

ISSUES REGARDING THE NEW NPS METH-  
ODOLOGY USED TO EVALUATE THE ACHIEVE-  
MENT OF NATURAL QUIET RESTORATION  
STANDARDS IN GRAND CANYON NATIONAL  
PARK

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OVERSIGHT HEARING

BEFORE THE  
SUBCOMMITTEE ON NATIONAL PARKS AND PUBLIC  
LANDS

OF THE

COMMITTEE ON RESOURCES  
HOUSE OF REPRESENTATIVES

ONE HUNDRED SIXTH CONGRESS

FIRST SESSION

—————  
MAY 25, 1999, WASHINGTON, DC  
—————

**Serial No. 106-33**

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WASHINGTON : 1999

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## CONTENTS

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	Page
Hearing held May 25, 1999 .....	1
Statements of Members:	
Berkley, Hon. Shelley, a Representative in Congress from the State of Nevada .....	5
Additional material submitted by .....	7
Gibbons, Hon. Jim, a Representative in Congress from the State of Nevada .....	12
Prepared statement of .....	12
Hansen, Hon. James V., a Representative in Congress from the State of Utah .....	1
Prepared statement of .....	2
Romero-Barceló, Hon. Carlos A., a Delegate to Congress from the Territory of Puerto Rico .....	7
Prepared statement of .....	4
Vento, Hon. Bruce F., a Representative in Congress from the State of Minnesota .....	4
Statements of witnesses:	
Alberti, John, Owner, JR Engineering .....	25
Prepared statement of .....	101
Bassett, Steve, President, United States Air Tour Association .....	66
Prepared statement of .....	69
Lowe, Jackie, Deputy Director, National Park Service; accompanied by Wes Henry, Research Administrator, National Park Service, and Robert Arnberger, Superintendent, Grand Canyon National Park .....	18
Prepared statement of .....	20
Resavage, Roy, President, Helicopter Association International .....	115
Prepared statement of .....	117
Snow, Jacob, Assistant Director, Clarke County Department of Aviation, McCarran International Airport .....	86
Prepared statement of .....	90
Stephen, Alan R., President, Twin Otter International, Inc. ....	39
Prepared statement of .....	41
Traynham, David, Assistant Administrator for Policy, Planning and International Aviation, Federal Aviation Administration; Thomas Connor, Office of Energy and Environment, Federal Aviation Administration .....	28
Prepared statement of .....	24
Additional material supplied:	
Hingson, Dickson J., Ph.D., Rockville, Utah .....	137
Santini, Jim, United States Air Tour Association, Rebuttal of NPS and FAA testimony at hearing .....	125
Sierra Club Washington, DC, statement of .....	141



**OVERSIGHT HEARING ON ISSUES REGARDING  
THE NEW NPS METHODOLOGY USED TO  
EVALUATE THE ACHIEVEMENT OF NAT-  
URAL QUIET RESTORATION STANDARDS IN  
GRAND CANYON NATIONAL PARK**

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**TUESDAY, MAY 25, 1999**

HOUSE OF REPRESENTATIVES,  
SUBCOMMITTEE ON NATIONAL PARKS  
AND PUBLIC LANDS,  
COMMITTEE ON RESOURCES,  
*Washington, DC.*

The Subcommittee met, pursuant to notice, at 10 a.m., in Room 1324, Longworth House Office Building, Hon. James Hansen [chairman of the Subcommittee] presiding.

**STATEMENT OF HON. JAMES V. HANSEN, A REPRESENTATIVE  
IN CONGRESS FROM THE STATE OF UTAH**

Mr. HANSEN. The Committee will come to order.

Good morning, and welcome to the oversight hearing which will address an ongoing issue in the Grand Canyon National Park. This issue deals with the relationship between air tour overflights and the assumed non-attainment of substantial restoration of natural quiet of the Grand Canyon. I will be brief because I want to get right to the hearing, but I do have a few comments.

It was not even a year ago that this Subcommittee heard testimony that was extremely convincing to me and others that the Park Service had made some major errors in their use of the integrated noise model of the 1994 report to Congress which looked at the effects of overflights on the National Park System. In fact, the testimony was convincing enough for me to conclude that natural quiet has been restored in the Grand Canyon. However, instead of thoroughly scrutinizing and integrating the new scientific analysis and information provided by these very reputable reviewers and to new regulations, the Park Service, has instead, developed a new standard, one that is unattainable and will have devastating effects on the core industry.

The January 26 public notice in The Federal Register states that the Park Service, to use their language, "will use this refined methodology in future restoration of natural quiet in the Grand Canyon National Park unless science or public planning process provides better approaches."

The clear meaning here is that this new standard is to be immediately used as the new measuring stick to see if the natural quiet

has been restored without the benefits of peer review or at the very least. This, to me, says two important things:

One is that the Park Service presents this issue as a moving target. When, for example, they are shown by good scientific study that substantial restoration of natural quiet has occurred even by their own standards, they switched to a harder-to-achieve and less obtainable different threshold. This is a common and very frustrating ploy of the environmental community: As soon as you get close to solving the problem, move the target.

Secondly, it seems to me that the Park Service is acting in less than good faith when they state, for example, that they may change to a "better approach." By this, I assume them to mean that they might change this new standard if science shows them a better way. However, last September, we had some distinguished acoustical scientists in here and they provided solid evidence that the Park Service had made some serious errors. Yet, what happened to this? I don't think that the Park Service looked at any of it, and now with this public notice we are supposed to believe that more good science may change things. Based on the past evidence, I am a little dubious.

Hopefully, this oversight will bring more light, so that we can finally come to some conclusion on this issue, and I believe the sooner the better, as natural quiet has surfaced in national parks beyond the boundaries of the Grand Canyon. In Michigan and in Biscayne Bay, a national park in Florida, to name two, they are both looking at eliminating a variety of traditional park uses because of concerns of natural quiet. We need to take a hard and careful look at what we are going to do with this.

I want to welcome our witnesses here, and because time is short, I am going to ask them all to stay within their five minutes.

Now, I have another problem, and that is that I am one of the nine members of the Cox Commission. The Cox Commission is looking to see whether or not there was quid pro quo with the Chinese development regarding things such as delivery systems, warheads, and all that intrigue. For some reason, I am told by someone way above my pay grade that I darn well better be over there at 10:30 or I am in big trouble. So, I have asked my good friend from Tennessee, the chairman of the FAA Subcommittee and also a member of this Committee, to chair the meeting when I have to leave, and which I would appreciate.

I thank you all for being here, and we are grateful that our colleague from Nevada, Shelly Berkley, will be our lead-off witness. So, we will start with the Congresswoman from Nevada and move on as rapidly as we can.

With that, I will turn to the gentleman from Puerto Rico for any opening statement he may have.

[The prepared statement of Mr. Hansen follows:]

STATEMENT OF HON. JAMES V. HANSEN, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF UTAH

Good morning everyone and welcome to this oversight hearing which will address an ongoing issue in the Grand Canyon National Park. This issue deals with the re-

lationship between air tour overflights and the assumed non-attainment of substantial restoration of natural quiet of the Grand Canyon.

I will be very brief because I want to get right to the hearing, but I do have a few comments to make. It was not even a year ago that this Subcommittee heard testimony that was extremely convincing to me and others that the Park Service had made some major errors in their use of the Integrated Noise Model for the 1994 Report to Congress which looked at the effects of overflights on the National Park System. In fact, the testimony was convincing enough for me to conclude that natural quiet has been restored in the Grand Canyon.

However, instead of thoroughly scrutinizing and integrating the new scientific analysis and information provided by these very reputable reviewers into new regulations, the Park Service has, instead, developed a new standard—one that is unattainable and will have devastating effects on the air tour industry. The January 26th Public Notice in the Federal Register states that the Park Service, to use their language, “*will use* this refined methodology in future restoration of natural quiet at GCNP, unless science or public planning processes provides better approaches.” The clear meaning here is that this new standard is to be immediately used as the new measuring stick to see if there natural quiet has been restored without the benefit of a peer review, at the very least.

This to me says two important things. One is that the Park Service presents this issue as a moving target. When, for example, they are shown by good scientific study that substantial restoration of natural quiet has occurred, even by using their own standards, they switch to a harder-to-achieve and less attainable different threshold. This is a common and frustrating environmental ploy—as soon as you get close to solving the problem, move the target.

Secondly, it seems to me that the Park Service is acting in less than good faith when they state, for example, that they may change to a “better approach.” By this I assume them to mean that they might change this new standard, if science shows them a better way. However, last September we had some distinguished acoustical scientists in here and they provided solid evidence that the Park Service had made some serious errors. Yet what happened to this? I don’t think that the Park Service looked at any of it. And now from this public notice we are supposed to believe that more good science may change things. Based on the past evidence, I wouldn’t be too sure.

Hopefully, this oversight will bring more things to light so that we can finally come to some conclusion on this issue. And I believe the sooner the better as natural quiet has surfaced in national parks beyond the boundaries of the Grand Canyon. Isle Royale in Michigan and Biscayne National Park in Florida, to name two, are both looking at eliminating a variety of traditional park uses because of concerns with natural quiet. We need to take a hard and careful look at where we are going with this.

With that, I want to welcome our witnesses here today. Because time is short, I would like to ask that each of them earnestly try to keep the oral statement to 5 minutes or less.

**STATEMENT OF HON. CARLOS A. ROMERO-BARCELÓ, A DELEGATE TO CONGRESS FROM THE TERRITORY OF PUERTO RICO**

Mr. ROMERO-BARCELÓ. Thank you, Mr. Chairman. I will be very brief also. I have to make a few comments when it deals with something as important as the Grand Canyon National Park, which is one of the most magnificent units of the National Park system. And it is not surprising, then, that there is a lot of interest in the park’s management, especially in the issue of aircraft noise.

Congress, in 1987, directed the NPS to develop a plan to restore the natural quiet of the park. In 1994, the NPS reported to Congress that the natural quiet of the park had not been substantially restored.

Today’s hearing focuses on the methodology used by the National Park Service to evaluate the achievement of natural quiet restoration standards in the Grand Canyon National Park.

The NPS, in cooperation with the FAA, has proposed a number of refinements to the methodology for determining the substantial

restoration of natural quiet. It should be noted that the underlying National Park Service definition of substantial restoration of natural quiet has been upheld by the courts. Aircraft overflights have been a source of continuing problems for Grand Canyon National Park, especially in light of the explosion of overflights that have occurred since the 1987 Act. We are pleased by the recent joint efforts of the National Park Service and the Federal Aviation Administration to address these problems, and we look forward to hearing from the witnesses, and in particular, from our colleague, Congresswoman Shelly Berkley from Nevada.

I would also like to also excuse myself that I will have to be leaving around 20 minutes of, because the Secretary of the Navy is in my office, and we have a real substantial problem with noise, which is even much more severe than the one in the Grand Canyon—noise and explosions on the Island of Vieques.

Mr. Chairman, we appreciate the attendance of our witnesses and look forward to their testimony. Thank you.

[The prepared statement of Mr. Romero-Barceló follows:]

STATEMENT OF HON. CARLOS ROMERO-BARCELÓ, A DELEGATE IN CONGRESS FROM  
THE TERRITORY OF GUAM

Mr. Chairman, Grand Canyon National Park is one of the magnificent units of the National Park System. It is not surprising then that there is a lot of interest in the park's management, especially on the issue of aircraft noise. Congress in 1987 directed the NPS to develop a plan to restore the natural quiet to the park. In 1994, the NPS reported to Congress that the natural quiet of the park had not been substantially restored.

Today's hearing focuses on the methodology used by the National Park Service to evaluate the achievement of natural quiet restoration standards in Grand Canyon National Park. The NPS, in cooperation with the FAA, has proposed a number of refinements to the methodology for determining the substantial restoration of natural quiet. It should be noted that the underlying National Park Service definition of substantial restoration of natural quiet has been upheld by the Courts.

Aircraft overflights have been a source of continuing problems for Grand Canyon National Park, especially in light of the explosion of overflights that has occurred since the 1987 Act. We are pleased by the recent joint efforts of the National Park Service and the Federal Aviation Administration to address these problems.

Mr. Chairman, we appreciate the attendance of our witnesses today and look forward to their testimony.

Mr. HANSEN. Thank you. The gentleman from Minnesota?

**STATEMENT OF HON. BRUCE F. VENTO, A REPRESENTATIVE  
IN CONGRESS FROM THE STATE OF MINNESOTA**

Mr. VENTO. Thank you, Mr. Chairman. This problem, in fact, the study that occurred out of the 100th Congress—I don't remember if it was 1987 or 1988 that we enacted legislation to limit overflights over the Grand Canyon, with the support of Senator McCain and many others. It took a long time for the Park Service to go through this process. Obviously, I had hoped that they would be open to future changes, depending upon what the acoustical science, and so forth, would provide. I would say that, obviously, we had limits over a series of parks at that time, as you recall, Mr. Chairman, including Haleakala and Glacier and a number of others.

I would just point out that the impact of aircraft overflight, especially related to tourism, over many of our parks and other types of new uses that are coming into vogue, whether it would be per-



sonal watercraft and/or snowmobiles, are, in fact, having an impact on, first of all, of course, the preservation of the areas and the enjoyment as it is experienced by others. Obviously, it has been an important part. The aircraft over at the tour industry has been interested in following regulation and cooperating. Many of the details of some of these rules are often left to those that can work on them full time because they require a lot of attention and study.

I know that you have had a series of hearings on this in the past year, so I hope to get up to speed a little bit today on what the status is. But I think the goal is pretty clear in terms of trying to preserve the visitor experience at the Grand Canyon. Perhaps at other parks, as we look at other types of impacts, as I have pointed out, from other types of technology that are occurring, whether it is snowmobiles or personal watercraft or yet others that I can't anticipate, I think we should try to be supportive of good science and of good policies that are attempting to be put in place and recognize that trying to harmonize these may result in some businesses changing the mode in which they have operated without regulation in the past. Although, I would point out again, that this industry has been somewhat cooperative in terms of the goal, but I look forward to the testimony and to learning more about some of the specifics. Thank you, Mr. Chairman.

Mr. HANSEN. I thank the gentleman. You may recall back in the 1980's, when we did this before, we thought we had solved the problem. But then you get into the safety issue and then you get into the noise issue. At that time, Moe Udall was the chairman of the Committee. You may recall Tony Coehlo was part of that. Many of us went out there and many of us confessed that we had flown airplanes right down the middle of there and repented of our many past sins for doing that.

[Laughter.]

We thought we pretty well had this thing resolved at one time, and now you get into this acoustical issue; it is kind of like global warming; there are 50 experts on both sides of this one.

Having been one of the old dogs on the Armed Services Committee and in procurement, I constantly am asking about new technology, as you alluded to. I am amazed at some of the technology we are now seeing come about regarding aircraft and possibly a dramatic change from what we have expected in the past.

With that said, I would like to turn to our colleague from Nevada.

**STATEMENT OF HON. SHELLEY BERKLEY, A REPRESENTATIVE  
IN CONGRESS FROM THE STATE OF NEVADA**

Ms. BERKLEY. Good morning. Mr. Chairman and members of the Subcommittee, thank you for allowing me to speak today in support of the air touring industry. I appreciate your efforts to strike a fair balance between protecting our fragile Grand Canyon environment, while addressing the needs and interests of more than a half million travelers who view the splendor of the Grand Canyon each year by air. Today, I ask you to consider a rulemaking that would strike a fair balance that enables visitors to experience the majesty of the Grand Canyon either from ground level or from the air.

As a business-minded Member with a strong environmental record, I realize just how difficult finding compromises may be. I, too, want to preserve this natural wonder for our children's grandchildren. That is undisputed. However, I feel that I must point out just how critical the air tour industry is to my home State. This industry has been a vital part of our economy and our way of life for more than 60 years. Since 1937, it has wooed tourists and locals who view Las Vegas as the gateway to the Grand Canyon. If the Park Service is permitted to redefine the parameters of natural quiet to include an aircraft noise threshold of flight decibels below natural ambient sound, it lays the foundation for the elimination of this industry. Valuable jobs would be lost and families in my district will be hurt.

According to a study by the University of Nevada, Las Vegas, my alma mater, air touring contributes more than \$374 million each year to the Nevada tourism economy. This is an enormous amount of money on which my constituents' livelihoods depend.

Secondly, the industry allows thousands of individuals, who would not normally be able to visit our national park on foot, the opportunity to view the Grand Canyon. Without air tours, many older Americans, many veterans, and the disabled would be denied this magnificent opportunity. Many others who are on a tight family vacation schedule or our international visitors whose schedules simply do not allow for hiking the back country will also miss out on this fabulous opportunity.

I fear that the Federal Aviation Administration and the National Park Service's proposed natural quiet methodology would demolish this tradition. Serious concerns have been raised that the National Park Service's overstating audibility of air tour aircraft by three things:

One, underestimating natural noise levels in the Canyon by using the quietest times of the day as representative noise levels during all times of the day.

Number two, overstating aircraft noise levels by not adequately accounting for barriers such as Grand Canyon walls that often intervene.

And number three, overstating aircraft noise levels by assuming that they fly at higher speeds and power settings than they actually do.

A decade ago, special Federal Air Regulation 52 was implemented in the Grand Canyon. I feel that this regulation meets the congressional mandate of the Overflights Act, which called for a substantial restoration of natural quiet in the Canyon. It reduced aircraft noise significantly; even the agency's own analysis revealed that noise complaints decreased by 92 percent.

I am not the only one concerned about the viability of this industry. The State of Nevada is so concerned that the legislature passed an emergency resolution, S.J.R. 21, just two weeks ago, supporting the southern Nevada air tour industry. Mr. Chairman, I ask unanimous consent that the entire text of S.J.R. 21 be entered into the record.

Mr. HANSEN. Without objection.  
[The information follows:]

**SJR21**

Introduced on May 10, 1999  
By Legislative Affairs and Operations,

Fiscal Note  
Effect On Local Government: No  
Effect on the State or on Industrial Insurance: No

*Expresses concern regarding proposals redefining space in which aircraft may be flown over Grand Canyon. (BDR R-1729)*

Current Status: In Assembly & Transmitted to Senate

Hearings Senate Transportation May-14-1999 Do pass

Votes  
Senate Final Passage May-12 20 Yea 1 Nay 0 Excused 0 Not Voting 0 Absent  
Assembly Final Passage May-12 34 Yea 6 Nay 2 Excused 0 Not Voting 0 Absent

Bill Text (PDF) [As Introduced](#)

Bill Text (HTML) [As Introduced](#)

Amendments (HTML)

**10-May-99**

- Read first time. Referred to Committee on Legislative Affairs and Operations.
- Action of referral rescinded.
- Referred to Committee on Transportation. To printer.

**11-May-99**

- From printer. To committee.

**12-May-99**

- From committee: Do pass.
- Declared an emergency measure under the Constitution.
- Read third time. Passed. Title approved. Preamble adopted. (Yeas: 20, Nays: 1). To Assembly.
- In Assembly.
- Read first time.
- Declared an emergency measure under the Constitution.
- Read third time. Passed. Title approved. Preamble adopted. (Yeas: 34, Nays: 6, Excused: 2).
- To Senate.

Senate Joint Resolution No. 21—Committee on  
Legislative Affairs and Operations

May 10, 1999

Referred to Committee on Transportation

**SUMMARY**—Expresses concern regarding proposals redefining space in which aircraft may be flown over Grand Canyon. (BDR R-1729)

**FISCAL NOTE: Effect on Local Government: No.**

**Effect on the State or on Industrial Insurance: No.**

**EXPLANATION** — Matter in *bolded italics* is new; matter between brackets (~~omitted material~~) is material to be omitted. Green numbers along left margin indicate location on the printed bill (e.g., 3-15 indicates page 3, line 15).

**SENATE JOINT RESOLUTION**—Expressing concern regarding proposals redefining the space in which an aircraft may be flown over the Grand Canyon.

- 1-1 Whereas, Tourism is the mainstay of the Nevada economy; and  
 1-2 Whereas, The air tour industry is an exciting and strong attraction for  
 1-3 visitors to Southern Nevada; and  
 1-4 Whereas, Air tours over the Grand Canyon have been a tourism  
 1-5 tradition for more than 70 years and this industry has maintained a strong  
 1-6 safety record; and  
 1-7 Whereas, Approximately 800,000 visitors from around the world  
 1-8 enjoyed air tours of the Grand Canyon in 1996 and 500,000 of those  
 1-9 visitors originated their flights in Southern Nevada; and  
 1-10 Whereas, Air tours are the only way that persons who have certain  
 1-11 physical disabilities can experience the grandeur of the Grand Canyon; and  
 1-12 Whereas, In 1996, a study conducted by the University of Nevada, Las

MAY 13 '99 12:45PM NV COMM. ON TOURISM

P.5

Thursday, May 13, 1999

SJR/21

Page: 2

1-13 Vegas, estimated that air tourism to the Grand Canyon using Southern  
1-14 Nevada air tour operators contributed more than \$374.8 million to the  
1-15 Southern Nevada economy; and  
1-16 Whereas, The study concluded that the Las Vegas Convention and  
1-17 Visitors Authority generates air tour industry expenditures of \$49.8 million  
1-18 each year; and  
1-19 Whereas, The study determined that more than 142,000 foreign  
1-20 visitors, which constitutes 32.4 percent of all foreign visitors, and more  
1-21 than 9,000 visitors from the United States, which constitutes 23.7 percent  
2-1 of all visitors from within the United States, would forego visits to  
2-2 Southern Nevada if the Grand Canyon air tours were unavailable; and  
2-3 Whereas, Recent economic downturns in Asia have adversely impacted  
2-4 tourism in Southern Nevada; and  
2-5 Whereas, The air tour industry provides visual access to back country  
2-6 of the Grand Canyon including many of its most spectacular sights, and  
2-7 without air tours, only a small minority of visitors who have the time and  
2-8 physical ability to hike in the canyon would be afforded the opportunity to  
2-9 appreciate these magnificent sights; and  
2-10 Whereas, Air tours do not cause a permanent negative impact on the  
2-11 fragile environment of the Grand Canyon as do some other activities; and  
2-12 Whereas, In 1988, Special Federal Aviation Regulation 50-2 was  
2-13 enacted establishing routes, altitudes and reporting requirements and as a  
2-14 result of this legislation, noise complaints have been dramatically reduced  
2-15 and there has been a substantial restoration of natural quiet to the Grand  
2-16 Canyon; and

2-17 Whereas, Since the enactment of the requirements of this regulation,  
2-18 92 percent of visitors to the park have reported that they were not adversely  
2-19 affected by aircraft sounds, and visitors to the back country have reported  
2-20 seeing or hearing only one or two aircraft a day; and  
2-21 Whereas, The United States Forest Service concluded in 1992 that  
2-22 there were "few adverse impacts to wilderness users" from aircraft tours  
2-23 and that the flights did not impair the overall enjoyment of the wilderness  
2-24 or reduce the likelihood of repeat visits; and  
2-25 Whereas, A hearing held on September 2, 1998, by the House National  
2-26 Parks and Public Lands Subcommittee disclosed that the National Park  
2-27 Service noise analysis failed to undergo scientific modeling or peer review;  
2-28 and  
2-29 Whereas, The National Park Service disclosed on February 2, 1999, its  
2-30 intention to redefine the threshold for substantial restoration of natural quiet  
2-31 in the air tour air space of Grand Canyon National Park at a noticeability  
2-32 level of 8 decibels below natural ambient air sound; and  
2-33 Whereas, Air tour operators and acoustical experts conclude that this  
2-34 higher threshold proposed by the National Park Service would virtually  
2-35 shut down air tours in the east end air space of the Grand Canyon National  
2-36 Park; and  
2-37 Whereas, The Federal Aviation Administration now proposes to  
2-38 conduct an environmental assessment of air routes from Las Vegas to the  
2-39 Grand Canyon based solely on sound that could lead to further restriction  
2-40 or capping of flights; and

MAY 13 '99 12:46PM NV COMM. ON TOURISM

P. 7

Thursday, May 13, 1999

SJR#1

Page: 4

2-41 Whereas, The Nevada Congressional Delegation, the Nevada  
2-42 Commission on Tourism, the Las Vegas Convention and Visitors Authority  
2-43 and McCarran International Airport repeatedly have supported maintaining  
3-1 a viable Southern Nevada air tour industry and continued air access to and  
3-2 from Las Vegas; now, therefore, be it  
3-3 Resolved by the Senate and Assembly of the State of Nevada,  
3-4 Jointly, That the Nevada Legislature expresses its concern regarding any  
3-5 proposal to redefine the space in which aircraft may be flown over the  
3-6 Grand Canyon and urges the Congress of the United States to effect an  
3-7 outcome for the Southern Nevada air tour industry that will protect, support  
3-8 and sustain the viability of this significant contributor to the tourism  
3-9 economy of the State of Nevada and the enjoyment of visitors and  
3-10 sightseers; and be it further  
3-11 Resolved, That the Secretary of the Senate prepare and transmit a copy  
3-12 of this resolution to the Vice President of the United States as presiding  
3-13 officer of the Senate, the Speaker of the House of Representatives, each  
3-14 member of the Nevada Congressional Delegation, the Grand Canyon Air  
3-15 Tour Council and the United States Air Tour Association; and be it further  
3-16 Resolved, That this resolution becomes effective upon passage and  
3-17 approval.

Ms. T4 Berkley. As I stated earlier, I am a strong supporter of our environment, but I ask you today, is there a more environmentally-sensitive way to see the Grand Canyon than by air? Air tour passengers leave no footprints, dispose of no garbage, flick no burning cigarettes into the brush. They simply fly over the Canyon, take pictures, and return with precious memories.

Mr. Chairman, we all share a fundamental commitment to protect our national parks and our natural resources. But, as Members of Congress, we also must strike a balance between the needs and requirements of all of our citizens. We must seek to produce regulations based on scientific information and public input that will not sacrifice the environment, the interests of the air tour industry, or the economic benefits to our local economy.

I would like to thank you for your kind attention, and I ask that an extension of my remarks be submitted for the record.

[The prepared statement of Ms. Berkley follows:]

Mr. HANSEN. Without objection, and we thank the gentlelady from Nevada.

Our other expert witness is also a member of the Committee. I mean by that, our other member who wanted to testify, the gentleman from Nevada. The gentleman is recognized.

**STATEMENT OF HON. JIM GIBBONS, A REPRESENTATIVE IN  
CONGRESS FROM THE STATE OF NEVADA**

Mr. GIBBONS. Thank you, Mr. Chairman. On behalf of the State of Nevada and the one-half million tourists who each year see the magnificent Grand Canyon, I want to thank you for holding this hearing, and it has taken a considerable amount of effort, I know, to strike a balance between the need to protect our fragile Grand Canyon environment and the air tourism industry, and it is greatly appreciated. With that, Mr. Chairman, what I would like to do is submit my comments for the record at this time, and yield back the balance of my time for you.

[The prepared statement of Mr. Gibbons follows:]

STATEMENT OF HON. JIM GIBBONS, A REPRESENTATIVE IN CONGRESS FROM THE  
STATE OF NEVADA

Mr. Chairman:

On behalf of the State of Nevada and the 1/2 million southern Nevada tourists who each year see the magnificence of the Grand Canyon by air—thank you for holding this important oversight hearing today.

Your considerable efforts to strike a balance between the need to protect our fragile Grand Canyon environment and the air tourism industry is greatly appreciated.

Tourism is a mainstay of our economy in Nevada and the air tour industry has been a vital part of Nevada's tourism industry for more than 70 years.

Today, I speak to you as both a member of Nevada's Congressional Delegation, deeply concerned about the future of our air tour industry, as well as a long-time aviator.

In addition to being a retired commercial airline and military pilot, I served as a combat pilot in the Vietnam and Persian Gulf War.

I am a graduate of the Air Force's Air Command and Staff College, and Air War College, and recently retired as a Colonel in the Air Force Reserves.

I highlight my aviation experience to demonstrate my personal interest in this issue and the air tour industry. Our successful Nevada based, small business enterprises have earned the support of our entire Nevada Congressional delegation, as well as Governor Kenny Guinn.

Unfortunately, Mr. Chairman, to put it in military terms—the National Park Service (NPS) has launched a pre-emptive strike against Nevada's air tour community.



I concur entirely with the assessment of the United States Air Tour Association (USATA).

If the Park Service is permitted to redefine the parameters of natural quiet to include an aircraft noise threshold of 8 decibels below natural ambient sound—or anything even close to that—the southern Nevada air tour industry will be put out of business.

And, while the Park Service's action of redefining natural quiet does not in itself eliminate air touring over the Grand Canyon, it certainly lays the foundation for such an action.

Once this new noise threshold is in place, the Park Service's next step may be to press for regulations requiring all aircraft flying over the Grand Canyon to meet this unreasonable sound limit.

Then, the coup de grace—the air sound threshold will be adopted for all mechanized vehicles using NPS roads, water and snow—**meaning trucks, boats and snowmobiles.**

Throughout my aviation career, I have had the pleasure of flying many aircraft, but have never seen or heard of a powered aircraft which can meet an 8 decibel below natural ambient sound noise limit.

What is most disturbing, Mr. Chairman, is that this latest NPS action is unwarranted. As acoustic experts will testify to today, the Park Service has absolutely no reasonable scientific basis for this action—just as Superintendent Arnberger admitted before this Committee during last September's hearing.

The agency has simply decided that the Special Federal Air Regulation (SFAR) 50-2 did not meet the agency's personal objectives, so they want **to change the ground rules in midair.**

A decade ago, SFAR 50-2 was implemented in the Grand Canyon. It more than meets the Congressional mandates of the Overflights Act contained in Public Law 100-91 which called for the substantial restoration of natural quiet in the Canyon.

The regulation made the skies over the Grand Canyon safer, and it reduced aircraft noise significantly.

The agency's own analysis revealed that noise complaints following implementation of SFAR 50-2 decreased by 92 percent.

However, we now see the NPS trying to take these regulations one step further—**or should I say leaps and bounds further.**

Indeed, one has to wonder if the Park Service or FAA even has the statutory authority under the decade-old, Overflights Act to implement further regulations in the Grand Canyon.

Furthermore, I am extremely concerned about aviation safety as a result of this redefinition of natural quiet. On the surface, they want us to believe that these actions are in the name of environmental protection.

In reality, the Park Service appears to be seeking nothing less than an expansion of its own regulatory authority. Frankly, this latest NPS action is a back door approach to airspace regulation.

I addressed this issue in the July '97 Senate Commerce Committee Hearing on S.268.

That legislation would have statutorily turned regulatory authority for national park airspace over to the National Park Service.

I opposed that action on the fundamental basis that it would throw America's national airspace system into chaos—who would manage or even regulate it—Mr. Chairman, **this is de-ja-vu.**

Since Congress won't give the Park Service the statutory authority it seeks, the agency is using political maneuvering and political pressure on the FAA to get what it wants.

All under the guise of preserving and protecting the environment!

What more environmentally-sensitive way is there to see the Grand Canyon than by air? Air tour passengers leave no footprints, dispose of no garbage, flick no burning cigarettes into the brush.

They simply fly over, take a few pictures, and return with lifelong memories of spectacular sights. More than 62 percent of them are either very young, elderly, disabled or suffer from other health problems which makes walking into the Grand Canyon unrealistic.

Others who visit the Canyon by air are on tight family vacation or international visitor schedules, and simply don't have the time or inclination to hike the backcountry.

Mr. Chairman, according to a study by the University of Nevada-Las Vegas, air touring contributes more than \$374.8 million directly to the Nevada tourism economy each year. Air touring is a vital part of the Las Vegas and Nevada landscape. **We want to keep it that way,**

Our state has been very concerned about the future of this industry, and two weeks ago the Nevada Legislature passed an emergency resolution—SJR 21—supporting the southern Nevada Grand Canyon air tour industry.

In SJR 21, the Nevada Senate and Assembly jointly expressed its concern regarding any proposal to redefine the space in which aircraft may be flown over the Grand Canyon.

SJR 21 urged the Congress of the United States to “. . . effect an outcome for the southern Nevada air tour industry that will protect, support and sustain the viability of this significant contributor to the tourism economy of the State of Nevada and the enjoyment of visitors and sightseers.”

I ask unanimous consent that the entire text of this joint Resolution—SJR 21—be entered into today’s hearing record.

Mr. Chairman, we are all environmentalists in one way or another. We all seek protection for our natural resources.

But, the environment can be balanced with America’s other important industries and activities. As Members of Congress, we have been entrusted with the responsibility of striking a harmony between the needs and requirements of all citizens.

This latest action by the Park Service is not about balance. It’s about dismantling this vital segment of the tourism industry piece-by-piece. We have a *duty—a responsibility—to not let that happen.*

I sincerely appreciate your leadership in helping to ensure that a balance is struck which adequately preserves our environment as well as a tourism industry that is so vital to the State of Nevada.

Thank you, and I yield back the balance of my time.

Mr. HANSEN. The gentleman’s testimony will be included in the record, and I appreciate your comment.

It has always been my prerogative—the young lady is free to join us, if she would like to, and also we may want to ask you some questions.

Ms. BERKLEY. Would you like me to sit down?

Mr. HANSEN. Well, whatever; if you have some place to go and you are in a hurry, we understand.

Ms. BERKLEY. I think I am all right for the immediate time-being, but I have people that will be going to my office very soon to be conducting issues.

Mr. HANSEN. Well, we appreciate your testimony. Thank you so much.

Let me just say, it has been kind of the custom of this Committee, since we have taken it, to go to the members before the chairman. As I stated earlier, I do have to go to this Cox Commission. I am going to turn the chair over to the gentleman from Tennessee. He was also the chairman of the FAA Committee, which we feel it very appropriate that he would take the chair for a few moments.

I would like to comment on your testimony. Like you, we receive a lot of attention on this particular issue. Between this and Gettysburg, I don’t know if I have had any more calls. There seems to be a tight issue going on up there, and we just get inundated with letters from both areas.

As I mentioned to the gentleman from Minnesota, I thought we resolved part of this in the 1980’s, when we did that overflight thing; possibly we did not. We have had as many experts on this as you can imagine—both sides—one of the reasons we think this thing should be resolved.

It is amazing to me how many letters that I have received from foreign visitors. I mean, why they even take the time to write amazes me, especially from Germany, from England, Japan; people saying, “We really don’t have a lot of time, but we did go to” St.

George, Las Vegas, Kanab, wherever it may be. "We did have this grand opportunity to fly over this canyon."

And I have found that, as you pointed out, and I agree with your statement, that one of the exhilarating, almost spiritual experiences for a lot of those people is to look over what many people consider one of the wonders of the world. Not everybody has the time or the ability to walk down the Bright Angel or the Kaibab, or run the river. I have done both of those canyons, and I have run the river three times, and it is a great experience and one of the things that people soon develop a great constituency for the Grand Canyon.

I honestly feel that it is kind of important that we somehow come up with some moderation of this thing to resolve it at this time, if we possibly can. You would be surprised at the way some people respond to this. We received a number of letters that I thought were almost humorous saying, "Well, why do you even let them on the ground?" I mean, "let's turn this thing around. Just have it for overflights and close the south rim and the north rim because more people could enjoy it that way than they could on the ground." It was kind of startling to me to read things such as this.

Also, a number of private pilots, which I am a private pilot, but I don't think that I subscribe to this, saying "I resent those people walking up and down those trails. Why do I have to see them when I am up there?" So you kind of get both sides of this argument, and it does not always come out the same way.

I am amazed, as I was talking to the Williams Company, who will probably be the next leaders in small aviation engines, which will be a real threat to Continental and Liconmen, that they are building the most powerful engine ever built that is so quiet, you can't hear it 50 feet away. What will that mean? When you get down to the point that you can't hear them up there, what does that have on it?

So, you are stuck with a number of these issues that are staring you in the face, and a very tough issue. I would like to say that I appreciate—I don't think that there is anybody here that is going to testify today that their intentions are not pure, and they are trying to do what is best for the park and for those who want to visit the park, and I would appreciate that.

With that said, I would like to turn the chair over to my good friend from Tennessee, Mr. Duncan, and I will run over to this Cox Commission thing which I mentioned to you. It is a command performance; I can't get out of it, and I wish I wasn't part of that committee.

Anyway, the gentleman from Puerto Rico.

Mr. ROMERO-BARCELÓ. Thank you, Mr. Chairman. I have no questions for our colleague. Thank you very much for your testimony.

Ms. BERKLEY. Thank you, Ranking Member. I can tell you that, having been raised in Las Vegas, I know that area well, and I loved, as a kid, going to Red Rock Canyon and the Valley of Fire and the Grand Canyon. Of course, my children and I enjoy it as well. So this was not something that I just jumped on the bandwagon, because I do appreciate the issue of environmental sensitivity and preserving those natural wonders.

I can also tell you that in the testimony, if I can emphasize the fact that in the last 17 weeks that I have served in Congress, I have had an opportunity to interact with people across the country that I have never had an opportunity to interact with before. When I tell them I am from Las Vegas, of course, that always creates some interest in people anyway, but I can tell you, almost to a person, when they tell me they have come to my district or they are planning a trip to Las Vegas, they invariably tell me about their time in the Grand Canyon and how they flew over the Grand Canyon, and how that was one of the highlights of their trip. I never appreciated it, since I am a local and I just took it for granted, how many of our tourists do come to southern Nevada in order to take that plane ride, take a helicopter ride, but mostly those plane rides with the tour companies to see the splendor of the Grand Canyon.

Even as late as last evening, when I was at a reception that had absolutely nothing to do this, I met a gentleman from New York who told me that for his mother's 70th birthday, that was his gift to her, and it was the highlight of her life.

So I am feeling very comfortable about my testimony and my position, and I know there are several other people here from my district that will testify as well.

Mr. ROMERO-BARCELÓ. Thank you very much.

Mr. DUNCAN. [presiding] Thank you. Mr. Vento?

Mr. VENTO. Well, thanks, Mr. Chairman.

I appreciate your testimony. Obviously, the Park Service has followed the law passed in the 100th Congress which says that, "no aircraft audible in the park at certain areas." They divided the park into apparently two zones. Apparently, what the concern here is about the zone which is about half the park, I guess—I don't know if it is quite half the park or not; it looks like it is less than that—but where there would be no audible noise for 75 percent of the time. So the issue is, you don't disagree with that goal, do you?

Ms. BERKLEY. I think there are experts here that can talk about the actual noise levels, and I think they are going to be giving you a demonstration.

Mr. VENTO. No, I am just talking about the goal. Do you agree with the goal?

Ms. BERKLEY. Yes.

Mr. VENTO. And so it isn't the question here what constitutes this. Now, obviously, if my colleague from Utah is correct in terms of less aircraft that are more quiet or engines that are obviously for power and safety and other reasons and administrative purposes, there are exceptions in this law that was passed. But I think that we can agree on the goal and it is just a question of what the effect is. If in fact, the Canyon, as an example, amplifies some of the noises, acts as a natural amplifier, that would be a concern. It is not just the noise that emanates from the internal combustion engine, or whatever is being used in this case, but it is the fact of how that is characterized.

The laws of sound are pretty solid. I don't think that anyone has modified them just lately. In fact, most scientists will tell you that it is one of the few absolutes. Acoustical science itself, in terms of how it behaves, is a little more complex.

Ms. BERKLEY. Although it is my understanding that evidence to the contrary suggests that the natural walls of the Grand Canyon act to not amplify the sound, but to buffer it.

Mr. VENTO. No, I know this. I read your testimony, but that depends on where you are standing, I expect. But that is the acoustical part of it, not the law of sound.

In any case, we will be looking over it, but as long as we agree upon the goals here, then I think we will have to—you know, clearly when we were dealing with this initially, it was aircraft below the rim or above the rim, what the height was. Safety factors are also important here. The Park Service, I think they have come along slowly—too slowly in my estimation. I think the real issue here, and I expect that what is happening, too, is that there is actually a growth in the number of these flights that have taken place from when this law was passed in 1988. I will have to ask the aircraft industry that. But I expect that more and more folks are enjoying it, and this might be one of the other issues.

There are other factors just besides noise and safety; the distance between aircraft and a number of other factors, as I recall when we were dealing with this, that were important.

I thank the chairman.

Ms. BERKLEY. I would like to beg your indulgence. I have a group of students from Las Vegas waiting in my office for me.

Mr. DUNCAN. You go right ahead. I was just going to say, Ms. Berkley, that Chairman Hansen and I held a joint hearing on this a couple of years ago in St. George, Utah, and we got into all of this. But then they took us on a flight across the Grand Canyon, and it was really a real highlight of our trip out there. In fact, because of time constraints, we would not have seen that if we had not done it in that way.

We want to thank you very much for coming to testify, and you are certainly excused to go on to your other duties.

Ms. BERKLEY. Thank you. My greatest concern is that the regulations would be so onerous that it would lead to the elimination of this very important component of the tourism industry.

Mr. DUNCAN. Thank you very much.

