation, to produce a section of the EIS. Amy Heuslein from the Bureau of Indian Affairs was part of the team to review the EIS as a tribal coordinator.

TABLE 5.2 PREPARERS NPS TEAM MEMBERS

Name	Title	Qualifications	Sections Worked On
Jill Beshears	Environmental Protection Specialist Office of Planning and Compliance GCNP	10 Years NEPA specialist	Entire document
Jennifer Carpenter	Grand Teton National Park Environmental Protection Specialist	NEPA specialist	Peer Review entire document
Janet Cohen	Tribal Consultation Coordinator		Reviewed entire document
Rick Ernenwein	Outdoor Recreation Planner Office of Planning and Compliance GCNP	30 years Federal land management, planning, and NEPA experience	Entire document
Kurt Fristrup	Natural Sounds, Senior Acoustician, NPS		Soundscapes, Wildlife
Mary Killeen	Chief, Office of Planning and Compliance, GCNP		Reviewed entire document
Catherine Lentz	Hawaii Volcano National Park Environmental Protection Specialist		Peer Review entire document
Steve Martin	GCNP Superintendent		Reviewed entire document
Carla Mattix	Department of the Interior Solicitor		Reviewed entire document
Vicki McCusker	Natural Resources Planner Project Manager, NPS		Soundscapes
Ken McMullen	Environmental Protection Specialist Office of Planning and Compliance GCNP (retired)		Reviewed Chapters 1-3
Gopaul Noojibail	Deputy Chief, Office of Planning and Compliance, GCNP		Entire document
Bruce Peacock	NPS Economist		Reviewed Chapter 4
Jane Rodgers	Deputy Chief, Socio-Cultural Resources, Science and Resource Management, GCNP		Reviewed Chapter 3 & 4
Denice Swanke	Environmental Protection Specialist Office of Planning and Compliance GCNP	20 years Federal land management experience; 10 years NEPA experience	Entire document
Karen Trevino	National Sounds Program Manager Fort Collins, NPS		Soundscapes
Chris Turk	Regional Environmental Coordinator NPS Region		Reviewed entire document for Intermountain Region
Gigi Wright	Writer/Editor, Visitor and Resource Protection, GCNP		Chapter 1-5, Appendices
Greer Chesher	Writer/Editor, Office of Planning and Compliance GCNP		Entire document

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TABLE 5.2 PREPARERS DENVER SERVICE CENTER INTERDISCIPLINARY TEAM

Name	Title	Qualifications	Sections Worked On
Nell Blodgett	GIS Specialist	B.A.(Geography); M.S.(GIS Science); expertise in Geographic Information Systems (GIS); 5 years with the National Park Service	Chapter 2, Google Earth Application, Maps for FAA Safety Review
Kerri Cahill	Visitor Use Technical Specialist	B.A. (Environmental Policy), M.S.P. (Environmental Planning), PhD (Natural Resource Recreation Management); expertise in Visitor Use and Experience management; 7 years with the National Park Service; 5 years as park planner for Florida State Parks and private consulting firms	Chapters 3 & 4
Greg Cody	Technical Specialist for Cultural Resources	B.A/M.A. (History); expertise in cultural resources and compliance with NHPA; 18 years with the National Park Service	Chapters 1, 3, 4
Aaron Gagne	Project Manager	B.S. (Environmental Planning), M.C.R.P. (Master of City and Regional Planning); expertise in planning, economics, finance and contracting; less than 1 year with the National Park Service, 14 years with local, county, state and other Federal agencies, 5 years with planning, consulting, and private development firms	Chapters 1, 2, 3,5
BJ Johnson	DSC Planning Division Chief	Master of Science in Environmental Science, BA in both Environmental Biology and Environmental Conservation, 25 years working within the professional disciplines of NEPA analysis and community planning	Entire document
David Kreger	Planning Branch Chief	B.S. (Environmental Resource Management); expertise in NEPA and natural resources management; 19 years with the National Park Service and 12 years with environmental consulting firms	Entire document
Cynthia Nelson	Project Manager		Entire document through early 2009
Dan Niosi	Project Manager	B.A. (Environmental Studies-Natural Resources Management); Expertise in NEPA and natural resources management; less than one year with the National Park Service and 11 years with environmental consulting firms	Entire document
Michael Rees	Natural Resource Specialist	B.A. (Environmental Studies) and M.F.S. (Master of Forest Science); Expertise in NEPA, park planning, and wilderness; 19 years with the National Park Service and 8 years with the U.S. Fish & Wildlife Service	Entire document
Paul Wharry	NEPA Technical Specialist	B.A. (Biology) Expertise in NEPA, and natural resources management; 5 years with the National Park Service and 11 years with environmental consulting firms; 13 years in academics	Entire document

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5**TABLE 5.2 PREPARERS VOLPE CENTER**

Name	Title	Qualifications	Sections Worked On
Cyndy Lee	USDOT / Volpe Center, Acoustics Facility		Chapter 4 analysis for Soundscape, reviewed Chapter 4, Appendix D

1 **Table 5.2** **Preparers** **Parsons Corporation Interdisciplinary Team (Contractor)**

