


# Lessons Learned



## from the Naturalist Center's Docents Regarding the National Museum of Natural History's New Learning Center

April, 2010

 Smithsonian Institution

Office of Policy and Analysis  
Washington, DC 20560-0405

## **PREFACE**

Docents make significant contributions to meeting the needs of audiences that visit the Smithsonian's museums. Without them, the experiences and learning that can take place would be greatly diminished. When the Office of Policy and Analysis (OP&A) is asked to do a study of an exhibition, it often turns to the docents to gain insights into how audiences engage with the display and what might have been done differently and better.

The fact that the National Museum of Natural History (NMNH) asked OP&A to conduct a study aimed at getting lessons learned and ideas for the new Learning Center being planned at the museum from docents at the Naturalist Center is testament to the important knowledge of audiences held among this group of volunteers. It was with pleasure that we undertook this study, both because it is an important one, but also because we were certain to learn a lot ourselves. And we did.

I found the docents' enthusiasm and insights useful, and I thank them for their generous contribution of time, information, expertise, and experience. I want to thank Naturalist Center employees Helene Lisy, Assistant Manager, and Richard Efthim, Manager of the Naturalist Center, for facilitating this study and for their valuable contributions. I also want to thank Shari Werb, Director for Education and Outreach and Bill Watson, Chief of Onsite Learning at NMNH, for their continuing efforts to improve the experiences of museum visitors.

As always, I am grateful to my staff who contributed to this study. They have again produced an exemplary study. Andrew Pekarik designed the study together with Bill Watson, assisted with development of the data collection instruments and collection of the qualitative data, and reviewed the report. Ioana Munteanu collected and analyzed the data and wrote the report, assisted by Whitney Watriss. Dawoon Jung, an intern in our office, entered the survey data, analyzed it and contributed to sections of the report.

*Carole M.P. Neves*  
*Director, Office of Policy and Analysis*

## TABLE OF CONTENTS

Introduction.....	1
Brief Description of the Naturalist Center .....	1
Purpose of the Study .....	2
Methodology .....	3
Findings.....	5
The Purposes of the Naturalist Center .....	5
Audiences .....	8
Center’s Strategies.....	13
The Building Blocks of the Naturalist Center .....	19
Activities and Programs .....	19
Naturalist Center Staff.....	23
The collection .....	25
Center’s Space, Design, Displays and Equipment .....	28
Reference Library.....	31
Marketing and Outreach.....	31
Evidence of experiences that suggest the impact of the center .....	34
Docent Recommendations for the New Learning Center .....	40
Functions .....	40
Core strategies .....	41
Staff .....	42
Audiences .....	43
Activities and Programs .....	46
Collections.....	50
Design.....	51
Afterword.....	55
Appendix A: Interview Guide.....	61
Appendix B: Focus Group Questions .....	63
Appendix C: Survey Form.....	64

# INTRODUCTION

## BRIEF DESCRIPTION OF THE NATURALIST CENTER<sup>1</sup>

Imagine you're a teenage girl passionate about butterflies. You have your own collection at home from your travels. You go to the Smithsonian National Museum of Natural History (NMNH) and see its displays of butterflies. You are even more interested. Now you want to find out what butterflies are in your collection and possibly to match them with another collection to see what you're missing. Where could you go to get the information?

In the mid-1970s, Dr. Porter Kier, the former director of NMNH, envisioned a collections reference center where anyone could come to seek in-depth information regarding any natural history topic. Kier envisioned that a center that would serve several functions:

- Provide visitors to NMNH with technical information
- Assist visitors who wanted to identify a particular natural object
- Provide visitors with a feeling of what it is like “behind the scenes” at NMNH
- Provide visitors a glimpse of the research world of a scientist
- Provide an opportunity to learn on his or her own

In December 1976 NMNH opened such a place – the Naturalist Center. Based on Kier's vision, the center was equipped with storage cases filled with 25,000 thousand catalogued, preserved, and organized collection items (typically, they were objects that lacked sufficient documentation to be part of the permanent collection); reference books; scientific equipment; and competent people to assist visitors. The center was located on a 7,500-square foot mezzanine between the public exhibition floors that was created when an interior yard of the museum was built over. As such, the center was not easily visible to regular museum visitors and did not get direct foot traffic; few visitors stumbled upon it. The main users arrived either because someone had told them about it, someone pointed it, or they had been there before.