We will now call up the first panel, and we have a very distinguished panel. We have Ms. Jackie Lowey, who is the Deputy Director of the National Park Service. We have my friend, Mr. David Traynham, who is the Assistant Administrator for Policy, Planning, and International Aviation with the Federal Aviation Administration. We have Mr. John Alberti, who is with JR Engineering, and Mr. Alan R. Stephen, who is president of Twin Otter International, Ltd.

What we do is to proceed in the order in which the witnesses are listed on the call of the hearing, and that means that, Ms. Lowey, we will begin with you, please.

**STATEMENT OF JACKIE LOWEY, DEPUTY DIRECTOR, NATIONAL PARK SERVICE; ACCOMPANIED BY WES HENRY, RESEARCH ADMINISTRATOR, NATIONAL PARK SERVICE, AND ROBERT ARNBERGER, SUPERINTENDENT, GRAND CANYON NATIONAL PARK**

Ms. LOWEY. Thank you. It is good to see you again. I was at that hearing in Utah. Let me first say I was pleased to listen to the last words that Congresswoman Berkley said because I think that where we are is not inconsistent with that at all. We continue to believe that there is a balance that is possible.

As you know, the statutory mission of the National Park Service is to preserve this Nation's natural and cultural resources unimpaired for future generations. In the case of Grand Canyon, I think there is no disagreement here, as Congressman Vento pointed out, that the mission, particularly as it relates to the Overflights Act, includes protecting the natural quiet or the natural sounds of the park.

Specifically, in the Act Congress passed, Congress said, and I quote, "noise associated with aircraft overflights at Grand Canyon is causing a significant adverse effect on natural quiet and the experience of the park." So we have a clear mandate with the FAA to achieve a goal. I think what has been a question among many is the implementation of that law in terms of how we measure our progress in achieving the goal that is clear.

The Park Service and the FAA continue to work together as partners on a rulemaking process to achieve the goal of substantial restoration of natural quiet, which has been defined by the Park Service as 50 percent of the park being quiet 75 percent or more of the day. The U.S. Court of Appeals for the District of Columbia, in 1998, upheld that definition of substantial restoration of natural quiet.

The Park Service, in cooperation with the FAA, continues to work on the administrative implementation of the Overflights Act. We anticipate that a new rule, along with new flight routes, will be fully implemented by the summer of 2000. As part of this rulemaking process, we have made refinements to the methodology we will use to evaluate progress toward the achievement of the goal. I am pleased to discuss those with you today, and, I think, have an opportunity to clarify what are some misconceptions about that.

First, let me say, to know when half the park is quiet 75 percent of the time, we have to know what that quiet means. The natural sounds of the park, from the Colorado River, from animals, to the wind, make up the natural sounds of the park, or the natural quiet of the park, which is not quiet at all. We have to determine these natural ambient sound levels because they are an essential factor in determining whether noises are audible. Second, we have to determine when noise from overflying aircraft is going to reach the point that natural quiet is disturbed or, conversely, when it is restored.

The first modification that we have made is in a refinement to the calculations of the natural ambient or baseline natural sound levels of the park. With the size of Grand Canyon and its highly varied terrain and vegetation patterns, we have found that no single acoustic level adequately reflects the range of natural sounds

present. To more accurately portray the range of natural sounds present, we have established a series of natural ambient zones, each representing a level of sound that is natural quiet for that part of the park.

Initially, we based our natural ambient acoustic zones just on vegetation communities as the single best predictor of acoustic conditions. More recently, we have recognized that, while these three initial zones do account for the vast majority of the park, they do not account for the variation by what is the major natural sound producer in the center of the park, the Colorado River. So we have added two new ambient acoustic zones. The first, called the "Colorado River Rapids," is for the natural river noise is great. The second is for what we label "water-affected" areas, that is, areas with perennial running water. In sum, we now have five natural ambient sound zones to characterize the park into scientifically meaningful, data-based acoustic units, each with a different level of natural quiet.

The second change we have made in our methodology has to do with when we and the FAA determine that noise from overflying aircraft will reach a level that quiet is disturbed. The FAA has considerable expertise at measuring the impact of aircraft noise. However, most of their expertise and most of their experience has been in modeling the impact of that noise around airports in urban cities, which, as a New Yorker, I can say is something that is quite different than Grand Canyon. Therefore, the National Park Service and the FAA have spent years working together to adapt the modeling that they have to make it more appropriate for a park environment.

In the 1994 report to Congress that the National Park Service issued, when we first proposed the definition of natural quiet in Grand Canyon, we said that it should be no aircraft audible. That was a single standard to apply equally throughout the park.

Now, in the notice that we have put out, we are proposing to move to a dual-zone standard to use in different parts of the park, two different standards for evaluating the impact of aircraft noise. In certain areas of the park, we will use a noticeability standard—the noise threshold at which one who is actively engaged in other things notices noise. It is what has been used in previous FAA rulemakings on Grand Canyon. In other areas of the park, we will use an audibility standard—the noise threshold at which an attentive listener can hear noise.

We are proposing to use the noticeability standard for an area that we have designated as zone 1, and the audibility standard as an area we have designated as zone 2, and I believe we have provided—I would be happy to provide for the Committee a map of those two different zones. But, in short, zone 1 contains approximately one-third of the park's area: the developed areas along the south rim, the much smaller developed area along the north rim, the Marble Canyon area, the Sanup area below Whitmore Rapids, and zone 2 constitutes the large continuous core of the park.

We believe that by using these different approaches in different areas of the park, we can get the most accurate picture possible as a way to measure the presence and impact of aircraft noise on the

park, taking into account different resources and uses that occur in different areas.

Let me be clear that what we are talking about is assessing aircraft noise. What we are not saying—and I think there has been quite a bit of misunderstanding about this—we are not saying that aircraft will be barred from those areas if they cannot achieve that level of sound. We are saying this is the most accurate way to just get a picture of what the actual cumulative sound is in the park.

We are going to continue to present this information in a public forum and work to get the best possible scientific information possible. I think that science is clearly something where you continue to improve, you continue to get more precise, and we believe that, by implementing both of these, we have done that. We will continue to welcome the active participation of all interested parties; there are many affected—Native American tribes; there are the American people; there are the air tour operators, and the environmental community. We do believe that balance is possible and that we can move forward and support a healthy air tour industry and preserve precious resources.

With that, I open myself to any questions or yield to the gentleman.

[The prepared statement of Ms. Lowey follows:]

STATEMENT OF JACQUELINE LOWEY, DEPUTY DIRECTOR, NATIONAL PARK SERVICE,  
DEPARTMENT OF THE INTERIOR

Thank you for the opportunity to discuss our efforts to substantially restore “natural quiet” at Grand Canyon National Park. As you know, the statutory mission of the National Park Service is to preserve the natural and cultural resources of National Parks unimpaired for future generations. In the case of Grand Canyon National Park, there is no disagreement that this mission includes protecting the natural quiet or the natural sounds of the park, and that aircraft overflights have an impact on that resource. Congress recognized this in Public Law 100-91, commonly known as the “Overflights Act,” when it said “noise associated with aircraft overflights at the Grand Canyon National Park is causing a significant adverse effect on the natural quiet and experience of the park.” The Overflights Act gave the National Park Service and the Federal Aviation Administration a mandate to achieve a “substantial restoration of natural quiet” in the park. A key question in the implementation of that law is how we measure our progress in achieving that goal.

The National Park Service and the FAA are continuing to work as partners on a rulemaking process to achieve the goal of substantial restoration of natural quiet, which has been defined by the NPS as 50 percent of the park being quiet 75 percent of the day. This definition was included by the FAA in the rules promulgated in 1996 under the Overflights Act. In response to suits brought by the air tour industry, environmental groups, and a Native American Tribe, the United States Court of Appeals for the District of Columbia in 1998 upheld this definition of substantial restoration of natural quiet. The National Park Service, in cooperation with the FAA, is continuing to work on the administrative implementation of the Overflights Act. We anticipate that a new rule, along with new flight routes, will be fully implemented by the summer of 2000. As part of this rulemaking process, we have made refinements to the methodology we will use to evaluate progress toward the achievement of substantial restoration of natural quiet. I am pleased to have the opportunity to discuss these refinements with the Subcommittee today.

To know when half of the park is quiet 75 percent of the time, we have to know what “natural quiet” means. There obviously are natural sounds in the park, from such sources as the Colorado River, the wind, and animals, that are part of the park’s natural quiet. We have to determine the natural ambient sound levels because the characteristics of that ambient sound are an essential factor in determining whether other noises are audible. Second, we have to determine when noise from overflying aircraft is going to reach the point that natural quiet is disturbed or, conversely, when we have achieved a substantial restoration of natural quiet.

We have made refinements in our methodology on both factors.



First, the NPS has refined its calculations of the natural ambient or baseline natural sound levels of the park. With the size of Grand Canyon National Park and its highly varied terrain and vegetation patterns, we have found that no single acoustic level adequately reflects the range of natural sounds present. To more accurately portray the range of natural sounds present, we have established a series of natural ambient zones, each representing a level of sound that is the natural quiet for that part of the park.

Initially, we based our natural ambient acoustic zones just on vegetation communities, as the best single predictor of acoustic conditions. This is largely for two reasons: (1) because wind passing through the foliage is one of the primary sound producers, the type and amount of foliage in that vegetation community provides a strong indicator of the sound levels present there; and (2) vegetation communities are also good indicators of the types of animals, birds, and insects likely to be present and the sounds that they may produce. Accordingly, we developed acoustic zoning that followed the three major vegetation communities present in the park: (1) desert scrub; (2) pinyon-juniper woodlands; and (3) sparse conifer forest, each with a specific level of sound that is equated with natural quiet.

More recently, we have recognized that while these initial three zones account for the vast majority of the park's area, they do not account for the variation caused by what is the major natural sound producer in the center of the park, the Colorado River. And, like the park itself, the river too, is acoustically complex. It contains world-class whitewater reaches that are connected by often quite lengthy relatively flat stretches between the rapids. In the immediate area of the major falls and rapids the sound levels seem almost thunderous while in the connecting reaches the relative stillness is just as impressive. So to better characterize the natural quiet in the proximity of the river, we have added two new ambient acoustic zones. The first, called the "Colorado River Rapids," is for areas where the natural river noise is great. The second is for what we label "water-affected" areas, that is, areas with perennial running water but outside the previously described "Colorado River Rapids" areas.

In sum, we now have five natural ambient sound zones, to characterize the park into scientifically meaningful, data-based acoustic units, each with a different level of natural quiet. These new zones add a degree of precision to our modeling that had previously not been possible. We strive to constantly improve our information and our science. We think the new ambient categorization does that.

The second change we have made in our methodology has to do with when we and the FAA determine that noise from overflying aircraft will reach the level that natural quiet is disturbed. The FAA has considerable expertise at measuring the impact of aircraft noise; however, most of their experience has been in measuring the impact of flights over urban areas near airports. Therefore, the NPS and the FAA have spent several years working on adapting existing models to make them more appropriate for use in a national park setting.

Initially, in the 1994 report to Congress mandated by the Overflights Act, the National Park Service proposed that natural quiet in Grand Canyon National Park should mean that there are "no aircraft audible" in the park. This was a single standard, to apply equally through the park.

Now, we have moved to a dual zone approach, to use in different parts of the park two different standards for evaluating the impact of aircraft noise. In certain areas of the park, we will use a "noticeability" standard—the noise threshold at which one who is actively engaged in other things "notices" noise. It is what has been used in previous FAA regulatory actions on Grand Canyon overflights. In other areas of the park we will use an "audibility" standard—the noise threshold at which an attentive listener can actually "hear" noise. The noticeability standard allows for more noise before natural quiet is considered "disturbed," the audibility standard allows for less noise.

We are proposing to use the noticeability standard for the area we have designated as zone 1, and the audibility standard for the area we have designated as zone 2.

Zone 1 contains approximately one-third of the park's area. It contains the developed area along the south rim, the much smaller developed area along the North rim, the Marble Canyon Area, and the Sanup area below Whitmore Rapids. The developed areas on each rim are zoned for relatively high visitor and park support uses; noise levels are higher in these relatively high use areas. Zone 2 constitutes the large, continuous core of the park. We believe that using these different approaches in the different areas of the park is the most accurate way to measure the presence and impact of aircraft noise on the park, taking into account the different resources and uses that occur in the different areas of the park.

We believe that the cumulative effect of these two refinements—natural ambient sound zoning and the dual noise standard zones—is to get an accurate portrayal of acoustic conditions in Grand Canyon National Park so that we can achieve our Congressional mandate of substantial restoration of natural quiet. We will continue to present this information and analysis through various public processes and we will continue to work to get the best possible scientific information available.

We welcome the active participation of all interested parties—affected Indian Tribes, the air tour industry, environmental organizations, and the American people. It is a great challenge, but I do believe that balance is possible and that we can protect the park's precious resources, respect tribal lands, and continue to support a healthy air tour industry.

This concludes my testimony, I would be happy to answer any of your questions.

Mr. DUNCAN. Thank you very much, Ms. Lowey.

Next we will hear from Mr. Traynham.

**STATEMENT OF DAVID TRAYNHAM, ASSISTANT ADMINISTRATOR FOR POLICY, PLANNING AND INTERNATIONAL AVIATION, FEDERAL AVIATION ADMINISTRATION; THOMAS CONNOR, OFFICE OF ENERGY AND ENVIRONMENT, FEDERAL AVIATION ADMINISTRATION**

Mr. TRAYNHAM. Thank you, Mr. Chairman and Members of the Subcommittee. It is a pleasure to appear before you today to discuss the FAA's role in working with the National Park Service to achieve substantial restoration of natural quiet at the Grand Canyon. I would like to express our appreciation for your continued leadership concerning national park overflights and reiterate our commitment to working with the Park Service and the Congress to reduce the impact of aircraft overflights on all of our national parks.

My testimony today will focus on FAA's part in using the revised NPS methodology to do this. We have worked closely with the Park Service over the past few years to balance various commercial and governmental interests within the parameters of our specific mandates and jurisdictions. We are cooperatively developing policies, rules, and processes that preserve, to the extent practicable, the natural resources without compromising aviation safety.

The FAA and the National Park Service have two distinct missions: Federal law and Congressional policy mandate that the authority to control air traffic over our Nation's air space resides solely with the FAA, while the Park Service is charged with the management of the natural and cultural resources and values of the national park system. I believe that we have proven over the past few years that, although these missions are separate and distinct, they are not necessarily incompatible.

Together we have developed a process to manage the impact of aircraft overflights to the national park system. This process is simple. National Park Service sets standards for noise levels in our national parks and the FAA integrates these standards into our regulation of the airspace. Within this framework, the National Park Service consults with the FAA on developing further actions to aid the substantial restoration of natural quiet, as well as planning for the development of comprehensive noise management plan for air tour operations over the Grand Canyon. For our part, the FAA offers advice and expertise on aircraft noise. This system has proven effective both in preserving our distinct missions and in progressing steadily toward natural quiet goals.

As you know, the Park Service has made a number of revisions to its noise standards and policies. In particular, in January of this year, the Park Service published its new Dual Noise Standard in The Federal Register as a new basis for evaluating restoration of natural quiet in the Grand Canyon. The new standard reflects whether a person is actively listening for aircraft or not, and other factors based on land use, visitor activity, and geography.

In addition, as Deputy Director Lowey has testified, the National Park Service has modified the use of average natural ambient sound levels for a noise impact threshold with a two-zone system: one for higher noise sensitivity and one for lower noise sensitivity. This will more precisely reflect the acoustic conditions of the park.

The FAA plans to issue a Notice of Proposed Rulemaking soon that will modify existing regulations governing aircraft flights over the Grand Canyon. The NPRM will reflect the changes in the National Park Service's policies. It will make use of the Integrated Noise Model. This is the FAA's standard computer methodology for assessing and predicting aircraft noise impacts. This mode is a computer program that predicts aircraft noise exposure. When certain types of information are input into the program, such as number of flights during the day and the types of planes making those flights, the model can produce information on the noise that those flights will generate. This has been used at approximately 400 airports in the United States, as well as another 200 or so overseas, and it has been found to be a very accurate predictor of noise impacts.

The FAA has continually refined and updated the computer program to reflect advances in acoustic science and the accurate evaluation of unique regional environments. In line with this, the FAA produced a modified version of the INM to provide specific data appropriate to aircraft noise conditions in the Grand Canyon. This data will then be used to assess the noise exposure implications of the actions proposed in our upcoming NPRM.

At this juncture, the FAA has not yet completed the NPRM, and therefore, it is premature to discuss the specific details. However, the FAA has committed to promulgating fair and equitable rules regarding aircraft operations, and as always, our highest priority is safety. Our NPRM will ensure the highest level of aviation safety possible while following the National Park Service guidelines and policies.

We believe that together the NPS and the FAA are well on the way to achieving our common goal of substantial restoration of natural quiet in the Grand Canyon, as well as other national parks, without eliminating safe access by the air. It has been, and will continue to be, our policy in managing the navigable airspace over these natural treasures to exercise leadership in achieving an appropriate balance between efficiency, technological practicability, and environmental concerns, while maintaining the highest level of safety.

I thank you again for the opportunity to appear before you this morning. This concludes my prepared statement, Mr. Chairman, and I would be pleased to answer any questions when we get to that point.

[The prepared statement of Mr. Traynham follows:]

STATEMENT OF DAVID F. TRAYNHAM, ASSISTANT ADMINISTRATOR FOR POLICY,  
PLANNING, AND INTERNATIONAL AVIATION, FEDERAL AVIATION ADMINISTRATION

Mr. Chairman and Members of the Committee:

It is a pleasure to appear before you today to discuss the Federal Aviation Administration's (FAA) role in working with the National Park Service (NPS) to achieve the substantial restoration of natural quiet in Grand Canyon National Park (GCNP). I would like to express our appreciation for your continued leadership concerning national park overflights and reiterate our commitment to working with NPS and the Congress to reduce the impact of aircraft overflights on our national parks. My testimony today will focus on FAA's part in using the revised NPS methodology to achieve statutorily required restoration of natural quiet.

This Administration has committed significant time and effort to developing specific plans to restore natural quiet to the GCNP and to formulating a national policy and process to manage aircraft overflights over national parks across the country. In developing this policy, the Administration has taken care to balance the interests of the numerous groups affected by rules concerning overflights. Many park visitors and those whose duty it is to preserve park resources are concerned about aircraft noise over park lands. Those charged with aviation safety are concerned about effectively managing the airspace. Those who provide access to park resources from the air offer a unique and unparalleled way to view the parks, and are, of course, interested in continuing these operations. And, in the case of western parks especially, Native American cultural and historical properties are affected by flights over or near park land.

We have worked closely with NPS over the past few years to balance these various interests within the parameters of each of our specific mandates and jurisdictions, cooperatively developing policies, rules, and processes that preserve, to the extent practicable, the natural resources without compromising aviation safety. The FAA and NPS have two distinct missions: Federal law and Congressional policy mandate that the authority to control air traffic over our nation's airspace resides solely with the FAA, while the NPS is charged with the management of the natural and cultural resources and values of the national park system. I believe that we have proven over the past few years that although these missions are separate and distinct, they are not necessarily incompatible.

Together, we have developed a process to manage the impact of aircraft overflights to the national park system: NPS sets standards for noise levels in our national parks and the FAA integrates these standards into our regulation of aircraft and airspace. Within this procedure, NPS consults with the FAA on developing further actions to aid the substantial restoration of natural quiet, as well as planning for the development of a comprehensive noise management plan for air tour operations over GCNP. For our part, the FAA offers advice and expertise on aircraft noise. This system has proven effective both in preserving our distinct missions and in progressing steadily towards the goal of substantially restoring natural quiet over GCNP.

As you know, NPS has made a number of revisions to its noise standards and policies. In particular, in January of this year, the NPS published its new "Dual Noise Standard" in the Federal Register, 64 Fed. Reg. 3969 (January 26, 1999), as the new basis for evaluating restoration of natural quiet in the GCNP. The new standard reflects whether a person is actively listening for aircraft or not, and other factors based on land use, visitor activity, and geography. In addition, as NPS Deputy Director Lowey has testified, the NPS has modified the use of average natural ambient sound levels for a noise impact threshold with a two-zone system, one for higher noise sensitivity and one for lower noise sensitivity. This will more precisely reflect the acoustic conditions of the park.

The FAA plans to issue a Notice of Proposed Rulemaking (NPRM) soon that will modify existing regulations governing aircraft flights over the GCNP. The NPRM will reflect these changes in the NPS policies. It will make use of the FAA's standard computer methodology for assessing and predicting aircraft noise impacts, the Integrated Noise Model (INM). To put it simply, the INM is a computer program that predicts aircraft noise exposure. That is, when certain types of information are input into the program, such as the number of flights during a day and the types of planes making those flights, the INM can produce information on the noise that those flights will generate.

The FAA has continually refined and updated the INM's system capabilities, aircraft noise and performance data, and computer technology, to reflect advances in acoustic science and the accurate evaluation of unique regional environments. In line with this, the FAA produced a modified version of the INM to provide specific data appropriate to aircraft noise conditions in the GCNP. This data will then be

used to assess the noise exposure implications of the actions proposed in the upcoming NPRM.

The FAA uses INM because of: (1) its widespread scientific acceptance; (2) its use of methodology that conforms to industry and international standards; (3) its measurement-derived noise and performance data; (4) its ability to calculate noise exposure over varying terrain elevation; and (5) its adaptability and reliability for assessing a variety of situations, including noise impacts on park lands. This is the type of computer modeling that supports the assessment of land use compatibility and the restoration of natural quiet. The INM uses specific measures of noise for these assessments. The data is analyzed to determine what changes may be needed to air traffic management in order to achieve particular goals in noise management.

At this juncture, the FAA has not yet completed our analysis, and therefore, it is premature to discuss the specific details of the upcoming NPRM. However, the FAA is committed to promulgating fair and equitable rules regarding aircraft operations. And, as always, our highest priority is aviation safety. Our NPRM will ensure the highest level of aviation safety possible while following the NPS' guidelines, policies, and standards for achieving the substantial restoration of natural quiet in the GCNP and other national park lands.

We believe that together the NPS and the FAA are well on the way to achieving our common goal of substantial restoration of natural quiet in the GCNP and other national parks, without eliminating safe access by air. It has been and will continue to be our policy, in managing the navigable airspace over these natural treasures, to exercise leadership in achieving an appropriate balance between efficiency, technological practicability, and environmental concerns, while maintaining the highest level of safety.

Thank you for the opportunity to appear before you this morning. This concludes my prepared statement, Mr. Chairman, and I would be pleased to answer any questions you and members of the Committee may have.

Mr. DUNCAN. Thank you very much, Mr. Traynham.

My next witness is Mr. John Alberti of JR Engineering. Mr. Alberti?

**STATEMENT OF JOHN ALBERTI, OWNER, JR ENGINEERING**

Mr. ALBERTI. Thank you, Honorable Chairman and members, and thank you for inviting me back. My name is John Alberti; I am the owner of JR Engineering. I am a big advocate of quiet in the Grand Canyon as well. I got involved in this working with Papillon Grand Canyon Helicopters to develop an ultra quiet helicopter for air tour use. I am also a big fan of dealing honestly and accurately with acoustics and of not moving the regulatory goal post around, which is why we are here today.

Last September, we discussed the 1994 NPS Report to Congress, revealed serious flaws in that report and demonstrated, contrary to NPS claims then and this morning, that substantial restoration of natural quiet had, in fact, occurred under SFAR-50-2. Measurements sponsored by the NPS in 1992 confirmed that. That data is presented in my Attachment No. 1.

Today, the NPS wants to change the ground rules by which natural quiet is defined. They wish to substitute the "detectability" for "noticeability." "Noticeability" occurs when a disinterested observer, such as a hiker pausing to observe the view, becomes aware of the sound of an aircraft. That is taken to occur three decibels above the background ambient sound level. That has been the basis for current studies and current court decisions, including the one referred to by Ms. Lowey today.

"Detectability" occurs when an observer who is actively listening for and straining to hear aircraft is just able to detect it. The notice proposes that that occurs 8dB(A) below background ambient noise. Thus, the direct effect is to lower the threshold by 11dB(A). The ef-

fect of this will be that any tour aircraft operating near the Grand Canyon would exceed that threshold, as would airliners, including quiet stage three airliners up to 40 miles away.

In the notice, the NPS cites additional information available to them which justifies this. We have reviewed the report that they provided—it was prepared by Harris, Miller, Miller and Hanson—and this is not true. That report provides no new data, no new measurements, no new observations, and no substantiation for a political desire to change the ground rules. What it does do is it does some arithmetic on some old measurements to convert from one measurement of signal-to-noise ratio called d-prime to signal-to-noise ratio measured in terms of dB(A), that produces some absurd results; for example, that an aircraft at 5.6 dB(A) would be detectable, never mind that the entire spectrum falls below the threshold of human hearing at every frequency. Yet no time did any observer detect aircraft at anything near these sound levels. In fact, the detectability criterion was based on detections by vigilant observers in the canyon at an average threshold level of 30 dB(A). Our analysis, in fact, of NPS data leads to 29 dB(A) as a conservative threshold of noticeability; that is what we recommend.

Moving ahead now to the HMMH study; if you turn to page 4, table 1, this shows the actual sound levels of the spectra that were used in this analysis.

You have four ambient levels, ranging from 17 to 46 dB(A), and you have eight different aircraft—the quietest of which was at 29.6 dB(A) when detected. What happened was they simply subtracted from these aircraft sound levels until they got predetermined values of d-prime and dB(A). There was no sound measurements, no observations, just arithmetic.

If you turn to figure 1 on page 5, you can see the result of this. This is an example at Hermit Basin where the ambient is 17.1 dB(A). All A-aircraft spectra were adjusted to 9.1 dB(A), exactly 8 dB(A) below that, in accordance with the proposal. Supposedly, these are audible by that standard. In fact, they all lie at or below the threshold of human hearing for young observers under ideal conditions. You can't hear these; more important, you can't measure these. You cannot measure a sound that is 8 dB(A) below the ambient. I do aircraft noise certification for the FAA for a living. If I turned in data like this, the FAA would still be laughing. Yet they are prepared to accept this data as a basis for noise regulations that will put the air tour industry out of business and affect air commerce from general aviation to airliners.

But more to the point, these manipulations of data do not even address the central issue; that is, should a noise regulation be based upon noticeability to protect ordinary visitors to the canyon, who have no vested interest in aircraft noise one way or the other? Or should it be based on detectability to prevent an activist who goes there just to listen for aircraft from being able to detect them? I think the answer is perfectly obvious.

I see I have just run out of time. I hope you will read my recommendations in the written testimony. And at the appropriate time, I would like to raise some questions about some of the testimony of the government witnesses.

And I thank you very much.

[The prepared statement of Mr. Alberti follows:]

QUIETLY  
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815 Sixth Street South, Suite 107 / Kirkland, WA 98033  
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e-mail: quietlyjr@aol.comTESTIMONY BEFORE THE U.S. HOUSE OF REPRESENTATIVES COMMITTEE ON  
RESOURCES -- May 25, 1999**SUBJECT:** CRITIQUE OF ACOUSTICAL BASIS FOR, "*Change in Noise Evaluation Methodology for Air Tour Operations over Grand Canyon National Park*" 64 Fed. Reg. 3969 (Jan. 26, 1999) -- (hereinafter "*the Notice*").**DELIVERED BY:** John R. Alberti, Tuesday, May 25, 1999**I. INTRODUCTION**

It is a pleasure to address this committee again. My name is John Alberti, owner of Quietly Superior, Inc. doing business as J R Engineering. My company specializes in acoustics, particularly aircraft noise.

For 33 years, the main thrust of my career has been the reduction of aircraft noise. My company's involvement in Grand Canyon noise began working with Papillon Grand Canyon Helicopters to develop a large, ultra-quiet helicopter for air tour use.

We are authorized by FAA to perform noise certification tests on all categories of aircraft. I have been appointed a Designated Engineering Representative (DER), authorized to represent FAA in the fields of acoustics and performance (flight analyst).

Last September I had the honor of discussing the 1994 NPS Report to Congress<sup>1</sup> with you. The discussion enumerated serious flaws in that report and demonstrated that, contrary to NPS claims, "*substantial restoration of natural quiet*" had been achieved under SFAR-50-2.

Today we address an attempt by NPS to change the ground rules by which "*natural quiet*" is defined. They seek to substitute *detectability* in place of *noticeability*.

- *Noticeability* occurs when a disinterested observer, such as a hiker pausing to enjoy the view (or doing something other than listening for aircraft), becomes aware of aircraft sound.
- *Detectability* (sometimes called *audibility*) occurs when observers actively and intently listening for aircraft are just able to detect aircraft sound. The notice defines aircraft sounds 8 dB(A) below the background sound level to be *detectable*
- All recent studies of aircraft sound in GCNP have used *noticeability*, defined as 3 dB(A) above the background sound level as the threshold of "*natural quiet*".

<sup>1</sup> CRITIQUE OF ACOUSTICAL INFORMATION PRESENTED IN, "*Report To Congress -- Report On Effects Of Aircraft Overflights On The National Park System*", NPS, 9/12/1994, delivered by: John R. Alberti, Thursday, September 24, 1998



Testimony of John R. Alberti, 5/25/1999

- The direct effect of the notice is to change the definition and lower the threshold of "natural quiet" by 11 dB(A). Any tour aircraft operating near the Grand Canyon would exceed that threshold, as would airliners 40 miles away.

## 2. SUMMARY

2.1. In the Notice, NPS cites the failure to achieve "substantial restoration of natural quiet" in GCNP. They define this as more than half the park free of aircraft sound 75% to 100% of the time.

2.1.1. This assertion is untrue as we demonstrated in our 1997 analysis.<sup>2</sup> I presented these findings to the House National Parks and Public Lands Subcommittee last September.

2.1.1.1. Not only did our analysis show that more than half of the park was free of aircraft sound more than 75% of the time (based on actual 1996 operations under SFAR 50-2), but observers hired by NPS found the same thing in 1992. (See Attachment 1)

2.1.1.2. Their own survey shows that when specifically asked, only 5% of visitors were annoyed by aircraft sound or thought it interfered with their enjoyment of GCNP. 66% reported that they did not notice any aircraft sound at all.

2.1.2. Conclusion: There is no acoustical emergency in GCNP that justifies the imposition of more economically burdensome regulations, as proposed in the Notice.

2.2. In the Notice, NPS cites "additional information", that requires NPS to "refine its methodology" used to evaluate the achievement of its "natural quiet restoration standard". Further to this "additional information", the narrative continues. "The technicians identified aircraft noise at A-weighted levels 8-12 decibels below the average A-weighted natural ambient sound levels." the Notice begs us to conclude that new research now dictates that the threshold of "natural quiet" be changed from 3 dB(A) above ambient to 8 dB(A) below ambient. Applying this to the minimum ambient levels (15 to 17 dB(A)) that NPS has (incorrectly) used in past studies would result in a "natural quiet" criterion of 7 to 9 dB(A) for most of GCNP.

2.2.1. This assertion is untrue. The engineering report by HMMH containing the claimed "additional information"<sup>3</sup>, hereinafter "HMMH Report") is both flawed and irrelevant.

2.2.1.1. There were no new measurements or observations; only some arithmetic performed on some old measurements and studies. HMMH's arithmetic indicates that aircraft sound meets their detectability criterion at levels as low as 5.6 dB(A).

2.2.1.2. At no time did any observer actually detect aircraft sounds at anything close to these levels -- in the Grand Canyon, or anywhere else.

2.2.1.3. Their detectability criterion was based on aircraft sounds that were detected by vigilant observers in GCNP at an average threshold level of 30 dB(A).

<sup>2</sup> Analysis report, IR 182, "Analysis Of National Park Service Data On Air Tour Overflight Sound At Grand Canyon National Park", John R. Alberti, et al of J R Engineering, 7/25/1997.

<sup>3</sup> HMMH Memorandum, "A-Weighted Differences Compared with Detectability", N.P. Miller of Harris Miller Miller & Hanson, Job # 294330.22, 5/15/1997

Testimony of John R. Alberti, 5/23/1999

2.2.1.4. In several cases, aircraft sound spectra, adjusted to meet their detectability criterion, are below the threshold of human hearing at every frequency and could not possibly be detected, by an observer with normal hearing, no matter how intently he or she strained to listen.

2.2.1.5. In the *Notice*, NPS is not "*refining its methodology*". It is attempting to switch from *noticeability* to *detectability* as the principle upon which aircraft noise criteria are set.

2.2.1.5.1. In so doing NPS is expressing a political opinion not supported by the HMMH Study or any other scientific study.

2.2.1.5.2. *the HMMH Study* is an arithmetic exercise that attempts to quantify detectability in units of dB(A) and makes some serious errors, in the attempt.

2.2.1.6. To their credit, HMMH admits that their study "...is likely to produce results that differ considerably from what a listener on the ground would experience."

2.2.2. Conclusion: The "*additional information*" cited in the *Notice* is flawed and would offer no credible scientific support for the proposed change from *noticeability* to *detectability* as a criterion for "*natural quiet*" even if it had been done right. The fact is, this proposed change reflects a political desire on the part of NPS and is not supported by any scientific study.

2.3. *The notice* does not specify background sound levels. We find a consistent pattern of under-stating the ambient sound level by NPS, however, that will add a further bias in the direction of an unreasonably low threshold of "*natural quiet*".

2.4. Our analysis of observations commissioned by NPS demonstrates that the correct tour aircraft sound criterion level for evaluating "substantial restoration of natural quiet" is 29.0 dB(A). This is 3dB(A) above the background sound level when aircraft were actually detected by vigilant human observers. We based this on the quietest 25% of detections at the quietest 50% of locations.

### 3. ANALYSIS OF THE HMMH STUDY

3.1. *The HMMH Study* uses as its audibility index, a masking parameter called *bandwidth adjusted signal to noise ratio*,  $d'$  (pronounced "d-prime"). Though not attributed in *the HMMH Study*, this derives from a 1994 study conducted under NPS contract by BBN in 1994 (hereinafter "*the BBN Study*").<sup>4</sup>

3.1.1. BBN observers intently listening for aircraft were able to detect them at an average  $10\text{LOG}(d')$  of about 7.

3.1.2. *The HMMH Study* fails to mention that the average sound level at onset and offset of detection in the BBN study was 30 dB(A).

3.1.3. *the BBN Study* also observed that noticeability, the level at which a typical visitor, not actively listening for aircraft, might become aware of aircraft noise occurs at about  $10\text{LOG}(d') = 17$ , typically about 3 dB(A) above ambient.

<sup>4</sup>NPOA Report No. 93-1/BBN Report 7197, "*Evaluation of the Effectiveness of SFAR 50-2 in Restoring Natural Quiet to Grand Canyon National Park -- Final Report*", S. Fidell, K. Pearsons, M. Sneddon, BBN Systems and Technologies, 6/23/1994. We have cited *the BBN Study* in several of our studies, including JR 182 HMMH contributed Appendix F to *the BBN Study*.

Testimony of John R. Alberti, 5/25/1999

- 3.1.4. BBN recommends the noticeability criterion,  $10\text{LOG}(d') = 17$ , as the appropriate criterion for "natural quiet" in GCNP and uses it in developing the acoustic map presented in *The BBN Study 3*.
- 3.1.5. In Table 2 of *the HMMH Study* confirms that 3 dB(A) above ambient corresponds to an average  $10\text{LOG}(d') \approx 17$ .
- 3.2. *The HMMH Study* compares various aircraft sound spectrum shapes (Four at maximum sound level and four just after detection) with various natural ambient sound levels measured in GCNP (under unstated circumstances). In each comparison they subtract enough from the aircraft spectrum that it meets their audibility criterion ( $10\text{LOG}(d')=7$ ), then compute the A-weighted sound levels – as low as 5.6 dB(A) for aircraft #1 at Hermit basin.
- 3.2.1. Table 1 shows the ambient and aircraft A-scale sound levels that we computed from the spectra in *the HMMH Study*.

**TABLE 1: SOUND LEVELS USED IN HMMH STUDY**

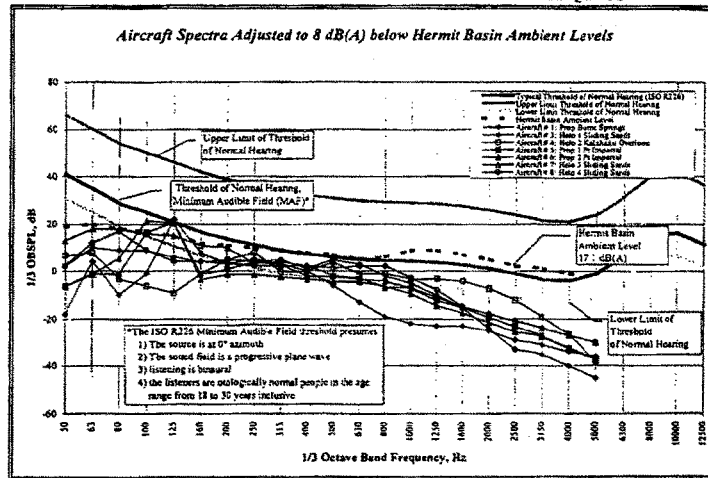
Aircraft #	Description	L <sub>A</sub> dB(A)
Ambient	Pt. Imperial	25.2
Ambient	117.4 Mile	46.6
Ambient	Toroweep	20.2
Ambient	Hermit Basin	17.1
1	Prop Burnt Spring – maximum level	62.6
2	Jet Toroweep – maximum level	32.8
3	Helo 1 Sliding Sands – maximum level	42.7
4	Helo 2 Kalahaku Overlook – maximum level	59.8
5	Prop 1 Pt. Imperial – detection level	39.9
6	Prop 2 Pt. Imperial – detection level	40.1
7	Helo 3 Sliding Sands – detection level	29.6
8	Helo 4 Sliding Sands – detection level	30.4

- 3.2.2. Observe that the levels for aircraft 5 through 8, measured just after detection, range from 29.6 dB(A) to 40.1 dB(A).

Testimony of John R. Alberti, 5/25/1999

3.2.3. We also adjusted the 1/3 octave sound pressure level spectra for the various aircraft studied in the *HMMH Study* (excluding the jet, #2) to produce a computed sound level 8 dB(A) below ambient at Hermit Basin. This is the level that NPS proposes as a standard for "natural quiet".

FIGURE 1: SOUND SPECTRA AT NPS PROPOSED "NATURAL QUIET"



- 3.2.3.1. Note that four of the spectra lie below the threshold of human hearing at every frequency. It is not possible for any observer, no matter how attentive, to detect aircraft sound that is below the threshold of hearing -- by definition.
- 3.2.3.2. Further, the threshold of hearing shown is an average value for young people without hearing loss. Many young people and most adults have higher thresholds, as noted by the upper gray line.
- 3.2.3.3. Further still, it is doubtful (and certainly not proven by NPS) that sounds slightly above the threshold of hearing could be detected at  $10\text{LOG}(d^*) = 7$ . The ear's ability to detect the small changes that reveal a new sound source is greatly degraded near the threshold of hearing.

Testimony of John R. Alberti, 5/25/1999

3.2.3.4. The fact remains that actual aircraft sound detection in GCNP (by attentive observers) occurs at an average sound level of 30 dB(A). The 7 to 9 dB(A) levels that would follow from the Notice are nonsensical, would require super-human hearing and have certainly not been demonstrated.

3.3. NPS and FAA studies since 1996 derive from a criterion for aircraft sound of 3 dB(A) above ambient, based on noticeability. That is the de-facto standard used by both FAA and NPS. (notwithstanding NPS's habit of using the term "audibility"). The NPS's proposed 11 dB(A) reduction in the criterion level is not a "refinement". It represents a major and unjustified change in philosophy from noticeability to detectability.

#### 4. DETERMINING THE THRESHOLD OF NOTICEABILITY

##### 4.1. Notes on Sound Detectability (or Audibility) and Noticeability

4.1.1. The detection of aircraft sound by humans (or sound analyzers) requires some increase in sound level above the ambient level with no aircraft present. That is the Signal to Noise Ratio, S/N, must be greater than zero.

4.1.1.1. For example, the sound measurements conducted in GCNP in the *BBN Study* found that observers at 13 different sites in GCNP (intently listening for aircraft) were able to detect aircraft at an average S/N of 1 dB(A).

4.1.1.2. This A-weighted Overall S/N=1 dB(A) is consistent with detectability of aircraft sound 6 dB(A) below ambient. *the BBN Study* acknowledges that one cannot reliably measure broadband sound levels (such as dB(A)) that are below ambient.

4.1.2. *The BBN Study* also made use of a commonly used measure of acoustical detectability in the presence of masking sound known as "d-prime" or bandwidth adjusted signal to noise ratio,

$$d' = \eta * S/N * \sqrt{W},$$

where,

d' is computed for every 1/3 Octave band

$\eta$  = detector efficiency (set to 40%, in *the BBN Study*)

W = critical bandwidth of the ear (~100Hz to ~150 Hz in the area of interest)

4.1.2.1. For convenience the decibel equivalent,  $10\text{LOG}(d')$  is often used. Typically, a prop or rotor blade passage tone will betray the presence of an aircraft. The band containing that tone typically has the highest d'.