Name	Title	Qualifications	Sections Worked On
Timberley Belish	Managing Scientist	B.S., Biology and M.S., Ecology and Evolution 16 years' experience	Document production coordination and NEPA requirement assurance for entire document. Focused writing for wildlife and T&E species.
Jacklyn Bryant	Environmental Planner	B.S., Natural Resource Management and M.S., Watershed Sciences 13 years' experience	Visitor Use and Experience
Gabriel Cosyleon	Scientist	B.S., Biology and M.S., Zoology 6 years' experience	Wildlife and T&E species support
Areg Gharabegian	Noise Specialist	B.S. and M.S., Mechanical Engineering 31 years' experience	Noise Analysis and technical support to writers
Ed Harvey	Economist, Harvey Economics	B.A., Economics and M.S., Economics 35 years' experience	Socioeconomics, Air Operator Impacts, Land Use
John Hoesterey	Project Manager	B.A., Zoology and M.A., Geography and Environmental Science 34 years' experience	Project Management
Scott Lowry	Writer/Editor	B.S., Psychology; J.D.; M.A. and Ph.D., English 19 years' experience	Writing/editing support, Park Operations
Alexa Mudgett	Landscape Architect/Graphics Specialist	B.A., Environmental Studies and M.S., Landscape Architecture 8 years' experience	Wilderness and graphic production
Diane Rhodes	Cultural Resource Specialist	M.A., Anthropology/Archeology 31 years' experience	Cultural Resources
Jan Snyder	Writer/Editor	B.S., Zoology 35 years' experience	Writing and editing
Bruce Snyder	Technical Director	B.S., Biology and M.S., Wildlife Biology 40 years' experience	Technical Direction, QA/QC Review
Susan Walker	Economist, Harvey Economics	B.A., Forestry and M.S., Forest Economics 7 years' experience	Socioeconomics, Air Operator Impacts, Land Use

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3
4

1 **CONTRIBUTORS**
2

TABLE 5.2 CONTRIBUTORS FAA TEAM MEMBERS

Name	Title	Qualifications	Sections Worked On
Barry Brayer	Manager Special Programs Staff, NEPA & Tribal Consultation Project Lead, FAA	NEPA, 24 years, Tribal, 18 years, BS Engineering	Entire document
Rebecca Cointin	Operations Research Analyst, Noise Division, Office of Environment and Energy, FAA	Aviation Noise, 8 years	Noise Analysis
Norman Elrod	Economist, Flight Standards Part 135/136 Air Carrier Operations Branch, FAA	Air Tour Industry and Operations Database Analyst, 14 years, PhD, Economics	Chapter 2 and various sections Chapters 3 & 4
Tina Gatewood	Manager, Environmental Programs, System Operation Airspace and AIM, FAA	NEPA, 19 years, Tribal, 14 years	Entire document
Carol Gaelick	Economist		Reviewed Socioeconomics
Raquel Girvin	Manager, Noise Division, Office of Environment and Energy, FAA		
Paul Joly	Air Tour Safety Specialist, Las Vegas Flight Standards District Office, FAA	Air-tour operational Safety and Analysis: 15 years. NEPA team: 10 years. Tribal: 10 years	
Keith Lusk	Program Manager, Special Programs Staff, Western Pacific Region, FAA	NEPA, 23 years	Entire document
Lynne Pickard	Deputy Director, Office of Environment and Energy, FAA	NEPA with emphasis on aircraft noise impacts and mitigation, compatible land use, DOT Section 4(f), 34 years	Entire document

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TABLE 5.2 CONTRIBUTORS BUREAU OF INDIAN AFFAIRS

Name	Title	Qualifications	Sections Worked On
Amy Heuslein	Tribal Coordination		Entire document

- 1
- 2
- 3
- 4

1 GLOSSARY

2
3 National park air-tour planning and the EIS process require use of technical terms. Some of the most important are
4 defined in this section. Terms below in *bold italics* are defined separately in this glossary.

5
6 **Acoustics** The science of *sound*

7
8 **Acoustic Zone** Areas with similar vegetation, terrain, animals, and weather likely have similar acoustic
9 characteristics including sound sources and sound attenuation characteristics. These areas are referred to as acoustic
10 zones and may be helpful in describing acoustic conditions in areas with similar characteristics

11
12 **Adverse Effect** Generally a change that moves a resource or visitor experience away from a desired condition or
13 that detracts from visitor experience or resource condition, as opposed to a *beneficial effect* which is generally a
14 positive change in resource condition, a positive change in visitor experience, or a change that moves a resource or
15 visitor experience toward a desired condition (consistent with the purpose and/or management objectives of the
16 affected park land or other area)

17
18 **Airway** A corridor of controlled airspace whose centerline is established by radio navigational aids. Low-altitude
19 airways (3,000 to 18,000 feet MSL) are identified by number with the letter V as a prefix. High altitude airways
20 (above 18,000 feet MSL) are known as Jet airways and are identified by number with J as a prefix

21
22 **All Scenarios** Base Year and Ten-Year Forecast Peak and Off-Peak Season

23
24 **Allocation** 14 CFR 93.303 (regulations that implement the 2000 National Parks Air Tour Management Act)
25 states that an Allocation is an authorization to conduct a commercial air tour in Grand Canyon National Park
26 (GCNP) Special Flight Rules Area (SFRA). Allocations are not a property interest, but an operating privilege
27 subject to absolute FAA control. FAA retains the right to redistribute, reduce, or revoke allocations

28
29 **Ambient Noise** Total sum of noise from all sources in a given place and time. Also known as *Existing Ambient*
30 *Noise*; see also *Natural Ambient Noise*

31
32 **Ambient Sound Conditions** Many different Soundscapes occur in national parks. In some areas natural
33 sounds predominate, while in others both natural and non-natural sounds occur. To understand and manage
34 Soundscapes, ambient conditions for different Soundscapes need to be acoustically described. Definitions of
35 common ambient sound conditions are provided below

36
37 **Ambient Sound, Existing** All sounds in a given area (all natural and non-natural sounds)

38
39 **Ambient Sound, Natural** All natural sounds in a given area, excluding all non-natural sounds. Natural
40 ambient sound is considered synonymous with the term natural quiet, although natural ambient sound is more
41 appropriate because nature is often not quiet

42
43 **Amplitude** Instantaneous magnitude of an oscillating quantity such as sound pressure. The peak amplitude is
44 the maximum value