---

<sup>1</sup> The information provided in this section comes from three sources: R. Efthim, Public Access to Museum Collections: the Naturalist Center, June 1989 [unpublished paper]; J. Madden, Bridge Between Research and Exhibits – The Smithsonian Naturalist Center, *The Curator* 21.2, 1978; and R. Efthim, The Naturalist Center: proof that a museum can do more to maximize the learning potential of their collections, *Museum Management and Curatorship* 21, 2006.

In 1996 the Naturalist Center moved to Loudoun County, VA as part of a collaboration with the Loudoun County public school system. Currently, the center provides public access to a collection of over 35,000 specimens including fossils, vertebrates, invertebrates, plants, rocks, and minerals, and anthropological objects belonging to various cultures. The specimens reflect each of the major research disciplines of NMNH and, as with many comprehensive collections, represent all biological and geological taxonomies. The displays within the Naturalist Center, however, focus mainly on natural history in the mid-Atlantic region. Most of these collections are on access in a large, open room, called here “Main Study Gallery”, and are organized into sections based on the departments at NMNH. Cabinets have representative displays on top and user-friendly labels, and typically each section has its own reference library. Collections can be taken out of the cabinets; tables and chairs are available for their study, along with microscopes and measuring tools; there is also a classroom available for students. The Main Study Gallery serves visitors over 10 who come for a number of different reasons; these audiences and the purpose and nature of their visits, described later.

The Naturalist Center space includes a front room, called the “Family Learning Center” by some interviewees, for children under 10, who as a matter of policy are not allowed in the main research part of the center. The Family Learning Center contains a variety of collections aimed at captivating the attention of families with small children. The Naturalist Center allows visitors to choose the themes, objects, and topics they want to research among the objects on display or in the drawer, along with a few engaging activities and displays.

The Naturalist Center also has an information desk in the hallway that links the Discovery and Main Study Gallery.

At the time of this study, the center’s staff was made up of two full-time employees, 50 to 70 docents, and a teacher naturalist on detail from Loudoun County public school system, who works full-time teaching classes for school children, most of whom come from Loudoun County.

## **PURPOSE OF THE STUDY**

Docents and volunteers are an exceptionally important part of the Smithsonian workforce. They are at the front line of the Institution, serving as the face of the Smithsonian for millions of visitors. They interact directly with Smithsonian audiences, are often the first to respond to their questions, and help visitors have satisfying and meaningful experiences, all the while observing what works and what doesn’t work and working to improve the Smithsonian’s offerings. Without the efforts and expertise of docents on the floor and behind the scenes, the Smithsonian would not be able effectively to carry out many of its functions, and especially the activities and programs intended to meet the needs of diverse audiences.

It would be remiss for any Smithsonian museum not to take advantage of the knowledge of the docents concerning audiences and how best to engage with them, particularly as they design new facilities and offerings. The National Museum of Natural History (NMNH) asked the Office of Policy and Analysis (OP&A) to explore in-depth what the Naturalist Center's docents believe makes the center effective, what lessons they have gleaned from their experiences, and their recommendations for the design of the new Learning Center, a 12,000-square foot facility to be developed at NMNH on the Mall. The insights and recommendations in the report come from the docents and center staff who spoke with the OP&A study team,<sup>2</sup> and do not come from either the study team or Naturalist Center visitors.

The specific aims of the study were to:

- Identify what elements/patterns/approaches at the Naturalist Center are critical to a positive visitor experience, so that they can be emphasized in the new center;
- Obtain docent views on how they see themselves contributing to the center, so as to maximize their input in the planning of the new center;
- Get the docents' perspective on the effectiveness of the Naturalist Center docent program.

## **METHODOLOGY**

The OP&A study team, together with the Director of onsite learning at NMNH, designed a study intended to give all Naturalist Center docents the opportunity to respond to questions such as: What lessons from the experience of staff of the Naturalist Center should be incorporated into the design of the new center? What works best for the Naturalist Center's visitors and why? What are the strengths and weaknesses of the docent program?