4.1.2.2. The observers in *the BBN Study* found detectability at  $10\text{LOG}(d') = 7$  and noticeability at  $10\text{LOG}(d') = 17$

##### 4.2. Computation of Threshold of Noticeability

4.2.1. We based our computations on the observations reported in *the BBN Study*.

4.2.2. We accepted the 3 dB above ambient definition of the threshold of noticeability used by NPS in its previous studies.

4.2.3. The NPS's definition of "substantial restoration of natural quiet" requires that 50% or more of the Park be free of noticeable aircraft sound 75% or more of the time. To determine the corresponding threshold of noticeability:

4.2.3.1. We determined the lower quartile sound level at which aircraft were detected at each site. Thus the detection level was higher 75% of the time.

4.2.3.2. We then computed the median of those site-specific, lower quartile sound levels. Thus the detection level was higher 75% of the time at 50% of the sites.

Testimony of John R. Alberti, 5/25/1999

4.2.3.3. The finding in the *BBV Study* that  $S/N = 1$  dB(A) at detection means that the ambient level was 1 dB(A) below the detection level. Thus, subtracting 1 dB(A) and adding 3 dB(A) to the median lower quartile detection level yields the threshold of *noticeability*.

4.2.3.4. Table 1 shows the computations. The median lower quartile threshold of noticeability is 28.93 dB(A) at onset and 28.796 dB(A) at offset. Averaging and rounding yields 29 dB(A). This is the correct aircraft sound criterion level for evaluating "substantial restoration of natural quiet". If aircraft sound is less than 29 dB(A) 75% or more of the time in 50% or more of the Park, then, by the NPS's definition and the NPS's data, "substantial restoration of natural quiet has occurred".

TABLE 1: COMPUTATION OF THRESHOLD OF NOTICEABILITY

Site	La at Onset of Detectability			La at Offset of Detectability		
	Mean La, dB(A)	std dev, s	25%ile La, =La-.67s	Mean La, dB(A)	std dev, s	25%ile La, =La-.67s
Horn Cr.	24.9	2.3	23.359	24.7	3.2	22.556
Nankowesp	45.9	7.8	40.674	45.8	7.8	40.574
Pt Imperial	34.2	4.3	31.319	35.8	5.8	31.914
S. Canyon	22.5	3	20.49	22	3.7	19.521
Hermit Cr.	35	8.3	29.439	36.8	9.4	30.502
Sanup Plateau	26.2	4.9	22.917	29.2	7.5	24.175
Tonto Overlook	27.6	1	26.93	27.6	1.2	26.796
Phantom Ranch	45.8	1.2	44.996	45.7	1.6	44.628
Tuna Cr.	18	1.2	17.196	17.1	1.8	15.894
Torowesp Overlook	20.4	2.6	18.658	20.3	1.7	19.161
Desert View	27.7	0.7	27.231	32.1	4.5	29.085
MEDIAN, dB(A)	27.6		26.93	29.2		26.796
Amt amt, SNR=1, dB(A)	26.6		25.93	28.2		25.796
Noticeability Threshold						
= amb + 3 dB(A)	29.6		28.93	31.2		28.796
Data from NPCA Report 93-1, Table E-3						

Testimony of John R. Alberti, 5/25/1999

#### 5. CONCLUSIONS

- 5.1. NPS has expressed its political desire to lower the criterion for "natural quiet" from 3 dB(A) above ambient, based on *noticeability* to 8 dB(A) below ambient based on *detectability*.
- 5.2. The "additional information" that NPS cites as justification for this change in ground rules is a sham.
  - 5.2.1. The HMMH report contains no new sound measurements or observations, only computations based on some old ones.
  - 5.2.2. These computations attempt to quantify detectability in terms of dB(A). Even if that had been done correctly, it would not have substantiated the proposed change in ground rules.
  - 5.2.3. The computations are flawed and lead to the absurd conclusion that aircraft sound levels that are below the threshold of human hearing at every frequency exceed their proposed threshold of "natural quiet".
  - 5.2.4. The detectability criterion used by HMMH was developed in a 1994 BBN study. In that study, the average sound level at which vigilant observers could detect aircraft in GCNP was 30 dB(A).
  - 5.2.5. NPS has submitted no data to substantiate aircraft sound detection at the 7 to 9 dB(A) levels that would result from their proposed new definition of "natural quiet". Indeed, such detection would be impossible for humans with normal, unaided hearing.
- 5.3. NPS has offered no credible scientific justification for their proposed change in ground rules. There is no justification other than their desire to justify more destructive regulation of the air tour industry.
- 5.4. The threshold of "natural quiet" should be set to protect ordinary park visitors whose interest is to enjoy the park, not activists straining to hear an aircraft so they can complain about it.
- 5.5. The correct tour aircraft criterion level for evaluating "substantial restoration of natural quiet" is 29.0 dB(A).

## Testimony of John R. Alberti, 5/25/1999

## 6. RECOMMENDATIONS

- 6.1. 29.0 dB(A) should be adopted as the aircraft sound criterion level for evaluating "substantial restoration of natural quiet" is 29.0 dB(A).
- 6.2. The threshold of noticeability (ambient + 3 dB(A)), as used in previous studies, is the level at which normal visitors would first notice aircraft sound. This should continue to be the standard.
- 6.3. The current, publicly available, version of the FAA/DOT developed Integrated Noise Model (INM) program should be used until or unless another program is determined, by peer reviewed field validation, to be superior. Any such software or enhancements, thereto should be available to all interested parties.
- 6.4. The following criteria should be adopted for acoustical standards and rulemaking
  - 6.4.1. **Positive Net Gain:** Any acoustical standard should lead to rules that do more good than harm. Specifically, measures that decrease tour aircraft sound should not cause more harm to the air tour industry and the 17% of park visitors who make use of them, than the harm done by the sound that would be eliminated.
    - 6.4.1.1. An NPS survey showed that only 5% of Park visitors said they were annoyed by air tour noise or thought it interfered with their enjoyment - when specifically asked - and 66% did not notice aircraft noise at all! Thus, any standard that leads to the shutdown, or large-scale curtailment of the air tour industry cannot be justified.
    - 6.4.1.2. The air tour industry should, however, incorporate economically reasonable quiet aircraft technology and quiet flying techniques and operating practices.
  - 6.4.2. **Good Faith:** Any acoustical standard and the rules deriving, therefrom should provide a stable, reliable and clear basis for compliance and equally clear and reliable incentives for further sound reduction.
    - 6.4.2.1. The development and acquisition of quiet aircraft is both desirable and enormously costly and time-consuming. No sane business owner, who expects to be ambushed at any time by ever more extreme requirements that will nullify any good faith effort, would make that investment.
    - 6.4.2.2. The pattern of proposed standards and regulations from NPS, including the *Notice*, suggest an adversarial and counter-productive intent to regulate the air tour industry out of existence.
  - 6.4.3. **Common Sense:** Acoustical standards should reflect common sense and the perceptions and sensitivities of typical park visitors, not activists, or others consciously seeking the sound of aircraft. Similarly, thresholds of *noticeability* should derive from typical daytime levels at which actual aircraft are observed, not minimum ambient noise values, hand-picked for low noise, as we have seen in past studies. *Noticeability* is the correct measure to apply to a normal visitor who is not looking for something to complain about.



Testimony of John R. Alberti, 5/25/1999

- 6.4.4. **Equal Protection:** Any acoustical standard applied to tour aircraft should be comparable to standards to which other sound sources could reasonably be held.
  - 6.4.4.1. Specifically, air tour aircraft should not be held to standards that commercial transport and general aviation aircraft could not meet.
  - 6.4.4.2. Conversely, onerous standards imposed on the air tour industry can and will be applied to other activities, with disastrous effects (particularly on the nation's air transportation system). If an audibility standard of 7 dB(A) is established for national parks and monuments, then even popular stage 3 aircraft such as the MD-80, would be deemed audible at a slant range of 44 miles at climb power. (Data extrapolated from INM 5.2 database).
- 6.4.5. **Scientifically Valid:** Any acoustical standard should derive from scientifically valid measurements and analyses that are open to peer review by all interested parties:
  - 6.4.5.1. Measurements and analysis to determine aircraft sound levels should conform to FAA and industry standards.
  - 6.4.5.2. Software and methodology used to determine aircraft sound contours should be subjected to field validation and both the software and field validation data should be available for peer review by all interested parties. At this time only the publicly available version of INM meets that standard.
- 6.5. We have already demonstrated, in JR 182, that the NPS's definition of "restoration of natural quiet" has been met under SFAR 50-2, but propose the following sound reduction measures in the interest of further, progressive sound reduction:
  - 6.5.1. SFAR 50-2 should remain in effect, but aircraft should be operated to produce minimum sound consistent with safety of flight and approved operating limits. This includes minimum prop and rotor RPM and adjusting helicopter descent paths to avoid blade slap and fixed wing climb gradients to minimize use of high RPM.
  - 6.5.2. Decreased operating fees and other strong incentives should be offered for "quiet aircraft" and should provide further incentives for ultra-quiet aircraft. These incentives should be binding on NPS and other regulatory agencies for an extended period to justify the large, long-term investment required to obtain "quiet aircraft".

Table F-3 Estimated Aircraft Audibility by Operator

Site	Measured Percentage of Time Aircraft are Audible	Estimated Percentage of Time Aircraft are Airborne by Operator				
		Tour	Commercial	G/A	Military	
1	12.8	✓ 5.4	7.4	0.0	0.0	< 25%
2.1	18.8	✓ 7.4	11.3	0.0	0.0	< 25%
2.2	11.2	✓ 7.6	3.5	0.0	0.0	< 25%
3	51.9	+ 50.8	1.4	0.0	0.0	
5	5.7	✓ 2.1	3.6	0.0	0.0	< 25%
6.1	8.7	✓ 1.6	7.1	0.0	0.0	< 25%
6.2	6.6	✓ 3.9	0.0	2.7	0.0	< 25%
7	12.3	✓ 9.3	0.8	1.9	0.4	< 25%
8	20.0	- 19.5	0.6	0.0	0.0	< 25%
9	19.5	- 16.3	3.4	0.3	0.0	< 25%
10	19.8	✓ 5.9	12.9	1.0	0.0	< 25%
12	20.4	✓ 13.8	5.9	0.7	0.0	< 25%
13	49.6	+ 47.0	2.6	0.0	0.0	
14	53.7	+ 43.6	11.3	0.0	0.5	
15	66.2	+ 61.0	7.8	0.8	0.0	
16	82.9	+ 78.8	17.8	0.6	0.0	
17	43.3	+ 30.4	14.3	1.2	0.0	
18	11.5	✓ 5.0	6.6	0.0	0.0	< 25%
19	76.4	+ 69.3	11.7	0.0	0.8	
20	4.1	✓ 0.0	3.5	0.0	0.6	< 25%
21	50.4	+ 47.6	2.8	0.0	0.0	
23	12.9	✓ 6.7	1.9	0.0	4.3	< 25%
31	7.4	✓ 1.2	6.2	0.0	0.0	< 25%

Estimated percentages by operator may not sum to measured percentage due to overlap between aircraft of different operators.

23 SITES (MOST UNDER FLIGHT CORRIDORS)

15 SITES: TOUR AIRCRAFT AUDIBLE < 25% OF TIME

8 SITES: TOUR AIRCRAFT AUDIBLE > 25% OF TIME

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1992 NPS SPONSORED STUDY

Mr. DUNCAN. All right; thank you very much, Mr. Alberti.  
Mr. Stephen.

**STATEMENT OF ALAN R. STEPHEN, PRESIDENT, TWIN OTTER  
INTERNATIONAL, INC.**

Mr. STEPHEN. Thank you, Mr. Chairman. I need to kind of explain why my testimony says Twin Otter International and my name tag says Grand Canyon. Actually, I wear a lot of different hats. Twin Otter International is the producer of the Vistaliner, which is a quiet air tour airplane. There are 22 Vistaliners in service at the Scenic Grand Canyon Airlines that, at the Grand Canyon, carry about 35 percent of all the air tour passengers. The airplane meets a proposed category C quiet aircraft standard. I am also an officer of Grand Canyon Airlines, which operates the Vistaliner.

Mr. Vento, I go back to a meeting with you in 1986 and appearing when you were chairman in support of the 1987 legislation, and I have been intimately involved as chief executive of Scenic Airlines until we sold the air tour business, focused on the Vistaliner.

I also served as a member of the 9-member National Park Overflight Working Group which met over about a 15-month period. There were nine of us; it was at times contiguous. It was always lively. We were successful in making unanimous recommendations to the Secretaries of Interior and Transportation on how to regulate overflight of the air tour aircraft over our national parks, which is in legislation now before the House and the Senate, and we urge your passage of that legislation. It is fair; it retains FAA's primary role to regulate the airspace and minimize the impact of air tours on ground visitors in our national parks.

I have to go back to that 1987 legislation and really what was at work there, as we had a very large volume—an unaccepted volume—of visitor complaints over aircraft activity at Grand Canyon. And, too, there was—after the mid-air collision, there was concern over safety. That 1987 legislation has been spectacularly successful in those two regards. The air tour industry is much safer today because of the special airspace regulation. And visitor complaints, which were averaging over 1,000 a year on 2.5 million visitors at Grand Canyon in that timeframe, have declined down over the last couple of years—and I don't have the latest numbers, but it is in the 2 to 3 dozen visitor complaints over aircraft sound at Grand Canyon—2 to 3 dozen out of 5 million visitors a year. And to my knowledge, we can't track whether those complaints are air tour-related, overflight of the major jet airway, or related to the Park Service helicopter flight operations at Grand Canyon.

All of the time we met, not once did the Park Service offer its definition for review. Everything was on the table during the National Park Overflight Working Group deliberations. We looked into the legal ramifications of FAA regulating in this way and the liable concerns, and so forth and so on. And some of us felt, frankly, betrayed when I saw a number that is ambient—a threshold of natural quiet is ambient minus 8 dB. Unfortunately, I am not an acoustics expert, and somebody like John Lobirdy has to give me advice on it, but I have been told it is such a low threshold that it is like listening to your blood circulating.

One thing we did agree on in the National Park Overflight Working Group unanimously was that there needed, as part of any regulation of our air tour industry, that there must be a recognition of quiet aircraft and what that can do to reduce the intrusion of aircraft sound on ground visitors at the Grand Canyon and other national parks. And we—and as in your legislation—stated that there must be incentives for aircraft to be converted to quiet aircraft, and those incentives should include, but be not limited to, preferred altitudes and routes and relief from curfews and caps.

Unfortunately, we have talked about it and talked about it. We have support from the FAA, and some of the National Park Service, from the environmental community, from the air tour industry. And as we sit, not one single incentive has been offered at Grand Canyon or anywhere else in the United States to my knowledge. I just had a chance to look at a preview of the new rule that the FAA is offering on making operational caps along with aircraft caps and curfews, and there is, again, not one word of incentive on quiet aircraft, and will be subject to the same caps as conventional aircraft.

And I want to just make the pitch real simply as the following—because quiet aircraft is expensive, and so the airplanes have to be larger. Larger capacity airplanes mean two things. One, if they are quiet, they, in all probability, make less sound, therefore, less noticeable to ground visitors. And, two, is they replace multiple flights. A 19-seat Vistaliner replaces 2 air tour flights by the 9-seat Cessna 402 and 3 flights by the single-engine Cessna 206, which has 5 passengers. And it makes plenty of sense to have these incentives, and I encourage this Committee to help us bring to this final rule some meaningful incentives for quiet aircraft.

I appreciate the opportunity to appear, and I will be happy to answer your questions.

[The prepared statement of Mr. Stephen follows:]

**STATEMENT OF ALAN R. STEPHEN  
PRESIDENT, TWIN OTTER INTERNATIONAL, LTD.  
SUBCOMMITTEE ON NATIONAL PARKS AND PUBLIC LANDS  
U.S. HOUSE OF REPRESENTATIVES  
MAY 25, 1999**

Thank you, Mr. Chairman and members of the committee, for inviting me to appear today. I want to echo the comments of my colleague, Steve Bassett, in noting our keen appreciation for your continuing focus on, and support for, maintaining a viable air tour industry at Grand Canyon. Unfortunately, neither the FAA nor the National Park Service can be similarly commended; indeed, if I were to grade the agencies' actions of late, it would be no higher than an "F."

I first became involved in the regulation of the air tour industry at Grand Canyon more than 15 years ago as executive vice president of the Regional Airline Association on behalf of its member companies, Scenic and Grand Canyon Airlines. We supported passage of the National Parks Overflight Act in 1987, and in fact, I appeared before this committee then, testifying in favor of it.

For the past twelve years, I have been president of Twin Otter International, Ltd., the company that modifies the 19 passenger seat DeHavilland Twin Otter into a highly specialized air tour aircraft we call the "Vistaliner." Among its many custom features, we have incorporated specially designed quiet props that make the Vistaliner among the quietest aircraft flying anywhere. The Vistaliner is one of just two air tour airplane types that meet FAA's proposed category C quiet aircraft standards. There are 22 of our Vistaliners in tour service at Grand Canyon. They account for about 35 percent of the 800,000 fixed wing and helicopter passengers flying over Grand Canyon annually.

Prior to the sale of its air tour operations in 1993, Twin Otter International was also Scenic Airlines, then and now, the largest air tour company in the world. Because of my background as the chief executive at Scenic then and vice president of operations at Grand Canyon Airlines now (Grand Canyon Airlines is an owned affiliate of Twin Otter International), I was pleased to be asked and serve as a member of the nine person National Park Overflights Working Group (NPOWG). We were tasked to develop comprehensive recommendations for the Secretaries of Transportation and Interior on

how to regulate aerial sightseeing over national parks nationwide. We accomplished that task last year after fifteen months of exhausting negotiations. Our recommendations preserve FAA's role in airspace regulation while creating a process by which air tour visitors at our national parks will have minimum impact on ground visitors, park resources and native Americans. We support legislation now before Congress to make those NPOWG recommendations federal law.

Others on this panel can better speak to the faulty, if not disingenuous, science NPS congers up in its notice "Change in Noise Evaluation Methodology for Air Tour Operations over Grand Canyon National Park." I want to speak instead to its implications for air tourism at Grand Canyon and over other national parks.

In its notice, NPS has now zoned Grand Canyon in order to "allow noise thresholds to be tailored to the circumstances of each zone." For one third of the park (approximately 400,000 acres) the threshold of natural quiet is ambient plus 3 dB(a). For the remaining two thirds (or 800,000 acres), the threshold has been set at ambient minus 8 dB(a). While I am no expert in acoustics, I have been told that ambient minus 8 dB(a) is a threshold of sound like listening to one's blood circulating.

This absurd threshold definition, in and of itself, does not render a fatal blow to the air tourism industry at Grand Canyon. As a member of the NPOWG, frankly, I feel betrayed by it however. It was never the subject of discussion within the NPOWG deliberations even though the people behind this definition attended, or were represented, at each and every NPOWG session. If this NPS definition of natural quiet is to become a national standard—then NPS has rendered the hard work of the NPOWG as a pointless exercise. No aircraft of any sort, except gliders, can fail to be detected under these thresholds and the inevitable result will be a ban on all air tours over all national parks. Meanwhile, commercial, military and general aviation will remain unaffected and, therefore, there will not be natural quiet for national park visitors due to the sounds of such aircraft activities.

While the new threshold for establishing natural quiet is nothing more than a definition, the new and ever more onerous restrictions that FAA and NPS intend to propose at Grand Canyon in the coming months will have profound consequences for air tourism. Let me begin by reviewing briefly the chronology of NPS actions at Grand Canyon in the name of "substantial restoration of natural quiet and experience" from air tour sound at Grand Canyon.

The National Parks Overflight Act of 1987 in part was justified on regulating air tours over Grand Canyon in such a way as to minimize aircraft sound for both back and front country visitors at ground level. Prior to the Act, NPS was averaging more than 1,000 written complaints a year regarding aircraft (whether air tour or not) from approximately

2.5 million visitors coming annually to Grand Canyon during the mid-1980s. With implementation of the Grand Canyon Special Flight Rules Area regulations (SFAR 50-2), those complaints nose-dived in the 1990s to only several dozen a year while Canyon visitation has now doubled to some 5.0 million visitors each year.

Aircraft overflight problem solved--reasonable people would think so--but not the National Park Service. Ground visitors are no longer part of NPS's noise calculations. Now NPS has demanded at Grand Canyon that 50 percent of the park must achieve "natural quiet" for 75 to 100 percent of the day. The NPS definition of "day" is daylight--not 24 hours. The NPS threshold of audibility is mechanically derived whether there are ground visitors there to hear aircraft or not. (NPS would have the fixed-wing air tour route on the east end of Grand Canyon extend beyond the north park boundary even though the Grand Canyon North Rim is closed to visitation seven months of each year.) And the threshold of audibility NPS employs at Grand Canyon to determine if there is natural quiet over 50 percent of the park 75 to 100 percent of the day--is being set as low as ambient minus 8 dB(a).

All this is being done utilizing a noise model that is flawed, that remains unvalidated and that FAA cannot substantiate with its own aircraft noise model. Trying to measure whether or not there has been substantial restoration of natural quiet at Grand Canyon using faulty science is analogous to trying to measure the size or weight of something without having standardized measures. I can speak for the entire air tour industry in applauding you, Mr. Chairman, for recognizing early-on the serious credibility problems NPS has created for itself using its noise model and setting such thresholds. I also want to point out that this ambient minus 8 dB(a) threshold was set in stone by NPS without public comment, virtually without explanation or justification and with a dubious promise to seek public comment on the NPS aircraft noise "model validation study" and aircraft "noise monitoring strategy" during the process for the development of its future "comprehensive noise management plan" for air tour operations over Grand Canyon National Park. Wouldn't it be prudent for those model validation and monitoring strategies to be accomplished first before our executive branch adopts a whole new round of restrictions at Grand Canyon? The NPS is not discussing what it has in mind in adopting a "comprehensive noise management plan." Unfortunately, Mr. Chairman and members of this committee, I fear the NPS war against the Grand Canyon air tour industry is far from over.

To achieve its self-serving and never ending goals at Grand Canyon, NPS in partnership with FAA, has barred new air tour companies from flying over Grand Canyon, capped the number of aircraft existing air tour operators can fly over Grand Canyon, prohibited redistribution of aircraft caps from air tour companies that have gone out of existence, and imposed overly restrictive curfews over the east end of the park that are unrelated to actual daylight hours. In the next few months, NPS in partnership with FAA, will propose

additional onerous air tour flight restrictions at Grand Canyon that will include a cap on operations using 1997 as the base year—one of the slowest for the Grand Canyon air tour industry in the past decade—and eliminate the vital Las Vegas-to-South Rim tour route entirely. What else may be proposed at the same time is unknown by us—and the devil is always in the detail of the fine print. In what can be described only as Orwellian logic, air tour aircraft coming from Las Vegas will be flying 10-12 miles south of the park's southern boundary. Meanwhile, a major east-west jet airway located over the entire 277-mile length of the canyon will remain unaffected. Aircraft using that airway can do so 24 hours a day, have many times the flight frequencies each day than all air tours flights combined, and will do so less than 6-7 miles from the park rim.

Implicit in the NPS ambient minus 8 dB(a) notice is that air tours are unwelcome anywhere over Grand Canyon. In taking ground visitors out of the natural quiet noise calculation and substituting in their place a formula for mechanically detectable sounds above an unreasonably low noise threshold, NPS will eliminate air tours over remote and largely inaccessible park lands where few visitors ever go.

As justification for this new definition for natural quiet, NPS states at F.R. Vol. 64, No. 16, page 3971, that it is charged with the "responsibility to preserve park areas and to provide for their enjoyment in a manner that will leave them unimpaired for the enjoyment of future generations." NPS goes on to state, "Preserving and maintaining natural and cultural 'soundscapes' in areas of the national park system is a component of this responsibility." Finally, NPS concludes, "A concern for the achievement of the 'substantial restoration of natural quiet' in GCNP is analogous to concerns regarding the preservation of wildlife, historic structures or ecosystems that are significant features of parks."

The NPS is making a tangle of its mandates in order to justify its need to issue the revised definition for the threshold of natural quiet. Let me untangle this web regarding its legislative mandates which this committee understands all too well.

NPS is actually charged with two mandates: the first is "to preserve park areas;" the second is "to provide for their enjoyment in a manner that will leave them unimpaired for the enjoyment of future generations." Air tour overflights comply with the first mandate. Air tour passengers leave no footprints or trash, require no trails or sanitation, and preserve cultural, wildlife, plant and geological features unlike ground visitors.

The second mandate is for NPS "to provide for their (national park units) enjoyment" but "in a manner that will leave them unimpaired for the enjoyment of future generations." Aircraft overflight sound leaves no trace once the event passes; therefore it cannot impair our national parks for the enjoyment of future generations. Period! To argue otherwise, as NPS does, is facetious. This second mandate thus reduces to "provide for their



(national park units) enjoyment" by park visitors. Over the last few years, approximately 800,000 air tour passengers a year have enjoyed Grand Canyon National Park from above it, in comfort and safety, while less than several dozen ground visitors have complained of aircraft sound.

Once again, we must point out that air touring is not about preserving resources; it is a visitor conflict issue in which a small minority must have the ability to experience natural quiet anywhere they chose and regardless of their impact on the geological, cultural and fragile ecosystems at Grand Canyon in two thirds (800,000 acres) of the park subject to the ambient minus 8 dB(a) standard. In doing so, that faction would deny that magnificent experience to air tour passengers.

The NPS argument that aircraft overflight is "analogous" to preservation of "wildlife, historic structures or ecosystems" which can be permanently degraded by ground visitors is less than accurate. Natural quiet can be instantly and fully restored at Grand Canyon...close the park to any means of visitation by motorized craft whether it be aircraft, train, bus, motorcycle, automobile or raft and all that will be left is silence broken only by the sounds of human voice and nature.

Had the National Park Service disclosed its plans to define "natural quiet" during the deliberations of the National Parks Overflights Working Group, our efforts would have been short lived and unproductive. Instead, the NPOWG recognized as a key component of its recommendations that incentives must be offered for air tour operators to convert to category C quiet aircraft. Twelve years ago Congress recognized that quiet aircraft technology rather than caps and curfews was good public policy—and directed that it be studied as part of passage of the National Park Overflights Act of 1987. In its 1996 report to Congress, NPS emphasized the need to provide incentives for air tour operators to convert to quiet aircraft. Our company has spent more than \$1.0 million in research and equipping our Vista liners to be good neighbors at Grand Canyon—yet not one single quiet aircraft incentive has been adopted by the NPS and FAA. The national parks overflight legislation now before Congress corrects that egregious lapse of regulatory judgement at Grand Canyon and for every other national park unit. It provides for quiet aircraft incentives such as, but limited to, preferred air tour routes and altitudes and relief from curfews and caps. We urge Congress to pass this legislation this session.

Let me provide you with a concrete example of why I have termed NPS's and FAA's regulation of air tours over Grand Canyon as "egregious." Historically, air tours by fixed wing aircraft and helicopters over the east end of Grand Canyon have been over the same route but at different altitudes for safety reasons. In 1994, FAA permitted helicopter operators, but not fixed-wing operators, to fly a vastly shortened route which permitted helicopter tours at one third the cost of the longer tour. The consequence was a dramatic

shift in the east canyon air tour business from approximately 50 percent fixed-wing to just 20 percent today. The result—many more helicopter flights and much more aircraft noise.

Let me put this into perspective. Grand Canyon Airlines operates four 19-passenger Vistaliners. In 1994, it carried 95,000 air tour passengers--declining to just 47,000 passengers in 1997. Every flight by Vistaliner is absolutely quieter than a flight by the Bell Jet Ranger helicopters used in competition with Grand Canyon Airlines. Every flight by Vistaliner with an average load factor of 15.2 passengers replaces four helicopter flights with an average load factor of four passengers.

Quiet technology for air tour aircraft and helicopters is available now and could be adapted to aircraft models other than the Vistaliner. The benefits of such larger, and quieter, aircraft should be obvious. Not only is each flight less audible, and therefore less noticeable to park ground visitors, but employing quieter aircraft will result in fewer flights in the future. One flight by Vistaliner replaces two flights by the 9-passenger Cessna 402 and three flights by the 6-passenger Cessna 206. With such obvious benefits, it is hard to imagine why NPS and FAA have done nothing to encourage use of quiet aircraft in air tourism over our national parks.

The air tour industry goal at Grand Canyon has been, and will continue to be, to preserve a quality air tour experience while mitigating to the extent practical air tour aircraft sound for ground visitors, on park resources, and for native Americans living near Grand Canyon National Park. SFAR 50-2 has worked. The next step should be converting all air tour airplanes used at Grand Canyon to quiet aircraft.

Thank you, Mr. Chairman, for your interest in our thoughts. I will be pleased to answer any questions the Committee may have.

Mr. DUNCAN. Thank you very much, Mr. Stephen.

We will go first to Mr. Gibbons.

Mr. GIBBONS. Thank you very much, Mr. Chairman. And I will tell you, I think this is one of the most elitist, nonsensical arguments that I have ever seen come before this Committee with this bureaucracy.

Mrs. Lowey, I am going to ask everybody in this room to be quiet, and I am going to establish the natural sound level of this room. And I want you to demonstrate to this Committee what 8 decibels below the natural ambient sound level of this Committee is.

Ms. LOWEY. Sir, let me just say that—

Mr. GIBBONS. Can you do that?

Ms. LOWEY. Can I—can I—I am sorry—can I—

Mr. GIBBONS. Can you demonstrate—

Ms. LOWEY. [continuing] demonstrate?

Mr. GIBBONS. [continuing] what 8 decibels below the ambient sound level of this room is?

Ms. LOWEY. In order to measure 8 below ambient, I'd have to first model, or measure the ambient. The question is confusing because we used the 8 db below ambient threshold to measure the point at which one can hear aircraft noise the way you are using it Mr. Gibbons.

Ms. LOWEY. I think that that has to do with the model, sir. The way you plug it in—

Mr. GIBBONS. Well, don't—

Ms. LOWEY. [continuing] if you—it is a—

Mr. GIBBONS. Don't give me this. Just tell me, can you do that today for this room? If we have everybody be quiet to establish a zero base noise level in this room, can you demonstrate what 8 decibels below that is?

Ms. LOWEY. Yes, sir, because—if I could give you back an example; if you have an orchestra, the ambient sound of the orchestra, you can still hear a piccolo playing. Why is it that you can pick out the piccolo when you are listening to the orchestra? It is because the piccolo has a different frequency than other instruments. That is the nature of sound.

Mr. GIBBONS. So, in that model, if you have a canyon with a river running and an airplane flying over it, you can still hear the river running?

Ms. LOWEY. Sometimes. But the issue, sir, has to do with the way various models calculate noise impact. When we were making the conversion from a Park Service model, which is how we started, which was one that had a false frequency, to an FAA model, which I am not a scientist, but I can tell you is A-weighted, which is an average sound. We had to make adjustments to calculate audibility. The Park Service multifrequency model was designed to do that, the FAA model was not.

Mr. GIBBONS. Well, can you—

Ms. LOWEY. That's how you come up with 8 dB below ambient. It is the range that best represents audibility.

Mr. GIBBONS. Can you measure the 8 decibels below?

Ms. LOWEY. Sir, I don't have a machine here, but that can be done, certainly.

Mr. GIBBONS. So it would have to be a machine out there to measure every decibel level?

Ms. LOWEY. I have to say to you, sir, Grand Canyon is a quiet place. It is quieter than this Committee room. Every bit of the sound there—the ambient sounds—have been measured and validated and proven.

Mr. GIBBONS. Well, if it quieter than this room, then there is—

Ms. LOWEY. It is quieter than this room.

Mr. GIBBONS. [continuing] nothing in the Grand Canyon that ever comes near it, that is going to establish this level.

Let me go to Mr. Traynham over here.

Can any aircraft meet a minus 8 decibel-level in that area?

Mr. TRAYNHAM. We think there will be significant parts of the park using this new standard that will be able to be overflowed by tour operators.

So, yes.

Mr. GIBBONS. And meet the 8 decibel level, below ambient standard?

Mr. TRAYNHAM. When you are looking at the 8-decibel standard, it is what the visitor hears. It is not what the aircraft is generating in a noise sense.

But, in our proposed rule, we contemplate major parts of the park being overflowed by overflows.

Mr. GIBBONS. Well, if that is the case, what you are telling us is you are going to do is move all the aircraft to where all the people are to make all the noise in one area, and then at which time you will say, “This is way too much, and we are going to reduce the air flights over all of the park because of this noise level.”

If that is the intent, then I think you are misrepresenting this whole purpose here today.

Mr. Alberti?

Mr. ALBERTI. Yes?

Mr. GIBBONS. Can a minus 8 decibels be measured?

Mr. ALBERTI. You can—a person may be able to pick out the piccolo, as Ms. Lowey says. That is correct.

The thing is, you cannot measure a sound level of an aircraft that is 8 dB below the ambient. You have to infer it; you have to estimate it; you have to measure the sound when the aircraft is much louder and then assume that it will still have the same spectrum shape, never mind that it is in a different position, at a different distance, different angle, different conditions. You have to guess. You cannot accurately measure—

Mr. GIBBONS. So how could they establish that? And if somehow it was violated—

Mr. ALBERTI. Well, that is—

Mr. GIBBONS. [continuing] what would be the penalty?

Mr. ALBERTI. That is a good question, which I guess I would pose to them.

When an observer says, “I can just hear that aircraft,” and pushes his button, I guess it is a fair question. How do you know that aircraft was 8 dB(A) below the ambient?

I think you have—I think the answer will be that there is a great deal of guesswork in that. It is not a direct measurement.

Mr. GIBBONS. Mr. Traynham, if you are going to modify VFR flights over the Grand Canyon for tour operators, I suppose that comes under part 91?

Is it your requirement that every VFR flight plan be filed at that point?

Mr. TRAYNHAM. No, sir. What the model is being used for is to develop policies, routes, flights—you know, how many flights are going to be flying that will generate a certain noise contour in the park.

We are not going to be measuring each flight to see whether it meets a certain decible level. This exercise on the model is to, basically, generate a map that routes would be established that would then be flown by the tour operators.

Mr. GIBBONS. But you are not going to force all the tour flights over the populated areas of the park—the high-noise areas?

Mr. TRAYNHAM. No, sir.

Mr STEPHEN. Mr. Gibbons, could I comment on this—

Mr. GIBBONS. Yes.

Mr STEPHEN. [continuing] as an air tour flight?

There is two things here that we have to look at. And when we put the visitor in the equation, and we saw the problem—visitors are not hearing air tour airplanes. Now we are putting in noise for noise sake.

And let me give you two orwellian-type conclusions you have got to draw. The north rim of the Grand Canyon over which we fly—Grand Canyon Airlines; that is our route—is closed seven months of the year, due to impassable snow. And, yet, in one of the route proposals that is floating around, they would make the air tour flights go farther north, north of the park boundaries and stay out of the park. I don't know where that logic comes. And as an airline pilot, you know one of the major east-west jet airways overflies the entire 277-mile length of the Grand Canyon. The FAA is contemplating eliminating the vital Las Vegas to Grand Canyon tour route which is so important to tourism in southern Nevada, forcing the airplanes that fly that to go south of the park boundary by 10 to 12 miles. So once the air tour flights out of Las Vegas going to Grand Canyon are no longer flying over the national park, do we have natural quiet, as defined?

The answer is, "No," because every single air carrier, general aviation, and military airplane that is on that overflight airway is making sound that is detectable under this definition.

I don't understand this.

Mr. GIBBONS. Mr. Chairman, thank you very much. I have got a number of additional questions. This is a truly frustrating exercise, if you ask me.

Mr. DUNCAN. We will come back to you, Mr. Gibbons.

Mr. VENTO.

Mr. VENTO. Well, thanks, Mr. Chairman. I had earlier referenced a question about the number of overflights of the Grand Canyon for tourism purposes. Obviously, we are not trying to deal with the commercial or the military airspace issue.

In any case, what has been the history since 1987 when the law was passed? Has it decreased the number of visitors flying over the park?

Ms. Lowey?

Ms. LOWEY. There has been an exponential increase. I believe it is two to three times the magnitude there right now.

Mr. VENTO. Number of persons in perhaps larger aircraft?

Ms. LOWEY. For visitation, I have the superintendent who could probably give visitation numbers better than I could.

Mr. VENTO. Well, you might want to do that for the record—

Ms. LOWEY. But—yes—

Mr. VENTO. [continuing] but I think that the issue is that more and more persons are enjoying—

Ms. LOWEY. Right.

Mr. VENTO. [continuing] this particular experience, I guess. And so that means the frequency of flights, I guess, where their helicopter, fixed wing, or whatever, have increased as well, so that the interval between the flights is not as great as once might have been. Is that correct?

Ms. LOWEY. Absolutely. There has been an exponential increase in air tours over the park.

Mr. VENTO. I mean unless they have increased these—I mean I understand the aircraft sizes have also increased. Is that correct?

Ms. LOWEY. Yes.

Mr. VENTO. And, of course, no one is—I mean anything that we are talking about here has to deal with safety under some circumstances. But when you talk about the 8 decibels below the ambient, that is that there is normal noise within the canyon, and in—do I understand right, that you are saying that one-third of the canyon area will not be subject to that—

Ms. LOWEY. Correct.

Mr. VENTO. [continuing] 8 decibels below?

Ms. LOWEY. Correct.

Mr. VENTO. So that will be, in other words, in over those areas, there will be an acceptance of a—

Ms. LOWEY. A higher level—essentially a higher level of noise.

Mr. VENTO. So I mean—so that would still—and can you give me some idea of how many aircraft were anticipated in this proposed rule? I don't know, someone said you were changing the rule, but there is no adoption of the rule yet, I guess, so I guess it is appropriate to reframe it.

But how many aircraft fly over that third that is not within this new standard that is being contested, I guess? How many aircraft fly in that area?

Ms. LOWEY. If I can, sir, just explain one thing which I think is important to clarify.

We are not saying that in the area which we are proposing to measure according to the ambient minus 8 standard, that unless aircrafts meet that standard, they won't be able to fly there. Tghis methodolgy does not zone it in terms of—you can fly here or you can't fly there. It is a method to measure noise.

What we are doing is saying in some of the most sensitive areas of the park, you can hear noise at that threshold. It is a threshold; it is not really a standard, and perhaps we confuse it in calling it that. And I say this again, in response to the questions asked earlier—we have measured that again. indeed one can hear aircrafft at 8 db below the ambient. You can hear it. Audibility is an objec-

tive standard. You can hear it when you you talk about the noticeability standard, you are talking about a nonobjective standard. You are talking about—at what point do people notice noise, if they are doing other things. Audibility is a more objective calculation.

Mr. VENTO. So you can't measure it exactly from the aircraft—plane, itself, in terms of what 8 decibels below it would be; it is a question of what is happening on the ground. Of course, I was always told that, as I said the professor here—or the physicist here—

[Laughter.]

[continuing] that is testifying in opposition to the proposed rule, that the laws of sound, nobody—as far as I know—nobody has modified those laws of sound, but the acoustics becomes more of an art than a science.

I guess probably you would contest that, as an engineer, Dr. Alberti?

Mr. ALBERTI. Whether it is an art or a science, I won't even touch it.

[Laughter.]

But I think that the measurements to determine what the threshold of audibility is—that is detectability by somebody actively trying to hear a sound—those experiments were done at an average threshold level of 30 decibels. Now, as I understand it, in two-thirds of the park, the threshold will now be 12 dB. That is—I think they are proposing 20 dB for grassland areas and 8 dB below that, which would be 12 dB(A). Nobody is detecting sounds at that level. That is down near the threshold of human hearing.

This is a case where it is sort of an ambush by degrees. We start out by selecting the ambient noise measurements—only the quietest ambient noise measurements—so we can get a nice low noise level there. And then we go back and we take some detections that occurred at much higher sound levels. We take that set of noise measurements—

Mr. VENTO. But I think some of this depends upon where you are, in terms of what you are experiencing. In other words, it also depends upon—I mean it obviously is a floating standard because the ambient level, in terms, obviously, have to be established for various parts of the park. In one place, you may have trees and winds and, you know, you may have waterfalls or rapids which are making more noise—rock slides—

[Laughter.]

[continuing] I don't know what else. Hummingbirds, you know, cicadas, you know, so there is a lot of different things that can contribute to that. So it isn't—I mean it is, obviously, you would have to combine this. That is why they are using. Now, as I understand, that this particular model that is being used, is an INS model; is that right? Have I got that right? The integrated noise system?