45
46 **Attenuation** Reduction of sound intensity by various means (e.g., air, humidity, and porous materials)

47
48 **Area of Audibility** Area within which a specific sound or sounds is audible

49
50 **Audibility** Audibility is the ability of animals and humans with normal hearing to hear a given sound, and is
51 affected by the animal's hearing ability, other simultaneous interfering sounds or stimuli, by sound frequency
52 content and amplitude, and whether the sound contains information the animal has learned to pay attention to or
53 ignore

54
55 **Audiogram** Graph showing hearing acuity as a function of frequency and amplitude

1 **Average Sound Level** Also called *Equivalent Sound Level*, it is the logarithmic energy average of aircraft
 2 sound pressure levels in *A-weighted decibels (dBA)* experienced over a given period of time (for this EIS, the 12-
 3 hour day described in Chapter 4, Methodology

4
 5 **A-Weighted Decibels (dBA)** System for measuring *sound* energy designed to represent the human ear's
 6 response to sound. Energy at frequencies more readily detected by the human ear is more heavily weighted in the
 7 measurement, while frequencies less well detected are assigned lower weights. A-weighted sound measurements are
 8 commonly used in studies where the human response to sound is the object of the analysis

9
 10 **A-Weighting** See *Weighting*

11
 12 **Bar Ten** Generally a reference to helicopter operations conducted between Bar Ten airstrip and the boat
 13 pullout at the base of Whitmore Canyon. Bar Ten Ranch is located nine miles north of Grand Canyon, in Grand
 14 Canyon—Parashant National Monument, 80 miles southeast of St. George, Utah.

15
 16 **Base Year** 2005 is the Base Year used for noise modeling in this EIS. The best available data as of the end of
 17 2005 is used as the base for noise modeling for the Alternatives. Since 2005, the 2005 database has been checked
 18 against data from subsequent years, and although there are some differences, given all factors contributing to those
 19 differences, the 2005 database has proven consistent enough to continue as a reasonable base for evaluating impacts
 20 of the Alternatives in this EIS

21
 22 **Beneficial Effect** Generally a positive change in resource condition, a positive change in visitor experience,
 23 or a change that moves a resource or visitor experience toward a desired condition (consistent with the purpose
 24 and/or management objectives of the affected park land or other area), as opposed to an *adverse effect* which is
 25 generally a change that moves the resource or visitor experience away from a desired condition or that detracts from
 26 visitor experience or resource condition

27
 28 **Central area** See Map 3.2

29
 30 **Clean Air Act, as amended in 1990 (CAA)** Serious efforts to control air pollution began in California in
 31 the 1950s in response to the southern coast's increasingly worsening smog problem. By the 1960s the U.S.
 32 Government began significant and continuing regulatory efforts to reduce emissions. As the nation's air quality
 33 continued to deteriorate, Congress passed the Clean Air Act of 1963. This Act has evolved through four major
 34 revisions, the most recent being Amendments of 1990. The result of these ongoing efforts is an evolving ambient air
 35 pollution control strategy based on the National Ambient Air Quality Standards and a provision that states would
 36 develop implementation plans to meet and maintain the standards

37
 38 **Commercial Aviation** Aviation industry's commercial sector consisting of air carriers providing passenger and
 39 cargo transportation for hire in domestic and international service. Commercial aviation includes air carriers that
 40 operate large passenger or cargo jets and regional/commuter/charter carriers operating smaller aircraft

41
 42 **Commercial Air-tours** Advertised air-tour flights and charter flights offered by commercial air-tour operators.
 43 The category of air-tour operation to which annual allocations and daily caps apply

44
 45 **Contour** See *Noise Contours*

46
 47 **Cooperating Agency** Agency or tribal government with jurisdiction by law or has special expertise with
 48 respect to an environmental issue, and cooperatively works with the lead agency to prepare an environmental impact
 49 statement

50
 51 **Council on Environmental Quality (CEQ)** The Council on Environmental Quality coordinates Federal
 52 environmental efforts and works closely with agencies and other White House offices in the development of
 53 environmental policies and initiatives. CEQ was established within the Executive Office of the President by
 54 Congress as part of the National Environmental Policy Act of 1969 (NEPA) and additional responsibilities were
 55 provided by the Environmental Quality Improvement Act of 1970