The study used three methods to collect the information:

- In-depth interviews with 2 staff and 15 docents. The interviews lasted from 35 minutes to 110 minutes, with an average of over 60 minutes (see Appendix A: Interview Guide)
- Three focus groups, two with nine docent participants and one with eight, that lasted over 90 minutes (see Appendix B: Focus Group Questions)
- A survey form sent at the beginning of 2010 to 52 current docents, with a completion rate of 45% (see Appendix C: Survey Form).

---

<sup>2</sup> The term staff is used in this study to denote both employees and docents.

In addition, the study team reviewed several published and unpublished articles about the Naturalist Center provided by center staff.

The study team transcribed the comments from the interviews and focus groups and analyzed all the qualitative data – including the qualitative data from the survey – with the aid of the NVivo software program. The other survey data were recorded and analyzed in MS Excel.

Some docents had the opportunity to give their feedback using all three methods if they wished.

This report consists of a finding and afterword sections. The findings section is divided into eleven sections that address aspects of the Naturalist Center such as purpose, audiences, strategies, activities and programs, staffing, collection, space display and design, reference library, marketing and outreach, interviewee's views of visitors' experiences, and recommendations for the new center.

## FINDINGS

### THE PURPOSES OF THE NATURALIST CENTER

Staff were asked to express their views about the purposes of the Naturalist Center. Together with the functions that Kier envisioned for the center, interviewees<sup>3</sup> noted: access to the real thing; teaching; learning; research; inspiration and motivation; and reconnection with nature. The docents perceived these functions to be complementary to one another.

#### Fill a niche in the museum world by “Satisfying the sparked interest” through access to the “real thing”

Most interviewees said the Naturalist Center’s main purpose is to provide hands-on access to “the real thing” and to give visitors a sense of being behind-the-scenes at NMNH. “The purpose is to give the public access to real specimens. People want to touch real things,” said one staff member.

Staff and docents alike felt that by providing that access, the center fulfills a unique role within the museum world. While a visit to a museum can “inspire” people and make them curious, it does not satisfy those ready to look more in-depth into a particular topic or phenomenon. In contrast, interviewees see the principal role of the Naturalist Center as providing people full access to the collection so as to satisfy their interests more fully.

*[At a museum] you have a cart that teaches an interesting experience about [bones]. In 5-10 minutes of experience I can give you a flavor of what you can learn about [bones] that I’m sure you’ll find interesting, but do you know what to do with that information? You may want to learn more about it. You can probably go online, but why not use the Naturalist Center? To me that is the ultimate sacrilege – to say... the purpose is to motivate people and [get them to] want to learn more about the natural world, and you do not do anything to sustain that learning. What you are doing is providing people with a skill set, but no access to further their learning at the museum.[...] For example, you*

---

<sup>3</sup> Because the qualitative survey responses were analyzed together with the interviews and focus groups, the term “interviewees” denotes all three sources of data.



*are watching TV, and they have a commercial whose purpose is to get you to buy a product like Coca Cola. You watch this thing, and you say you're thirsty and you want a Coke. But then you go and ask for one, and you're told, "I'm sorry, but we can't sell you a Coke." So basically it's [like we're saying] we want you to be motivated to learn about science but not here [at the museum]. You can go learn about science some other place.*

Another interviewee described the unique experience available to visitors at the Naturalist Center:

*As someone mentioned, being able to touch these things, that's a difference that when you go to a different type of museum you can't pick these things up. Here you can pick them up, you can show them to people, they can look at them from all sides. That's invaluable.*

## Teaching<sup>4</sup>

Many interviewees indicated that the Naturalist Center's most effective function is teaching. This function is mainly facilitated by the partnership between the Smithsonian and the Loudoun County public school system, with the resident teacher naturalist offering lessons to visiting classes on a variety of topics using Naturalist Center resources. One interviewee made this point forcefully:

*I can't really be the teacher I am without the Naturalist Center. I use the Naturalist Center in so many ways. Yes, as a teacher, I can't do the job I do at my school without the Center.*

Many interviewees went further, saying that almost every interaction they have with audiences is a teaching opportunity, from "teaching them how to touch objects" to "teaching them process or knowledge."