Mr. TRAYNHAM. Integrated noise model—

Mr. VENTO. Yes, so this is used broadly.

Mr. TRAYNHAM. [continuing] the INM.

Mr. VENTO. I mean this is not something that is only being applied here. I mean there has been a lot more—if you think this is a hot argument about noise, you ought to go to some of the subur-

ban neighborhoods in Minneapolis-St. Paul. In fact, even the Committee here has got into trying to help me out in that particular venture, with regards to the Minnesota—

[Laughter.]

[continuing] Refuge.

Ms. Lowey, did you have any—I want to especially welcome David Traynham, who is a long-time staff, Mr. Chairman, as you know, on the Committee, and was instrumental in working with our Committee, in terms of this law in 1987, I guess, now. So I welcome, David, good to see you and pleased with your role and performance in this new task.

Did you have further comments, Ms. Lowey?

Ms. LOWEY. No.

Mr. VENTO. I just, you know—I hope that we can work it through. It is, you know, I guess one of the reasons that we don't get involved in writing the rules and regulations here, although I would be happy to do it, Mr. Chairman, if that is all I had to do. You know, I would be—but it is good to see you working on it, and I certainly will take into consideration the comments. But the point is, that I think that this experience, in terms, has been growing greatly, and there is nothing wrong with that, and there is nothing wrong with business and people enjoying this. I don't, you know—but I hope that we can—I think there is some misunderstanding about what is being pursued here and, hopefully, you can work it out because this isn't absolute quiet as I think some had feared it might be.

Mr STEPHEN. Could I respond to your question? Would you have time?

Mr. VENTO. With the indulgence of the chairman, I have overstated by time.

[Laughter.]

Mr STEPHEN. Can I give a—I think this—

Mr. DUNCAN. Go ahead, Mr. Stephen.

Mr STEPHEN. Okay—is Scenic Airlines had a peak year in 1981 of 211,000 passengers, and due to the international economy tanking in during the early years of the Reagan Administration, then, rebuilding. We went down to 93,000 passenger in 1994—excuse me—1984, in 1981 and 1984. And so, 1986 is not exactly a great year, or 1987, as a baseline year. So you have to look back further. So when you hear the word “exponential,” it is not the truth.

In that timeframe, we flew Cessna 402's. We had 40 of them for 211,000 passengers going to the Grand Canyon out of Las Vegas. We had seven Vistaliners in service in 1987, and we carried 139,000 passengers. Going forward, we went up to a total of 18 Vistaliners. But what has happened in the last couple of years is there has been massive consolidation in the Las Vegas/Grand Canyon tour market. There is one company today—it is called Scenic Airlines—which operates 4 F-27's at 40 passengers and 18 Vistaliners. And it is our successor company, after we sold the air tour business. That is the consolidation of the Las Vegas Airlines, Air Nevada, and Eagle Canyons. And, in that consolidation, alone, nearly 40 Cessna 402's that were in service 2 years ago are out of the Grand Canyon. So there are less flights. And I don't think the



history that is being presented is actually accurate either, if you look at the 20-year history or look at what is really happening in the nature of the tour business at Grand Canyon.

And, frankly—as you remember, sir—we felt that the overflight legislation was good for the business, and that was why we supported it.

Mr. VENTO. You know I think—I appreciate that, but there ought to be some common understanding about the numbers here which shouldn't be, you know—so that we could pin it down to understand what the growth is. This isn't really about the growth, in any case; it is about the noise.

Mr. Chairman, one statement I noted that came through—perhaps there is some misunderstanding about it, but my understanding is that the flight paths over the Grand Canyon are all already identified, so it isn't just free, you know, you have to have that planned, and there are certain areas already where you cannot fly over the Grand Canyon. So the idea that they were somehow going to be condensed by virtue of this new—this proposed rule, which is being implemented, would really follow the existing—that there are existing corridors where you can fly over, and flight plans would have to be established already. So this would not be something new.

Now, one might argue that that has some problems with the enjoyability or with the safety or with other factors, but I assume that most of that had been taken into consideration. And that there is less frequency for the bigger aircraft, or what the circumstances are, I don't know—but we should be able to agree upon the number of aircraft. We may not agree upon what the measurement of this acoustical art is, Mr. Chairman.

But I think if I am incorrect, I would hope somebody would correct me. If not, thank you, Mr. Chairman.

Again, I appreciate it.

Mr. DUNCAN. Well, thank you; thank you very much.

This is at least the fourth or fifth hearing that I have participated in on this issue, and it has always been very interesting to me. And I thought that—I know last year we had a group that everybody started out pretty far apart, and I thought we had worked and come together and reached a compromise that was pretty acceptable to almost everyone. And that is the way I like to do things, and so I was pleased about that. And I can tell you that I have never liked noise or loud noises. I don't even like to have a television on in another room when I am reading in the next room. So I thought that, you know, we should try to work on this as much as possible.

On the other hand, I don't suppose on any issue, you can ever satisfy the extremists. And I have been amazed in all these hearings, that how few complaints there are, Mr. Stephen. You mentioned 2 or 3 dozens out of 5 million visitors. I have said before and I still think this, that I am amazed that some of these groups can't stir up more complaints than that, because we have had this issue around for several years, and I have just been amazed at how few complaints there are about the noise there at the Grand Canyon.

But, Mr. Alberti, let me ask you this; you mentioned that some of these levels are outside the range of human hearing. And I am

not sure—I am not a scientist or a technician—would you describe for me what is 8 decibels below ambient? What is ambient, in this situation? What does that mean? And what are we talking about here? What would be the noise level of, say, a typical, quiet suburb, that is not near an airport, let's say, and does not have heavy traffic? Or what would be the noise level of someone who is hiking through the Grand Canyon, stepping on leaves or twigs? Do you have some examples like that that you can give to me?

Mr. ALBERTI. Yes. As far as a quiet suburb, actually the EPA has set up 55 dB(A) as a desirable goal for residential communities. Probably pretty typical of what you would find in a quiet suburb. You might get down to maybe 50 or so when there is not much traffic.

In this room, while we are talking, we are probably up in the 70-plus dB(A) range. If we all stop talking, it might drop into the, maybe, the 40's, possibly.

Mr. DUNCAN. When we all stop talking and we are quiet, like Mr. Gibbons tried to get everybody a while ago, that is about a 40?

Mr. ALBERTI. I think something in that ballpark. I think we will have some discussion on that later, actually.

Mr. DUNCAN. And so the level we are trying to get to in the park is 8 decibels below ambient?

Mr. ALBERTI. That is correct, if I understand. That is the proposal.

Mr. DUNCAN. Well, what would be the—I know there are a great many commercial airliners that fly across the Grand Canyon, because I have been on commercial planes myself, you know, and the pilots will always announce the Grand Canyon is down below us. What—can you hear those flights in the park or—

Mr. ALBERTI. Oh, yes. Observers have noted that. Some of the people that the Park Service hired noted rather a high percentage of the time that they could hear commercial aircraft, you know, 10 or 20 percent of the time.

Mr. DUNCAN. How high would those flights have to go before you wouldn't hear those?

Mr. ALBERTI. Well, about 180,000 feet.

[Laughter.]

No, about 40 miles. A slant range is for a MD-80, which is a very popular Stage 3 aircraft that flies in and out Phoenix regularly. That is the—the slant range has to be about 40 miles for that aircraft, to meet the 12 dB limit that is being proposed here.

Mr. DUNCAN. What did you mean at the start of your testimony when you said that they are moving these regulatory guideposts around? Are they changing the—do you feel like they have been changing the standards—

Mr. ALBERTI. Yes.

Mr. DUNCAN. [continuing] in all of this?

Mr. ALBERTI. All of the regulations that have been made to date, have been based on noticeability 3 dB(A) above the ambient. The court case in 1998 that I think Ms. Lowey referred to, refers specifically to noticeability 3 dB(A) above ambient. That has been the de facto standard in the canyon in recent years. So this is a change from that. It is an attempt to lower that standard by 11 dB(A). I have yet to hear any substantiation for it, except a desire to do it.

Mr. DUNCAN. And so—I have noticed over the years in chairing the Aviation Subcommittee that people who live near airports develop almost super-human hearing and sometimes complain about sounds that aren't there.

But what we are talking about, if you had 100 people who weren't noise experts and who didn't go into the park with the goal of hearing something, as opposed to people who are going in with machinery and trying to hear every sound that they can hear from an aircraft, what is the difference here? I mean would the group—if we surveyed the group of 100 people who went into the park, do you think that they would notice these overflights?

Mr. ALBERTI. The majority would not, and, in fact, the majority do not. I think 66 percent of the people who were actually asked that question said they didn't recall noticing aircraft.

As to the sound level, we looked at NPS data. We took the quietest 25 percent of the cases where aircraft were actually detected and determined that the ambient, at that time, was about 26 dB(A)—it was a rather conservative approach we took; 3 dB(A) above that is 29 dB(A). We proposed that as a standard for natural quiet in the park. The notice proposes 8 dB(A) above ambient, and now there is some additional information been presented which suggests that that ambient should be 20 dB(A) over about two-thirds of the park. So we get down to 12 dB(A), down where most people can't even hear it.

I think it is interesting that the database from which that 20 dB(A) came from—there were 23 different sites where observers went down and measured the sound. The average value of the ambient sound at those 23 sites was 34 dB(A). But somehow, by a selection process that I don't pretend to understand, we come up with an average of 20 dB(A).

And I have seen this over and over in Grand Canyon National Park, where there is a careful picking of which ambient sound measurements are going to be used. We saw measurements taken in the spring thrown out because the wind blows too much in the spring, and so we have only used fall measurements. Over and over, we see the ambient being “cherry-picked” down to very, very low levels. And then we turn around and use a standard of 8 dB below that which only a person who is straining to hear aircraft would respond to, and you get down to really absurd sound levels. And then on top of that, we look at the INM model, which is not the INM model that is used at the 400 airports, under FAA regulation under parts 150 and 161, but a modified version of it that produces higher noise levels because they took out the lateral attenuation and because there are corrections made for—speed corrections for helicopters that add noise instead of subtract it, as the helicopter noise model indicates—you know, all the things that we discussed last fall.

You would now have an overstatement of the noise, and understatement of the ambient, and then a standard that goes 8 dB below that. And, bit by bit, you have produced an absurd result—a standard that no one can reasonably meet, and, in fact, even airliners 40 miles away can't meet.

Mr. DUNCAN. I have gone over my time, but, Mr. Stephen, let me ask you this; what effect, if they go to this 8 decibels below ambient, what effect would that have on your business?

Mr. STEPHEN. In and of itself, that standard is a standard; it is picked, whether it is right, wrong, or something different. It is what regulations emanate from that, and as the last couple of years, on the east-end of the canyon where Grand Canyon Airlines flies, we have now curfews that aren't related to true daylight. I mean it is not even time to change the curfew hours to the—it is on a date certain as opposed to daylight savings change. We are looking at a cap on operations. We are looking at modified routes which would add costs because it would make us go outside the park, a longer tour route, bringing us over a higher terrain more subject to weather. So, at what point does this stop?

And what is very interesting here is that these are only interim measures that I just talked about. There is still out there both the comprehensive noise management model.

And I don't know at what point these restrictions just really detract from the ability to provide a good tour and be a profitable business. But, obviously, a threshold of audibility minus 8 dB is a very tough standard, and it could be used to justify any restriction that the Park Service believes is necessary.

Mr. DUNCAN. All right; thank you.

Mr. Gibbons, you had an additional question or two.

Mr. GIBBONS. Yes, Mr. Chairman, I think a great deal has been said to sort of disprove a lot of the intent here.

But I want to ask Ms. Lowey how they came to change from 34 dB(A) down to 20 dB(A)?

Ms. LOWEY. Let me first say that the folks that work for me have reviewed Mr. Alberti's report and think that there is a misinterpretation of our data, and I can ask them to speak directly to that question.

Let me ask Wes Henry to discuss that question.

Mr. HENRY. Mr. Chairman, I am not an acoustician; I wouldn't pretend to be.

Mr. GIBBONS. Would you identify yourself, for the record, and your academic background?

Mr. HENRY. I am Wes Henry; I am with the National Park Service. My doctorate is in natural resources. I am a research administrator for the Park Service.

We have under contract probably some of the top acoustics firms in the country, and they happen to disagree with Mr. Alberti. I asked them to review the report, and they did with what they had with the information they had. And they suggested that there may be a number of reasons why Mr. Alberti is getting different results.

The first is the possible misinterpretation of the original BBN report that they reviewed. And they said—even HMMR contractors said it was very difficult to work their way through the original BBN report. It was misleading. The data in there is actually aircraft plus ambient, not just aircraft noise, and that leads you to the wrong conclusions about the ambient levels. And they suggested that this might be the reason for this misinterpretation. There is not—you know, it is just a simple misinterpretation, that if Alberti had talked to BBN, they might have straightened that one out.

We also found out that at that time, BBN was not using the low-noise microphones that are being used now. In other words, maybe BBN was measuring the floor of the instrumentation of those standard microphones. They weren't measuring the accurate numbers to start with.

The Alberti—the JR Engineering reports models differently than the FAA. They only looked at part of the canyon. They excluded all the Las Vegas to Tucson traffic, which is the noisiest part of all the routes in the park. They left their ground attenuation feature on, and I can't pretend to get in between Mr. Alberti and the FAA, but the FAA authorities have assured us that by switching off that attenuation feature, they were getting their results much more aligned to the actual ground data. That is what I—that is in my report.

And the last thing is, if you spread the impact of a 12-hour—all the impact you get on a 12-hour day, which is when the aircraft are flying, and you spread that over a 24-hour time period, it looks like a lot less impact.

So when you start to combine all those features together, you could easily come out with some very different answers.

Mr. GIBBONS. Mr. Alberti, your integrity has just been put into question.

Do you want to respond to that?

Mr. ALBERTI. Sure.

Okay, there is quite a few different items. The attenuation—the lateral attenuation—actually there is a very good reason we didn't turn it off, because in the version of the INM that is available to the public that is used in every airport noise survey in the country, you cannot turn it off. This was—the FAA went in and modified the code—they happen to own the code—and changed the program in a way that no one else can. Now why, only in the Grand Canyon, is lateral attenuation not applicable, again, I will leave it to the FAA to explain. We used the program in the manner in which it is normally used, under FAA direction, and, in fact, the only way you can.

As for the 12-hour versus 24-hour day, well, I guess I thought a day was 24 hours, but I won't quibble about that. The sound levels—we did, in fact, consider the fact that the measurements in the BBN report did include both the aircraft and the ambient. And, in fact, the actual observations of sound occurred at an average of 30 dB(A). We have inferred from that, given that the BBN reported a 1 dB signal-to-noise ratio, at detection, that the ambient was, therefore, 1 dB less or about 29 dB(A). We took the quietest 25 percent of those cases, being actually more conservative than the Park Service in that regard, and came up with a ambient of 26 dB(A); 3 dB(A) above that is 29, and that is where we got that standard, so we certainly did account for that.

And I can't remember if there were any other issues.

Mr. GIBBONS. Just one question, Mr. Chairman, if I may? I know my time is short here.

Mr. Traynham, is there any airport in the United States that can meet this sort of a standard with a 8 dB(A) below ambient without the airport being there to begin with?

Mr. TRAYNHAM. The short answer would be "No." I think we need to keep in mind what we are using this model for. It is to construct routes and maps. It is not to be used to assess an individual aircraft or flight operation.

Mr. GIBBONS. Well, has the FAA ever found that noise has an effect on animals?

Mr. TRAYNHAM. Noise studies show that there are impacts on humans and animals by aircraft noise.

Mr. GIBBONS. Well then, in every reserve, every wildlife reserve, we should be establishing refuge in wildlife refuge, we should be establishing a 12 dB(A) of noise level, which will go to my colleague over here at the Minneapolis-St. Paul problem, and we can surely work out the airport problems there over a wildlife refuge, with a minus 8 dB(A). I think if we set that standard, your proposal would be certainly allowable.

But thank you, Mr. Chairman.

Mr. VENTO. Mr. Chairman—

Mr. HANSEN. [presiding] The gentleman from Minnesota.

Mr. VENTO. Well, I think that, obviously, if you are talking about an airport, it is a different ambient level than it might over the Grand Canyon.

Mr. GIBBONS. Well, if the gentleman will yield, we are talking about a wildlife preserve—

Mr. VENTO. Right.

Mr. GIBBONS. [continuing] versus a park. I mean they both have animals; they are both there for the enjoyment of the people.

Mr. VENTO. Yes.

Mr. GIBBONS. And we are setting standards for one that we wouldn't set for the other, and I am not sure where you would balance the two.

Mr. VENTO. Well, I think that, obviously, on that, on the issue with regards to Minnesota, the issue there, of course, was not affecting—it wasn't based on the fauna or flora; it was based on the interpretative and educational activities that went on and, of course, the airport was there. And so the ambient level, in terms of noise, would be, I think at an airport site, would be higher as opposed to these flights.

But I think the question I just want to direct to Mr. Traynham is with regards to lateral attenuation and the concern about that—why that was deleted from this model, which is apparently a criticism of your IFN model?

Mr. TRAYNHAM. I will need to call my noise expert to the witness table to respond to that directly.

Mr. VENTO. Well, we are interested and all; that is why we are doing this thing.

Mr. TRAYNHAM. Tom Connor is with the Office of Energy and Environment at the FAA.

Mr. CONNOR. The lateral attenuation is used in a model to assess the excess ground attenuation between the source and the observer on the ground. So between them, you have sound propagating, then you are assuming a ground surface that will refract, reflect, and absorb the sound.

In the Grand Canyon we saw, well, that was not appropriate, because what we are dealing with is a big hole in the ground. There

is hardly any ground between where the aircraft is and where the observer is. So, we said, "Okay, for the Grand Canyon, it is appropriate to turn it off." And it is an effect that is really for low angles of elevations between the observer and the aircraft.

Mr. VENTO. So my question is, of course, and I guess the question of our colleagues, is what effect does that have on the model in terms of—in other words, this makes it more accurate? In other words, isn't that right, because it isn't a flat—

Mr. CONNOR. That was the intent.

Mr. VENTO. It isn't a flat area; it is a very unusual geophysical feature, I guess, in the Earth's crust. So, the issue is that this actually—it isn't appropriate if you brought that in; it would be a less accurate measurement.

Mr. CONNOR. That is right, because there isn't any ground, there can't be any excess ground attenuation.

Mr. VENTO. And so this makes it more accurate. If you actually treat it as though it were flat, then—

Mr. CONNOR. Right.

Mr. VENTO. [continuing] the standards would be tougher, wouldn't they?

Mr. CONNOR. That is right. That is what we saw.

Mr. VENTO. That is what you felt?

Mr. CONNOR. Yes.

Mr. VENTO. So, you were going for accuracy here and, obviously, recognizing this as a, you know, sort of a pragmatic decision. You don't have other circumstances like that that the FAA uses. It is generally apparently for airports; is that right?—which are, last time I looked are pretty flat.

Mr. CONNOR. That is right; yes.

Mr. VENTO. Thank you.

Mr. VENTO. I guess Mr. Alberti has a comment on that.

Mr. Alberti?

Mr. ALBERTI. Right. I believe the INM, in its normal mode, adjusts the lateral attenuation based on the elevation angle of the sound, so that if you were propagating sound into a hole, in fact, it would give you zero lateral attenuation. In other words, the accuracy mentioned is, in fact, built into the program. By turning it off, what you did was take away the program's ability to deal with situations, for example, the south and north rim where you are propagating much more horizontally, or propagation at long distances which you certainly get within the canyon, where the angle of the sound to the ground is smaller. So the effect of turning it off was not to increase the accuracy, it was to increase the noise levels.

Mr. VENTO. That is the effect, but that is what we are trying to measure the noise level within the hole. I mean, obviously, if you are just concerned about what the noise level would be at the rim level, that would obviously be—and you assume that there was no lateral attenuation—I mean you obviously would not be measuring, then, what is happening on the surface.

Mr. ALBERTI. The INM—if you have an aircraft at some, let's say, 8,000 feet over the canyon; you have got the rim at, let's say, 6,000 feet. That would be a small propagation angle. There should be—there would be and should be attenuation produced by that INM. If you are measuring sound directly under that aircraft, 5,000 feet

further down, the INM would not attach any lateral attenuation to that sound propagation in its normal mode. So this correction was unnecessary, and, in fact, it had the effect of taking away one of the features that the INM is supposed to have.

Mr. VENTO. Well I could understand where you would need it between the distance between the rim and the aircraft that you would need attenuation, but I understand below that, it has different—it behaves differently than it would if it were flat.

But you say it already adjusts for that?

Mr. ALBERTI. That is correct.

Mr. VENTO. And they are saying that it was inappropriate.

Mr. ALBERTI. Right.

Mr. VENTO. So——

Mr. ALBERTI. And it argues—we did, in fact, have the actual——

Mr. VENTO. This Committee is very interested in this. I hope we can get all this information, Mr. Chairman.

[Laughter.]

Mr. HANSEN. [presiding] Well, I thank the gentleman from Minnesota.

The gentleman from Tennessee.

Mr. DUNCAN. Just one more thing; Ms. Lowey, I notice in your statement that you say the National Park Service and the FAA are continuing to work as partners on a rulemaking process to achieve the goal of substantial restoration of natural quiet which has been defined by the NPS as 50 percent of the park being quiet 75 percent of the day. And you say this definition was included by the FAA in the rules promulgated in 1996 over the Overflights Act. In response to suits and so forth, the United States Court of Appeals for the District of Columbia in 1998 upheld this definition of substantial restoration of natural quiet.

You refer favorably to that decision by the U.S. Court of Appeals in November of 1998. Have you read that decision?

Ms. LOWEY. Yes, I have.

Mr. DUNCAN. So you know, then, that several times in that decision, the Court of Appeals describes as a reasonable definition of natural quiet, a level of ambient plus 3 decibels?

Ms. LOWEY. Yes.

Mr. DUNCAN. You do know that?

Ms. LOWEY. Yes. Yes; I would be happy to clarify that.

Mr. DUNCAN. Yes, several times they refer to that as being a reasonable level of natural quiet. Yet, you are wanting to refer favorably to that decision in some parts, but then go to a standard that is much, much lower than that—much, much lower than what they describe as a reasonable level of natural quiet.

Ms. LOWEY. I have a couple of different things I would like to touch on.

First, sir, our report to Congress in 1994 talked about the substantial restoration of natural quiet in terms of no aircraft audible. The National Park Service has been quite consistent in terms of talking about no aircraft audible as being a definition. And, in fact, as you will see also in the court decision, they talk about attentive listeners. They don't talk about noticeability; they talk about attentive listeners.



The challenge has been in the movement between the NODS model, which is a multi-frequency model and the FAA model, which is A-weighted—and I am not a scientist, so I will give you the best layman’s definition of that I can—the A-weighted measurement is an averaging of sound it is not a representation of all of the different frequencies that comprise sound. We continue to move forward and improve our ability to most accurately assess audibility in our models. The National Park Service has been quite consistent in that.

And so we think that where we are right now is quite consistent with the court decision, in light of the fact that we continue to have better refinements to our ability to define and to express audibility.

Mr. DUNCAN. Well, let me say this; you know, I am, personally, am one who would like to make our entire society as quiet as possible, and I have been, over the last two or three years, one who has been trying to encourage the air tour industry to move in the direction of more quiet. And, yet, when I see that United States Court of Appeals has ruled that a level ambient plus 3 is a very reasonable definition of “natural quiet,” and yet I hear the Park Service trying to get to a level of ambient minus 8—and I am not a scientist either—but it seems to me, I said earlier, that in all these issues, I will tell you, I have a wonderful relationship with the other side of the aisle in this Congress, almost everyone. And I have always tried, in every issue, to try to compromise and reach some middle ground level, just because it is my personality; I just don’t like conflict and argument. But it seems to me that when you are—I mentioned earlier, that you just can’t please the extremists on the ends of any issue, either the extremists on the far right or the extremists on the far left.

And it seems to me that on this particular issue, the National Park Service has been taken over by extremists on this issue, because this—you are going to a range that Mr. Alberti said is below the range of ordinary human hearing. I mean it seems pretty obvious to me that anybody who wants to go to this standard is just wanting to ban all the planes flying over, regardless of what they might say. They can deny it to high heaven, but they are just wanting to ban all the flights over the parks.

So what they should say is, “This is what we want to do. We want to ban all the flights over the parks.” Because, obviously, you are reaching to a standard that I don’t believe can be achieved.

Anyway, thank you very much, Mr. Chairman.

Mr. HANSEN. Thank you.

The gentleman from Nevada, do you have further questions for this panel?

I apologize to the panel and folks here, but I had no choice, and I am sure I missed a lot of good stuff that I would have liked to have heard in this thing.

Let me ask Jackie Lowey a couple of questions if I may—and probably it has already been covered. And you have, of course, Mr. Superintendent sitting behind you if you need further help on this thing.

Do you have any restrictions in that park on motorcycles?

Ms. LOWEY. I believe so.

Rob, do you want to talk about the different restrictions?

Mr. HANSEN. Mr. Superintendent, if you would like to come up and identify yourself for the record.

Mr. ARNBERGER. I am Robert Arnberger, superintendent of Grand Canyon National Park. I am pleased to be here and share the seat here.

[Laughter.]

Motorcycles are allowed in developed areas, just as are buses and cars and so forth, and there are no restrictions on motorcycles in those developed areas any more than there are restrictions on cars or buses.

Mr. HANSEN. Do you have any restriction on any cars, regarding the amount of decibels that you would hear on a car going through?

Mr. ARNBERGER. Those cars only operate in those developed areas, and there are no restrictions.

Mr. HANSEN. What about a teenager playing his radio so loud that everybody within 500 yards can hear it?

Mr. ARNBERGER. There is no regulation; however, a lot of times peer pressure on those overlooks when that happens, gets the radio turned off.

Mr. HANSEN. What are your restrictions on camping in certain areas?

Mr. ARNBERGER. Well——

Mr. HANSEN. North rim, you have camping in——

Mr. ARNBERGER. [continuing] we have regulations on different use areas and so forth.

I would also point to you to the fact that, under the code of Federal regulations, there are regulations, for instance, on some noise limits. In the campground, for instance, there is a quiet hours limitation. At 10 o'clock at night in the campground, generators can't be turned on either. And so the code of Federal regulations does have some limitations as well on some of these noise levels, but they are specific applications within specific areas.

Mr. HANSEN. What about people that are hiking, say, down to Phantom Ranch and up one of the trails or the other. Do you have a restriction on the size of groups?

Mr. ARNBERGER. We have a restriction on the number of people that can camp overnight. For the day-use hikers, there are no restrictions for those hikers. But for——

Mr. HANSEN. But if a 100 Boy Scouts wanted to go down to the Coconino, the Phantom Ranch, and up Bright Angel to the Kaibab, could they do it in one day? I mean I have done it in one day. I mean you would have no restrictions on that?

Mr. ARNBERGER. We don't have any restrictions; however, we go out of our way, especially with groups such as that, to advise them that is not wise business. As witness to the fact, we have had several Boy Scout deaths over the last couple of years due to poor trip planning such as that.

Mr. HANSEN. What about the concessionaires who have mules and horses or that type of thing? Any restrictions on those folks?

Mr. ARNBERGER. Yes, sir; there are. There is a number of mules per trip is limited. The size of the person riding the mule is limited. And the total number of overnighters that can spend the night down in Phantom on those mule trips is limited as well.

Mr. HANSEN. Are there any plans like we have at Zion to, say, from Jacob Lake, to run a type of bus or trolley or something in there and prohibit cars?

Mr. ARNBERGER. Yes; the Grand Canyon is involved in an effort of mass and public transportation into the park, wishing to limit the number of vehicles into that park.

Mr. HANSEN. Mr. Stephen, I didn't get an opportunity to hear your testimony. You are president of the Twin Otter International Limited?

Mr. STEPHEN. That is correct.

Mr. HANSEN. And we are going back to the aircraft that we are talking about, used to be around for years and years?

Mr. STEPHEN. Yes. Twin Otter aircraft was manufactured in Canada was a very popular, regional airliner. We found it to be an adaptable airplane for the air tour business. We put in large, panoramic windows; we have an automated narration system so that our 90 percent of the passengers—Twin Otter was Scenic Airlines until we sold the Scenic air tour portion of the business in 1993. We had 15 different languages we could broadcast to individual passengers a narration in that language of choice of 8 different languages at one time.

The Twin Otter also employed the quiet aircraft technology props which reduced our sound footprint by I believe about 60 percent.

Mr. HANSEN. Correct me if I am wrong, but, as you pointed out, you make a special airplane for this type of thing—bigger windows and all that type of thing. What is the—what have you done on acoustical things, aside—far as your sound? What improvements have you made, or what are you doing?

Mr. STEPHEN. A major improvement is the employment of a four-bladed prop which has a shorter length of prop, which means the tip speed is much lower. And, too, as we—I am not a maintenance-type—but we adjusted and had engineered a prime blade angle change which allows us to cruise the airplane several hundred RPM slower than a non-modified Twin Otter. So not only is it a quieter prop, but also we have adjusted the prime blade angle.

We have engineers that have told us we can actually reduce the sound of the Vistaliner even more by going into automated phasing over the props. You get sort of a slap when you do it manually. You can get props always totally in phase; creates a little more noise.

But without adding any incentives to move forward, we already spent a million dollars to equip our 22 Vistaliners that are in service at Grand Canyon—little more than a million dollars. We have nothing to benefit from trying to make these investments and be good neighbors, and we want to be good neighbors. We want to fly where we don't impact visitors, and we want to fly in a neighborly way where we do impact visitors.

Mr. HANSEN. Have you worked with some of the concessionaires, the air tour groups, as you develop these aircraft? Have they given you suggestions on how to do it—like Sky West, people like that?

Mr. STEPHEN. Sky West acquired Scenic from us in 1993; that is who did.

We have done all this ourselves internally. The concepts that are involved here, both from the manufacturers that are building new equipment and the concepts that we have in the Vistaliner, could

be adapted to other aircraft models flying at Grand Canyon. But, again, if we can't get the utilization out of the airplanes, nobody can afford to make those changes.

Mr. HANSEN. What is your opinion of the recommendations of the National Park Service?

Mr STEPHEN. Could you be more specific, sir?

Mr. HANSEN. I mean on the amount of sound, that type of thing that you probably heard testimony on.

Mr STEPHEN. As I said earlier, it is how this is applied in the way of restrictions. I mean we see more and more restrictions, and at what point do we get a diminishing return?

There is permanent bar to new entry; there is a cap on the number of airplanes that can be flown; there is soon to be a cap on the number of operations; they are eliminating air tour routes. I suggest, as you go down this line, you have to balance, in my view—our view, the consensus of our industry—is, you know, an appropriate use of the airspace over the park for the enjoyment of nearly 800,000 people a year. And what impact would those 800,000, if a fraction of 100,000 of them decided to get to the remote areas of the park because they couldn't do a air tour; they decided to somehow take advantage of back-country visitation.

To us, the issue is visitors, and when you have less than four dozen complaints a year from aircraft noise, I think we have achieved what the Congress intended when it passed a legislation in 1987.

Mr. HANSEN. Always hard to find that middle ground isn't it?

Mr. Traynham, let me ask you, we are in kind of a basic, philosophical argument. What does the Parks do, and what do you do? I mean, in a way—this is an old pilot. I get really nervous having somebody on the ground tell me something that is in conflict with the FAA. I see this in the Parks. We are now seeing that on wilderness bills. We are now seeing it on areas of Forest Service.

What can you prevent somebody from doing and not doing? I am a little concerned that the expertise of the FAA is being taken over by people who have great expertise on the ground, but I wonder if they have the expertise in the air. And I hope we can come to a middle ground.

In those general terms, would you like to comment on any of that?

Mr. TRAYNHAM. Yes, sir. As we said in our testimony, the Park Service and the FAA have been working together as partners in this exercise on the Grand Canyon.

The FAA works with partners with many other types of entities on the ground as well. We have environmental responsibilities. Our first responsibility is the safety in the airspace. So, with the Grand Canyon, or like with any other entity, someone will make a proposal to make the flying over a particular area more environmentally sensitive. And we will look at those proposals, determine whether they have safety factored into them, are safe, and we will make changes in the airspace to be environmentally sensitive. We have redrawn routes in the New York and New Jersey area for that very reason. People have asked us to look at other changes in the New Jersey area to route flights out over the ocean. We have determined that sort of routing puts it in conflict with the multiple

airports that are in that area. So we continue to exercise our expertise on the airspace and air traffic routings, but we do work with other agencies to be environmentally sensitive.

Mr. HANSEN. What is your opinion of the regulation that we now have over the Grand Canyon?

Mr. TRAYNHAM. The current regulation on routings has done a lot to restore natural quiet to the park, as the Congress has directed be done.

The Park Service has determined that more needs to be done to restore natural quiet the definition of "natural quiet," and they are making proposals to us for routings. We are looking at them, discarding some of them, saying others would be okay.

But we are regulating the airspace in the context of proposals being made to us for environmental reasons. We do that everyday in hundreds of places in this country, not just the Grand Canyon.

Mr. HANSEN. Well I sure applaud you on the safety thing. I remember distinctly when a United DC-7 and a TWA Constellation had a mid-air there. In fact, I guess they have hauled out most of that stuff, but back when I used to go down the river, there was this tail section of the "Coney" sitting at one place. In fact I have taken a number of pictures of it.

What bothers me about the whole thing is that I am not just seeing it there, but this Committee has seen in it Forest Service and other areas, the military test and training ranges, and you know, somewhere we still got to exist.

Mr. TRAYNHAM. There is no question that the FAA is ever-increasingly being asked to look at air routings all over the country for environmental sensitivity. When you fly in from the north into National Airport here, you make about half a dozen turns on the river before you get to the airport. That is not an FAA-designed route, or the conceived route. We did design the route after it was suggested we need to fly down the river for environmental reasons, and we have designed a very safe route down the river. But years ago, FAA, left to its own devices, would not have designed that route like that, but we are responding to environmental sensitivities on noise.

We are about to cross a milestone at the end of this year where the noisy Stage 2 aircraft will be totally phased out of the U.S. fleet. We still have environmental responsibilities after that because there are still lots of airport neighbors that are very much impacted by noise, so we will continue to work on this.

Mr. HANSEN. I appreciate the testimony of this panel. I am sorry that I wasn't here to hear your testimony. I will take the time to read it, however, and we will excuse this panel, if the gentleman from Nevada has no further questions.

And we will turn to our second panel.

Mr. Steve Bassett, president of United States Air Tour Association; Jacob Snow, assistant director, Clarke County Department of Aviation; and Roy Resavage, president of Helicopter Association International.

I guess you folks all know the rules. If you can limit it to five minutes, we would appreciate it.

Mr. Bassett, we will start with you, sir.

**STATEMENT OF STEVE BASSETT, PRESIDENT, UNITED STATES  
AIR TOUR ASSOCIATION**

Mr. BASSETT. Thank you, Chairman Hansen and members of the Committee, for the opportunity to testify here today. I want to congratulate you for your continued leadership of this troubling issue and for your vigilance in seeking fair and equitable treatment for the air tour industry.

The U.S. Air Tour Association represents 55 of the largest air tour operators and allied companies in the United States, including a coalition of airline and associated aviation companies that provide the majority of the Grand Canyon air tour services, both out of Las Vegas and Grand Canyon Airport in Arizona.

The Agency's published intention to alter the definition of "natural quiet" with an 8 decibel below natural ambient sound noise threshold in the vast majority of the Grand Canyon National Park, as we have heard, is once again appear to be based on voodoo science; ignores impact on 99 percent of the park visitors; seeks to protect quiet for quiet's sake; is yet another attempt to regulate airspace; circumvents any reasonable or rational attempt to work with the air tour industry to find an approach to this issue acceptable to all parties; appears neither consistent with Public Law 100-91, the stated policy of senior officials of the Department of Interior, may well exceed the statutory authority granted in the 1987 Overflights Act; will set a noise standard which will, ultimately, not only kill the Grand Canyon air tour industry, but establish a very dangerous precedent that will impact air touring throughout the United States.

Now, Mr. Chairman, I have sat here for two hours; I guess we have to be careful of bureaucratic double-speak, and I have suddenly found myself very confused with much of what I heard.

As for the April 23, 1999, letter to you, Chairman Hansen, from Grand Canyon National Park Superintendent Rob Arnberger, the Park Service would seemed to have us all believe that this new method of evaluating noise is not nearly as dire as it appears. They would have us believe that this two-zone concept is actually a good thing for the air tour industry because, while it may very well eliminate aircraft from the center of the park, it still provides an opportunity for these air tour aircraft to fly over another area of the Grand Canyon.

What the Park Service has failed to clarify, however, for this Committee, is that the center of the park, approximately two-thirds of the park area, is where the fewest ground visitors are—approximately 18,000 per year out of 5 million, one-half of 1 percent. That is where the aircraft currently are; that is where the routing system currently has air tour aircraft; that is where they should be, if impact on visitors is the benchmark that we are seeking to achieve.

The Park Service then suggests, however, that we can move aircraft to this other zone, this other zone where the standard noise threshold, or the definition of "natural quiet" doesn't change. Well, the practical result, Mr. Chairman, is that we seem to be headed in a direction whereby we will take the aircraft out of the area of the park where the fewest people are, and we will then modify the routes—at least as I read Mr. Arnberger's letter to you—we will

modify the routes, perhaps in such a way that we put the aircraft over where the preponderance of the people are, along this area around the south rim.

Now perhaps that is supposed to be good news for the air tour industry, because we have someplace to fly, but the practical result will be an enormous and justifiable increase in noise complaints—

[Laughter.]

[continuing] from all of the people that are visiting the park—well, more than 99 percent of the people visiting the park on the ground. And, then, that just sets us up for the next survey that occurs in six months, where they ask park visitors, “Are they annoyed by aircraft sound?” And, of course, the response will be, “Yes, we are.” And the next thing you know, there are further regulations to try and get us out of that one area.

May I continue just for a moment?

Thank you.

Deception by the Park Service is not necessarily new when it comes to air touring. Grand Canyon air tour operators have been told repeatedly by Park Service officials over the years that the Agency supports air touring in the Grand Canyon and does not seek the Grand Canyon air tour operators out of business. It is just a very brief example of a decade of deception by the Park Service.

Following the Overflights Act in 1987, William Horn, Assistant Secretary of the Interior, says of the Overflights Act, quote, “Congress intended to provide for the use of sightseeing aircraft. Seeing the Grand Canyon from the air is enjoyed by many park visitors. The recommendations allow for air tours of 30 minutes or more that encompass spectacular portions of the Canyon.”

A year later, SFAR 50-2 goes into effect.

We have already heard, and I won’t go through the details, of the successes of SFAR 50-2. And at last count, I heard we had 26 complaints registered out of 5 million visitors to the Grand Canyon. So by all standards and measurements, we achieved substantial restoration of natural quiet, based on the 1987 Overflights Act. But, apparently, that wasn’t good enough for the Park Service, so they continued to promulgate further regulations.

We met with Director Stanton personally, the United States Air Tour Association Board of Directors. He assured us that it is not their intent to put the Grand Canyon air tour operators out of business. During the 17-month negotiation of the National Park Overflight Working Group, we were told the same thing by Park Service officials. At the USATA convention in Alaska last year, we were told exactly the same thing by Park Service officials. Yet every action the Park Service takes is contrary to their public pronouncements to us they are looking to ensure the viability of the Grand Canyon air tour industry.

The Park Service may already have overstepped its statutory boundaries. At a minimum, the Agency has abused its power. It turns a deaf-ear on the important segments of its constituency, 99 percent of ground visitors and air tour passengers. It engages in a systematic campaign of deception with air tour operators. And the airspace control, it cannot obtain statutorily because you won’t give

them—and wisely so—that statutory jurisdiction, authority, they seek to obtain by intimidation and political pressure.

S.J.R. 21, the Nevada Legislature asked Congress to effect an outcome for the southern Nevada air tour industry that will protect, support, and sustain the viability of this significant contributor to tourism economy in the State of Nevada and the enjoyment of visitors and sightseers.

That is our request, as well, Mr. Chairman, for without your intervention, the end of Grand Canyon air touring, as well as air touring nationally is at hand.

What we would request is this; at the very minimum, because you have requested and you have achieved sequential referral of H.R. 1000, our request is, at a minimum, number one, that the sound standards contained in that piece of legislation that air tour operations in the Grand Canyon must be based on valid and reasonable scientific methodology and standards, and that such standards must allow for the continued existence of a viable air tour industry in the Grand Canyon. And, secondarily, the provision which ensures that future air tour management plans at Lake Meade National Recreation Area, and other public lands adjacent to the Grand Canyon, may not be used as artificial barriers to the Grand Canyon.

These are two key provisions of H.R. 1000, and, at the very minimum, we request your support on those provisions.

Thank you for the opportunity to testify. I look forward to answering your questions.