- 1 **Current Condition** *Existing condition* or conditions prior to future development, which serve as a
 2 foundation for analysis
 3
- 4 **Day-Night Average Sound Level (DNL)** Noise measure used to describe the Average Sound Level over a 24-
 5 hour period, typically an average day over the course of a year. In computing DNL, an extra weight of 10 *decibels* is
 6 assigned to noise occurring 10:00 p.m. to 7:00 a.m. to account for increased annoyance when *ambient Average*
 7 *Sound Level* are lower and people are trying to sleep. DNL may be determined for individual locations or expressed
 8 in noise contours
 9
- 10 **dB** See *Weighting*
 11
- 12 **Decibel (dB)** Logarithmic measure of any measured physical quantity, and commonly used in sound pressure-
 13 level measurement. The decibel provides the possibility of representing a large span of signal levels in a simple
 14 manner as opposed to using the basic unit Pascal. The difference between the sound pressure for silence versus a
 15 loud sound is a factor of 1,000,000:1 or more; therefore, it is less cumbersome to use a small range of equivalent
 16 values: 0 to 130 decibels. *Amplitude* is the relative strength of a sound wave described in decibels. Amplitude is
 17 related to what we commonly call loudness or volume. An increase of 10 dBA represents a perceived (to human
 18 hearing) doubling of sound pressure level; meaning 20 dBA would be perceived as twice as loud as 10 dBA; 30
 19 dBA would be perceived as four times louder than 10 dBA; 40 dBA as eight times louder than ten dBA, etc.
 20 Humans with normal hearing can hear sounds as low as 0 dB at 1,000 Hz.
 21
- 22 **Detectability** Noise detected by an actively listening human on the ground. The measure of whether aircraft
 23 noise is audible in Grand Canyon National Park's backcountry areas
 24
- 25 **Direct Effect** A direct effect is caused by an action and occurs in the same time and place, as opposed to an
 26 *indirect effect* which is caused by an action but is later in time or farther away but still reasonably foreseeable
 27
- 28 **East End** See Map 3.2
 29
- 30 **EIS Planning Team** The EIS Planning Team is made up of representatives from the NPS (Grand Canyon
 31 National Park, AZ; Natural Sounds Program, Feet. Collins, CO; Denver Service Center [DSC], Denver, CO;
 32 Intermountain Regional Office, Denver, CO), FAA, Bureau of Indian Affairs (BIA), Parsons Corporation (DSC
 33 subcontractor).
 34
- 35 **Elevator Flights (or Over the Edge Flights)** A helicopter descent from Grand Canyon West Airport to
 36 Colorado River pads conducted wholly on and within the Hualapai Reservation
 37
- 38 **Energy Equivalent Sound Level** Level of a constant sound over a specific time period that has the same
 39 sound energy as the actual (unsteady) sound over the same period
 40
- 41 **Enplanements** Number of passengers boarding an aircraft at an airport
 42
- 43 **En Route System** That part of the *National Airspace System* where aircraft are operating between origin
 44 and destination airports
 45
- 46 **Environmental Impact Statement (EIS)** A detailed, concise document discussing significant environmental
 47 impacts resulting from a proposed Federal action; informs decision-makers and the public of reasonable Alternatives
 48 which would avoid or minimize adverse impacts. Public participation and consultation with other Federal, state, and
 49 local agencies is a cornerstone of the EIS process
 50
- 51 **Equivalent Sound Level (LAeq₁₂)** Also called *Average Sound Level*, it is the logarithmic energy average
 52 of aircraft sound pressure levels in *A-weighted decibels (dBA)* experienced over a given period of time (for this EIS,
 53 the 12-hour day described in Chapter 4, Methodology
 54
- 55 **Events per Hour** Number of times a non-natural sound source is heard, on average, in one hour (this may
 56 be specific to a particular human-caused sound or to all human-caused sounds)

- 1 **Existing Ambient Noise** See *Ambient Noise*; see also *Natural Ambient Noise*
2
- 3 **Existing Condition** See *Current Condition*
4
- 5 **Federal Aviation Regulations (FAR)** Federal regulations relating to aviation published as Title 14 of the
6 Code of Federal Regulations
7
- 8 **Federal Interagency Committee on Aviation Noise (FICAN)** Committee formed in 1993 to provide
9 forums for discussion of public and private sector proposals on aviation noise, and to identify and encourage needed
10 research. All Federal agencies concerned with aviation noise are represented on the committee, including the
11 Department of Defense (Air Force, Army, Navy), Department of Interior (NPS), Department of Transportation
12 (FAA), Environmental Protection Agency (EPA), National Aeronautics and Space Administration (NASA), and
13 Department of Housing and Urban Development (HUD)
14
- 15 **Frequency** Number of times per second the sine wave of sound repeats itself. It can be expressed in cycles per
16 second or Hertz (Hz). Frequency equals Speed of Sound/Wavelength
17
- 18 **Frequency Spectrum** A standard frequency spectrum is made up of 12 octave bands, representing acoustic
19 wave length ranges, centered from 20 Hz to 3000 GHz. A sound source can have many different frequencies mixed
20 together. Each frequency stimulates a different length receptor in our ears. When only one wave length is dominant,
21 we hear a pure tone, while other sounds are made up of a combination of frequencies. When displayed in graphic
22 form, the magnitude of the sound pressure level at each frequency comprises a frequency spectrum. In some
23 instances, more detailed information is needed than what the octave band analysis gives. Narrower bands, such as
24 one-third octave bands, are selected for such analysis
25
- 26 **General Aviation** Aviation industry's private sector consisting of privately owned and operated aircraft not
27 for hire. Aircraft size and range vary widely from small single engine aircraft to large jet aircraft
28
- 29 **Grand Canyon National Park Airport** Airport located outside Grand Canyon National Park in the town of
30 Tusayan, Arizona, also referred to in this document as Grand Canyon Airport
31
- 32 **Grand Canyon West** Airport located on the Hualapai Reservation at Grand Canyon National Park's West End
33
- 34 **Grand Canyon Working Group** Established under authority of the *National Parks Overflights Advisory Group*,
35 and consists of representatives from NPS, FAA, air-tour operators, environmental groups, tribes, commercial and
36 general aviation, recreational interests, and other Federal agencies. The Working Group developed recommendations
37 for proposed actions to meet the statutory mandate contained in the 1987 Overflights Act. Specifically, the group's
38 purpose was to: review data and analysis, identify and review issues related to overflight noise, and consider a
39 variety of Alternatives to address issues. Information is available at
40 [http://www.faa.gov/about/office_org/headquarters_offices/arc/programs/grand_canyon_overflights/documents/docu](http://www.faa.gov/about/office_org/headquarters_offices/arc/programs/grand_canyon_overflights/documents/documents_list.cfm)
41 [ments_list.cfm](http://www.faa.gov/about/office_org/headquarters_offices/arc/programs/grand_canyon_overflights/documents/documents_list.cfm)
42
- 43 **Grid Analysis** Type of aircraft noise analysis that evaluates Average Sound Level at individual points rather than
44 through generation of *noise contours*
45
- 46 **Ground Effect** Noise *attenuation* attributed to absorption or reflection of noise by human-made or natural
47 features on the ground surface
48
- 49 **Hearing Range (human)** An average healthy young person can hear frequencies from approximately 20 Hz to
50 20000 Hz, and sound pressure levels from 0 dB to 130 dB or more (threshold of pain)
51
- 52 **Hualapai Exempt Flights** Air tours conducted in support of the Hualapai Tribe are exempt from annual
53 allocations and daily caps to which other tours are subject. This exemption is the result of concerns regarding
54 potential impacts flight limitations would have on the Tribe's economic development (Federal Register, Vol. 65, No.
55 65). These flights are accounted for separately from commercial tours described. Table 3.20 presents number of
56 Hualapai exempt flights 2000 through 2005