The teaching function also came up when docents talked about students teaching students, parents and grandparents teaching their children and grandchildren, etc.

## Learning about the world

---

<sup>4</sup> This study did not attempt to assess the effectiveness of the "teaching" aspect of the center. Rather it focused on eliciting the docents' experiences and views of what makes the center effective. That is, it presents what the docents had to say about the effectiveness of the center. More details on the center's learning function can be found in Efthim Richard, A Touchable Museum That Teaches, *The Science Teacher* 55.1., 1988, National Science Teachers Association, Washington, DC.

According to the interviewees, the Naturalist Center is an incredible learning environment in which visitors can engage in a variety of forms and levels of learning. They can engage in completely self-directed learning by interacting with objects of interest from the collection, they can complete one of the structured activities available for any user, or they can engage with a knowledgeable expert on a topic of interest.

Interviewees described the learning that takes place at the Naturalist Center as “unique,” “informal,” “free-choice,” and “hands-on,” in that it “engages visitors at various learning levels and styles,” from simply “exposing visitors to the natural world” to learning about “science knowledge, process, or concepts,” or answering visitors’ very practical questions. One interviewee spoke about a very basic learning that takes place:

*It means making people aware of the natural world that they aren't normally aware of, things that people don't normally come in contact with. This is a place that broadens their appreciation of the world they live in.*

### **In-depth study and research**

A recurring comment was the opportunity the Naturalist Center provides visitors to conduct in-depth research. Many interviewees said that one purpose of the Naturalist Center is “to encourage independent scientific study” and “provide professional scientific information to serious researchers.”

### **“To spark the interest” or “to hook” audiences into science and the natural world**

This is the function that interviewees were the most passionate about. When describing this purpose of the center, they used words such as “spark interest in nature,” “connect with nature,” “re-excite people about the natural world,” “motivate,” and “engage them in the process of discovery.” Some interviewees used a “hooking” analogy “to hook people into learning more about the natural world,” one staff said. Another interviewee simply said “the purpose is to motivate people to want to learn more about the natural world.”

In describing the role of the center with the life-long learner, one person said it is

*To spark the interest of our visitors, from those 2-year olds to those 102-year olds, in objects they can find in nature, even in their own backyard, and instill the instinct to question how and why nature functions as it does.*

Another person, describing how audiences can get engaged in science by being exposed to a semblance of the work environment of scientists at NMNH, said:

*I think giving people the opportunity to work like a scientist for a day, which could be just for fun, or even a career for them. I didn't have anything like that when I was a kid, and I think it is important to give kids that opportunity, realizing that they could do that as well.*

## Other purposes

Interviewees saw the Center as serving additional purposes. One was to advocate for nature and science by describing “to visitors about conservation and pollution, for this is one area that most people know little about.” Another interviewee described the Naturalist Center as “reaching out to the public – old and young – through a hands-on approach to discover the meaning and purpose of science as well as its excitement.” A further purpose was “taking questions from the public and giving information, mainly to take the burden off of the researchers downtown.”

## AUDIENCES

According to interviewees, a variety of audiences visit the Naturalist Center, each with its own needs and interests. Before looking in more detail at which audiences staff think are best served by the center, it is worth reviewing those aspects of the center that docents and staff alike mentioned as particularly important to serving visitors:<sup>5</sup>

- Number and variety of collections
- Location of the center
- Access to staff
- Programs and outreach activities
- External events
- Space
- Operating hours

---

<sup>5</sup> Interviewees spoke about how the location of the Naturalist Center within NMNH, before its move to Virginia, affected audiences. R. Efthim, Public Access to Museum Collections: the Naturalist Center, June 1989 [unpublished paper] provides more details on this topic.

Interviewees commented on how critical it was that the center have enough specimens to allow audiences to conduct proper research. In this respect, the center encourages visitors, mainly amateur naturalists or other individuals with a question or an object to be identify, to conduct research that will lead them to the answer.

The change in the location of the center from the National Mall to Loudon County dramatically altered its audiences. When it was on the Mall, 80-90% of its visitors were made up of amateur naturalists, repeat visitors, general visitors, and visitors who were sent there because they had specific questions or objects to identify. It did not, however, fully carry out its “teaching/educating” function until it moved to Loudoun County.