[The prepared statement of Mr. Bassett follows:]





TESTIMONY OF

MR. STEVE BASSETT, PRESIDENT  
UNITED STATES AIR TOUR ASSOCIATION (USATA)

TO

U.S. HOUSE OF REPRESENTATIVES  
SUBCOMMITTEE ON NATIONAL PARKS AND PUBLIC LANDS  
HONORABLE JAMES V. HANSEN, CHAIRMAN

CHANGE IN NOISE EVALUATION METHODOLOGY FOR AIR TOUR  
OPERATIONS OVER GRAND CANYON NATIONAL PARK (GCNP)

MAY 25, 1999

Thank you, Chairman Hansen and Members of the Committee for the opportunity to testify before you today on a subject which significantly impacts the future of the air tour industry in southern Nevada and northern Arizona – air tour companies which, each year, fly more than 800-thousand tourists from around the world on spectacular aerial tours of the Grand Canyon.

Mr. Chairman, I want to congratulate you for your continued leadership of this troubling issue and for holding this oversight hearing and for your vigilance in seeking fair and equitable treatment of the air tour industry at the Grand Canyon and nationally. We sincerely appreciate your interest and that of your committee colleagues.

These comments are offered by the United States Air Tour Association (USATA). USATA represents 55 air tour operators and allied companies in the United States including a coalition of airline and associated aviation companies that provide the majority of air tour Services to the Grand Canyon. Air tour operators represented by USATA range from large-fleet, multi-million dollar FAR Part 121 certificated scheduled airlines to small single-aircraft FAR Part 135 on-demand air tour Service providers. These comments also are made on behalf of the Grand Canyon Air Tour Council (GCATC) and further incorporate the technical evaluation of JR Engineering, Kirkland, Washington, consultants to USATA and the air tour industry on this matter (See Attachments "A" and "B").

#### **The Impact of Grand Canyon Air Touring**

Travel and tourism and recreation is the number one industry in southern Nevada. The air touring industry has been a tradition in the Grand Canyon for more than 70 years.

Approximately 800,000 tourists from all over the world take air tours of the Grand Canyon each year, 500,000 of whom fly to the Canyon from Las Vegas. More than 62-percent are under 15, over 50, handicapped or fly because of other health related reasons.

A comprehensive study by the University of Nevada-Las Vegas (UNLV) concluded that the estimated economic impact of air touring on southern Nevada in 1996 exceeded \$374,000,000. The UNLV study also concluded that the estimated expenditures of Grand Canyon air tourism from the Las Vegas Convention and Visitors Authority (LVCVA) are about 443.5 million dollars. Most significant, the UNLV study found that 23.7% (9,120) of American visitors and 32% (142,086) of international visitors would not come to southern Nevada in the absence of air tours to the Grand Canyon.

So, besides the outcome of this issue affecting air tour operators directly, it also will have a profound impact on the ability of nearly a half a million people a year who take aerial sightseeing tours of the Canyon because there is no other way for them to see it.

#### **NPS Action Arbitrary and Capricious**

The arrogance of the National Park Service is mindboggling. This latest round of air tour overflight actions by the Park Service represents arbitrary and capricious decision making.

The agency's published intention to alter the definition of natural quiet with an 8 decibel below natural ambient sound noise threshold in the vast majority of the Grand Canyon National Park area –

- is once again based on voodoo science,
- ignores impact on 99-percent of visitors,
- seeks to protect quiet for quiet's sake,
- is yet another attempt to regulate the airspace,
- circumvents any reasonable or rational attempt to work with the air tour industry to find an approach to this issue acceptable to all parties,
- is neither consistent with P.L. 100-91, the stated policy of senior officials of the Department of Interior, or recent comments by other officials of the NPS and Members of Congress, and may well exceed the statutory authority granted in the 1987 Overflights Act, and
- will set a noise standard which will kill the Grand Canyon air tour industry and will establish a dangerous precedent that will impact air touring throughout the United States.

#### OVERVIEW OF NPS NOTICE

In a "Public Notice" published in the Federal Register on January 26, 1999, the Park Service has stated it will, in essence, redefine "natural quiet" for 50 percent of the Park and will change the noise evaluation methodology for air tour operations over the Grand Canyon. The practical result of this unscientific and ill-advised action is to ground every powered aircraft currently providing aerial sightseeing tours of the Canyon and impact all aircraft flying anywhere in the vicinity of the Grand Canyon National Park.

Most disturbing, this "Public Notice," circumvents any reasonable or rational attempt to work with the air tour industry to find an approach to this issue acceptable to all parties involved – an approach recommended by USATA and the air tour industry repeatedly with our suggestion that the FAA and NPS jointly sanction a formal Aviation Rulemaking Advisory Committee Working Group to hammer out recommendations acceptable to all involved.

Further evidence of this is the statement contained in the final paragraph of the January 26, 1999 Public Notice:

*"The NPS and FAA will use this refined methodology in future evaluations of the substantial restoration of natural quiet at GCNP, unless science or*

*public planning processes provide better approaches. These refinements of the evaluation methodology may make more challenging the efforts to achieve the substantial restoration of natural quiet in GCNP. . . .*

This is not just a "trial balloon," but a clear statement of the intention of the Park Service that it will implement this new noise threshold immediately.

The NPS has set a two-zone system for evaluating aircraft noise and determining if natural quiet, under the agency's definition, has been achieved. According to the Park Service, natural quiet is defined as "natural ambient sound conditions when people of normal hearing can perceive nothing but the sounds produced by the natural and cultural components of the Park." The existing NPS-imposed standard for achieving natural quiet (no aircraft audible) is when 50 percent of the Park has achieved "natural quiet" for 75- 100 percent of the day.

Under the NPS action, Zone 1 encompasses "developed" areas such as the areas along the south rim where the preponderance of ground tourists gather (approximately one-third of the Park area). These are areas that air tours avoid. In these areas, the Park Service says that it will maintain a noise threshold of ambient sound plus 3db. Zone 2 would cover the rest of the middle and eastern portions of the Grand Canyon (approximately two-thirds of the Park area) – the areas above which air tour routes are currently flown.

In Zone 2, the NPS has adopted a noise threshold of ambient sound minus 8 dB. The Park Service has selected this level because, as it states in the Notice, "...technicians monitoring the sound environment identified aircraft noise levels at levels significantly below A-weighted natural ambient levels." The NPS goes on to state, "These technicians, tested to have normal hearing, were listening actively to note the source of noise levels as the source changed over time . . . The technicians identified aircraft noise at A-weighted levels of 8-12 decibels below the average A-weighted ambient sound levels . . . Therefore, the threshold for Zone Two is set at 8 decibels below the average ambient sound levels a threshold which reflects the point at which aviation noise can be heard (i.e., audible) by ground visitors seeking to experience the natural and cultural soundscapes of national Parks."

The NPS action to change the noise evaluation methodology in the Grand Canyon National Park (GCNP) will require aircraft to fly so far away from the Grand Canyon as to make aerial sightseeing unattractive, effectively killing the industry.

#### **FAA AIRSPACE AUTHORITY CHALLENGED**

In our view, this is nothing short of a another backdoor attempt by the Park Service to tread on the FAA's authority and regulate the airspace and is contrary to repeated declarations by senior officials of the Department of Interior and National Park Service that controlling the airspace was better left to the Federal Aviation Administration (FAA).

Throughout the ARAC/NPOWG process as well as during two separate negotiating sessions with key Senate and House senior staff, the Park Service claimed that it was not their intention to seek control of the airspace. However, by being permitted to establish a noise threshold which prohibits aircraft from accessing certain airspace, the Park Service is, de facto, "controlling" the airspace, an authority provided the Federal Aviation Administration by Congress.

The Federal Aviation Administration is recognized as the federal government experts in the management of the national airspace system. FAA staff has been trained and has developed significant expertise in all aspects of airspace design and air traffic control and management. The United States Congress, in the Federal Aviation Act of 1958, charged the FAA with maintaining a safe and efficient national air transportation system. To strip the FAA of its authority to accomplish its Congressionally-mandated mission would have a devastating impact on aircraft movements in the United States and significantly jeopardize the national economy as well as aviation safety. It would invite airspace management chaos over all public lands. There would be no way other federal land management agencies – BLM, U.S. Forest Service, Fish and Wildlife Service, etc. and all Native American tribes would not in short order insist that their agencies have the right to control the airspace over all of their lands as well.

Handing over to land management agencies within the federal government the authority to make decisions regarding aircraft movements makes about as much sense as handing over to the FAA authority to make decisions regarding the promotion and regulation of national parks, monuments and reservations as established in the Organic Act of 1916.

Air touring in the Grand Canyon is currently dictated by a series of patchwork regulations implemented by the FAA over a period of years. They are often disjointed and frequently have only marginal bearing on each other. Regulations implemented in May of 1997 were based solely on acoustical studies which have been shown to be flawed. In testimony before the House National Parks and Public Lands Subcommittee last year, acoustical experts testified that aircraft sound data had been manipulated by the NPS to show more aircraft noise than actually existed. The National Park Service candidly admitted that the computer model used had never been subjected to a model validation study with traditional peer review.

As a result, Subcommittee Chairman Jim Hansen, in an October 6, 1998 letter to Interior Secretary Babbitt with copies to Transportation Secretary Slater, FAA Administrator Garvey and NPS Director Stanton insisting that there should be no further regulations on air tours in the Canyon and that regulations implemented as a result of the flawed study should be rescinded:

*"...there is no scientific validation that natural quiet has not been restored [at the Grand Canyon] by previously adopted air tour regulations . . . indeed, logic and equity compels us to urge rescinding all recently adopted air tour management modifications because they were predicated upon bad science. The result we now have, with the recently imposed air and*

*tour management changes, are, without question, inappropriate regulations based on bad science . . . if the U.S. Court of Appeals for the District of Columbia had the above admission by the NPS...there is every reason to believe their decision would have been substantially different to reflect this critical evidentiary fact."*

*James Hansen, Chairman*

#### **Not As Bad As We Think**

The Park Service would have us all believe that this new method for evaluating noise is not nearly as dire as it appears. They would have us believe that this two-zone concept is actually a good thing for the air tour industry because, while it would eliminate aircraft from the center of the Park, air tours could still be provided elsewhere in the Park.

What the Park Service has failed to tell this Committee is that the center of the Park -- approximately two-thirds of the Park area -- is where the fewest ground visitors are (less than half of one percent). That's where the aircraft should be if impact on Park visitors is the measuring stick. The Park Service then has the audacity to suggest that aircraft could be moved to the remaining one-third of the Park area, which is over the most populated areas of the Park along the south rim. The practical result will be an increase complaints which then will provide the Park Service the ammunition they need to then wipe out all air tour activity entirely.

It's a deliberately contrived Catch-22 situation. Air tours won't be able to meet the new noise limits in the center of the Park and would create widespread and justifiable visitor complaints along the south rim. We can't win.

But, deception by the Park Service is not new when it comes to air touring.

#### **A Decade of Deception by the NPS**

Grand Canyon air tour operators have been told repeatedly by NPS officials over the years that the agency supported a viable air tour industry at the Grand Canyon and did not seek to put Las Vegas- and Arizona-based air tour operators out of business. But, their regulatory actions have not matched their words. Here is an example of a decade of deception by the National Park Service:

##### **1987 -- Overflights Act Passes Congress**

In August, Congress passes Overflights Act mandating that the FAA put in place regulations to increase air tour aircraft safety and restore natural quiet to the Grand Canyon.

##### **1987 -- Department of Interior Expresses Support for Air Touring**

William Horne, assistant secretary of the Department of Interior, makes it clear that, in Public Law 100-91, the law which guided the development of the Overflights Act, "Congress intended to provide for the use of sightseeing aircraft. Seeing the [Grand Canyon National] Park from the air is enjoyed by many Park visitors. The recommendations allow for air tour of 30 minutes or more that encompass spectacular portions of the Canyon."

#### **1987 – Department of Interior Reiterates Support for Air Touring**

Pursuant to Section 3, P.L. 100-981, the recommendations contained in the Grand Canyon Aircraft Management Plan states: "The purpose of the designated air corridors is to provide: (1) an opportunity to fly over the Grand Canyon to view unsurpassed scenic vistas, and (2) approximately 30-minute to 60-minute tour opportunities . . . consistent with current tour packages and avoidance of noise-sensitive locations within the Park."

#### **1988 – New Regulations Implemented in Grand Canyon**

A year later, Special Federal Aviation Regulation (SFAR) 50-2, the fourth such SFAR, was implemented at the Grand Canyon as a result of Public Law 100-91. The rule put in place a new route structure ensuring that aircraft avoided areas of large concentrations of ground visitors and set standard altitudes for fixed- and rotor-wing aircraft.

The results of SFAR 50-2 were and are significant and clearly restored natural quiet to the Grand Canyon as the Overflights Act mandated:

- Safety improved dramatically. There has not been one accident involving an air tour aircraft in SFAR airspace since the rule went into effect;
- NPS' own studies have shown that 92 percent of Park visitors report that they are not adversely affected by aircraft sound;
- Back country Park visitors representing approximately 18,000 visitors a year (out of 5 million) – *one half of one percent of all visitors to the Grand Canyon* -- reported either seeing or hearing only one or two aircraft per day;
- Park Service studies also showed that visitor complaints about aircraft noise dropped significantly. 26 complaints from more than five million visitors is a remarkable achievement by air tour operators;
- A 1992 follow up study by the U.S. Forest Service concluded that:

*"Few adverse impacts to wilderness users were found resulting from aircraft overflights . . . it appears that many visitors do not notice aircraft even when they are present . . . aircraft noise intrusions did not appreciably impair surveyed wilderness users overall enjoyment of their visits to wilderness nor reduce their reported likelihood of repeat visits."*

So, by all standards and measurements, natural quiet as per the Congressional mandates established in the 1987 Overflights Act, has been achieved in the Grand Canyon as a result of SFAR 50-2.

**1994 – Environmentalists Seek Prohibition of Air Touring Over Parks**

At a July hearing of the House Aviation Subcommittee Oversight Hearing on air touring over all national parks, the National Parks Conservation Association (NPCA) and Sierra Club testified in favor of eliminating all aviation activity over all national parks in the U.S. These groups also advocated that the NPS should be given statutory authority to control airspace and aircraft over all national parks.

**1996 – NPS Presses For Further Regulations on Air Touring**

Unhappy with the results of SFAR 50-2, environmental community presses for more stringent federal requirements. At urging of NPS, FAA implements new and more onerous requirements including expanded "no-fly" zones, curfews on morning and sunset flights, caps on aircraft fleet sizes and burdensome reporting requirements.

**1997 – Senate Bill Would Strip FAA of Regulatory Authority**

Senator John McCain introduces Senate Bill 268 which would give the National Park Service jurisdiction over airspace above national parks, stripping the FAA of its long-standing authority to regulate air traffic.

**1997 – Senator John McCain Claims Support for Air Touring**

Senator John McCain contradicts the key provisions of S.268 and tells officials of the United States Air Tour Association (USATA) that he is supportive of air touring in the Grand Canyon and does not seek to put Grand Canyon air tour companies out of business.

**1997 – Senator McCain Reiterates Support for Air Touring**

Senator John McCain, opening a Senate Commerce Committee hearing on S.268, announces publicly that it is not his intention to put Grand Canyon air tour operators out of business. Other Members of Congress object to S.268 provision stripping FAA of its authority to regulate aviation over national parks. Environmental groups including Grand Canyon Trust and NPCA testify that they have not retreated from 1994 position that all aircraft should be prohibited from flying over national parks.

**1997 – NPS Director Offers Support for Air Touring**



NPS Director Robert Stanton tells the Board of Trustees of the United States Air Tour Association (USATA) that it is not his agency's intention to put Grand Canyon air tour operators out of business.

**1997 – NPS Reiterates Support for Air Touring**

NPS officials, during the 17-month negotiation on federal legislation to address air touring at all national parks in the United States, often reiterates Director Stanton contention that it is not the intention of the agency to put air tour operators at the Grand Canyon out of business.

**1998 – NPS Admits Data Manipulation**

NPS is found to have manipulated the acoustical data used in the 1996 Grand Canyon rulemaking action. Acoustics experts uncovered evidence that the Park Service had modified the computer program used to evaluate noise impact to show more noise from aircraft than actually existed. In testimony before Congress (House National Parks Subcommittee Oversight Hearing), the NPS admitted in writing and in response to questioning that its modified computer modeling process had not undergone validation or peer review within the scientific community.

**1998 – NPS Officials Maintain Support for Air Touring**

At the USATA annual convention in Anchorage, Alaska, senior NPS officials, once again, reiterate that it is not the intention of the Park Service to put Grand Canyon air tour operators out of business.

**1999 – FAA Announces More Restrictive Rules for Grand Canyon**

At the urging of the NPS, the FAA announces its intentions to implement further regulations on air touring in the Grand Canyon by early 2000. This would include modified routes from Las Vegas eliminating any "touring" (point-to-point transportation only), further expansion of flight free zones and reduction/elimination of flight corridors for air tour aircraft. The FAA also announced its intentions to add to the current cap on aircraft an additional operational cap based on 1997-1998 levels flown during the worst year in Grand Canyon air tour history.

**1999 – NPS Unveils Plan To Eliminate Grand Canyon Air Touring**

Contrary to all public pronouncements by senior officials of the National Park Service and key members of Congress, the NPS announces its intention to implement arbitrary sound standard in the Grand Canyon prohibiting any mechanical noise above 8dB below natural ambient sound. This would prohibit any powered aircraft including air touring aircraft, major airlines, commuter and regional carriers, general aviation and military aircraft from flying anywhere in the vicinity of the national park closing down entirely the southern Nevada and Arizona air tour industry

Sadly, nearly every action with respect to air touring over the Grand Canyon taken by the Department of Interior, National Park Service or Federal Aviation Administration in the ensuing decade has been contrary to providing tours which encompass "spectacular portions of the Canyon" and would do exactly what the DOI and NPS have said was not their intent – put Grand Canyon air tour operators out of business..

#### **CONCLUSION**

The Park Service may already have overstepped its statutory boundaries. At a minimum is that the agency has consistently abused its power. It turns a deaf ear on important segments of its constituency – 99 percent of Park ground visitors and air tour passengers. It thumbs its nose at concerns expressed by Members of Congress. It engages in a campaign of deception with air tour operators. And, the control it cannot obtain statutorily it seeks to obtain with political pressure.

As Congressman Gibbons pointed out, in SJR 21, the Nevada Legislature has asked Congress to "...effect an outcome for the southern Nevada air tour industry that will protect, support and sustain the viability of this significant contributor to the tourism economy of the State of Nevada and the enjoyment of visitors and sightseers."

That is our request, as well. For, without your intervention, the ultimate demise of the Grand Canyon air tour industry and the end of air touring nationally is at hand.

Thank you.

## Attachment "A"

1. NPS Proposal "Change in Noise Evaluation Methodology for Air Tour Operations Over Grand Canyon Park", Federal Register / Vol. 64, No. 16, 1/26/99
2. J R Engineering Analysis Report, "Analysis of National Park Service Data on Air Tour Overflight Sound at Grand Canyon National Park", J. R. Alberti, K. L. Mann, 7/25/97
3. NPOA Report No. 93-1, "Evaluation of the Effectiveness of SFAR 50-2 in Restoring Natural Quiet to Grand Canyon National Park -- Final Report", S. Fidell, K. Pearsons, M. Sneddon, BBN Systems and Technologies, 6/23/94.

**1. SUMMARY**

## 1.1. Observations:

1.1.1. The Reference 1 NPS action cites unidentified research performed by unknown persons that is said to show that observers intently listening for aircraft could detect them when the aircraft sound level is 8 to 12 dB(A) below ambient. Based on this unpublished finding, NPS proposes to change the threshold for determining "substantial restoration of natural quiet" from 3 dB(A) above ambient to 8 dB(A) below ambient.

1.1.1.1. Reference 1 does not state the implications. If NPS persists in using minimum (rather than typical) ambient levels in the 15 to 17 dB(A) range, as they have in past studies, they would be setting the threshold of "natural quiet" at 7dB(A) to 9 dB(A). This is near or below the threshold of hearing for most adults, well below the sound of leaves rustling in a breeze, and outside of normal human experience.

1.1.1.2. Stage 3 commercial airliners 40 miles away would be in violation, as would any tour aircraft that came near the Park.

1.1.2. They do not state how they established the aircraft sound levels at the time of detection. Since it is impossible to directly measure a sound level that is below ambient, some (unstated) form of inference or estimation must have been used. At best, such methods produce results of dubious accuracy that would not be accepted by any government agency for regulatory purposes - certainly not aircraft noise certification.

1.1.3. Apart from its questionable accuracy, the NPS's action offers no new information, only an attempt to change the ground rules. The 3 dB(A) above ambient threshold previously used to define "natural quiet" is the threshold of noticeability, the level at which a person thinking about something other than aircraft (i.e. a typical Park visitor) would first notice aircraft sound. NPS's new 8 dB(A) below ambient threshold of "natural quiet" is represented as the threshold of audibility, at which a person intently listening for a sound of known character can first detect it.

1.1.3.1. That the threshold of audibility is lower than the threshold of noticeability has been well known for many years and should have been known to the NPS in its previous rulemaking to define natural quiet. Reference 3 gives 10 dB as the difference (in signal to noise ratio).

1.1.3.2. Thus, the "new information" alluded to in Reference 1 is irrelevant. The real purpose of Reference 1 is to change the basis for setting the threshold of "natural quiet" from the threshold of noticeability to the threshold of audibility (detectability).

## 1.2. Recommendations:

1.2.1. 29 dB(A) should be used as the threshold of noticeability in evaluating the % time that Park visitors will notice tour aircraft. This is based on the lowest 25%ile sound level for aircraft sound detection. This is a minor refinement of previous studies, where we used 30 dB(A) based on median detection levels.

1.2.1.1. The threshold of noticeability (ambient + 3 dB(A)), as used in previous studies, is the level at which normal visitors would first notice aircraft sound. This should continue to be the standard.

1.2.1.2. The lower threshold of audibility set by NPS is based only on the observations of technicians whose attention was focused on finding aircraft noise.

1.2.2. The current publicly available version of the FAA/DOT developed Integrated Noise Model (INM) program should be used until or unless another program is determined, by peer reviewed field validation, to be superior. Any such software or enhancements thereto should be available to all interested parties.

1.2.3. We have already demonstrated that the formal definition of "restoration of natural quiet" has been met in Reference 2, but propose the following sound reduction measures in the interest of further, progressive sound reduction:

1.2.3.1. SFAR 50-2 should remain in effect, but operators should be encouraged to ensure that their aircraft are operated to produce minimum sound consistent with safety of flight and approved operating limits. This includes minimum prop and rotor RPM and adjusting helicopter descent paths to avoid blade slap and fixed wing climb gradients to minimize use of high RPM.

#### CRITERIA FOR ACOUSTICAL STANDARDS AND RULEMAKING

2.1. The Reference 1 NPS Proposal cites unpublished studies indicating that trained observers, intently listening for aircraft, could detect them as low as 8-12 dB(A) below ambient (Such claims may be difficult for them to substantiate, as discussed in section 2.3)

2.1.1. On this basis, they propose to define the threshold of audibility as 8 dB(A) below ambient for most of the Park. If they apply this to the 15 to 17 dB(A) ambient level that they have typically assigned to much of the Park, they will end up with audibility thresholds in the 7 dB(A) to 9 dB(A) range. This is a nonsensically low level, barely above the threshold of hearing for people with excellent hearing, and below the threshold of hearing for many adults.

2.2. Reference 3 makes an important distinction between audibility (or detectability) by an intent observer, specifically looking and listening for aircraft, and noticeability by a visitor not particularly thinking about airplanes. The difference is about 10 dB in Signal to Noise Ratio (S/N). Thus, an aircraft would have to be at least 10 dB louder to be noticed against a given ambient than to be detected. Noticeability is the correct measure to apply to a normal visitor who is not looking for something to complain about.

2.2.1. If an audibility standard of 7 dB(A) is established for national Parks and monuments, then a 727 would be deemed audible at slant ranges from 23 to 123 miles, depending on power. Even popular stage 3 aircraft such as the MD-80, would be deemed audible at slant ranges from 15 to 44 miles. (Data extrapolated from INM 5.2 database).

2.3. Measurements and analysis to determine aircraft sound levels should conform to FAA and industry standards. Particularly, broadband sound levels such as dB(A) should not be inferred from measurements where the aircraft sound level is less than ambient (S/N < 3 dB). Industry standards, including those set forth by FAA and American national Standards Institute (ANSI), disallow broadband data with S/N < 3dB.

2.3.1. NPS provides no methodology for their claims in Reference 1 to detect aircraft sounds 8 dB(A) below ambient. If they are basing this on broadband measurements (such as dB(A)), then aircraft sound 8 dB(A) below ambient would produce a 0.6 dB(A) up tick in A-weighted level (from an unsteady ambient that may vary a dB or more) as the aircraft approaches and recedes. Thus, S/N = 0.6 dB(A). S/N = 0.3 dB(A) corresponds to aircraft sound 12 dB(A) below ambient. S/N = 0.9 dB(A) corresponds to aircraft sound 6 dB(A) below ambient. Thus, ± 0.3 dB(A) fluctuations (which could result from trivial changes in wind or insect activity) produces a 6 dB(A) swing in the inferred aircraft sound level. Such inferences are, thus, extremely unreliable and should not be used in rulemaking.

2.3.1.1. If a narrower bandwidth is considered, as in a  $10\text{LOG}(d\text{-prime})$  analysis, then the relationship between  $10\text{LOG}(d')$  and  $\text{dB}(A)$  must be determined at high  $S/N$  and extrapolated to low  $S/N$ , with uncertain accuracy.

2.4. Software and methodology used to determine aircraft sound contours should be subjected to field validation and both the software and field validation data should be available for peer review by all interested parties. At this time only the publicly available version of INM meets that standard.

### 3. DETERMINING THE THRESHOLD OF NOTICEABILITY

#### 3.1. Notes on Sound Audibility and Noticeability

3.1.1. The detection of aircraft sound by humans (or sound analyzers) requires some increase in sound level above the ambient level with no aircraft present. That is the Signal to Noise Ratio,  $S/N$ , must be greater than zero.

3.1.1.1. For example, the sound measurements conducted in GCNP by Bolt Beranek and Neuman (BBN) under NPS contract and reported in Reference 3 found that observers at 13 different sites in GCNP (intently listening for aircraft) were able to detect aircraft at an average  $S/N$  of 1  $\text{dB}(A)$ .

3.1.1.2. This A-weighted Overall  $S/N=1$   $\text{dB}(A)$  is consistent with detectability of aircraft sound 6  $\text{dB}(A)$  below ambient. Reference 3 acknowledges that one cannot reliably measure broadband sound levels (such as  $\text{dB}(A)$ ) that are below ambient (This is discussed further in Section 2.5.1.).

3.1.2. Reference 3 also made use of a commonly used measure of acoustical detectability known as "d-prime" or bandwidth adjusted signal to noise ratio,  $d' = h \cdot S/N \cdot \sqrt{W}$ , where,  $d'$  is computed for every critical frequency band (Reference 3 used 1/3 Octave bands).  
 $h$  = detector efficiency (set to 40%, in Reference 3)  $W$  = bandwidth.

3.1.2.1. For convenience the decibel equivalent,  $10\text{LOG}(d')$  is often used. Typically, a prop or rotor blade passage tone will betray the presence of an aircraft. The band containing that tone typically has the highest  $d'$ .

3.1.2.2. The observers in Reference 3 found detectability at  $10\text{LOG}(d') = 7$  and noticeability at  $10\text{LOG}(d') = 17$ .

#### 3.2. Computation of Threshold of Noticeability.

3.2.1. We based our computations on the observations reported in Reference 3.

3.2.2. We accepted the 3  $\text{dB}$  above ambient definition of the threshold of noticeability used by NPS in its previous studies.

3.2.3. The NPS's definition of "substantial restoration of natural quiet" requires that 50% or more of the Park be free of noticeable aircraft sound 75% or more of the time. To determine the corresponding threshold of noticeability:

3.2.3.1. We determined the lower quartile sound level at which aircraft were detected at each site. Thus the detection level was higher 75% of the time.

3.2.3.2. We then computed the median of those site-specific, lower quartile sound levels. Thus the detection level was higher 75% of the time at 50% of the sites.

3.2.3.3. The finding in Reference 3 that  $S/N = 1$   $\text{dB}(A)$  at detection means that the ambient level was 1  $\text{dB}(A)$  below the detection level. Thus, subtracting 1  $\text{dB}(A)$  and adding 3  $\text{dB}(A)$  to the median lower quartile detection level yields the threshold of noticeability.

3.2.3.4. Table 1 shows the computations. The median lower quartile threshold of noticeability is 28.93 dB(A) at onset and 28.796 dB(A) at offset. Averaging and rounding yields 29 dB(A). This is the correct aircraft sound criterion level for evaluating "substantial restoration of natural quiet". If aircraft sound is less than 29 dB(A) 75% or more of the time in 50% or more of the Park, then, by the NPS's definition and the NPS's data, "substantial restoration of natural quiet has occurred".

TABLE 1: COMPUTATION OF THRESHOLD OF NOTICEABILITY

Site	La at Onset of Detectability			La at Offset of Detectability		
	Mean	25%ile La	Mean	25%ile La		
	La, dB(A) std dev, s =La-.67s			La, dB(A) std dev, s =La-.67s		
Horn Cr.	24.9	2.3	23.359	24.7	3.2	22.556
Nankoweap	45.9	7.8	40.674	45.8	7.8	40.574
Pt Imperial	34.2	4.3	31.319	35.8	5.8	31.914
S. Canyon	22.5	3	20.49	22	3.7	19.521
Hermit Cr.		35	8.3	29.439	36.8	9.4
Sanup Plateau	26.2	4.9	22.917	29.2	7.5	24.175
Tonto Overlook	27.6	1	26.93	27.6	1.2	26.796
Phantom Ranch	45.8	1.2	44.996	45.7	1.6	44.628
Tuna Cr.	18	1.2	17.196	17.1	1.8	15.894
Toroweap Overk.	20.4	2.6	18.658	20.3	1.7	19.161
Desert View	27.7	0.7	27.231	32.1	4.5	29.085
MEDIAN, dB(A)	27.6		26.93	29.2		26.796
Ambient, SNR=1 dB(A)	26.6		25.93	28.2		25.796
Noticeability Threshold = amb + 3 dB(A)	29.6		28.93	31.2		28.796

Data from NPOA Report 93-1, Table E-3

## ATTACHMENT "B"

**SUBJECT:** CRITIQUE OF HARRIS MILLER MILLER & HANSON STUDY SUPPORTING NATIONAL PARK SERVICE PROPOSED NEW STANDARD FOR "NATURAL QUIET" IN GRAND CANYON NATIONAL PARK

## References:

1. NPS Proposal "Change in Noise Evaluation Methodology for Air Tour Operations Over Grand Canyon Park", Federal Register / Vol. 64, No. 16, 1/26/1999
2. HMMH Memorandum, "A-Weighted Differences Compared with Detectability", N.P. Miller, Harris Miller Miller & Hanson, Job# 294530.22, 5/15/97
3. NPOA Report No. 93-1, "Evaluation of the Effectiveness of SFAR 50-2 in Restoring Natural Quiet to Grand Canyon National Park -- Final Report", S. Fidell, K. Pearsons, M. Sneddon, BBN Systems and Technologies, 6/23/1994.
4. J.R. Engineering Letter, "A Proposed Standard For "Natural Quiet" In Grand Canyon National Park", J. R. Alberti, 3/7/1999
5. NPS Report, "Draft Environmental Assessment -- Noise Limitations for Aircraft Operations in the Vicinity of Grand Canyon National Park" Jeff Griffith (ATA-1), FAA/NPS, 12/24/1996
6. J.R. Engineering Analysis Report JR 182. "Analysis of national Park Service Data on Air Tour Overflight Sound at Grand Canyon National Park", J. R. Alberti, K. L. Mahn, 7/25/1997

## 1. SUMMARY

- 1.1. In Reference 1, the National Park Service (NPS) states, "In light of its experience and additional information, NPS is now refining its methodology used to evaluate the achievement of its natural quiet restoration standard." Further to this "additional information", the Reference 1 narrative continues, "... The threshold for Zone 2 is proposed to be different because data collected at GCNP indicates that technicians monitoring the sound environment identified aircraft noise levels at levels significantly below A weighted natural levels." .... "The technicians identified aircraft noise at A-weighted levels 8-12 decibels below the average A-weighted natural ambient sound levels."
- 1.2. In summary, Reference 1 begs us to conclude that new research now dictates that the threshold of "natural quiet" be changed from 3 dB(A) above ambient to 8 dB(A) below ambient.
  - 1.2.1. Applying this to the minimum ambient levels (15 to 17 dB(A)) that NPS has (incorrectly) used in past studies would result in a "natural quiet" criterion of 7 to 9 dB(A) for most of GCNP.
  - 1.2.2. This would be used to justify the complete annihilation of air tours at GCNP (and other parks).
- 1.3. Upon reviewing Reference 2, the engineering report by HMMH containing the claimed "additional information" (and written two years ago), I find that this conclusion is entirely false and is not supported in any way by Reference 2.
  - 1.3.1. There were no new measurements or observations; only some arithmetic performed on some old measurements and studies. HMMH's arithmetic indicates that aircraft sound meets their detectability criterion at levels as low as 5.6 dB(A).
  - 1.3.2. At no time did any observer actually detect aircraft sounds at anything close to these levels -- in the Grand Canyon, or anywhere else.
  - 1.3.3. Their detectability criterion was based on aircraft sounds that were detected by vigilant observers in GCNP at an average threshold level of 30 dB(A).
  - 1.3.4. In several cases, aircraft sound spectra, adjusted to meet their detectability criterion, are below the threshold of human hearing at every frequency and could not possibly be detected, by an observer with normal hearing, no matter how intently he or she strained to listen.
- 1.4. In Reference 1, NPS is not "refining its methodology". It is attempting to switch from noticeability to detectability as the principle upon which aircraft noise criteria are set.
  - 1.4.1. In so doing NPS is expressing a political opinion not supported by Reference 2 or any other scientific study.

- 1.4.2. Reference 2 is an arithmetic exercise that attempts to quantify detectability in units of dB(A) and makes some serious errors, in the attempt.
- 1.4.3. To their credit, HMMH admits that their study (Reference 2) "...is likely to produce results that differ considerably from what a listener on the ground would experience."

## 2. DISCUSSION

- 2.1. In Reference 2, HMMH uses as its audibility parameter, bandwidth adjusted signal to noise ratio,  $d'$  (pronounced "d-prime"). Though not attributed in Reference 2, this derives from a 1994 study conducted under NPS contract by BBN in 1994, Reference 3<sup>1</sup>.
- 2.1.1. BBN observers (Reference 3) intently listening for aircraft were able to detect them at an average  $10\text{LOG}(d')$  of about 7.
- 2.1.2. HMMH (Reference 2) fails to mention that the average sound level at onset and offset of detection in the BBN study was 30 dB(A).
- 2.1.3. BBN (Reference 3) also observed that noticeability, the level at which a typical visitor, not actively listening for aircraft, might become aware of aircraft noise occurs at about  $10\text{LOG}(d') = 17$ , typically about 3 dB(A) above ambient.
- 2.1.3.1. BBN recommends the noticeability criterion,  $10\text{LOG}(d') = 17$ , as the appropriate criterion for "natural quiet" in GCNP and uses it in developing the acoustic map presented in Reference 3.
- 2.1.3.2. In Table 2 of Reference 2, HMMH confirms that 3 dB(A) above ambient corresponds to an average  $10\text{LOG}(d') = 17$ .
- 2.2. HMMH's study, Reference 2, compares various aircraft sound spectrum shapes (Four at maximum sound level and four just after detection) with various natural ambient sound levels measured in GCNP (under unstated circumstances). In each comparison they subtract enough from the aircraft spectrum that it meets their audibility criterion ( $10\text{LOG}(d')=7$ ), then compute the A-weighted sound levels – as low as 5.6 dB(A) for aircraft #1 at Hermit basin.
- 2.2.1. Table 1 shows the ambient and aircraft A-scale sound levels that we computed from the spectra in Reference 2.

TABLE 1: SOUND LEVELS USED IN HMMH STUDY

Aircraft #	Description	$L_A$ dB(A)
Ambient	Pt. Imperial	25.2
Ambient	117.4 Mile	46.6
Ambient	Toroweep	20.2
Ambient	Hermit Basin	17.1
1	Prop Burnt Spring – maximum level	62.6
2	Jet Toroweep – maximum level	32.8
3	Helio 1 Sliding Sands – maximum level	42.7
4	Helio 2 Kalahaku Overlook – maximum level	59.8
5	Prop 1 Pt. Imperial – detection level	39.9
6	Prop 2 Pt. Imperial – detection level	40.1
7	Helio 3 Sliding Sands – detection level	29.6
8	Helio 4 Sliding Sands – detection level	30.4

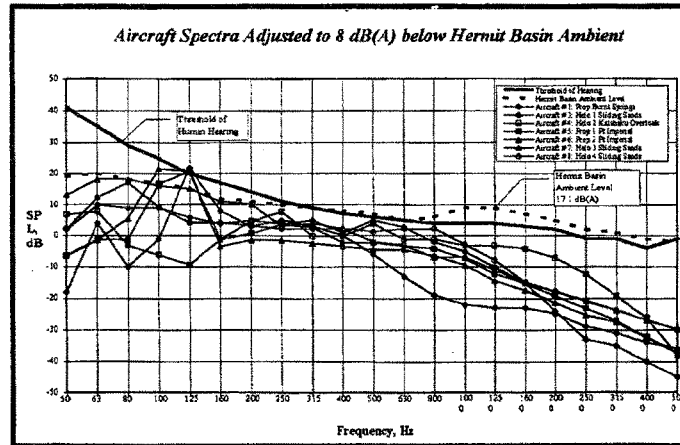
<sup>1</sup> We have cited Reference 3 in several of our studies, including Reference 4 which finds that the data presented in Reference 3 supports 29 dB(A) as the aircraft noise criterion level for "restoration of natural quiet" in GCNP. HMMH, authors of the Subject report contributed Appendix F to Reference 3.



Observe that the levels for aircraft 5 through 8, measured just after detection, range from 29.6 dB(A) to 40.1 dB(A).

2.2.2 We also adjusted the 1/3 octave sound pressure level spectra for the various aircraft studied in Reference 2 (excluding the jet, #2) to produce a computed sound level 8 dB(A) below ambient at Hermit Basin. This is the level that NPS proposes as a standard for "natural quiet".

FIGURE 1: SOUND SPECTRA AT NPS PROPOSED "NATURAL QUIET"



2.2.2.1. Note that four of the spectra lie below the threshold of human hearing at every frequency. It is not possible for any observer, no matter how attentive, to detect aircraft sound that is below the threshold of hearing – by definition.

2.2.2.2. Note, also, that the NPS has (incorrectly) attributed a 15 dB(A) ambient sound level to large part of GCNP. In these areas the aircraft sound levels would have to be 2.1 dB lower in each band than those shown in Figure 1 to meet NPS's proposed criterion for "natural quiet".

2.2.2.3. Further, the threshold of hearing shown is an average value for young people without hearing loss. Many young people and most adults have higher thresholds.

2.2.2.4. Further still, it is doubtful (and certainly not proven by NPS) that sounds slightly above the threshold of hearing could be detected at  $10\text{LOG}(d') = 7$ . The ear's ability to detect the small changes that reveal a new sound source is greatly degraded near the threshold of hearing.

2.2.3. The fact remains that actual aircraft sound detection in GCNP (by attentive observers) occurs at an average sound level of 30 dB(A). The 7 to 9 dB(A) levels that would follow from the NPS's proposal are nonsensical, would require super-human hearing and have certainly not been demonstrated.

2.3. In Reference 2, HMMH seeks to defend detectability ( $10\text{LOG}(d')=7$ ) as the criterion for "natural quiet" with the observation that "The 'time audible' curves in the dose response report were derived from observations of detectability judged by a vigilant listener." This is a non sequitur. An investigator's use of "time audible" as an independent variable in a particular study only proves that

Mr. HANSEN. Thank you.  
Mr. Snow.

**STATEMENT OF JACOB SNOW, ASSISTANT DIRECTOR, CLARKE COUNTY DEPARTMENT OF AVIATION, McCARRAN INTERNATIONAL AIRPORT**

Mr. SNOW. Good afternoon, Mr. Chairman, members of the Subcommittee.

I am Jacob Snow; I am assistant director of aviation for the Clark County Department of Aviation in Las Vegas, Nevada. We own/operate McCarran International Airport, which is the tenth biggest airport in the country.

Like the Park Service, Clarke County has hired acoustical experts to go out and to take noise monitors, similar to this one, and to do noise studies in the Grand Canyon. And we would agree with Ms. Lowey's assertion that there are parts of the Grand Canyon that do get to as low as 15 or 20 decibels, but that is only during certain parts of the day.