- 1 **Human-caused Sound** Any sound attributable to a human source. May be used interchangeably with non-
2 natural, human-made, man-caused, or human-made sound
3
- 4 **Indirect Effect** An indirect effect which is caused by an action but later in time or farther away but still reasonably
5 foreseeable as opposed to a *direct effect* which is caused by an action and occurs in the same time and place
6
- 7 **Infrasound** Frequencies below 20 Hz. Humans perceive frequencies below about 20 Hz as pressure rather than
8 sound
9
- 10 **Instrument Flight Rules (IFR)** Rules governing conduct of flight using instruments and air traffic services to
11 avoid obstacles, terrain, and other air traffic
12
- 13 **Integrated Noise Model (INM)** Computer model developed, updated, and maintained by FAA to predict noise
14 exposure generated by aircraft operations
15
- 16 **Integrated Noise Model Version 6.2 (INM 6.2)** FAA's computer model for calculating aircraft noise. Version
17 6.2 of INM includes the capability to calculate aircraft audibility
18
- 19 **Intensity** Sound energy flow through a unit area in a unit time
20
- 21 **kilohertz (kHz)** A measure of frequency, or the number of times something occurs in a second. In terms
22 of sound, 1 Hz (Hertz) = 1 cycle of the sound waveform per second. 1 kHz (kilohertz) = 1000 Hz
23
- 24 **L50** L50 represents the sound pressure level, in decibels, of all sounds(natural plus non-natural) exceeded 50%
25 of the time (the median)
26
- 27 **Ldn** See *Day-Night Average Sound Level (DNL)* Ldn is used in place of DNL in mathematical equations only
28
- 29 **LAeq₁₂** See *Equivalent Sound Level*
30
- 31 **L_(nat)** The natural ambient sound level, or sound level of all natural sounds in a given area, excluding all
32 mechanical, electrical and other human-caused sounds. The L_(nat) is the sound level associated with an exceedance
33 value calculated by removing the percent time human-caused sounds are audible
34
- 35 **Local Operation** Aircraft flight that begins and ends at the same airport
36
- 37 **Location Point** As described in Appendix D, 127 Location Points were selected by the NPS for
38 EIS noise modeling. NPS selected 25 Location Points (GC008-GC033) corresponding to monitoring sites where
39 acoustic data was collected by GCNP personnel. Other named points were selected as representative locations for
40 visitor experience and/or park resources (e.g., Wilderness Character, Ethnographic Resources, wildlife).
41 Additionally, Location Points GRID01 through GRID36 were selected based on a ten-kilometer grid to provide
42 spatial coverage throughout the park. Map 3.2 shows all 127 Location Points referred to throughout this EIS
43
- 44 **Loudness** Subjective judgment of sound intensity by humans. Loudness depends on stimulus sound pressure
45 and frequency
46
- 47 **Masking** Process by which the threshold of audibility for a sound is raised by presence of another (masking)
48 sound. A masking sound is one that renders inaudible or unintelligible another sound also present
49
- 50 **Maximum Average Sound Level (L_{Amax})** Maximum sound pressure for a given event adjusted toward the
51 frequency range of human hearing
52
- 53 **Mean Sea Level (MSL)** Average height of the surface of the sea for all stages of the tide; used as a reference for
54 elevations; also called sea level datum
55