*[On the Mall] we had a lot more access to the inner-city schools, and also George Washington University, [to] one of their geology professors. ... We had a lot more people off the street, because they knew about us. And I think in part the information center downstairs [at the museum] would send people in, and that was helpful.*

A number of comments noted how the move to Virginia changed the center’s audiences. The new location’s limited visibility, and lack of access to public transportation and foot traffic, along with the partnership with Loudoun County, reversed the proportion of the different types of audiences. The access to scientist was also significantly diminished. Currently, 80-90% of the visitors to the Naturalist Center are classes and organized groups.

*The percentage of visitors at the center now compared to what it was in DC, when you think of visitors vs. school groups, is completely reversed. Ninety percent of our visitors were walk-in visitors and 10% were school groups in DC. In Loudoun County it’s reversed: 90% is school groups and 10% is general visitors. We no longer have the walk-in visitors from the rest of the museum. In Loudoun County we are a [specific] destination. We do not have public transportation. You have to know that you are going here, and you have to drive in. So motivation is much stronger than serendipitous. We still get that [walk-in] as well because we have the signs.*

One interviewee, talking about how the two locations affected audiences, said:

*You have a rural vs. urban difference; they don’t want to deal with the traffic. You have very highly educated [audiences] in both populations. We get a lot of home-schooled children here, with the Discovery Center up front. The standards of learning in Virginia helped us out a lot. One difference for here – most of the teachers were science teachers.*

Interviewees often mentioned the spike in audiences when programs (e.g., lectures, “Drawings from Nature”) or outreach activities (e.g., collections loan programs) are conducted.

External events such as a graphic illustration or drawing contest arranged by outside organizations also bring in more audiences, according to the interviewees. A discussion of the impact of space and that of operating hours is included in a different section of this report.

When asked about the audiences for which the center works best and why, many staff could not pick a single type. They generally believed the center, through its strategies and features, captures everybody's attention in a meaningful way. To stress this point, one docent said:

*I don't think it is limited to a specific audience. We have little kids to grandparents, and I think all groups are interested and get something out of it.*

The study team classified the various audiences based on the staff's descriptions of visitors' levels of interest, nature of their visits, engagement with the center and with the collection and staff, and time spent in the center.

**Accidental visitors:** these people stumbled upon the center by chance. Some leave immediately and some become immersed in the center, talk to staff, and use resources.

**General museum-goers:** this type of visitor wants to check out a Smithsonian venue. They are curious, but not necessarily interested in nature. They may become immersed in the center, talking to staff or using resources.

**The curious:** these visitors have an interest in nature that's not (yet or necessarily) passionate. This category includes families or groups who have come to the center because someone believes that providing kids with access to the center is a good developmental opportunity or because a member of the group is particularly interested and curious about nature. These visitors are likely to engage with the center and use its resources and activities.

**Amateur naturalists:** members of this group have a high level of interest in nature, although they may not have a concrete purpose for the visit; they may be repeat visitors. They engage with the collection by pursuing their own interests, and sometimes will engage with the staff or in activities.

**Purposive visitor:** the following audiences fall into this category –

- Artists, illustrators, photographers
- “Oracle” visitors: those who come to the Smithsonian with a specific question or object to be identified, as to an “oracle”

- Teachers<sup>6</sup> are using the center for research or teaching

The purposive visitor generally wants one-on-one access with the objects and tends to use the center's resources fully.

**Classes:** In addition to classes of students<sup>7</sup>, some adults interested in drawing, etc. come to the Naturalist Center for a structured experience. The teacher naturalist, with the help of docents and staff, teaches classes/conducts activities on various topics such as classification, adaptation, etc. for these audiences.

**Organized groups:** This category includes groups from schools, people with special needs, and the elderly. They are likely to take a tour of the facility, talk to docents or staff, and engage with the activities or collection.

**Docents:** The study team considered docents themselves to be an important audience of the Naturalist Center because most docents said they get multiple benefits from dedicating their time and knowledge to the Center.