The studies that we spent money to do, they weren't cheap, but they revealed some very important information. And that is, those times of the day that Ms. Lowey and the Park Service are referring to occur only, those low noise levels, occur only between the hours of 2 a.m. and 7 a.m., when air tours are not flying. But, however, during the daytime, when the sun comes, and the wind comes up, and the animals are moving, the natural ambient noise in those quietest parts of the canyon is 100 times noisier, on average, about 40 decibels, according to Brown and Buntin's extensive noise monitoring in the canyon. That is a significant problem because the net effect of that is that it overstates aircraft noise. For example, our trained experts in the Grand Canyon could look up in the sky, and they could see an air tour aircraft flying over, but they couldn't hear it and the noise monitor could not register the impact of it because the background ambient was so high.

So, imagine if you are the Park Service and you are saying that the noise level in that canyon is 20 decibels or 15 decibels all day long, and the noise level really gets down that low, or if an air tour aircraft were flying over at night, which would never happen, then you would notice that air tour aircraft much more.

In pointing this error out to the Park Service and the FAA, they shrug their shoulders and they say, "We are going to go ahead and regulate you, and we will sort it all out later."

Problem number two, as discussed earlier today, the Park Service and the FAA, with their integrated noise model, had no way of differentiating between acoustical shielding or lateral attenuation of noise. Now let me demonstrate that.

Suppose that my hand here is an air tour aircraft flying at 7,500 feet over the Grand Canyon, and we have this microphone in a canyon wall in between a group of hikers in the Grand Canyon, down here in the canyon. Their model has no way of accounting for the attenuation or the natural shielding of that canyon wall. However, our noise studies show that for the specifically—the type of aircraft, the Dehaviland-6 Twin Otter, that operates extensively in the Grand Canyon, the FAA and the Park Service are over-predicting that particular aircraft by as much as 10 decibels, because

they cannot account for this lateral attenuation, this natural shielding, that takes effect in the Grand Canyon.

Now it is true that the FAA's integrated noise model is a very good tool to use at airports. Since I have been in my position at Clarke County, I have seen probably 10 different versions of that noise model come out. It is a very good tool for measuring noise at airports when you have got about 20 miles, when you are trying to get the noisiest areas around the airport defined, and they use their 65 DNL metric for that. However, it is a very lousy tool if you are trying to measure noise impacts over hundreds of miles—the Grand Canyon being hundreds of miles long—and a big hole in the ground with all sorts of natural terrain variations and vegetation barriers. It is a terrible tool, especially when you are trying to measure noise that is at such a low level.

The FAA, themselves, will tell you that when it goes—the lower you go in trying to measure noise levels with their integrated noise model, the less accurate it becomes.

Third, an area of concern with the noise methodology is, Mr. Chairman, as you know, flying aircraft for so long, that when a new aircraft goes into service, it has to be certificated by the FAA. And part of that certification process is extensive noise tests on how noisy it is on takeoff. They do max-EPR, max power, on takeoff. They see how noisy it is on takeoff. And what they have done, rather than go into the canyon and to measure how noisy these air tour aircraft really are, they just take that number from their certification data that is in their database, and they plug it in to their noise model, assuming max power over the Grand Canyon. Now these air tour aircraft are not a commercial flight that is trying to go from point-A to point-B in the quickest way possible at the fastest speed. They are flying back and forth trying to provide an air tour; they are trying to fly slower so that people can see, rather than pass everything by. They are not flying at max power; they are not flying at max speed. And once again, the Park Service and FAA have overestimated the true impact from air tours.

Those are my three primary concerns, Mr. Chairman. I would like to point out that I would recommend that this Subcommittee should insist that the agencies desist from their rulemaking and the use of the NPS methodology until they have developed an adequate scientific basis for rulemaking. If not, then we are just going to be back before this Subcommittee, talking about the cart being put before the horse, and we will be still dealing with these extreme positions.

And if you would allow me, Mr. Chairman, I have a brief presentation that I would like to make to show how extreme I think that this new proposed methodology is, and I would like to use this noise monitor to do that, with your permission, sir.

Mr. HANSEN. Sure; go ahead.

Mr. SNOW. If I could, I would just like to take this precision sound level meter which measures—this will give you decibel readout in A-weighted decibels, which is designed to correspond to the frequency that the human ear hears. I would like to bring this up to the dais and have you hold it, and take some noise measurements, similar to what Mr. Gibbons was referring to earlier, if you wouldn't mind.

Mr. HANSEN. Come on up.

Mr. STEPHEN. If you wouldn't mind noting, Mr. Chairman, the Park Service, as we have talked about today, has divided the National Park, the Grand Canyon, into two different noise zones. And they originally started with this definition of "natural quiet" at what we call "ambient plus 3" or "20 decibels plus three." And they notice that in the more developed parts of the park and in the areas down by the river where there was water, it was just too noisy in those areas to even—ever attain that restoration of natural quiet in the Grand Canyon. So, irrespective of air tours, they couldn't do it in that zone.

And so, therefore, they have created this more restrictive Zone Two, very restrictive noise levels. In fact, they have got the ambient in some places measured as low as 15, so if you take 8 away from that, you are down to 7.

So, what I am going to do, if you have noticed while I am talking, I don't know what the noise level reads, but would you mind just giving the audience a general feel for what the average has been on that read-out there?

Mr. HANSEN. Well, I don't know if I am an authority enough to read this thing.

Mr. SNOW. Just read what it is saying right now.

Mr. HANSEN. Sixty-four point six.

Mr. SNOW. Okay. What I would like to do is to just take a few seconds, and we will see how—if we could ask for quiet—see how low we can get this room to measure.

Mr. HANSEN. All right. We will ask everyone to be very quiet.

Mr. SNOW. How low did we get?

Mr. HANSEN. You got down to 34.

Mr. SNOW. Okay. Once you get below 34 decibels, it is very difficult to measure accurately.

Mr. HANSEN. Then when you started speaking, it jumped back up to 69.

Mr. SNOW. Yes, sir.

[Laughter.]

Let me just put this in perspective. To get down to 7 decibels from 34, is roughly a 1,000-fold reduction in noise. And to meet that standard, the Park Service is going to have to get the bugs and the bunnies to get out of the park as well, because just the virtue of the fact that insects and animals living in the park, they are never going to be able to reach that standard.

We hope to show that this is an extreme proposal, as we think it is. The Clark County Department of Aviation, on the other hand, when we were at a meeting in Flagstaff with most of the key stakeholders in attendance, we wanted to get to middle ground, because we have airports in Clark County that we would like to see quieter aircraft operating in those airports.

We think that substantial restoration of the natural quiet is a laudable goal. We think—and we proposed it that day, with the air tour operators' support, that we put all of these issues on the table—caps on operations, curfews, higher altitudes, the location of the routes, avoiding sensitive lands—and "let's sit down and let's do a negotiated rulemaking on this." And the response we got back from the FAA and the Park Service is, "We don't have the re-

sources or the time to deal with that.” The response we got back from the environmentalists was, “Well, shoot; we think we can just get rid of you and get all the air tours out of the Grand Canyon. That is what our goal is anyway, and so we don’t want to participate in that. We think we, you know, we can get rid of you completely.”

We have been trying to achieve the middle ground here, and I would recommend to the Committee that they direct the Park Service and the FAA to—and initiate a negotiated rulemaking so that we can reach the balance that Congress said to reach between air tours, safety, and concern for the environment.

Thank you very much.

[The prepared statement of Mr. Snow follows:]

90

**WRITTEN TESTIMONY OF JACOB SNOW, A.A.E.,  
ASSISTANT DIRECTOR,  
CLARK COUNTY DEPARTMENT OF AVIATION**

**TO**

**THE SUBCOMMITTEE ON NATIONAL PARKS AND PUBLIC LANDS,  
COMMITTEE ON RESOURCES,  
UNITED STATES HOUSE OF REPRESENTATIVES**

**HEARING ON ISSUES REGARDING THE NEW NATIONAL PARK SERVICE  
METHODOLOGY USED TO EVALUATE THE ACHIEVEMENT OF NATURAL  
QUIET RESTORATION STANDARDS IN GRAND CANYON NATIONAL PARK**

**MAY 25, 1999  
WASHINGTON, D.C.**

Good morning, Chairman Hansen and Members of the Subcommittee on National Parks and Public Lands. I am Jacob Snow from the Department of Aviation of Clark County, Nevada. Clark County appreciates this opportunity to apprise the Subcommittee of the continuing failure of the National Park Service ("NPS") and Federal Aviation Administration ("FAA") to develop a reasonable rulemaking process regarding Grand Canyon overflight issues.

Clark County operates the airports from which roughly eighty percent of all air tours of the Grand Canyon originate. As this Subcommittee knows from prior hearings, Grand Canyon air tours provide a unique and valuable experience for hundreds of thousands of Park visitors every year. They also provide extensive airport revenue to Clark County, help support critical airport facilities in Clark County, provide jobs on and off Clark County's airports and are an important part of the local economy. The proposed NPS methodology that is the subject of this hearing, 64 Fed. Reg. 3,969 (Jan. 26, 1999), would jeopardize these benefits by ultimately requiring – without scientific basis – a reduction in the number and extent of allowable air tours in the Grand Canyon.

This Subcommittee has previously held oversight hearings that revealed the serious shortcomings of FAA's and NPS's Grand Canyon rulemakings. Unfortunately, the proposed NPS "natural quiet" methodology shows that the agencies still (1) do not have adequate scientific information to support its proposed rules, and (2) do not have a reasonable process for rulemaking. Indeed, the agencies are probably now farther from reasonable rulemaking than when this Subcommittee last addressed this issue.

NPS proposes to use a new threshold of "audibility" (ambient A-weighted noise minus eight decibels) in a portion of Grand Canyon National Park ("Grand Canyon" or "Park"), but retain the currently used noticeability threshold (ambient A-weighted noise plus three decibels) in the rest of the Park. The "substantial restoration of the natural quiet" goal defined five years ago by NPS creates a noise (or audibility) budget for air-tour noise in the Grand Canyon.

The new NPS proposal would create different accounting rules for calculating "natural quiet" for the two proposed zones of the Park. NPS claims that the sum of the noise calculated under these different accounting rules meaningfully represents the restoration of "natural quiet." However, "noticeability" and "audibility" cannot simultaneously represent "natural quiet." Apples and oranges cannot be added together to equal apples.

In addition, NPS's justifications for its two-zone methodology directly undermine its approach of treating all areas of the Park as equal for purposes of attaining a

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<sup>1</sup> NPS has defined "substantial restoration of the natural quiet" for purposes of the National Parks Overflights Act of 1987, P.L. 100-91, to mean "50% or more of the [Grand Canyon] must achieve 'natural quiet' (i.e., no aircraft audible) for 75-100 percent of the day." 64 Fed. Reg. at 3,970.

“substantial restoration of the natural quiet.” The new methodology acknowledges in a backwards way that all areas of the Park are *not* equal for quiet purposes and thus that the notion of measuring quiet through a single Park-wide summary figure makes no sense. NPS should step forward to make this admission in an intellectually honest fashion. Henceforth, it should design any future rulemaking to identify areas of special concern and tailor the substantive rules towards achieving noise reductions in those special areas.

In addition to creating unsupportable double standards in the calculation of the noise budget, NPS’s proposal would reduce the size of the noise budget by using an “audibility” threshold of A-weighted ambient conditions minus eight decibels in the proposed Zone Two of the Park. This new threshold is unsupportable. It is well below the level necessary to protect Park visitors’ experience of “natural quiet.” Not only would the majority of people not actually hear many of the aircraft that NPS now claims would be audible, most of them probably could not hear them even if they tried. The obvious explanation is that NPS has proposed its new methodology as part of an agenda to push aircraft out of the Park – regardless of whether they are actually affecting visitors.

The flaws in the proposed NPS methodology underscore the long-standing need for NPS and the “FAA” to abandon their approach of regulating first and developing a scientific basis later. There are numerous other outstanding questions about FAA’s and NPS’s abilities to predict adequately the spatial and temporal extent of “natural quiet” in the Grand Canyon, including the accuracy of their predictions about how loud aircraft will be and the level of background noise in the Park.

It is imperative that FAA and NPS validate their noise models and metrics *prior* to further limiting air tours in the Grand Canyon. Without a solid scientific understanding of “natural quiet” levels in the Park, FAA and NPS have no defensible way of knowing whether additional regulation is needed to address noise levels, what kind of regulation is needed or how far the regulations should go. The agencies currently lack this understanding using the current NPS definition of “substantial restoration of the natural quiet.”

Nonetheless, FAA has indicated in the Federal Register that it plans to proceed with promulgating further substantive regulation of tour overflights this summer. 64 Fed. Reg. 6131 (Feb. 8, 1999). The Subcommittee should be very concerned about FAA’s and NPS’s backwards approach to rulemaking. It should demand justification from the agencies for their announced plan to restrict legitimate and valuable air tours before having a scientifically valid basis to understand both the need and effects of its proposed actions.



**I. NPS'S PROPOSED DOUBLE STANDARD FOR "NATURAL QUIET" IS INHERENTLY FLAWED AND IRRATIONAL**

NPS's proposal to make "noticeability" (ambient noise level plus three decibels) and "detectability" or "audibility" (ambient level minus eight decibels) the thresholds for disruption of "natural quiet" in different parts of the park is inherently flawed and irrational. There is no rational basis for using two separate thresholds to measure what is supposed to be one concept – "natural quiet" – and then recombining data using the two thresholds into a summary figure of the "substantial restoration of the natural quiet." NPS provides no reason why "natural quiet" should mean two different things in different parts of the Park. Indeed, NPS's definition of "substantial restoration" suggests that "natural quiet" should mean one thing: a lack of noticeable aircraft noise for Park visitors. 64 Fed. Reg. at 3,970; NPS, United States Dep't of the Interior, *Report on the Effects of Aircraft Overflights on the National Park System, Report to Congress* 182 (July 1995).

**A. NPS Cannot Reasonably Advance Two Different "Natural Quiet" Disturbance Definitions Simultaneously**

NPS states that it uses two thresholds because its unsupportably restrictive definition of "natural quiet" (ambient minus eight decibels) cannot be attained in large areas of the Park, especially west of Whitmore Rapids and in Marble Canyon.

The area west [of] Whitmore Rapids is included in Zone One because the relatively low designated aircraft ceiling of the Sanup Flight-free Zone (7999 feet MSL), needed for safe transit of the area by general aviation, limits the ability of the flight-free zone to provide acoustic protection to this area.

The Marble Canyon Sector is included in Zone One because the narrowness of Marble Canyon and the Special Flight Rule Area boundary effectively preclude acoustic protection of the canyon floor and river area, and because it is not feasible to establish a flight-free zone while still providing for safe transit of the area by general aviation traffic.

64 Fed. Reg. at 3,971.

These proffered justifications have nothing to do with whether these areas attain "natural quiet" or whether there is any expectation of such quiet; they are purely determinations that NPS's new preferred "natural quiet" definition (ambient minus eight decibels) cannot be attained in these areas. Such determinations belong in the analysis of where and how to achieve a "substantial restoration," not in the scientific determination of what level of noise constitutes a substantial restoration of "natural quiet." The approach NPS takes is intellectually dishonest and unsupportable.

NPS's inclusion of "frontcountry" areas of the Park in "Zone One" is similarly flawed. NPS claims that the "North and South Rim developed areas . . . are included in Zone One in recognition of the greater amount of human activity and consequent [sic] *more limited expectations of natural quiet* in these areas as opposed to undeveloped areas of the park." 64 Fed. Reg. at 3,971 (emphasis added). This is an implied admission that, in NPS's opinion, the "ambient plus three decibels" threshold does not measure "natural quiet."

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NPS and FAA cannot rationally include the areas measured by this "ambient plus three decibels" threshold in the "substantial restoration" calculation and claim that the ultimate number measures "natural quiet" if NPS truly believes that the Zone One threshold does not measure "natural quiet." NPS cannot measure two different things ("ambient plus three decibels" and "ambient minus eight decibels"), add them together (the "substantial restoration definition"), and claim that this somehow represents a summary of a single concept – the extent of "natural quiet." Adding apples and oranges does not equal apples.

**B. The NPS Methodology Creates Inconsistencies with NPS's Own "Substantial Restoration of the Natural Quiet" Definition**

Exacerbating the irrationality of NPS's approach is the fact that the lower threshold for disturbance of "natural quiet" in the proposed Zone Two would not necessarily lead to the attainment of the "natural quiet" throughout Zone Two. Because NPS is retaining its definition of "substantial restoration of the natural quiet," which makes an acre of "natural quiet" in Zone One equal to an acre in Zone Two, it is possible that a large portion of the "substantial restoration" will occur in Zone One instead of Zone Two.

This is despite the fact that (1) NPS deems Zone One to be less important than Zone Two from the perspective of natural quiet, and (2) **"natural quiet" in Zone One means something different than "natural quiet" in Zone Two.** *E.g.*, 64 Fed. Reg. at 3,971 (Zone One areas have a "greater amount of human activity and consequent [sic] more limited expectations of natural quiet in these areas as opposed to undeveloped areas of the park"). Indeed, because the "ambient minus eight" threshold will be exceptionally difficult to attain, FAA and NPS will likely need to achieve much of the "substantial restoration" within Zone One – an upside-down result based upon NPS's reasoning.

If NPS cannot restore its version of "natural quiet" in some portions of the Park (*e.g.*, Sanup, the South Rim and Marble Canyon), it should be forthright about that fact and

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<sup>2</sup> Clark County disputes that the "ambient minus eight" threshold is a reasonable measure of whether aircraft disturb the experience of "natural quiet" for Park visitors. Clark County's experienced and highly trained noise consultants have found that it is quite challenging to hear aircraft noise much of the time in the Grand Canyon at levels that are deemed audible under the "ambient plus three" threshold, let alone under the "ambient minus eight" threshold.

abandon the unworkable definition of “substantial restoration of the natural quiet” that looks at a single, summary figure for the whole Park. NPS is acknowledging through back-door means that not all acres of the Grand Canyon are equivalent for purposes of “natural quiet” priorities; some parts of the Park (e.g., the backcountry in Zone Two) are more important than others from an acoustic perspective.

If that is the case, it makes sense to identify the critical areas and set standards for these areas, thereby allowing regulations to directly meet the apparent need. Twisting the thresholds for “noticeability” or “audibility” is not the way to reach that goal. NPS cannot use deceptive threshold methodologies to achieve what it rejected earlier – standards for noise that are tied to the human use (and potential use) of the Park and not an abstract measurement of the total number of acres experiencing a certain amount of noise per day.

## II. NPS’S PROPOSED NOISE THRESHOLD IS UNREASONABLY LOW

NPS’s notice of its methodology in the Federal Register provided no adequate scientific justification for NPS’s extremely low “audibility” threshold for Zone Two (eight decibels below ambient). Instead, it cryptically referred to “data collected at GCNP” without providing any reference, summary or other means of commenting on such “data.” 64 Fed. Reg. at 3,971. In response to inquiries made by Clark County’s consultants, NPS indicated that the “data” supporting the Methodology Notice were contained in a May 15, 1997 Memorandum from Nicholas P. Miller to Wesley Henry (“Miller Memorandum”).

However, as discussed in detail below, the Federal Register notice and Miller Memorandum do not provide rational support for NPS’s proposed use of the “audibility” threshold in Zone Two.

### A. Tests Based on Subjects Actively Seeking to Hear Aircraft Noise Do Not Reasonably Represent the Disruption of “Natural Quiet” for Park Visitors

The first fundamental problem with NPS’s proposed threshold is that it is based on audibility data generated by technicians who had the sole task of *actively listening for aircraft sound*. NPS has made no demonstration that the ability to detect noise of individuals actively trying to hear aircraft noise is at all the same as an appreciation of “natural quiet” by visitors to the Grand Canyon. To the contrary, an “audibility” threshold – as defined by NPS based on active attempts to hear aircraft – would deem some aircraft “audible” that would not be noticed by real Park visitors. This is despite the fact that the appreciation of “natural quiet” by actual Park visitors is the ostensible goal of NPS.

Appreciating solitude and natural quiet as a part of the Park experience is not the same as actively working, as a sole task, to detect and isolate aircraft sounds. A park visitor is likely to be experiencing and enjoying a multi-sensory experience: the views of natural features near and far, the feel of sun and wind, the smell of vegetation, etc. He or she is not

seeking to hear aircraft. NPS's contractors have confirmed this fact in work on Grand Canyon overflight issues:

Under less constrained listening conditions [than exist in laboratory experiments with technicians actively listening for aircraft sound], acoustic signals may require higher signal-to-noise ratios before observers reliably report their presence. Outdoor recreationists, for example, may not be specifically listening for an aircraft overflight at the time of its occurrence, or may be distracted by ongoing activities.

Sanford Fidell et al., BBN Sys. and Technologies, *Evaluation of the Effectiveness of SFAR 30-2 in Restoring Natural Quiet To Grand Canyon National Park*, NPOA Report No. 93-1, at 44 (June 23, 1994) ("Fidell Report").

Because not all park visitors are always intent on listening for aircraft noise, an adjustment [to the audibility threshold for a "vigilant observer"] is needed to define the noticeability of aircraft noise to non-vigilant observers. Fidell (1978) and Fidell and Teffeteller (1981) describe laboratory findings on the levels which signals must attain in excess of their audible levels to come to the notice of observers engaged in a foreground activity other than listening for sounds. **The results of these studies suggest that an acoustic signal must attain a level of 10 dB greater than that required for simple audibility to elicit an overt behavioral indication that a signal has been noticed.**

*Id.* at 55 (emphasis added).

Indeed, Clark County's acoustical consultants – themselves actively listening for aircraft in the Grand Canyon – found it very difficult to discern aircraft sound in the Park above ambient conditions, often incorrectly indicating aircraft presence.

NPS implicitly recognized the problem with "audibility" as a threshold in the Methodology Notice: "The level at which an attentive listener, such as these technicians, can begin to hear a noise source is the only objective point from which the amount of time the source is audible can be measured . . ." 64 Fed. Reg. at 3,971. This language suggests that NPS recognizes that listening for aircraft is not necessarily the same as enjoying natural quiet, but that NPS proposes to settle on this threshold due to its supposed "objectivity."

However, NPS's rationalization of its "audibility" threshold is flawed in two essential respects. First, the mere fact that a measure is objective does not mean that it reasonably reflects the concept sought to be measured, in this case the disruption of "natural quiet" for a Park visitor. Difficulty in obtaining an objective metric for the "natural quiet" concept may suggest that the problem is with the definition of the concept itself and that more thought may be needed regarding the definition.

Second, the use of trained technicians to search actively for aircraft sound is not the only objective way to measure audibility for purposes of determining natural quiet. There is no reason why NPS could not conduct a study using actual park visitors in the process of appreciating the Park to determine a more defensible threshold (or thresholds) – close to the “noticeability” concept FAA and NPS have been using.

Congress intended the Overflights Act to protect Park visitors enjoying the resources of the Grand Canyon, including “natural quiet.” It was not intended to protect those who are actively trying to hear aircraft. Because of this difference, NPS’s proposal to use its artificial “audibility” threshold is arbitrary and capricious.

An additional problem with the Miller Memorandum used as support for the eight-decibel–below-ambient threshold is that it was based on results derived in a laboratory environment. Miller Memorandum at 1. Reliance on data from tapes reviewed in a laboratory environment further removes NPS’s proposed methodology from representing real-world aircraft audibility for park visitors. *See e.g.*, Fidell Report at 44 (transition from laboratory to real world conditions requires higher signal-to-noise ratios for “audibility”). NPS needs to adjust its laboratory results to have meaning in the real world.

**B. NPS’s Own Purported Support Document Concludes that NPS’s Approach Inaccurately Portrays**

Even NPS’s own research fails to provide support for the proposed threshold for Zone Two. Indeed, the Miller Memorandum concluded that “using a single A-weighted difference between background and aircraft A-weighted sound levels to judge when an aircraft becomes detectable *is likely to produce results that differ considerably from what a listener on the ground would experience.*” Miller Memorandum at 3 (emphasis added). The memorandum concludes it *may* be possible to generalize detectability thresholds by using a number of thresholds for different combinations of background environments and aircraft types. “*Possibly* through a *carefully designed measurement and computation protocol*, a matrix of appropriate differences *could* be determined for a defined set of park environments and aircraft types.” *Id.* (emphasis added). However, the memorandum does not purport to achieve this result.

Despite the conclusion that use of a single A-weighted aircraft-ambient noise difference as a threshold would cause predicted results to “differ considerably” from reality, NPS is proposing to use precisely such a single “difference” as a threshold. 64 Fed. Reg. at 3,972. NPS has not developed the matrix of thresholds through a “carefully designed measurement and computation protocol” that its own support document claims is necessary to prevent “results that differ considerably from what a listener on the ground would experience.” Miller Memorandum at 3. This is a particularly serious concern because the data presented in the support document reflect a wide range of results for the relatively few data points represented.

Further, NPS's Federal Register notice misrepresents the results reported in the Miller Memorandum. The notice claims that the "technicians identified aircraft noise at A-weighted levels of 8-12 decibels below the average A-weighted natural ambient sound levels . . ." 64 Fed. Reg. at 6,972. However, this claim is misleading in three ways. First, the 8-12 decibel range noted was found only at one point in the Grand Canyon, Hermit Basin. Other portions of the Park registered a much greater range in A-level differences. Miller Memorandum at Table 1. Second, there is no indication in the Miller Memorandum that the ambient conditions compared to aircraft noises in any way represented an "average A-weighted ambient sound." Third, the statement misleadingly suggests that the results were based on direct field observations and not laboratory review of recordings.

Based on these facts, there is no current defensible basis for NPS's proposed new threshold for Zone Two of the Grand Canyon.

**C. The "Data" On Which the NPS Methodology Is Based Were Not Generated Through Defensible Means**

Even if the Miller Memorandum did, on its face, support the proposed NPS thresholds, it would not provide an adequate basis for rulemaking due to methodological flaws. The Miller Memorandum's results were based on a laboratory review of A-weighted noise tape recordings of aircraft at noise levels well below ambient A-weighted levels. As a result, the signal-to-noise ratio for these measurements was well below the ratio considered acceptable for broadband noise measurements. Measurements with signal-to-noise ratios below 3dB are unreliable and cannot form a reasonable basis on which to support rulemaking. *E.g.*, Fidell Report at 54.

**D. Through Its Extremely Low Threshold for Sound, NPS Would Deem Normally Inaudible Sounds Audible for Purposes of its Regulations**

Reliance on the NPS data is particularly unreasonable because the aircraft noise levels at issue under the NPS methodology are at or below the threshold of human hearing. Because NPS appears to have assigned ambient noise levels of 15 decibels and below to large swaths of the Grand Canyon, the proposed "ambient minus eight" threshold would consider aircraft noise levels of seven decibels to be audible. This is despite the fact that such noise would, at most, be barely audible *even in the absence of background ambient noise*. *E.g.*, Federal Interagency Committee on Noise ("FICAN"), *Federal Agency Review of Selected Airport Noise Analysis Issues* at B-7 (Aug. 1992).

**III. FAA AND NPS NEED TO DEVELOP AN ADEQUATE SCIENTIFIC BASIS FOR RULEMAKING BEFORE IMPOSING ADDITIONAL SUBSTANTIVE BURDENS ON AIR TOURS**

It is clear that NPS needs to develop a better basis for determining the threshold or thresholds at which "natural quiet" is impaired. NPS's own documents acknowledge that its proposed thresholds would cause its predictions of audibility "to produce results that

differ considerably" from reality. This alone should give NPS and FAA pause before embarking on further regulation of air tours.

However, the NPS threshold issue is just one of the many scientific areas for which FAA and NPS have not provided an adequate basis for rulemaking. In the last year, NPS has acknowledged to FICAN, to the main Grand Canyon stakeholders (at the Flagstaff meeting on April 28, 1998) and this Subcommittee (in September 1998) that the agencies' noise models need to be validated. See e.g., FICAN Meeting Minutes at VIII.1 (Feb. 5, 1998). NPS noted to FICAN that a "*particular concern is the accuracy of both models in predicting low level noise in unusual terrain conditions.*" *Id.*

Clark County and other stakeholders have repeatedly raised serious concerns about the ability of the agencies' tools to adequately reflect noise and "natural quiet" conditions for the purposes for which NPS and FAA seek to put them. Among these concerns have been data-based arguments that NPS appears to overstate "audibility" by: (1) underestimating natural noise levels in the Park through its use of the quietest times of the day as representative noise levels in the Park during all times, including the windiest times of the day; (2) overstating aircraft noise levels in the Park by not adequately accounting for barriers (such as canyon walls) that often intervene between aircraft and listeners; and (3) overstating tour aircraft noise levels by assuming that they fly at higher speeds and power settings than they actually fly.

The minimal work the agencies have done to check the accuracy of their models suggested that the models generally overpredict tour aircraft noise levels by two to three decibels (three decibels representing a *doubling* of sound energy). However, the studies have also shown the models to overpredict aircraft noise by almost 10 decibels (a ten-fold increase in sound energy) in the common situation in which canyon walls or other features intervene between the aircraft and the site where noise is measured. This is of critical importance because the small and large individual errors cumulate into significant error under the agencies' "substantial restoration" summary figure and probably drastically overstate the need for regulation.

The questions and problems have not been addressed by the agencies – at least not publicly. Further, neither the FAA's modified Integrated Noise Model nor NPS's Park-specific noise model has been made fully available to the public for comment. Further, their usefulness has not been peer reviewed.

In this context, it is imperative that NPS and FAA develop a sound scientific basis for rulemaking *before* proceeding with plans for further regulation. Any other course of conduct would be an abuse of agency power. NPS's and FAA's plan to promulgate additional substantive regulations and *then* undertake the research to determine the proper metrics and modeling through the comprehensive "noise management plan" sets rational decision making on its head.

#### IV. CONCLUSION

NPS and FAA are on a dangerous course in their Grand Canyon overflight rulemaking. Both agencies acknowledge that more work needs to be done to understand noise and quiet in the Canyon. Many serious questions about the accuracy of their "audibility" modeling remain unanswered. Further, NPS's own documents suggest the irrationality of its new "audibility" methodology for the Grand Canyon. Nonetheless, the agencies have proposed to add to the already significant burdens on air tours before developing a scientifically adequate basis for understanding whether and what regulations are actually needed.

This Subcommittee should insist that the agencies desist from rulemaking and the use of the NPS methodology until they have developed an adequate scientific basis for rulemaking. Further, it is imperative that the agencies involve interested members of the public – especially air-tour operators, Native Americans, local governments and environmental interests – in the process of developing a better scientific understanding of "natural quiet" and aircraft noise in the Grand Canyon. Unless and until the agencies meaningfully involve the interested public, it is likely that this Subcommittee will have many future oversight hearings like today's in which NPS and FAA act or propose to act without an adequate understanding of their actions.

Clark County has pushed FAA and NPS unsuccessfully for two years to involve the stakeholders in a negotiated process to achieve the balance between quiet, safety and the value of air tours that Congress sought through the Overflights Act. Each of Clark County's efforts has been rebuffed. The most recent rebuff came from the FAA, which cited a lack of resources as the reason for not initiating a negotiated rulemaking process. The agencies have also failed to resolve the critical safety problems with their proposals that have been identified for over two years. Similarly, the agencies have not made any efforts to answer or address the significant flaws in noise modeling and monitoring that Clark County and others have identified.

It is unclear at this point what the agencies fear from increased public involvement in the rulemakings and/or full disclosure of their noise models and data. One of the few viable explanations is that NPS seeks to manipulate the technical details of noise modeling methodologies to undermine Congress' intended balance between air tours, safety and quiet in the Overflights Act. Through its original definition of "substantial restoration of the natural quiet," its new two-zone methodology and consistent biases towards overprediction of noise, NPS effectively reduces the possible extent of air tours without acknowledgement and debate about its real aims.

This is not good government. This process needs more openness, honesty and public involvement. The agencies need to develop better scientific information with peer review and public input. Otherwise, the result of the Grand Canyon rulemakings will be lopsided regulations that unnecessarily sacrifice the interests in air tours, the economic benefits provided to local economies and aviation safety.



QUIETLY  
SUPERIOR.

**JR**

E N G I N E E R I N G

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May 30, 1999

Mr. Jim Santini, Legislative Counsel  
United States Air Tour Association  
1101 King Street, Suite 350  
Alexandria, VA 22314

**SUBJECT: REBUTTAL OF NPS AND FAA TESTIMONY AT 5/25/1999 HEARING ON GRAND CANYON NOISE**

The Subject hearing dealt with the National Park Service's 1/26/1999 notice, "Change in Noise Evaluation Methodology for Air Tour Operations over Grand Canyon National Park" 64 Fed. Reg. 3969. In my testimony I repeated the conclusion of our 1997 report, JR 182, that "substantial restoration of natural quiet" had, in fact, been achieved under SFAR 50-2. Ms. Jacqueline Lowey, Mr. Wes Henry of NPS and a gentleman from FAA raised several objections to our analysis in JR 182. I have enumerated these below and would like to add the following materials to my oral rebuttal:

1. NPS Claim: *Our study only encompassed the East Canyon and ignored noisy West Canyon operations.*

Rebuttal: The statement that we only evaluated the East Canyon is correct, but the implication that this invalidates our study is absurd.

- We limited our study to the East Canyon because:
  - The public version of INM cannot analyze the entire Park in one pass
  - Our client for that study (Papillon Grand Canyon Helicopters) operates in the East Canyon and provided first-hand operating data.
- If NPS thinks that the West Canyon is much noisier than our study area (which I doubt) then they should limit their proposed new noise rules to the West Canyon. We have certainly demonstrated that "substantial restoration of natural quiet" has occurred in the East Canyon.
- I would note that the FAA (at NPS instigation) has proposed and imposed draconian measures on both the East and West ends of the Park.

2. NPS Claim: *We mis-understood the 1994 BBN report (NPOA Report No. 93-1 / BBN Report No. 7197) and did not realize that their measurements included background noise and as well as aircraft.*

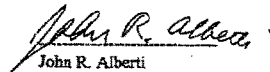
Rebuttal: That is incorrect. We recommend 29 dB(A) as a conservative threshold of "natural quiet". This is based on the facts that:

- Sound measurements are the logarithmic sum of aircraft and background sounds.
- Sound level at detection was 1 dB(A) above background, as stated in the BBN report.
- At each of the 11 sites in the BBN study, we determined the sound level when aircraft were detected, for the quietest 25% of detections.
- The median of these 11 bottom quartile detection levels was 27 dB(A)
- The median background level was 1 dB(A) less or 26 dB(A)

- The threshold of noticeability is background plus 3 dB(A), or 29 dB(A). This was discussed in detail in my written testimony and is reproduced here in Appendix A.
3. NPS Claim: *BBN observers detected aircraft at a reported average sound level of 30 dB(A) because their microphones would not measure lower levels.*
- Rebuttal: That is incorrect. BBN was able to measure levels as low as 15 dB(A). The measurements reported in the BBN Study were made with Bruel & Kjaer Type 4155 microphones. These are rated by B&K for sound levels as low as 15 dB(A), as shown in Attachment 1.
- As proof of that capability, the measured sound levels at Tuna Creek averaged 18 dB(A) at onset of detection and 17.1 dB(A) at offset (See Attachment 2).
  - The detection levels at the other sites were substantially higher yielding an average detection level of 30 dB(A).
4. NPS Claim: *We should have used a 12-hour day, rather than 24 in determining the allowable time above threshold of "natural quiet" because aircraft operate 12 hours.*
- Rebuttal: That is incorrect, absurd and irrelevant.
- It is irrelevant because we demonstrated "substantial restoration of natural quiet" even if the allowable time above the threshold of "natural quiet" were three hours per day (25% of 12 hours).
    - Attachment 3 shows that in the busiest month (July), much less than 50% of the study area had four aircraft above the threshold of "natural quiet" more than 3 hours (180 minutes).
    - The area above the threshold of "natural quiet" more than 6 hours (25% of 24 hours, or 360 minutes) is even smaller.
  - The NPS statement is incorrect because tour operations are now limited to 10 hours per day under curfews imposed for noise reduction.
  - The argument that the time of operation should be used to determine the noise criterion is absurd when the time of operation can be restricted as a means to meet that criterion.
    - By that argument, the limit should now be 25% of 10 hours.
    - This would justify a further reduction in the permitted hours of flight, thus a further reduction in the permitted time above threshold, until permitted hours of flight is zero. Perhaps that is real the point of this line of reasoning.
  - I would further note that the Park users most likely to object to air tour noise, or to benefit noticeably from proposed new restrictions are 24 hour users of the back country and river corridor.
  - Our original use of the traditional 24-hour solar day is the only reasonable interpretation how many hours per day constitute "25% of the time".
5. NPS Claim: *FAA turned off the Lateral Attenuation feature of INM to avoid incorrectly applying LA when propagating downward from an aircraft into the canyon.*
- Rebuttal: That is doubly incorrect.
- FAA did not "turn off" LA they changed the INM code to eliminate LA.
    - The INM used by the acoustical engineering community under FAA regulation and pursuant to CFR 14, Part 150 cannot "turn off" LA.
    - The adulterated version of INM used in the FAA Grand Canyon study produces higher predicted sound levels than any other version in use.

- INM 5.1a (as used in our study, with digitized terrain provided by USGS), automatically phases out Lateral Attenuation as the sound propagation angle increases from parallel to the ground to 60 degrees.
- There was no need or justification for changing the code to eliminate LA.
- Attachment 4 defines the INM lateral attenuation algorithm as well as the elevation angle and sideline distance which are the key parameters in calculating lateral attenuation.
- Attachment 5 depicts aircraft sound propagation in typical conditions in and around the canyon rim. Lateral Attenuation was calculated using the INM LA algorithm at points 1 through 5.
  - The FAA's adulterated INM would produce LA = 0 dB in every case.
  - Points 1 and 2 simulate points on the rim. It is evident that as a listener gets farther from the aircraft, the elevation angle,  $\beta$ , decreases and the lateral attenuation gets larger.<sup>1</sup> Note that the FAA version under-predicts LA, thus over-predicts aircraft noise by several dB(A) in these cases.
  - Point 3 simulates a condition on the floor of the canyon. The elevation angle,  $\beta$ , is rather steep in this case (over 65 °) and LA = 0 dB. Thus, inappropriate LA is not applied.
  - Point 4 is on the wall of the canyon. Again LA = 0 dB.<sup>2</sup>
  - Point 5 is similar to Point 4 in that it is on the sidewall of the canyon. Note that INM under-predicts sound attenuation in this case, as it ignores shielding by the intervening ridge.
    - This amounts to an over-prediction of aircraft sound by several dB.
    - This affects both our study and the FAA study and causes both to err on the side of over-predicting aircraft sound levels.

Best regards,



John R. Alberti  
/jra  
attachments  
cc:  
Brenda Halvorson  
Elling Halvorson

<sup>1</sup> The algorithm that INM uses to calculate lateral attenuation limits lateral attenuation to 13.86 dB regardless of how far a listener is from the plane. (The attenuation is less than 13.86 dB at lateral distances less than 3000 ft.)

<sup>2</sup> The elevation angle,  $\beta$ , is calculated from the ground to the airplane and not from a horizontal plane to the airplane. The terrain feature of INM allows for use of approximately a 300 ft. by 300 ft. grid to approximate the terrain contour locally. The result is that  $\beta$  is over 60° so the lateral attenuation is 0 dB. Note that if the terrain feature were turned off, the elevation angle would have been less than 60° and some attenuation would have been calculated.

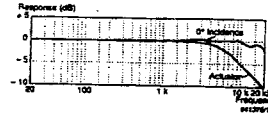
JRA to USATA, "Rebuttal Of NPS And FAA Testimony",

Attachment 1 of 5

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Free-field 1/2-inch Microphone Type 4155 is for making sound level measurements in accordance with IEC/ANSI Type 1. It is pre-polarized, and its diaphragm is covered with a thin layer of quartz for protection in severe environments.

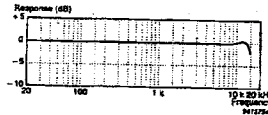
- Response: Free-field
- Sensitivity: 50mV/Pa
- Polarization voltage: 0V
- Frequency range: 4Hz to 16kHz
- Dynamic range: 15 to 145dB with Preamplifier 2639/69
- Venting: Rear



Order No.: 4155

Free-field 1/2-inch Microphone Type 4176 is pre-polarized, and is for making sound level measurements in accordance with IEC/ANSI Type 1.

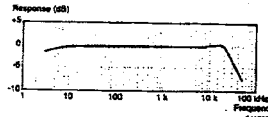
- Response: Free-field and random
- Sensitivity: 50mV/Pa
- Polarization voltage: 0V
- Frequency range: 6.5Hz to 12.5kHz
- Dynamic range: 14 to 142dB with Preamplifier 2639/69
- Venting: Rear



Order No.: 4176

Calibration 1/2-inch Microphone Type 4180 is for laboratory standard, precision calibration.