- 1 **National Airspace System (NAS)** Common network of U.S. airspace, air navigation facilities, equipment, services,
2 airports, or landing areas; aeronautical charts, information, and services; rules, regulations, and procedures; technical
3 information, staffing, and materials, all of which are used in aerial navigation
4
- 5 **National Environmental Policy Act of 1969 (NEPA)** Legislation establishing a national policy for the
6 environment that requires preparation of an environmental impact statement for major Federal actions significantly
7 affecting the environment
8
- 9 **National Historic Preservation Act of 1966 (NHPA)** Legislation requiring projects on Federal lands, funded
10 by Federal monies, or requiring a Federally-issued permit, be evaluated for impacts to historic properties
11
- 12 **National Parks Overflights Advisory Group (NPOAG)** Advisory group of representatives of FAA, NPS,
13 general aviation, air-tour operators, environmental concerns, and tribes established by the Air Tour Management Act
14 of 2000 to provide continuing advice and counsel on commercial air-tour operations over and near national parks
15
- 16 **Natural Ambient Noise** *Existing Ambient Noise*, minus manmade sounds. See also *Ambient Noise* and
17 *Existing Ambient Noise*
18
- 19 **Natural Quiet** All natural sounds in a given area, excluding all non-natural sounds. See *Ambient Sound, Natural*
20
21 **Noise** Traditionally, noise has been defined as unwanted, undesired, or unpleasant sound. This makes noise a
22 subjective term. Sounds unwanted and undesired by some may be wanted and desired by others. The
23 appropriateness of any sound in a given area of a park will depend on a variety of factors including area
24 management objectives
25
- 26 **Noise Abatement** Measure or action minimizing impact of noise on environs of an airport. Noise abatement
27 measures include aircraft operating procedures and use or disuse of certain runways or flight tracks
28
- 29 **Noise Contours** Continuous lines on a map connecting all points of the same noise exposure level
30
- 31 **Noise Floor** Lowest amplitude measurable by sound monitoring equipment. Most commercially available
32 sound-level meters and microphones detect sound levels to about 15 to 20 dBA; however, there are microphones
33 capable of measuring sound levels below 0 dBA
34
- 35 **Noise-Free Interval** The length of time during which only natural sounds are audible
36
- 37 **Notch, The** The SFRA boundary forms a notch around Grand Canyon West Airport so that the airport area is
38 outside the SFRA to facilitate traffic to and from the airport. The notch is entirely over Hualapai tribal lands south of
39 the Colorado River. In Alternatives A and E, it is approximately 6 statute miles long, and 6.5 miles wide at its
40 northeastern end narrowing to approximately 5 miles wide at its southwestern end. In Alternative F and the NPS
41 Preferred, the notch is narrowed to approximately 5 miles wide throughout to include visitor areas at Eagle and
42 Guano Points inside the SFRA
43
- 44 **Notice of Proposed Rulemaking (NPRM)** Draft of a proposed rule for public input and comment. Under
45 the Administrative Procedures Act, in most cases, before a Federal agency may adopt a Final Rule, the agency must
46 publish in the Federal Register a Draft rule and seek public comment. An NPRM contains a preamble that describes
47 the rule and its purpose, commenting information and deadlines, and text of the proposed rule
48
- 49 **Noticeability** Noise noticed by a human on the ground who is not necessarily actively listening. The
50 measure of whether aircraft noise is audible in developed areas of GCNP
51
- 52 **Octave Band, One-Third** Frequency band whose cutoff frequencies have a ratio of two to the one-third
53 (approximately 1.26). One-third octave bands reflect reasonably the human ability to differentiate tones
54
- 55 **Off-Peak Season** Because Action Alternatives (E, F, and the NPS Preferred) propose seasonal route shifts,
56 Alternatives are analyzed for different *Peak and Off-Peak Seasons*. Off-Peak Season encompasses periods of both

1 high and low visitation. Peak and Off-Peak Seasons refer more to the analysis than visitation levels. Dates may
 2 correspond to avian nesting, non-motorized vs. motorized river use, and spring/fall high-demand Wilderness
 3 backpacking use to provide opportunity to experience these under quieter conditions

Alternative	Peak Season	Off-Peak Season
E	July 1- September 15	September 16-June 30
F	February 1-November 30	December 1-January 31
NPS Preferred	May 1-October 31	November 1-April 30

4
 5
 6 **Over the Edge (or Elevator Flights)** A helicopter descent from Grand Canyon West Airport to
 7 Colorado River pads conducted wholly on and within the Hualapai Reservation
 8

9 **Peak Day** Noise analysis for this EIS is based on a 12-hour time period of 7 a.m. to 7 p.m. on the Peak Day;
 10 the day with the highest total number of air-tour and air-tour-related operations. Based on a review of the best
 11 available data at the time EIS noise modeling analysis began, Peak Day occurred August 8, 2005, with a total 635
 12 operations. This day forms the basis for Base Year analyses for the Alternatives. Data for subsequent years was
 13 checked to ensure use of 2005 Peak Day as the basis for Base Year analysis was still reasonable
 14

15 **Peak Season** Because Action Alternatives (E, F, and the NPS Preferred) propose seasonal route shifts,
 16 Alternatives are analyzed for different Peak and Off-Peak Seasons. Peak Season generally encompasses periods of
 17 high visitation. Peak and Off-Peak Seasons refer more to the analysis than visitation levels. Dates may correspond to
 18 avian nesting, non-motorized vs. motorized river use, and spring/fall high-demand Wilderness backpacking use to
 19 provide opportunity to experience these under quieter conditions

Alternative	Peak Season	Off-Peak Season
E	July 1- September 15	September 16-June 30
F	February 1-November 30	December 1-January 31
NPS Preferred	May 1-October 31	November 1-April 30

20
 21
 22 **Percent Exceedance (Lx)** These metrics are the sound levels (L), in decibels, exceeded $x\%$ of the time.
 23 The L50 value represents the sound level exceeded 50% of the measurement period. L50 is the same as the median.
 24 The L90 value represents the sound level exceeded 90% of the time during the measurement period
 25

26 **Percent Time Audible** Time various sound sources are audible to animals, including humans, with normal
 27 hearing (hearing ability varies among animals)
 28

29 **Propagation** *Sound* propagation is the spreading or radiating of sound energy from the noise source. It
 30 usually involves a reduction in sound energy with increased distance from the source. Atmospheric conditions,
 31 terrain, natural objects, and manmade objects affect sound propagation
 32

33 **Quiet Technology** Procedures for determining the Grand Canyon National Park SFRA quiet-aircraft
 34 technology designation status for different aircraft are defined in Part 93 of chapter I of Title 14, Code of Federal
 35 Regulations. Designation of Grand Canyon National Park quiet-aircraft technology is generally based on measured
 36 flyover Average Sound Level of an aircraft and seating configuration. Table 3.15 shows types of aircraft designated
 37 Grand Canyon National Park quiet-aircraft technology. Requirements and identification of aircraft that meet them
 38 are in a Final Rule published by FAA in the Federal Register on March 29, 2008, Average Sound Level for Aircraft
 39 Used for Commercial Operations in Grand Canyon Special Flight Rules Area. FAA Advisory Circulars are available
 40 at <http://www.faa.gov>
 41

42 **Record of Decision (ROD)** Official notice of an agency's findings after review of a final *Environmental*
 43 *Impact Statement*
 44

45 **Scoping** An early and open process for determining the scope or range of issues addressed in the
 46 *Environmental Impact Statement*, and identifying significant issues related to a proposed Federal action. Issues

1 important to the public and local, state, and Federal agencies are solicited through direct mailing, public notices, or
2 meetings. Scoping is generally conducted before development of the *Environmental Impact Statement* scope of
3 work.