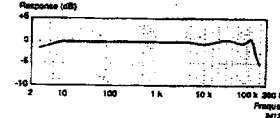
- Response: Pressure-field and random
- Sensitivity: 12.5mV/Pa
- Polarization voltage: 200V
- Frequency range: 4Hz to 20kHz ± 1.5dB
- Dynamic range: 21 to 160dB with Preamplifier 2645/73
- Venting: Side



Order No.: 4180

Free-field 1/2-inch Microphone Type 4135 is for high-level, high-frequency measurements and model work.

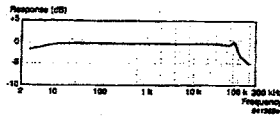
- Response: Free-field and random
- Sensitivity: 4mV/Pa
- Polarization voltage: 200V
- Frequency range: 4Hz to 100kHz
- Dynamic range: 39 to 164dB with Preamplifier 2633/70
- Dynamic range: 39 to 164dB with Preamplifier 2639/69 and Adaptor UA 0035
- Venting: Side



Order No.: 4135

Pressure-field 1/2-inch Microphone Type 4136 is for high-level, high-frequency measurements and coupler work.

- Response: Pressure-field
- Sensitivity: 1.6mV/Pa
- Polarization voltage: 200V
- Frequency range: 4Hz to 70kHz
- Dynamic range: 47 to 172dB with Preamplifier 2633/70
- Dynamic range: 43 to 172dB with Preamplifier 2639/69 and Adaptor UA0035
- Venting: Side



Order No.: 4136

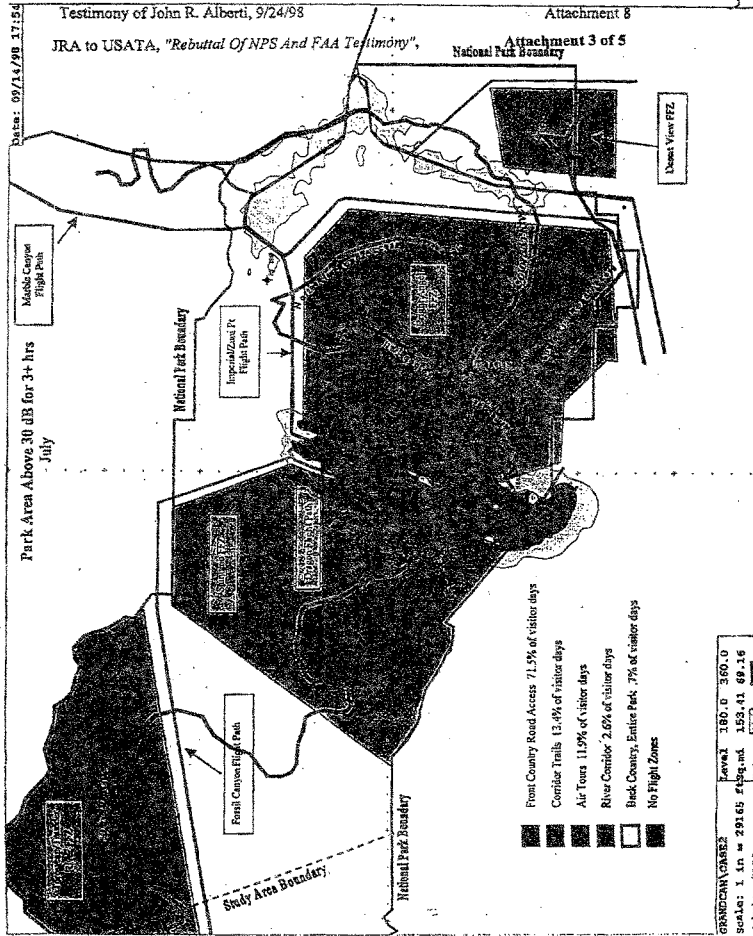
JRA to USATA, "Rebuttal Of NPS And FAA Testimony", Attachment 2 of 5

Table E-3 Weighted Means and Standard Deviations of A-weighted Sound Pressure Levels at Onset and Offset of Aircraft Audibility, in dB re 20 µPa

Site Name	Observer	A-weighted SPL at Onset		A-weighted SPL at Offset	
		Mean	St. Dev	Mean	St. Dev
Horn Creek	1	24.9	2.3	24.7	3.2
Nankowcap	1	45.9	7.8	45.8	7.8
Point Imperial	1	34.2	4.3	35.8	5.8
South Canyon	1	22.5	3.0	22.0	3.7
Hermit Creek	2	35.0	8.3	36.8	9.4
Samup Plateau	2	26.2	4.9	29.2	7.5
Tonto Overlook	1	27.6	1.0	27.6	1.2
Phantom Ranch	1	45.8	1.2	45.7	1.6
Tuna Creek	1	18.0	1.2	17.1	1.8
Torowcap Overlook	2	20.4	2.6	20.3	1.7
Desert View	1	27.7	0.7	32.1	4.5

Note: Mean values are average A-weighted levels for event-specific and site-specific ambient spectra.

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JRA to USATA, "Rebuttal Of NPS And FAA Testimony", Attachment 4 of 5, Page 1 of 3  
**INM 5.1 Technical Manual**

### 3.5 Airspeed Adjustment for Exposure-Based Metrics (AS<sub>ADJ</sub>) 4 - 1

The aircraft speed adjustment takes into account the effect of time-varying aircraft speed, both acceleration and deceleration, on the exposure-based metrics. It is not applied to maximum noise level metrics since they are inherently independent of time. In addition, since a runup is a stationary operation in INM 5.1, i.e., it does not have an associated speed, the speed adjustment is not applicable, regardless of noise metric.

The L<sub>AE</sub> and L<sub>EPN</sub> values in the NPD data are for a reference true airspeed of 160 kt. For aircraft speeds other than 160 kt, the airspeed adjustment, AS<sub>ADJ</sub>, is given by:

$$AS_{ADJ} = 10 \log_{10} [160 / AS_{seg}] \quad (dB)$$

where AS<sub>seg</sub> is the true airspeed at the closest point of approach (CPA), as discussed in Section 3.1.2.

### 3.6 Lateral Attenuation Adjustment (LA<sub>ADJ</sub>) ✓

The lateral attenuation adjustment is meant to take into account the following effects on aircraft sound due to over-ground propagation: (1) ground reflection effects; (2) refraction effects; and (3) airplane shielding effects, as well as other ground and engine/aircraft installation effects. It is computed as a function of two empirical parameters, the sideline distance from the flight-path segment to the observer,  $l_{seg}$ , computed in Section 3.1.2, and the angle formed by SLR<sub>seg</sub> and the ground plane beneath the observer location,  $\beta$ .

The ground plane beneath the observer is either defined by a flat plane, or, if the terrain elevation enhancement is invoked, elevation data are used to compute the actual slope of a three-by-three arc-second ground plane, with the observer at its physical center (see Figure 3-8).

The INM 5.1 database includes all of the aircraft from the United States Air Force's (USAF) NOISEMAP suite of programs,<sup>3</sup> as of January 1996. The specific NOISEMAP aircraft are identified in the MODEL\_TYPE category of INM 5.1 NOIS\_GRP.DBF database file with an "N" (NOISEMAP), as compared with an "I" (INM). The specific algorithms used for computing lateral attenuation in INM 5.1 are dependent upon whether the MODEL\_TYPE associated with a particular aircraft is categorized as INM or NOISEMAP.

\* The lateral attenuation adjustment in INM was derived from field measurements made over grass-covered, acoustically soft terrain. Consequently, when source-to-receiver propagation occurs primarily over an acoustically hard surface (e.g., water), and the hard surface dominates the study environment, it is possible that INM could under predict the actual noise level.

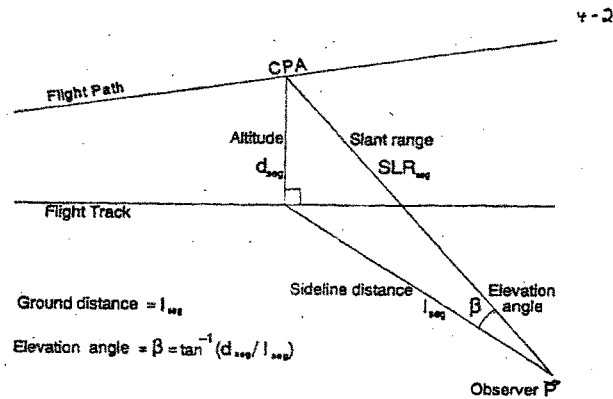


Figure 3-8: Lateral Attenuation Geometry

3.6.1 INM Aircraft

If the MODEL\_TYPE associated with a particular aircraft in the NOIS\_GRP.DBF database file is categorized as INM, computation of the lateral attenuation adjustment depends upon whether the aircraft is located on the ground or in the air. If the aircraft is on the ground, the adjustment has a ground-to-ground component only. If the aircraft is in the air, it has both a ground-to-ground and an air-to-ground component. In the latter case, the two components are computed separately and then combined.<sup>26</sup>

✓ The ground-to-ground component of the lateral attenuation adjustment is computed as follows:

$$G(l_{spg}) = \begin{cases} 15.09 [ 1 - e^{-0.00274 l_{spg}} ] & \text{for } 0 < l_{spg} \leq 914 \text{ m (3000 ft)} \quad (\text{dB}) \\ 13.86 & \text{for } l_{spg} > 914 \text{ m (3000 ft)} \quad (\text{dB}) \end{cases}$$

where,  $l_{spg}$  = sideline distance in the horizontal plane from the observer to the ground-projection of CPA (m).



JRA to USATA, "Rebuttal Of NPS And FAA Testimony", Attachment 4 of 5, Page 3 of 5

**INM 5.1 Technical Manual**

The air-to-ground component of the lateral attenuation adjustment,  $\Lambda(\beta)$ , is computed as follows:

$$\Lambda(\beta) = \begin{cases} 3.96 - 0.066 \beta + 9.9 e^{-0.13\beta} & \text{for } 0 \leq \beta \leq 60 \text{ degrees} \quad (\text{dB}) \\ 0 & \text{for } 60 < \beta \leq 90 \text{ degrees} \quad (\text{dB}) \end{cases}$$

The overall lateral attenuation adjustment,  $LA_{ADJ}$ , which takes into account both the ground-to-ground component,  $G(l_{srg})$ , and the air-to-ground component,  $\Lambda(\beta)$ , is then computed as follows:

$$LA_{ADJ(INM)} = G(l_{srg}) \Lambda(\beta) / 13.86 \quad (\text{dB})$$

### 3.6.2 NOISEMAP Aircraft

If the MODEL\_TYPE in the NOIS\_GRP.DBF database file is categorized as NOISEMAP, computation of the lateral attenuation adjustment depends upon the elevation angle,  $\beta$ . If the elevation angle is less than 2 degrees, the adjustment has a ground-to-ground component only. If the elevation angle is greater than or equal to 2 degrees, it has both a ground-to-ground and an air-to-ground component. In the latter case, the two components are computed separately and then combined.

The ground-to-ground component of the lateral attenuation adjustment is computed as follows:

$$G(l_{srg}) = \begin{cases} 15.09 [ 1 - e^{-0.00274 l_{srg}} ] & \text{for } 0 < l_{srg} \leq 401 \text{ m (1316 ft)} \quad (\text{dB}) \\ 10.06 & \text{for } l_{srg} > 401 \text{ m (1316 ft)} \quad (\text{dB}) \end{cases}$$

where,

$l_{srg}$  = sideline distance in the horizontal plane from the observer to the ground-projection of CPA (m).

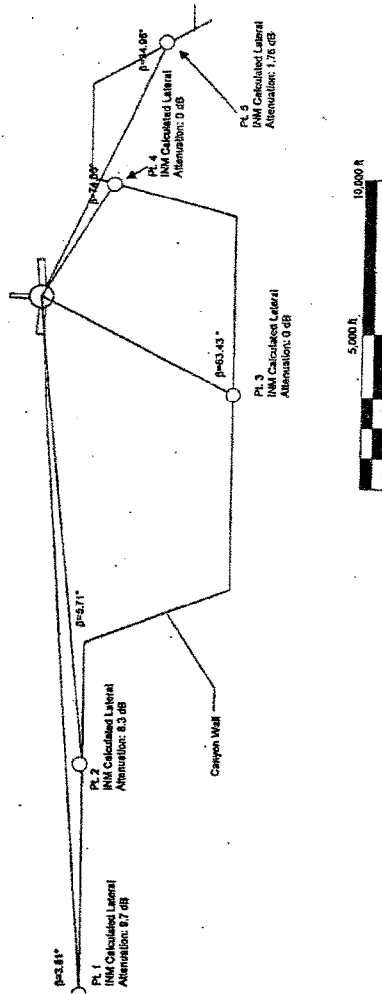
The air-to-ground component of the lateral attenuation adjustment is computed as follows:

$$\Lambda(\beta) = \begin{cases} (21.055 / \beta) - 0.468 & \text{for } 2 \leq \beta \leq 45 \text{ degrees} \quad (\text{dB}) \\ 0 & \text{for } 45 < \beta \leq 90 \text{ degrees} \quad (\text{dB}) \end{cases}$$

<sup>3</sup> The ground-to-ground component of the lateral attenuation adjustment actually computed by the NOISEMAP program is dependent upon the one-third octave-band frequency characteristics of the noise source. Due to this fact, small differences are expected when comparing INM and NOISEMAP results directly, especially in the immediate vicinity of the airport runways.

IRA to USATA, "Rebuttal Of NPS And FAA Testimony",

Attachment 5 of 5



## DETERMINING THE THRESHOLD OF NOTICEABILITY

## 4.1. Notes on Sound Detectability (or Audibility) and Noticeability

- 4.1.1. The detection of aircraft sound by humans (or sound analyzers) requires some increase in sound level above the ambient level with no aircraft present. That is the Signal to Noise Ratio, S/N, must be greater than zero.
- 4.1.1.1. For example, the sound measurements conducted in GCNP in the *BBN Study* found that observers at 13 different sites in GCNP (intently listening for aircraft) were able to detect aircraft at an average S/N of 1 dB(A).
- 4.1.1.2. This A-weighted Overall S/N=1 dB(A) is consistent with detectability of aircraft sound 6 dB(A) below ambient. The *BBN Study* acknowledges that one cannot reliably measure broadband sound levels (such as dB(A)) that are below ambient.
- 4.1.2. The *BBN Study* also made use of a commonly used measure of acoustical detectability in the presence of masking sound known as "d-prime" or bandwidth adjusted signal to noise ratio,
- $$d' = \eta * S/N * \sqrt{W},$$

where,

d' is computed for every 1/3 Octave band

$\eta$  = detector efficiency (set to 40%, in the *BBN Study*)

W = critical bandwidth of the ear (~100Hz to ~150 Hz in the area of interest)

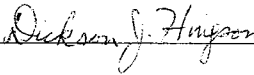
- 4.1.2.1. For convenience the decibel equivalent,  $10\text{LOG}(d')$  is often used. Typically, a prop or rotor blade passage tone will betray the presence of an aircraft. The band containing that tone typically has the highest d'.
- 4.1.2.2. The observers in the *BBN Study* found detectability at  $10\text{LOG}(d') = 7$  and noticeability at  $10\text{LOG}(d') = 17$ .
- 4.2. Computation of Threshold of Noticeability
- 4.2.1. We based our computations on the observations reported in the *BBN Study*.
- 4.2.2. We accepted the 3 dB above ambient definition of the threshold of noticeability used by NPS in its previous studies.
- 4.2.3. The NPS's definition of "substantial restoration of natural quiet" requires that 50% or more of the Park be free of noticeable aircraft sound 75% or more of the time. To determine the corresponding threshold of noticeability:
- 4.2.3.1. We determined the lower quartile sound level at which aircraft were detected at each site. Thus the detection level was higher 75% of the time.
- 4.2.3.2. We then computed the median of those site-specific, lower quartile sound levels. Thus the detection level was higher 75% of the time at 50% of the sites.
- 4.2.3.3. The finding in the *BBN Study* that S/N = 1 dB(A) at detection means that the ambient level was 1 dB(A) below the detection level. Thus, subtracting 1 dB(A) and adding 3 dB(A) to the median lower quartile detection level yields the threshold of noticeability.
- 4.2.3.4. Table 1 shows the computations. The median lower quartile threshold of noticeability is 28.93 dB(A) at onset and 28.796 dB(A) at offset. Averaging and rounding yields 29 dB(A). This is the correct aircraft sound criterion level for evaluating "substantial restoration of natural quiet". If aircraft sound is less than 29 dB(A) 75% or more of the time in 50% or more of the Park, then, by the NPS's

definition and the NPS's data, "substantial restoration of natural quiet has occurred".

TABLE 1: COMPUTATION OF THRESHOLD OF NOTICEABILITY

Site	La at Onset of Detectability			La at Offset of Detectability		
	Mean La, dB(A)	std dev, s	25%ile La =La-.67s	Mean La, dB(A)	std dev, s	25%ile La =La-.67s
Horn Cr.	24.9	2.3	23.359	24.7	3.2	22.556
Nankoweap	45.9	7.8	40.674	45.8	7.8	40.574
Pt Imperial	34.2	4.3	31.319	35.8	5.8	31.914
S. Canyon	22.5	3	20.49	22	3.7	19.521
Hermit Cr.	35	8.3	29.439	36.8	9.4	30.502
Sanup Plateau	26.2	4.9	22.917	29.2	7.5	24.175
Tonto Overlook	27.6	1	26.93	27.6	1.2	26.796
Phantom Ranch	45.8	1.2	44.996	45.7	1.6	44.628
Tuna Cr.	18	1.2	17.196	17.1	1.8	15.894
Toroweap Overlook	20.4	2.6	18.658	20.3	1.7	19.161
Desert View	27.7	0.7	27.231	32.1	4.5	29.085
<b>MEDIAN, dB(A)</b>	27.6		26.93	29.2		26.796
<b>Ambient, SNR=1 dB(A)</b>	26.6		25.93	28.2		25.796
<b>Noticeability Threshold</b>						
<b>= amb + 3 dB(A)</b>	29.6		28.93	31.2		28.796
Data from NPOA Report 93-1, Table E-3						

**Statement for the House Committee on National Parks and Public Lands Hearing Record of May 25, 1999 on "Change in Noise Evaluation Methodology for Air Tour Operations Over Grand Canyon National Park."**

Submitted By: Dickson J. Hingson, Ph. D. (signed) 

Home Address: P. O Box 630132  
Rockville, Utah 84763

Date: June 4, 1999

**- Statement -**

The proposed change in Noise Evaluation methodology that NPS proposes, i.e. to "Audibility", (to the 2/3 extent actually applied) is a welcome, significant, and scientifically-based improvement. It furthers protection for the uniquely, phenomenally quiet, mysterious Grand Canyon soundscape. Full appreciation of the primeval, timeless aura of the Grand Canyon National Park requires preserving *its* fragile natural quietness, on *its* scale, which to our ears is mostly in the very quietest ranges. That very difference in scale is precisely what enhances this as a landscape and soundscape to be uniquely protected, by us, for us. It is what gives the vastness of the Canyon the greatest sense of mystery, a haunting, ageless hush. The Canyon's very *aura*, the source of deepest feeling to a visitor, is realized in that silence.

NPS commendably relies upon two key "threshold" principles, the first one noted in its own 1994 Report to Congress on Effects of Aircraft Overflights on Units of the National Park System.

**Principle I:**

*(from NPS Report - Sec. 3.4, also 3.2.1)*

**The Quiet to be Preserved**

*"The quiet to be preserved is "the quiet at the lower end of the ambient sound level range that occurs regularly between wind gusts, animal sounds, etc., not just the average sound level."* (emphasis supplied)

(The term "etc." it should be noted, applies to intermittent sounds including various, inevitable but sporadic, artificial man-made intrusions, as from aircraft.)

The Park Service eloquently justifies this principle in Sec. 3.2.1: *"Lulls in the wind or interludes between animal sounds create intervals where the quiet of a sylvan setting is quite striking. In considering natural quiet as a resource, the ability to hear clearly the delicate and quieter intermittent sounds of nature, the ability to experience interludes of extreme quiet for their own sake, and the opportunity to do so for extended periods of time is what natural quiet is all about."*

The National Park Service's "audibility threshold" of -8 dB below ambient (for audible aircraft intrusion) has been scientifically demonstrated. The ambient levels themselves in different vegetative zones have been scientifically determined (as cited in this NPS Notice). They are published in the FAA's "Re-clarified, Re-evaluated Environmental Assessment (1998)."

Thus Audibility is Science. NPS, in using audibility, appropriately utilizes *science* as the basis for the appropriate measurement standard for Park settings, in general. In this way the *experience* of visitors seeking to enjoy the natural and cultural soundscape can be protected.

#### Principle II:

##### The Experience to be Preserved

*"Park visitors sitting quietly but actively seeking to experience the natural quiet and solitude of the Park were key people that NPS decision makers had in mind concerning the phrase 'no aircraft audible' in the natural quiet standard."*

This second principle connects the first Principle to the nature of the total, sensory visitor experience, including again, "audibility". Audibility is a *scientific* articulation of the aforementioned visitor *experience*.

##### Noticeability is Politics

Surprisingly, NPS then weakens both principles by proposing to apply an improperly-based "Noticeability" standard in a large portion of the Park. Unfortunately, "Noticeability" is really "Politics." On a strictly scientific basis, there is no justification for extending "Noticeability" to a full third of the Park.

In fact, there is probably less than 1% of the Park area where the "Noticeability" standard might really apply at any given time. Surely NPS doesn't mean, then, to imply that visitors on-ground in the remote western one-third of the Park, or in the Marble Canyon region, are substantially more engaged in "activities other than contemplation of the national park"?

(Even in the so-called "developed areas" demarcated by NPS, such assumption is fallacious. People frequently engage in active contemplation of the national park in quiet times out on the Rim in front of El Tovar! Or on the woodland trails just southward of the "developed Rim", the same holds true. These experiences are characteristic on much of the North Rim's Bright Angel Peninsula. There are many very quiet, attentive periods possible within the "developed areas" even if somewhat more transiently. Visitors have a right to anticipate substantial periods of true natural quiet there, too, and indeed often do experience such.)

"Sleight-of-hand", *irrelevant* regulatory jargon seems to have crept in, masking NPS' excessive compromise in designating so expansive a Zone Two, *especially* the Sanup area and in the Marble Canyon area. The reasoning seems a disservice to attentive listeners and solitude-

Mr. HANSEN. Thank you, Mr. Snow.  
Mr. Resavage, the floor is yours—our business.

**STATEMENT OF ROY RESAVAGE, PRESIDENT, HELICOPTER  
ASSOCIATION INTERNATIONAL**

Mr. RESAVAGE. Thank you, Chairman Hansen, and members of the Subcommittee, for allowing me to respond to the changes the National Park Service is requesting relative to air tours in the Grand Canyon National Park.

My comments are intended to reflect the interests and concerns of the members of the Helicopter Association International. HAI is the trade association of the civil helicopter industries with members operating more than 4,000 helicopters and flying in excess of 2 million hours each year. HAI provides programs that enhance safety, encourage professionalism, and promote the unique contributions of the helicopter to society.

I would like to take a moment to mention HAI's Fly Neighborly Program, a program that is adhered to by the air tour industry. Through varied instructional techniques, attention is focused on the needs of the non-participating public on the ground. Numerous technical and common-sense approaches that can mitigate sound propagation are stressed to the aircrews and their owners. The aviation community understands that it must be accountable to a larger constituency than its direct customers if it is going to maintain its economic viability.

The evolution of the regulations commented on by other witnesses is a perfect example of how the air tour has successfully adapted their operations to blend with the reasonable expectations of park visitors. However, the current proposal to divide the park into two segments with dramatically stricter sound limitations does not allow the tour industry the latitude of even extending an olive branch in hope of reaching a fair compromise.

One of the questions before the Committee today is whether the National Park Service has the statutory power to force its perception of what it believes to be right against the wishes of the people. There has been no human outcry to rid the Grand Canyon of air tours by the millions of people that enjoy its majesty every year. Quite the contrary. You have heard testimony today that reflects that incredible small percentage of people that feel aviation negatively impacted their experience. In 1997 and 1998, a combined total of approximately 78 people complained, out of the 9,700,000 who visited the Grand Canyon. Most leaders charged with the governance of a diverse constituency would hardly consider those numbers a mandate for change.

It is distressing to see an agency arrogantly pursue its own misguided agenda, after being cited by this Committee just last year for improper actions. Although this statement appears harsh, I don't know how else to account for the Park Service's treatment of the sound studies they had manipulated.

Last year, testimony was given that unequivocally rendered the noise study assumptions of the Park Service to a status of pseudoscience. It was obvious to all in attendance that the sound models were incorrectly altered, and industry standards were not followed,

and the results of their efforts were not subject to the scrutiny of a peer review.

And I would like to emphasize that for just a minute there were some questions earlier about the validity of Mr. Alberti's sound studies.

HAI became aware of the sound studies and USATA wanted us to join in this process, we had no reason to doubt them, but we also had no reason to be able to testify publicly in support of them without a peer review, and that is what we did. Last year, you heard testimony from Dr. Ahuja, who was one of the country's leading acousticians. This was a gentleman that was given no direction—I stress again, he was given no direction by our association as to what the outcome of his results should be. We asked him to give us the best professional effort he could. He did, and he, in fact, concurred with the findings of the initial report.

The Park Service acknowledged there were serious shortfalls in their analysis. Yet, in their rush to change the world, they proposed even stricter limitations on the air tour industry. This was not because new and improved data had been analyzed that supports their previous incorrect claim, but because they feel they can impose their extreme interpretation on others.

Anyone who has been to the Grand Canyon and participated in either a helicopter or fixed-wing tour can tell you they do not fly over assemblages of people. The tours rigidly follow the routes and altitudes, as directed by SFAR 50-2, while practicing Fly Neighborly flight techniques. The aircrews do not deviate from their assigned airspace. All flights are flown above the rim of the canyon, away from the tourists, in very narrow routes, clear of the free-flight zones that blanket the majority of the park. There is only one spot on the extreme western edge of the visitors' tour route along the southern rim of the canyon that helicopters cross over. The tour industry has asked to have this crossing point displaced several miles to the west to totally eliminate even the minimal exposure a ground tourist might encounter. Unfortunately, no action has been directed at this easily correctable situation.

The acoustic experts agree that new limits imposed by the two-tier system are not needed to satisfy the Park Service's own definition of "natural quiet," and their attempts to justify their position are practically a laughing matter in the scientific community.

The 5 million people who visit the Grand Canyon each year are not demanding increased restrictions on the air tour industry. In fact, 800,000 visitors per year want to view the park via air touring.

The new restrictions would lower the acceptable sound levels in many areas below the human threshold of hearing. If the air tour industry is denied access to the areas that are not frequented by the vast majority of the visiting public, then it would be forced to either operate at a distance so far from the canyon as to render its service meaningless, or to crowd into the remaining area where the ground visitors are in mass. Does this make sense?

I would like to finish up with a quote from Mark Twain's "Gilded Age," and it conveys our message with crystal clarity.

"No country can live well-governed unless its citizens, as a body, keep religiously before their minds that they are the guardians of



the law, and the law officers are only the machinery for its execution, nothing more.”

Honored Committee members, we are the citizens to whom Mark Twain refers and we request that you carefully consider the pending legislation that you will be acting on in the near future.

I thank the Committee for an opportunity to speak for HAI and all its members, and also for the remainder of the air tour industry.

[The prepared statement of Mr. Resavage follows:]

STATEMENT OF ROY RESAVAGE, PRESIDENT, HELICOPTER ASSOCIATION  
INTERNATIONAL

Thank you Chairman Hansen, Ranking Member Romero-Barceló and members of the Subcommittee for affording me an opportunity to address the changes requested by the National Park Service (NPS) relative to air-tour operations at Grand Canyon National Park. My comments are intended to reflect the interests and concerns of the members of the Helicopter Association International (HAI).

HAI is the trade association of the civil helicopter industry with members operating more than 4,000 helicopters and flying in excess of 2,000,000 hours each year. HAI provides programs that enhance safety, encourage professionalism and promote the unique contributions made by helicopters to society.

I would like to take a moment to mention HAI's *Fly Neighborly* program, a program that is adhered to by the air-tour industry. Through varied instructional techniques, attention is focused on the needs of the non-participating public on the ground. Numerous technical and common sense approaches that can mitigate sound propagation are stressed to the aircrews. The aviation community understands that it must be accountable to a larger constituency than its direct customers if it is going to maintain its economic viability.

The evolution of regulations commented on by other witnesses is a perfect example of how the air-tour industry has successfully adapted their operations to blend with the reasonable expectations of the Park visitors. However, the current proposal to divide the park into two segments with dramatically stricter sound limitations does not allow the tour industry the latitude of extending an olive branch in hope of reaching a fair compromise.

One of the questions before this Committee today is whether the National Park Service has the statutory power to force its perception of what it believes to be right against the wishes of the public. There has been no human outcry to rid the Grand Canyon of air tours by the millions of people that enjoy its majesty every year. Quite the contrary. You have already heard testimony today that reflects the incredibly small percentage of people that felt that aviation negatively impacted their experience. In 1997 and 1998 a combined total of approximately 78 people (.000008 percent) complained out of the 9,700,000 who visited the Grand Canyon. Most leaders charged with the governance of a diverse constituency would hardly consider those numbers a mandate for change.

It is distressing to see an agency arrogantly pursue its own misguided agenda, after being cited by this Committee for improper actions. Although that statement appears harsh, I don't know how else to account for the Park Service's treatment of the sound studies they have manipulated.

Last year, testimony was given that unequivocally rendered the noise study assumptions of the Park Service to a status of pseudo-science. It was obvious to all in attendance that sound models were incorrectly altered, industry standards were not followed, and the results of their efforts were not subjected to the scrutiny of a peer review. The Park Service acknowledged there were serious shortfalls in their analysis, yet in their rush to change the world to fit their agenda, they have proposed even stricter limitations on the air-tour industry. This was not because new and improved data have been analyzed that supports their previous incorrect claim, but because they feel they can impose their extreme interpretation on others.

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The new restrictions would lower the acceptable sound levels in many areas below the human threshold of hearing. If the air-tour industry is denied access to the areas that are not frequented by the vast majority of the visiting public, then it would be forced either to operate at a distance so far from the Canyon as to render it's service meaningless, or to crowd into the remaining area where the ground visitors are in mass. Does this make sense to anyone?

A quote from Mark Twain's Golden Age, conveys our message with crystal clarity:

*"No country can live well governed unless its citizens as a body keep religiously before their minds that they are the guardians of the laws and that the law officers are only the machinery for its execution, nothing more."*

Mr. Chairman and honored Committee members, we are the citizens to whom Mark Twain refers. The National Park Service is the machinery for executing the law. Therefore, we the citizens, ask that you enact a law that will get the machinery back on line, and preserve the right of our citizens to responsibly enjoy the Grand Canyon as they do today.

I thank the Committee and its leaders for this opportunity to be heard and look forward to answering your questions.

Mr. HANSEN. Thank you.

Mr. Gibbons.

Mr. GIBBONS. Thank you very much, Mr. Chairman.

Mr. Bassett, you have been involved with the ARAC Working Group; have you not, for some time?

Mr. BASSETT. The Overflights Working Group?

Mr. GIBBONS. Yes.

Mr. BASSETT. The National—yes. I am not a member of the working group, but, yes, involved.

Mr. GIBBONS. You have been involved.

To your best understanding and recollection, did the Park Service ever bring to the working group, to their attention, that they were working on changing the methodology or standards for determining this ambient noise standard?

Mr. BASSETT. Not once. Had they done that, that would probably have been a series of very short, brief meetings, and it would have been over.

Mr. GIBBONS. Well do you believe, then, that the Park Service was acting in good faith during all these negotiations over the past years?

Mr. BASSETT. Absolutely not. In fact, Congressman, I don't believe the Park Service has worked in good faith on any of these issues, with respect to air touring, particularly in the Grand Canyon.

Mr. GIBBONS. Mr. Snow, let me ask you a quick question about liability. Could you address any of the liability concerns that would be caused by implementing this new standard?

Mr. SNOW. I think for the agencies to go forward at this point in time, when there is enough evidence on the record about the invalidity of the noise methodology, for them to proceed forward with regulating the industry at this time, opens the Federal Government up to a significant amount of liability. And they certainly would be

subject to challenge, and the precedent is established that they would not be able to—under scrutiny, it wouldn't hold up in a court of law.

Mr. GIBBONS. So, in essence, what you are saying is, when there is a contract, say, between an aircraft manufacturer and an air tour operator who had ordered aircraft to be made and purchased under certain standard ambient conditions of noise production of the aircraft, if the government comes in, then, and changes those standards that can't be met by the aircraft, someone is going to lose in that contract, whether it is the air tour operator or the manufacturer, under that contract. Then would the government, then, be liable for changing the standards at that point in time?

Mr. SNOW. I am not an attorney—I play one on TV on occasion—but I would say “yes” to that question—and I am kidding about being on TV.

[Laughter.]

Mr. GIBBONS. Mr. Resavage, do you use noise abatement procedures for helicopter operations?

Mr. RESAVAGE. Yes, sir; we certainly do. There are many things that the aviation industry, as a whole—and the helicopter industry, in particular—can do, in addition to quiet technology.

Before I get off on those, though, I would like to say that one of our board members is a principal operator of helicopters in the Grand Canyon, and he is developing, at his own expense, ultra-quiet technology for helicopter tours, which will significantly reduce their levels.

But there are other things that you can do that are common sense that, again, don't fall in the realm of rocket science. If you climb quickly so that you don't constantly fly at low altitude over people, you can do that. If you adjust your air speeds, you can control your sound propagation. Adjusting your rotor RPM will also have an effect on sound. The rate that you descend, and also the airspeed that you descend at, can mitigate the sounds of what we call “blade slap.” All of these things can be done—making smooth maneuvers instead of radical maneuvers can greatly reduce the noise that is generated by the aircraft. These things are all practiced, not only by the helicopter community, but also the fixed-wing community that operate in the tour, sir.

Mr. GIBBONS. Mr. Resavage, you have indicated in your testimony that you have approached the Park Service in order to modify routes to make them less intrusive to ground park visitors.

Can you explain whether the Park Service has responded to your requests or not?

Mr. RESAVAGE. I have not personally asked them, but many of the operators behind me can, and I am sure they could probably give you dates and times that they have done that. They have repeatedly asked to have the final route where they come back over the canyon, prior to going to the airport, they have to cross the rim at some point. The point that they have I believe is called “Hermit's Lookout,” or something similar to that, and it is at the extreme western end of where their little bus tour is. If they were to displace that two or three miles to the west, the people in that point, at the western-most point, would not even hear them. To my

knowledge, sir, there has been no feedback to the tour industry that would accommodate that request.

Mr. GIBBONS. So the Park Service has, in their action, refused to change the route, as requested by the helicopter operators to make it quieter, from the impact of the helicopter. This is what you are saying?

Mr. RESAVAGE. Yes, sir; that is my knowledge of the situation.

Mr. GIBBONS. Thank you very much, Mr. Chairman.

Mr. HANSEN. Thank you, Mr. Gibbons.

Mr. SNOW, you said on the north rim, with this—let's say around noon, say, there at the lodge, you know, where that big circle is and the whole bit, and there is cars and there is motorcycles and there is people and all that stuff.

What do you think this would register?

Mr. SNOW. I think it would register very similar to the noise levels we registered in this room.

Mr. HANSEN. Between 60 to 70—

Mr. SNOW. Probably 70—

Mr. HANSEN. [continuing] somewhere in there?

Mr. SNOW. I would say between 60 and 80 decibels.

Mr. HANSEN. Now, let's put Mr. Stephen's Twin Otter flying over, 7,500 feet above. What does it go up to?

Mr. SNOW. It is probably going to up to about 40, 45.

Mr. HANSEN. Let's put a group of Hell's Angels going through on Harleys.

[Laughter.]

What does it go up to?

Mr. SNOW. Hell's Angels going through on a Harley. I would say that that is probably going to exceed the 94 decibel limit at the top of that noise-level meter.

Mr. HANSEN. Now, let's fly you down in the canyon—I guess we would have to have an emergency to get you there, but we did put that in the bill, because I did that myself—and put you near Lava Falls or Crystal. Now what is it?

Mr. SNOW. Near one of the falls down there?

Mr. HANSEN. I think Crystal and Lava Falls are the two I fear the most when I go through there. And they are noisy rascals. What—

Mr. SNOW. We are near the falls—

Mr. HANSEN. [continuing] are they going to up to?

Mr. SNOW. [continuing] I think we are probably going to be off the scale for that. We will be above 94 decibels if we are real close to the falls.

Mr. HANSEN. Let's take an F-15 out of Nellis and fly it right up there. Now what are you going to?

Mr. SNOW. Afterburner Estates—

[Laughter.]

We are off the scale, again.

Mr. HANSEN. I see.

Mr. SNOW. I think the loudest one we get is the—

Mr. HANSEN. Okay, let's take a Cessna 210, and fly it over there above. What is it going to go up to?

Mr. SNOW. Cessna 210 would probably be in the 50—

Mr. HANSEN. It would?

Mr. SNOW. Yes.

Mr. HANSEN. Now move out to Point Royal out there. Is that what you called that, Mr. Arnberger, out there when we—Point Royal. A little quieter there. What would this thing be?

Mr. SNOW. It depends on what time of day. If it was doing the daytime, it would probably be somewhere between 30 and 40 decibels.

Mr. HANSEN. Okay, let's make it 2 in the morning. What is it?

Mr. SNOW. Probably between 20 and 25 decibels at Point Royal; maybe a little bit lower.

Mr. HANSEN. Mr. Bassett, do you think with all that, that the aircraft are getting picked on?

[Laughter.]

Mr. BASSETT. Thank you for the softball, Mr. Chairman.

Absolutely we do, and the concern that we have, in that regard, is a comment that was made by the administration and that was "This change in the definition of 'natural quiet' does not, in itself, exclude aircraft."

Well, of course it does.

Mr. HANSEN. A lot of people are of the opinion—and I don't buy the conspiracy theories—but a lot of people are of the opinion that the administration on wilderness, national parks—well, not national parks, but monuments, areas like that—that they definitely are death on mining. Also, they are death on aircraft. Do you subscribe to that?

Mr. BASSETT. Absolutely. And what we have found over the—you know, we are an easy target. We are visible; we are there. We advertise; people who go into Las Vegas or into Utah or Arizona, I mean they see the ads. I mean this is a visible industry, although it is a very small industry, so it becomes a very easy target. And, also, because we are small, from a political perspective, you know, we are not a multibillion dollar lobby, I mean, and so we, at that point, become a very easy target—probably the first of many, but very easy, nonetheless.

Mr. HANSEN. Mr. Resavage, we have talked a lot about technology, and I think the gentleman from Nevada has alluded to some of these things, but how do you hear a Huey or a Blackhawk or a Cobra or even some new—they are pretty noisy rascals. I mean you hear "whoop, whoop, whoop" in those babies, and stuff like that. Now, I get into the Ranger-3 and some of those are a lot quieter. What technology are they doing on helicopters?

Mr. RESAVAGE. They are doing a lot to decrease the sound of the aircraft—or the noise that is emitted from helicopters, sir.

They are working on rotor technology. They are trying to slow down the blade-tip speed which would decrease the sound. They are altering the way the tail rotor guidance is given; they are going to fenestrans and no-tail rotor, arrangements which greatly reduce the noise. So those things are being contemplated.

They are even working on baffling and acoustic techniques for the engines, even though the engines are a lower noise emitter than the main transmission and rotor and tail rotor system. So they are working on all of those.

Also, some of the aircraft that you mentioned, Mr. Chairman, are very old vintage military aircraft that were not designed to be un-

obtrusive, I guess if you will. They are designed for maximum performance of their mission, and stealth was not part of that mission. So those technologies—there are a lot of aircraft that are still out there that are noisier than the new-generation aircraft, but those manufacturing techniques are no longer being followed, and those are not the type of aircraft that are being flown in the Grand Canyon National Park today.

Mr. HANSEN. The gentleman from Nevada.

Mr. GIBBONS. Thank you, Mr. Chairman.

I certainly hope that if these types of regulations may never get approved. But anytime regulations like this come to being, I would only hope that the Park Service limits its own aircraft, helicopter activities, to the same noise levels that these gentlemen and the air tour industry have been attempting to do, also. Because I think they may be contributing to their own noisy parks, as well.

But my question would be, Mr. Chairman, to Mr. Bassett, maybe. Of all the people that travel with your service over the Grand Canyon, and many of them are either old, infirm, disabled, or very young and have no other means by which to see the Grand Canyon—it is a two-part question. One, does this regulation, or would this regulation, by excluding your service, deny them access to the park?