4
5 **SFAR 50-2** Special Federal Aviation Regulation, codified at Part 93 of the Federal Aviation Regulation that
6 contains the Special Flight Rules for aircraft operations in the vicinity of Grand Canyon National Park

7
8 **Signal-to-Noise Ratio (SNR)** Ratio between amplitude of a signal (meaningful information) and amplitude of
9 background noise. Because many signals have a very wide dynamic range, SNRs are often expressed in terms of the
10 logarithmic decibel scale

11
12 **Single event** One noise event. For many kinds of analysis, sound from single event is expressed using the
13 *Sound Exposure Level* metric

14
15 **Sound** Wave motion in air, water, or other media; the rapid oscillatory compressional changes in a
16 medium that propagate to distant points characterized by changes in density, pressure, motion, and temperature as
17 well as other physical properties. Not all rapid changes in the medium are sound (wind distortion on a microphone
18 diaphragm)

19
20 **Soundscape** Soundscape refers to the total acoustic environment associated with a given area. In a national
21 park setting, Soundscapes can be composed primarily of natural sounds, or of both natural and non-natural sounds

22
23 **Sound Exposure Level (SEL)** The total sound energy of an actual sound calculated for a specific time period,
24 usually expressed using a time period of one second. This metric is useful in comparing two sounds that differ in
25 amplitude and duration. A very long, very low-level sound may have the same 1-second SEL as a very short, very
26 loud sound

27
28 **Sound Level** Generally refers to the weighted sound pressure level obtained by frequency *weighting*, usually A-
29 or C-weighted

30
31 **Sound Pressure** Fluctuations in air pressure caused by presence of sound waves. Sound pressure is the
32 instantaneous difference between the actual pressure produced by a sound wave and the average barometric pressure
33 at a given point in space. Sound pressure is measured in Pascals (Pa), Newtons per square meter, which is the metric
34 equivalent of pounds per square inch

35
36 **Sound Pressure Level (SPL)** Logarithmic form of sound pressure; also expressed by attachment of the word
37 decibel to the number

38
39 **Sound Speed** Speed of sound in air is about 344 m/sec (1,130 feet/sec or 770 mph) at 70°F at sea level. It varies
40 substantially depending on temperature and type of medium

41
42 **Special Federal Aviation Regulation (SFAR)** A regulation adopted by FAA for unique and specific
43 situations. SFARs generally have expiration dates that can be extended. **SFAR 50-2**, codified at FAR Part 93, is the
44 rule containing regulations for the Special Flight Rules Area over Grand Canyon National Park

45
46 **Special Flight Rules Area (SFRA)** A portion of airspace, with both vertical and lateral dimensions,
47 wherein special operational rules and restrictions apply. The Grand Canyon Special Flight Rules Area overlies
48 Grand Canyon National Park and portions of surrounding lands. It extends from the surface to 17,999 feet MSL

49
50 **Special Use Airspace (SUA)** Airspace of defined dimensions identified by an area on the earth's surface
51 wherein activities must be confined because of their nature, and/or wherein limitations may be imposed on aircraft
52 operations that are not part of those activities

53
54 **Spectrum (Frequency Spectrum)** Amplitude of sound at various frequencies; given by a set of numbers
55 that describe the amplitude at each frequency or band of frequencies

56

- 1 **Stage 2 Aircraft** Aircraft that meet Average Sound Level prescribed by *Federal Aviation Regulations*
 2 Part 36, which are less stringent than those established for the quieter *Stage 3* designation. The Airport Noise and
 3 Capacity Act required phase-out of all Stage 2 aircraft over 75,000 pounds by December 31, 1999, with potential for
 4 case-by-case exceptions through 2003
 5
- 6 **Stage 3 Aircraft** Aircraft that meet the most stringent Average Sound Level set in *Federal Aviation*
 7 *Regulations* Part 36
 8
- 9 **Substantial Restoration of Natural Quiet (SRNQ)** A legislatively mandated requirement associated with
 10 recommendations by the Secretary of the Interior with respect to aircraft noise at Grand Canyon National Park.
 11 Substantial Restoration of Natural Quiet has been clarified by NPS as the achievement of natural quiet (i.e., no
 12 aircraft audible) in 50% or more of the park for 75-100% of any given day
 13
- 14 **Substantive vs. Nonsubstantive Comments** The general rule under CEQ regulations is that a Final EIS
 15 must respond to all “substantive” comments on a Draft EIS. CEQ regulations and guidance do not define the term
 16 “substantive.” The National Park Service issued guidance stating that a comment is considered substantive if it
 17 raises specific issues or concerns regarding the project or the study process, but not if it merely expresses support for
 18 or opposition to the project or a particular Alternative.
 19
- 20 National Park Service NEPA guidance states that substantive comments “(a) question, with reasonable basis, the
 21 accuracy of information in the EIS; (b) question, with reasonable basis, the adequacy of environmental analysis; (c)
 22 present reasonable Alternatives other than those presented in the EIS; [or] (d) cause changes or revisions in the
 23 proposal.” NPS guidance also states that “[c]omments in favor of or against the proposed action or Alternatives, or
 24 comments that only agree or disagree with NPS policy, are not considered substantive.” See NPS Director’s Order
 25 12, Conservation Planning, Environmental Impact Analysis and Decision Making, Section 4.6, Environmental
 26 Impact Statements, Final EIS (Jan. 8, 2001)
 27
- 28 **Ten-Year Forecast** For each Alternative, analysis includes assessment of impact during the *Base Year* and
 29 Ten-Year Forecast. Ten-Year Forecast is the best estimate of what will occur ten years after implementing each
 30 Alternative, starting from the Base Year scenario. For the Ten-Year Forecast, growth in aircraft operations was
 31 assumed as explained in Appendix D. Also, full implementation of each Alternative’s action elements is assumed to
 32 be achieved in the Ten-Year Forecast (for example, full conversion to quiet-technology aircraft if that is an
 33 Alternative element).
 34
- 35 **Time above Natural Ambient** Time sound levels from non-natural sounds are greater than natural sound levels
 36
- 37 **Transportation or Repositioning** Aggregate category of all flight operations in support of commercial air tours.
 38 Transportation is typically the return leg of the Las Vegas/Tusayan (South Rim) fixed-wing commercial air tour,
 39 while repositioning refers to movement of empty aircraft in support of trans-Canyon commercial air-tour operations
 40
- 41 **Ultrasound** Sounds of a frequency higher than 20,000 Hz
 42
- 43 **Visual Flight Rules (VFR)** Rules pilots may operate under in appropriate airspace when weather meets
 44 certain criteria allowing ample visual ability to see and avoid other aircraft, obstacles, and terrain
 45
- 46 **Volpe Center** U.S. Department of Transportation, Volpe National Transportation Systems Center online
 47 at <http://www.volpe.dot.gov>. See Chapter 5 for explanation of Volpe Center’s involvement in this EIS
 48
- 49 **Wavelength** Distance a wave travels in the time it takes to complete one cycle. A wavelength can be
 50 measured between successive peaks or between any two corresponding points on the cycle. Wavelength (feet) =
 51 Speed of Sound (feet) / Frequency (Hz)
 52
- 53 **West End** See Map 3.2
 54
- 55 **Weighting** Adjustment of sound level data to achieve a desired measurement. A-Weighting is used to account
 56 for changes in human-hearing sensitivity as a function of frequency. The A-weighting network de-emphasizes high

1 (6.3 kHz and above) and low (below 1 kHz) frequencies, and emphasizes frequencies between 1 kHz and 6.3 kHz in
2 an effort to simulate the relative response of human hearing. C-Weighting is linear over the mid-frequency range
3 from 200 Hz to 1.6 kHz, and de-emphasizes the low (below 200 Hz) and high (above 1.6 kHz) frequencies
4

5 **Windscreen** Porous device covering a sound-level measurement system microphone. Windscreens are designed
6 to minimize effects of wind disturbance on sound levels being measured while minimizing attenuation (<0.5 dB) of
7 signal. When using windscreens that attenuate sound levels >0.5 dB, amount of attenuation for each one-third octave
8 band must be known and corrections applied
9

10 **Yearly Day-Night Average Sound Level** See *Day-Night Average Sound Level (DNL)*
11
12

1	ACRONYMS	
2		
3	AGL	Above ground level
4	ANSI	American National Standards Institute
5	ARD	Alternative Dispute Resolution
6	AZGFD	Arizona Game and Fish Department
7		
8	BA	Biological Assessment
9	BIA	Bureau of Indian Affairs
10	BLM	Bureau of Land Management
11	BO	Biological Opinion
12		
13	CAA	Clean Air Act, as amended in 1990
14	CEQ	Council on Environmental Quality
15	CFR	Code of Federal Regulations
16	CRMP	Colorado River Management Plan
17		
18	dB	decibel
19	dB(A)	A-Weighted Sound
20	DEIS	Draft Environmental Impact Statement
21	DNL	Day-Night Average Sound Level
22	DOT	Department of Transportation
23	DSC	Denver Service Center (NPS)
24		
25	EA	Environmental Assessment
26	EIS	Environmental Impact Statement
27	EPA	Environmental Protection Agency
28		
29	FAA	Federal Aviation Administration
30	FAR	Federal Aviation Regulations
31	FEIS	Final Environmental Impact Statement
32	FICAN	Federal Interagency Committee on Aviation Noise
33	FL180	Flight Level 180
34	FONSI	Finding of No Significant Impact
35	FPL	Federal Poverty Level
36	FTE	Full-Time Equivalent
37	FY	Fiscal Year
38		
39	GCNP	Grand Canyon National Park
40	GMP	General Management Plan
41		
42	IFR	Instrument Flight Rules
43	INM	Integrated Noise Model
44	INM 6.2	Integrated Noise Model Version 6.2
45		
46	kHz	kiloHertz
47		
48	LAeq12	Equivalent (Average) Sound Level
49		
50	MSL	Mean sea level
51		
52	NAS	National Airspace System
53	NEPA	National Environmental Policy Act
54	NHPA	National Historic Preservation Act
55	NMSIM	Noise Map Simulation Model

1	NNL	National Natural Landmark
2	NOI	Notice of Intent
3	NPOAG	National Parks Overflights Advisory Group
4	NPRM	Notice of Proposed Rulemaking
5	NPS	National Park Service
6	NRPM	Notice of Proposed Rule Making
7	NTSB	National Transportation Safety Board
8		
9	PAC	Protected Activity Center (for Mexican spotted owl)
10	PEPC	Planning Environment and Public Comment Website (NPS)
11		
12	RNA	Research Natural Area
13	ROD	Record of Decision
14		
15	SEL	Sound Exposure Level
16	SFAR	Special Federal Aviation Regulation
17	SFRA	Special Flight Rules Area
18	SHPO	State Historic Preservation Office/Officer
19	SNR	Signal-to-Noise Ratio
20	SPL	Sound Pressure Level
21	SRNQ	Substantial Restoration of Natural Quiet
22		
23	VFR	Visual Flight Rules
24	VOR	Very high frequency Omnidirectional Range
25		
26	USATA	U.S. Air Tour Association
27	UNESCO	United Nations Educational, Scientific and Cultural Organization
28	USFS	U.S. Forest Service
29	USFWS	U.S. Fish and Wildlife Service
30		
31		
32		

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