And, secondly, what would we do to ensure that they had the access to a park, to see the grandeur of the Grand Canyon, without your service available to them?

Mr. BASSETT. Congressman, part one, the number is about 62 percent. Those who take air tours of the Grand Canyon, who are either under 15 years old, elderly—over 50, have some kind of health-related problem, or, indeed, are disabled. That number is somewhere in the neighborhood of 62 percent, total.

And the answer to question two, would they have access to the park? Well, I guess they would. I guess there is a way for them to access the park, but there is certainly not a way for them, given that, to see the park. I guess the Park Service could argue that there are alternatives for them. For example, they can ride into it and stand and look. If they are disabled, they may have a difficult time getting in or out of vehicles and—so it would be difficult to sit here and say, “Well, they don’t have an alternative,” because I am sure the Park Service would argue that they do. But, would it be an alternative that would give them any type of reasonable view of the Grand Canyon, such as they are able to get by air tour? Absolutely not.

And, if this modification of the definition of “natural quiet” is permitted to be implemented, as the January notice suggested, then we are only a short step or two away from an NPRM and a regulatory action that, then, says, “Well, because of this, you can no longer fly aircraft in this area.”

The change in definition doesn’t, in itself, eliminate aircraft. The frightening part is the regulation that comes after that will eliminate the aircraft.

Mr. HANSEN. The gentleman from Nevada has brought up a very interesting point, though. You know we get all kinds of letters from people; we average maybe 100 letters a day in all our offices. And people from BART—you know that retired group? They write on a

regular basis. I look at my own in-laws, my father-in-law and mother-in-law in their late-80's, who had never seen the Grand Canyon or Glen Canyon Recreation Area. And they flew over it; they raved about it for a long time, what a beautiful experience it was.

Now, those of us in Congress, we got to say—well, look; it is a big country out there, and more than just the person who is young and athletic and well-heeled deserves to enjoy some of our parks. And I think the aircrafts has been the answer for a lot of those. Maybe at an inconvenience to somebody else, but at some time I am inconvenienced every day of my life, as you are, too.

And so, somewhere, there is some moderation in this thing, and I would hope, working with the Park Service, we could come to something we could all agree on with this administration.

I thank this committee—or the panel for being with us.

Superintendent Arnberger, did you—you didn't get a chance to talk. Do you want to come on up and say a word or two, or would you rather not?

You are welcome to, and I would invite you to come up if you are so inclined. This is the man that has to catch the slings and the arrows, you know. Sometimes my heart goes out to our superintendents; they get caught and be in a vise sometime. And if you would like to say a word or two, we welcome you to take the mike there.

Mr. ARNBERGER. Well, you are very kind, and I won't take the mike for very long. I will be seeing you later, I think, to discuss other issues.

But I just want to assure this panel—and it is, obviously, that there is a creditability gap here, but this National Park Service and the Grand Canyon National Park is trying to find a balance. In fact, every year in Tusayan, we have a big July 4 event, and our community does. And every year, I end up buying some air tour tickets for my family that I use for my family. My father, who is old and infirmed, in fact, has taken that tour. We are not interested in putting the air tour business out of business. We are interesting in finding that balance, and that is the difficulty. And we will continue to stride forward with the FAA to do that, and all the interested to do that.

Mr. HANSEN. Well, thank you; I appreciate those remarks. Every superintendent has his cross to bear, so to speak. Mike Finley sits up there in Yellowstone wondering what to do with all those impassable roads. We got sewer system problems down in the Everglades. Every time my phone rings, it is another superintendent telling me the problems he has got. So, my heart goes out to all of them.

But let me thank you folks for the excellent testimony. It has been very interesting, and believe me, the Committee will do a lot in digesting this and trying to work with the Department of Interior and this administration in coming up with something that we hope is very reasonable.

And this is quite an instrument you have here, Mr. Snow.

[Laughter.]

I would like to take this to the House floor on occasion.

[Laughter.]

I could make some great use of it. And with that, we will consider the meeting adjourned.

[Whereupon, at 12:34 p.m., the Subcommittee adjourned.]

[Additional material submitted for the record follows.]



QUIETLY  
SUPERIOR

**JR**

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May 30, 1999

Mr. Jim Santini, Legislative Counsel  
United States Air Tour Association  
1101 King Street, Suite 350  
Alexandria, VA 22314

**SUBJECT: REBUTTAL OF NPS AND FAA TESTIMONY AT 5/25/1999 HEARING ON GRAND CANYON NOISE**

The Subject hearing dealt with the National Park Service's 1/26/1999 notice, "Change in Noise Evaluation Methodology for Air Tour Operations over Grand Canyon National Park" 64 Fed. Reg. 3969. In my testimony I repeated the conclusion of our 1997 report, JR 182, that "substantial restoration of natural quiet" had, in fact, been achieved under SFAR 50-2. Ms. Jacqueline Lowey, Mr. Wes Henry of NPS and a gentleman from FAA raised several objections to our analysis in JR 182. I have enumerated these below and would like to add the following materials to my oral rebuttal:

1. NPS Claim: Our study only encompassed the East Canyon and ignored noisy West Canyon operations.

Rebuttal: The statement that we only evaluated the East Canyon is correct, but the implication that this invalidates our study is absurd.

- We limited our study to the East Canyon because:
  - The public version of INM cannot analyze the entire Park in one pass
  - Our client for that study (Papillon Grand Canyon Helicopters) operates in the East Canyon and provided first-hand operating data.
- If NPS thinks that the West Canyon is much noisier than our study area (which I doubt) then they should limit their proposed new noise rules to the West Canyon. We have certainly demonstrated that "substantial restoration of natural quiet" has occurred in the East Canyon.
- I would note that the FAA (at NPS instigation) has proposed and imposed draconian measures on both the East and West ends of the Park.

2. NPS Claim: We mis-understood the 1994 BBN report (NPOA Report No. 93-1 / BBN Report No. 7197) and did not realize that their measurements included background noise and as well as aircraft.

Rebuttal: That is incorrect. We recommend 29 dB(A) as a conservative threshold of "natural quiet". This is based on the facts that:

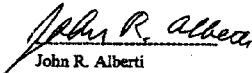
- Sound measurements are the logarithmic sum of aircraft and background sounds.
- Sound level at detection was 1 dB(A) above background, as stated in the BBN report.
- At each of the 11 sites in the BBN study, we determined the sound level when aircraft were detected, for the quietest 25% of detections.
- The median of these 11 bottom quartile detection levels was 27 dB(A)
- The median background level was 1 dB(A) less or 26 dB(A)

JRA to USATA, "Rebuttal Of NPS And FAA Testimony", 5/30/1999 Page 2 of 3

- The threshold of noticeability is background plus 3 dB(A), or 29 dB(A). This was discussed in detail in my written testimony and is reproduced here in Appendix A.
3. **NPS Claim:** *BBN observers detected aircraft at a reported average sound level of 30 dB(A) because their microphones would not measure lower levels.*  
**Rebuttal:** That is incorrect. BBN was able to measure levels as low as 15 dB(A). The measurements reported in the BBN Study were made with Bruel & Kjaer Type 4155 microphones. These are rated by B&K for sound levels as low as 15 dB(A), as shown in Attachment 1.
- As proof of that capability, the measured sound levels at Tuna Creek averaged 18 dB(A) at onset of detection and 17.1 dB(A) at offset (See Attachment 2).
  - The detection levels at the other sites were substantially higher yielding an average detection level of 30 dB(A).
4. **NPS Claim:** *We should have used a 12-hour day, rather than 24 in determining the allowable time above threshold of "natural quiet" because aircraft operate 12 hours.*  
**Rebuttal:** That is incorrect, absurd and irrelevant.
- It is irrelevant because we demonstrated "substantial restoration of natural quiet" even if the allowable time above the threshold of "natural quiet" were three hours per day (25% of 12 hours).
    - Attachment 3 shows that in the busiest month (July), much less than 50% of the study area had tour aircraft above the threshold of "natural quiet" more than 3 hours (180 minutes).
    - The area above the threshold of "natural quiet" more than 6 hours (25% of 24 hours, or 360 minutes) is even smaller.
  - The NPS statement is incorrect because tour operations are now limited to 10 hours per day under curfews imposed for noise reduction.
  - The argument that the time of operation should be used to determine the noise criterion is absurd when the time of operation can be restricted as a means to meet that criterion.
    - By that argument, the limit should now be 25% of 10 hours.
    - This would justify a further reduction in the permitted hours of flight, thus a further reduction in the permitted time above threshold, until permitted hours of flight is zero. Perhaps that is real the point of this line of reasoning.
  - I would further note that the Park users most likely to object to air tour noise, or to benefit noticeably from proposed new restrictions are 24 hour users of the back country and river corridor.
  - Our original use of the traditional 24-hour solar day is the only reasonable interpretation how many hours per day constitute "25% of the time".
5. **NPS Claim:** *FAA turned off the Lateral Attenuation feature of INM to avoid incorrectly applying LA when propagating downward from an aircraft into the canyon.*  
**Rebuttal:** That is doubly incorrect.
- FAA did not "turn off" LA they changed the INM code to eliminate LA.
    - The INM used by the acoustical engineering community under FAA regulation and pursuant to CFR 14, Part 150 cannot "turn off" LA.
    - The adulterated version of INM used in the FAA Grand Canyon study produces higher predicted sound levels than any other version in use.

- INM 5.1a (as used in our study, with digitized terrain provided by USGS), automatically phases out Lateral Attenuation as the sound propagation angle increases from parallel to the ground to 60 degrees.
- There was no need or justification for changing the code to eliminate LA.
- Attachment 4 defines the INM lateral attenuation algorithm as well as the elevation angle and sideline distance which are the key parameters in calculating lateral attenuation.
- Attachment 5 depicts aircraft sound propagation in typical conditions in and around the canyon rim. Lateral Attenuation was calculated using the INM LA algorithm at points 1 through 5.
  - The FAA's adulterated INM would produce LA = 0 dB in every case.
  - Points 1 and 2 simulate points on the rim. It is evident that as a listener gets farther from the aircraft, the elevation angle,  $\beta$ , decreases and the lateral attenuation gets larger.<sup>1</sup> Note that the FAA version under-predicts LA, thus over-predicts aircraft noise by several dB(A) in these cases.
  - Point 3 simulates a condition on the floor of the canyon. The elevation angle,  $\beta$ , is rather steep in this case (over 65 °) and LA = 0 dB. Thus, inappropriate LA is not applied.
  - Point 4 is on the wall of the canyon. Again LA = 0 dB.<sup>2</sup>
  - Point 5 is similar to Point 4 in that it is on the sidewall of the canyon. Note that INM under-predicts sound attenuation in this case, as it ignores shielding by the intervening ridge.
    - This amounts to an over-prediction of aircraft sound by several dB.
    - This is affects both our study and the FAA study and causes both to err on the side of over-predicting aircraft sound levels.

Best regards,



John R. Alberti  
/jra  
attachments  
cc:  
Brenda Halvorson  
Elling Halvorson

<sup>1</sup> The algorithm that INM uses to calculate lateral attenuation limits lateral attenuation to 13.86 dB regardless of how far a listener is from the plane. (The attenuation is less than 13.86 dB at lateral distances less than 3000 ft.)

<sup>2</sup> The elevation angle,  $\beta$ , is calculated from the ground to the airplane and not from a horizontal plane to the airplane. The terrain feature of INM allows for use of approximately a 300 ft. by 300 ft. grid to approximate the terrain contour locally. The result is that  $\beta$  is over 60° so the lateral attenuation is 0 dB. Note that if the terrain feature were turned off, the elevation angle would have been less than 60° and some attenuation would have been calculated.

JRA to USATA, "Rebuttal Of NPS And FAA Testimony",

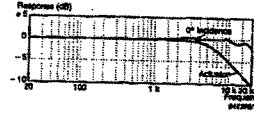
Attachment 1 of 5

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1977 P.4*



Free-field 1/2-inch Microphone Type 4155 is for making sound level measurements in accordance with IEC Type 1. It is prepolished, and its diaphragm is covered with a thin layer of quartz for protection in severe environments.

- Response: Free-field
- Sensitivity: 50mV/Pa
- Polarization voltage: 0V
- Frequency range: 4Hz to 16kHz
- Dynamic range: 15 to 146dB with Preamplifier 2639/69
- Venting: Rear

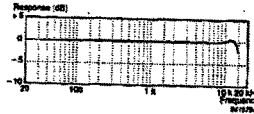


Order No.: 4155



Free-field 1/2-inch Microphone Type 4176 is prepolished, and is for making sound level measurements in accordance with IEC/ANSI Type 1.

- Response: Free-field and random
- Sensitivity: 50mV/Pa
- Polarization voltage: 0V
- Frequency range: 6.5Hz to 12.5kHz
- Dynamic range: 14 to 142dB with Preamplifier 2639/69
- Venting: Rear

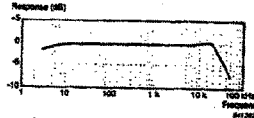


Order No.: 4176



Calibration 1/2-inch Microphone Type 4189 is for laboratory standard, precision calibration.

- Response: Pressure-field and random
- Sensitivity: 12.5mV/Pa
- Polarization voltage: 200V
- Frequency range: 4Hz to 20kHz  $\pm 1.5$ dB
- Dynamic range: 21 to 160dB with Preamplifier 2645/73
- Venting: Side

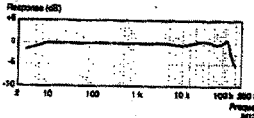


Order No.: 4189



Free-field 1/2-inch Microphone Type 4133 is for high-level, high-frequency measurements and model work.

- Response: Free-field and random
- Sensitivity: 4mV/Pa
- Polarization voltage: 200V
- Frequency range: 4Hz to 100kHz
- Dynamic range: 30 to 164dB with Preamplifier 2633/70
- Dynamic range: 36 to 164dB with Preamplifier 2639/69 and Adaptor UA0034
- Venting: Side

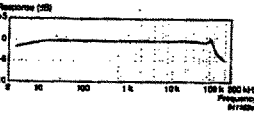


Order No.: 4133



Pressure-field 1/2-inch Microphone Type 4136 is for high-level, high-frequency measurements and cooler work.

- Response: Pressure-field
- Sensitivity: 1.6mV/Pa
- Polarization voltage: 300V
- Frequency range: 4Hz to 70kHz
- Dynamic range: 47 to 172dB with Preamplifier 2633/70
- Dynamic range: 43 to 172dB with Preamplifier 2639/69 and Adaptor UA0035
- Venting: Side



Order No.: 4136

JRA to USATA, "Rebuttal Of NPS And FAA Testimony",

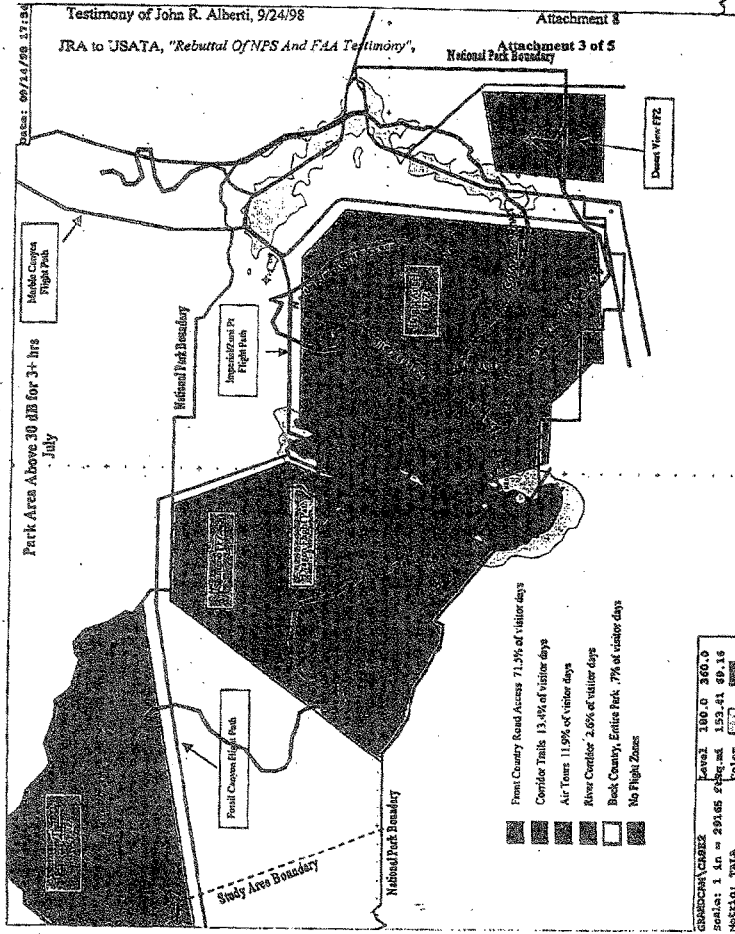
Attachment 2 of 5

Table E-3 Weighted Means and Standard Deviations of A-weighted Sound Pressure Levels at Onset and Offset of Aircraft Audibility, in dB re 20  $\mu$ Pa

Site Name	Observer	A-weighted SPL at Onset		A-weighted SPL at Offset	
		Mean	St Dev	Mean	St Dev
Horn Creek	1	24.9	2.3	24.7	3.2
Nankoweap	1	45.9	7.8	45.8	7.8
Point Imperial	1	34.2	4.3	35.8	5.8
South Canyon	1	22.5	3.0	22.0	3.7
Hermit Creek	2	35.0	8.3	36.8	9.4
Samup Plateau	2	26.2	4.9	29.2	7.5
Tonto Overlook	1	27.6	1.0	27.6	1.2
Phantom Ranch	1	45.8	1.2	45.7	1.6
Tuna Creek	1	18.0	1.2	17.1	1.8
Toroweap Overlook	2	20.4	2.6	20.3	1.7
Desert View	1	27.7	0.7	32.1	4.5

Note: Mean values are average A-weighted levels for event-specific and site-specific ambient spectra.

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JRA to USATA, "Rebuttal Of NPS And FAA Testimony", Attachment 4 of 5, Page 1 of 3  
 INM 5.1 Technical Manual

### 3.5 Airspeed Adjustment for Exposure-Based Metrics (AS<sub>ADJ</sub>)

4 - 1

The aircraft speed adjustment takes into account the effect of time-varying aircraft speed, both acceleration and deceleration, on the exposure-based metrics. It is not applied to maximum noise level metrics since they are inherently independent of time. In addition, since a runup is a stationary operation in INM 5.1, i.e., it does not have an associated speed, the speed adjustment is not applicable, regardless of noise metric.

The L<sub>AE</sub> and L<sub>EPN</sub> values in the NPD data are for a reference true airspeed of 160 kt. For aircraft speeds other than 160 kt, the airspeed adjustment, AS<sub>ADJ</sub>, is given by:

$$AS_{ADJ} = 10 \log_{10} [ 160 / AS_{true} ] \quad (dB)$$

where AS<sub>true</sub> is the true airspeed at the closest point of approach (CPA), as discussed in Section 3.1.2.

### 3.6 Lateral Attenuation Adjustment (LA<sub>ADJ</sub>)

The lateral attenuation adjustment is meant to take into account the following effects on aircraft sound due to over-ground propagation: (1) ground reflection effects; (2) refraction effects; and (3) airplane shielding effects, as well as other ground and engine/aircraft installation effects. It is computed as a function of two empirical parameters, the sideline distance from the flight-path segment to the observer,  $l_{seg}$ , computed in Section 3.1.2, and the angle formed by SLR<sub>seg</sub> and the ground plane beneath the observer location,  $\beta$ .

The ground plane beneath the observer is either defined by a flat plane, or, if the terrain elevation enhancement is invoked, elevation data are used to compute the actual slope of a three-by-three arc-second ground plane, with the observer at its physical center (see Figure 3-8).

The INM 5.1 database includes all of the aircraft from the United States Air Force's (USAF) NOISEMAP suite of programs,<sup>3</sup> as of January 1996. The specific NOISEMAP aircraft are identified in the MODEL\_TYPE category of INM 5.1 NOIS\_GRP.DBF database file with an "N" (NOISEMAP), as compared with an "I" (INM). The specific algorithms used for computing lateral attenuation in INM 5.1 are dependent upon whether the MODEL\_TYPE associated with a particular aircraft is categorized as INM or NOISEMAP.

\* The lateral attenuation adjustment in INM was derived from field measurements made over grass-covered, acoustically soft terrain. Consequently, when source-to-receiver propagation occurs primarily over an acoustically hard surface (e.g., water), and the hard surface dominates the study environment, it is possible that INM could under predict the actual noise level.

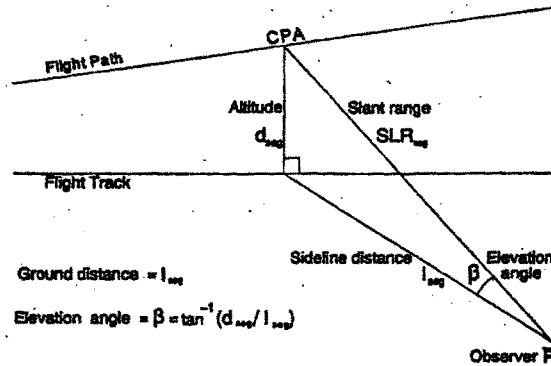


Figure 3-8: Lateral Attenuation Geometry

3.6.1 INM Aircraft

If the MODEL\_TYPE associated with a particular aircraft in the NOIS\_GRP.DBF database file is categorized as INM, computation of the lateral attenuation adjustment depends upon whether the aircraft is located on the ground or in the air. If the aircraft is on the ground, the adjustment has a ground-to-ground component only. If the aircraft is in the air, it has both a ground-to-ground and an air-to-ground component. In the latter case, the two components are computed separately and then combined.<sup>28</sup>

The ground-to-ground component of the lateral attenuation adjustment is computed as follows:

$$G(l_m) = \begin{cases} 15.09 [ 1 - e^{-0.00274 l_m} ] & \text{for } 0 < l_m \leq 914 \text{ m (3000 ft)} \quad (\text{dB}) \\ 13.86 & \text{for } l_m > 914 \text{ m (3000 ft)} \quad (\text{dB}) \end{cases}$$

where,  $l_m$  = sideline distance in the horizontal plane from the observer to the ground-projection of CPA (m).



JRA to USATA, "Rebuttal Of NPS And FAA Testimony", Attachment 4 of 5, Page 3 e  
**INM 5.1 Technical Manual**

The air-to-ground component of the lateral attenuation adjustment,  $\Lambda(\beta)$ , is computed as follows:

$$\Lambda(\beta) = \begin{cases} 3.96 - 0.066 \beta + 9.9 e^{-2.13\beta} & \text{for } 0 \leq \beta \leq 60 \text{ degrees} \quad (\text{dB}) \\ 0 & \text{for } 60 < \beta \leq 90 \text{ degrees} \quad (\text{dB}) \end{cases}$$

The overall lateral attenuation adjustment,  $LA_{\text{ADI}}$ , which takes into account both the ground-to-ground component,  $G(l_{\text{ng}})$ , and the air-to-ground component,  $\Lambda(\beta)$ , is then computed as follows:

$$LA_{\text{ADI (INM)}} = G(l_{\text{ng}}) \Lambda(\beta) / 13.86 \quad (\text{dB})$$

### 3.6.2 NOISEMAP Aircraft

If the MODEL\_TYPE in the NOIS\_GRP.DBF database file is categorized as NOISEMAP, computation of the lateral attenuation adjustment depends upon the elevation angle,  $\beta$ . If the elevation angle is less than 2 degrees, the adjustment has a ground-to-ground component only. If the elevation angle is greater than or equal to 2 degrees, it has both a ground-to-ground and an air-to-ground component. In the latter case, the two components are computed separately and then combined.

The ground-to-ground component of the lateral attenuation adjustment is computed as follows:

$$G(l_{\text{ng}}) = \begin{cases} 15.09 [ 1 - e^{-0.00274 l_{\text{ng}}} ] & \text{for } 0 < l_{\text{ng}} \leq 401 \text{ m (1316 ft)} \quad (\text{dB}) \\ 10.06 & \text{for } l_{\text{ng}} > 401 \text{ m (1316 ft)} \quad (\text{dB}) \end{cases}$$

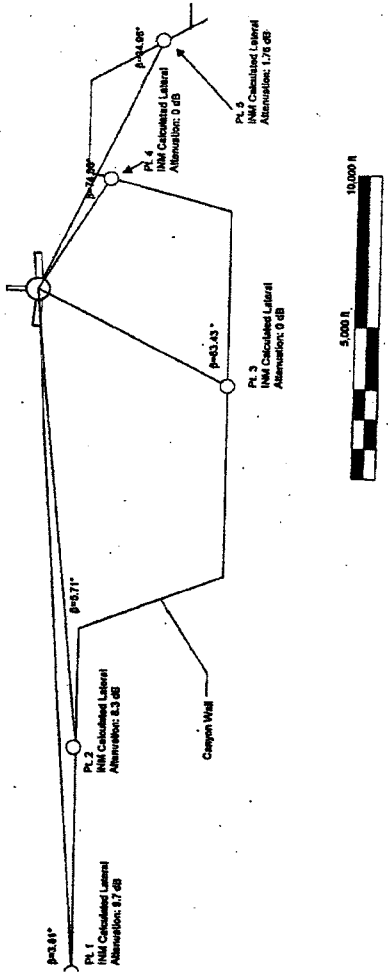
where,

$l_{\text{ng}}$  = sideline distance in the horizontal plane from the observer to the ground-projection of CPA (m).

The air-to-ground component of the lateral attenuation adjustment is computed as follows:

$$\Lambda(\beta) = \begin{cases} (21.056 / \beta) - 0.468 & \text{for } 2 \leq \beta \leq 45 \text{ degrees} \quad (\text{dB}) \\ 0 & \text{for } 45 < \beta \leq 90 \text{ degrees} \quad (\text{dB}) \end{cases}$$

<sup>1</sup> The ground-to-ground component of the lateral attenuation adjustment actually computed by the NOISEMAP program is dependent upon the one-third octave-band frequency characteristics of the noise source. Due to this fact, small differences are expected when comparing INM and NOISEMAP results directly, especially in the immediate vicinity of the airport runways.



Plane is 1000 ft. above (in Canyon Depth is 4500 ft.

## DETERMINING THE THRESHOLD OF NOTICEABILITY

- 4.1. Notes on Sound *Detectability* (or Audibility) and *Noticeability*
- 4.1.1. The detection of aircraft sound by humans (or sound analyzers) requires some increase in sound level above the ambient level with no aircraft present. That is the Signal to Noise Ratio, S/N, must be greater than zero.
- 4.1.1.1. For example, the sound measurements conducted in GCNP in *the BBN Study* found that observers at 13 different sites in GCNP (intently listening for aircraft) were able to detect aircraft at an average S/N of 1 dB(A).
- 4.1.1.2. This A-weighted Overall S/N=1 dB(A) is consistent with detectability of aircraft sound 6 dB(A) below ambient. *the BBN Study* acknowledges that one cannot reliably measure broadband sound levels (such as dB(A)) that are below ambient.
- 4.1.2. *The BBN Study* also made use of a commonly used measure of acoustical detectability in the presence of masking sound known as "d-prime" or bandwidth adjusted signal to noise ratio,
- $$d' = \eta * S/N * \sqrt{W},$$
- where,
- d' is computed for every 1/3 Octave band
- $\eta$  = detector efficiency (set to 40%, in *the BBN Study*)
- W = critical bandwidth of the ear (~100Hz to ~150 Hz in the area of interest)
- 4.1.2.1. For convenience the decibel equivalent, 10LOG(d') is often used. Typically, a prop or rotor blade passage tone will betray the presence of an aircraft. The band containing that tone typically has the highest d'.
- 4.1.2.2. The observers in *the BBN Study* found *detectability* at 10LOG(d') = 7 and *noticeability* at 10LOG(d') = 17.
- 4.2. Computation of Threshold of Noticeability
- 4.2.1. We based our computations on the observations reported in *the BBN Study*.
- 4.2.2. We accepted the 3 dB above ambient definition of the threshold of noticeability used by NPS in its previous studies.
- 4.2.3. The NPS's definition of "substantial restoration of natural quiet" requires that 50% or more of the Park be free of noticeable aircraft sound 75% or more of the time. To determine the corresponding threshold of noticeability:
- 4.2.3.1. We determined the lower quartile sound level at which aircraft were detected at each site. Thus the detection level was higher 75% of the time.
- 4.2.3.2. We then computed the median of those site-specific, lower quartile sound levels. Thus the detection level was higher 75% of the time at 50% of the sites.
- 4.2.3.3. The finding in *the BBN Study* that S/N = 1 dB(A) at detection means that the ambient level was 1 dB(A) below the detection level. Thus, subtracting 1 dB(A) and adding 3 dB(A) to the median lower quartile detection level yields the threshold of *noticeability*.
- 4.2.3.4. Table 1 shows the computations. The median lower quartile threshold of noticeability is 28.93 dB(A) at onset and 28.796 dB(A) at offset. Averaging and rounding yields 29 dB(A). This is the correct aircraft sound criterion level for evaluating "substantial restoration of natural quiet". If aircraft sound is less than 29 dB(A) 75% or more of the time in 50% or more of the Park, then, by the NPS's

definition and the NPS's data, "substantial restoration of natural quiet has occurred".

TABLE 1: COMPUTATION OF THRESHOLD OF NOTICEABILITY

Site	La at Onset of Detectability			La at Offset of Detectability		
	Mean La, dB(A)	std dev, s	25%ile La =La- .67s	Mean La, dB(A)	std dev, s	25%ile La =La- .67s
Horn Cr.	24.9	2.3	23.359	24.7	3.2	22.556
Nankoweap	45.9	7.8	40.674	45.8	7.8	40.574
Pt Imperial	34.2	4.3	31.319	35.8	5.8	31.914
S. Canyon	22.5	3	20.49	22	3.7	19.521
Hermit Cr.	35	8.3	29.439	36.8	9.4	30.502
Sanup Plateau	26.2	4.9	22.917	29.2	7.5	24.175
Tonto Overlook	27.6	1	26.93	27.6	1.2	26.796
Phantom Ranch	45.8	1.2	44.996	45.7	1.6	44.628
Tuna Cr.	18	1.2	17.196	17.1	1.8	15.894
Toroweap Overlook.	20.4	2.6	18.658	20.3	1.7	19.161
Desert View	27.7	0.7	27.231	32.1	4.5	29.085
<b>MEDIAN, dB(A)</b>	27.6		26.93	29.2		26.796
<b>Ambient, SNR=1, dB(A)</b>	26.6		25.93	28.2		25.796
<b>Noticeability Threshold</b>						
<b>= amb + 3 dB(A)</b>	29.6		28.93	31.2		28.796
Data from NPOA Report 93-1, Table E-3						

**Statement for the House Committee on National Parks and Public Lands Hearing Record of May 25, 1999 on "Change in Noise Evaluation Methodology for Air Tour Operations Over Grand Canyon National Park."**

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Date: June 4, 1999

**- Statement -**

The proposed change in Noise Evaluation methodology that NPS proposes, i.e. to "Audibility", (to the 2/3 extent actually applied) is a welcome, significant, and scientifically-based improvement. It furthers protection for the uniquely, phenomenally quiet, mysterious Grand Canyon soundscape. Full appreciation of the primeval, timeless aura of the Grand Canyon National Park requires preserving *its* fragile natural quietness, on *its* scale, which to our ears is mostly in the very quietest ranges. That very difference in scale is precisely what enhances this as a landscape and soundscape to be uniquely protected, by us, for us. It is what gives the vastness of the Canyon the greatest sense of mystery, a haunting, ageless hush. The Canyon's very *aura*, the source of deepest feeling to a visitor, is realized in that silence.

NPS commendably relies upon two key "threshold" principles, the first one noted in its own 1994 Report to Congress on Effects of Aircraft Overflights on Units of the National Park System.

**Principle I:**

*(from NPS Report - Sec. 3.4, also 3.2.1)*

**The Quiet to be Preserved**

*"The quiet to be preserved is "the quiet at the lower end of the ambient sound level range that occurs regularly between wind gusts, animal sounds, etc., not just the average sound level."* (emphasis supplied)

(The term "etc.", it should be noted, applies to intermittent sounds including various, inevitable but sporadic, artificial man-made intrusions, as from aircraft)

The Park Service eloquently justifies this principle in Sec. 3.2.1: *"Lulls in the wind or interludes between animal sounds create intervals where the quiet of a sylvan setting is quite striking. In considering natural quiet as a resource, the ability to hear clearly the delicate and quieter intermittent sounds of nature, the ability to experience interludes of extreme quiet for their own sake, and the opportunity to do so for extended periods of time is what natural quiet is all about."*

The National Park Service's "audibility threshold" of -8 dB below ambient (for audible aircraft intrusion) has been scientifically demonstrated. The ambient levels themselves in different vegetative zones have been scientifically determined (as cited in this NPS Notice). They are published in the FAA's "Re-clarified, Re-evaluated Environmental Assessment (1998)."

Thus Audibility is Science. NPS, in using audibility, appropriately utilizes *science* as the basis for the appropriate measurement standard for Park settings, in general. In this way the *experience* of visitors seeking to enjoy the natural and cultural soundscape can be protected.

#### Principle II:

##### The Experience to be Preserved

*"Park visitors sitting quietly but actively seeking to experience the natural quiet and solitude of the Park were key people that NPS decision makers had in mind concerning the phrase 'no aircraft audible' in the natural quiet standard."*

This second principle connects the first Principle to the nature of the total, sensory visitor experience, including again, "audibility". Audibility is a *scientific* articulation of the aforementioned visitor *experience*.

##### Noticeability is Politics

Surprisingly, NPS then weakens both principles by proposing to apply an improperly-based "Noticeability" standard in a large portion of the Park. Unfortunately, "Noticeability" is really "Politics." On a strictly scientific basis, there is no justification for extending "Noticeability" to a full third of the Park.

In fact, there is probably less than 1% of the Park area where the "Noticeability" standard might really apply at any given time. Surely NPS doesn't mean, then, to imply that visitors on-ground in the remote western one-third of the Park, or in the Marble Canyon region, are substantially more engaged in "activities other than contemplation of the national park"?

(Even in the so-called "developed areas" demarcated by NPS, such assumption is fallacious. People frequently engage in active contemplation of the national park in quiet times out on the Rim in front of El Tovar! Or on the woodland trails just southward of the "developed Rim", the same holds true. These experiences are characteristic on much of the North Rim's Bright Angel Peninsula. There are many very quiet, attentive periods possible within the "developed areas" even if somewhat more transiently. Visitors have a right to anticipate substantial periods of true natural quiet there, too, and indeed often do experience such.)

"Sleight-of-hand", *irrelevant* regulatory jargon seems to have crept in, masking NPS' excessive compromise in designating so expansive a Zone Two, *especially* the Sanup area and in the Marble Canyon area. The reasoning seems a disservice to attentive listeners and solitude-

seekers in those huge areas. It's like saying attentive listening in those areas is essentially futile, if engaged in, or just isn't sought by visitors there. That's really not true. What is being proposed amounts to a kind of political "Sacrifice Zone", for weakened noise evaluation/assessment.

In Marble Canyon, as well as in the Sanup area, many people on the ground are especially likely to be attentively listening to (enjoying) the *natural* Park soundscape. This includes, again, the "quiet at the lower end of the ambient sound level range that occurs regularly *between* wind gusts, animal sounds, "etc." (The *etc.*, again, may inevitably include some sporadic aircraft noise intrusions, albeit this time by general aviation. But that doesn't alter the lengthy and frequent "lower end ambient" periods here specified.)

To gratuitously load a 10dB "handicap" for noise assessment modelling into those areas ("Zone Two"), is more Politics than Science. Both Principles, in this instance, are being wrongly compromised or ignored.

My hope for NPS, and for this committee, then is please not to somehow mistake "Politics" (and that includes "Economic Greed") for true Science. True science has to prevail wherever it is most appropriate, so as to fairly carry out noise evaluation everywhere in the Canyon.

There are plenty of other places in this whole scheme where "politics" has a perhaps more inevitable place. The argument as to precisely what the cap on operations should be, or on the length of the curfew, or on the presence or absence of "flight-free seasons", or on the incentives to be provided for quiet aircraft technology, or on how close a route should be to a certain Tribe or to a renowned vista point (such as Point Sublime, for example): all these seem inherently more subjective, and hence partly political, determinations.

The problem of NPS decisions (or FAA decisions) based on *premature* politics, though, has unacceptably compromised many principles throughout this whole controversy. The Grand Canyon *aura* has been the loser, because FAA has seen this as primarily a "turf" battle, discounting the mission of the Park Service. NPS then makes political "deals" with FAA, or the other way around --sometimes without scientific warrant, or aesthetic, or even perhaps legal, justification--based on political and power considerations. Intimidation sometimes originates, sometimes not, from high level officials or from *perceptions* about power bases elsewhere in the Administration, or in Congress.

This would be fine if there were two Grand Canyons, maybe, but in fact there is only this one, and it is a premier National Park.

In my view, NPS should not become prematurely responsive, or do any "dirty work" for others (i.e., agencies, corporations, individuals) less sensitive or protective of the Canyon's resources. Let those others be the ones responsible -- openly -- for any "watering down" or interference-delay. NPS need not carry water for them prematurely.

The threat to stall or derail this whole process, whether coming from FAA or the

Administration, or the Congress, in an ideal world would not skew NPS from sticking to the "straight and narrow." But here again it has, apparently skewed by a factor of 1/3, over a matter which should solely be *NPS* not FAA's prerogative. We certainly congratulate NPS, however, for the 2/3 extent by which it has genuinely honored Science by coming to the defense of the Audibility principle.

Concerning the appropriate Congressional oversight:

The committee should restrain any scoffing at, or intimidation of, skilled National Park System employees. The committee should insist, rather, upon 95 to 100% of the Park being brought under the "Audibility" standard, and reject an obvious NPS/FAA "deal" compromising the Science. Also, it should certainly reject the effort to once again introduce economic and non-scientific ideology and comparisons into what is a *scientific issue*.

It was scientifically inappropriate for a lobbyist on May 25 to compare the 34 dB "quiet" of that suddenly quieted Congressional hearing room with the 17 dB *quiet* of the ambient Grand Canyon environment. When all the heated words were suspended, such a room must have seemed "silent" indeed! Yet that was still comparing apples and oranges. The Grand Canyon's sound level ambient pressure is only 1% to 10% of that found in a House hearing room, even when the room is "silent." Grand Canyon is a 10 to 100 times *more* fragile acoustic environment. Thus even a (far-off) 34-dB overflight through the *much* quieter Canyon environment conveys a perceived loudness to human ears, comparatively speaking, of a 50-55 dB buzz through that quieted room. Such motor buzz, in the Canyon, does relentlessly repeat every two minutes, for most of the day across many vast areas beneath and well beside air tour route corridors. Such endless buzz and drone and "whop-whop" unacceptably derogates one of the last true, grandly profound (but fast disappearing) silent landscapes anywhere on Earth.

For once, one asks the Committee to leave politics out of what has to be a rigorously *scientific* determination, if fairness is to mean anything elsewhere in this whole process or in other Parks and times to come.

In conclusion: *Audibility is Science. Noticeability is Politics.* Thus, this Splitting of the Canyon is Politics. This committee should stand up for Science, 100% Science, in this matter. Stand up for your National Park system's irreplaceable, actual *quality*. Stand up for the promise of the Park Organic Act: that this quality shall not be impaired for future generations.



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**PRINCIPLES OF LINKAGE  
BETWEEN  
THE NATIONAL PARK SERVICE ORGANIC ACT  
AND THE *NATURAL QUIET***

- (I) The sounds and silences of nature are among the intrinsic elements which combine to form the natural environment. Natural sounds amidst intervals of stillness are inherent components of the "scenery and the natural and historic objects and the wildlife" within National Parks.
- (II) Visitors to National Park System units have a right to experience all of the natural environment unimpaired. Within units of the System, natural quiet - the extended opportunity to experience simply natural sounds amid periods of deepest silence - must be preserved for the enjoyment and inspiration of present and future generations.
- (III) An important value of our National Parks System - not to be lost - is as protected, often vast, places of astonishing beauty and wildness. Each has thereby a distinct and powerful *aura*, fully dependent upon the often-subtle natural sounds and the hush. As such, they afford unique opportunities for undistracted respite, solitude, contemplative recreation, inspiration, and education.

Further, these units also provide scarce refuge and undisturbed natural habitat for animals. Artificial, human-generated noise can interfere with sensitive animal behavior. Such noise also degrades the *aura*, the special presence of place, with its sense of primeval character and solitude.

Therefore, thrill-seeking and noisy sorts of experiences which disturb the peace are not normally appropriate demands for our National Park System. These experiences should be provided by the private sector, elsewhere.

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