- **Reaching out to others.** Often-cited reasons for volunteering with the Naturalist Center are “sharing my knowledge with visitors,” “teaching the students,” “helping visitors find the answer to their question,” “helping visitors have a good experience,” and “serving the visitors.”
- **Social interaction.** Most docents enjoy the social opportunities at the center – “I enjoy meeting the public,” “talking with and learning from the other docents,” and “interacting with staff.”

**Personal enrichment.** At the top of the list of benefits was the personal enrichment that comes from interaction with other docents, staff, visitors, and the collection, and from the opportunity to pursue research – “learning from others,” “learning from collections,” “research,” and “satisfying my interests.” One docent talked about the unique opportunity the center offers:

*As a docent you have these incredible opportunities. For instance, the corals were orphaned when I arrived, so I immersed myself in studying the corals. It was wonderful. I would not have had this opportunity anywhere else.*

Another docent elaborated on explained learning from others:

---

<sup>6</sup> The ways in which teachers use the Naturalist Center is discussed in R. Efthim, The Naturalist Center: proof that a museum can do more to maximize the learning potential of their collections, *Museum Management and Curatorship* 21, 2006.

<sup>7</sup> The use of the Naturalist Center by classes is further discussed in R. Efthim, *ibid.*, and in R. Efthim, A Touchable Museum That Teaches, *The Science Teacher* 55.1., 1988, National Science Teachers Association, Washington, DC.

*Certainly the people connection. From all the docents I have learned a ton of things that I did not know before. Learning from the children is valuable, seeing them react to the things that they have never seen before... I also enjoy the materials; they broaden the teaching possibilities.*

- **The Naturalist Center docent experience.** The vast majority of docents listed the work atmosphere as a principal benefit of the Naturalist Center. They described the environment as “inclusive,” “allows independence,” “family-like,” “reliable,” “fun,” “caring,” “entertaining,” and “accepting.” Said one person,

*It's also a very accepting environment, so if I'm interested in something, and I pose a question, I know that I'll get many responses, and no one will mind talking about that ... it's a very inclusive place... I have all these people in my life; I know that there's always somebody that I can talk to validate the approach I'm using.*

Another docent compared the docent experience at the Naturalist Center with that in other places:

*This is a much better place than any I volunteered before. You have space for volunteers to meet, and you have considerable independence. For example, we can do our own schedule. We don't have to follow rigid protocols. It is also very intimate and self-contained.*

Yet another docent talked about how “we all have specialties, and we work together on different projects. I would be very sad if I could not serve as a docent here. It has become a part of my social life.”

A comment made by many docents is how supportive the center's staff are and how much they do to facilitate the docents' work. All praised the docent manager.

## CENTER'S STRATEGIES

When asked what makes the center effective in addition to its collection and specific features such as resources and staff, interviewees talked about key strategies and operating principles (the outcomes of these strategies are further discussed in the “Experiences” section).

### An audience-driven experience

Interviewees repeatedly highlighted that the center’s main strategy is to allow visitors to pursue their own interests, find what they are looking for, and get answers to their own questions. This strategy is implemented by providing open access to ALL of the collection, staff, and other resources of the center to enhance free-form exploration and discovery. Visitors are able to interact with the collection at any level they please –looking, touching, measuring, comparing similar or different objects, and sharing with a family or group member. “Providing a collection of artifacts that enable people of any age to learn more about aspects of scientific interest them” is how one interviewee put it. Yet another commented, “to provide learning opportunities in a wide variety of areas for all to discover.”

### Highly personalized/customized experiences

According to staff, besides that fact that the center bases its operational approach with the goal of offering visitors the option to interact with the collection at the level they please, every visitor gets personal staff assistance if they want it. Staff help visitors identify what to see or do and how to do so. There are opportunities for one-on-one dialog with staff to get answers to questions. Some docents described how these conversations “build momentum,” “spark visitors’ interest,” and “get people motivated” to pursue something on their own, further engage with the center’s resources, and make new discoveries. Highlighting this point, an interviewee said:

*The center is highly customer-centered. When somebody comes up to the door, they are greeted immediately by a [staff member], and we assess their needs, tell them what we are and how we can be used. So whether it’s for simple reasons or expanded possibilities, that [customization] has always been the main focus: visitor assistance and helping them get where they need to be, even on the phone. Often the Smithsonian telephone service would send people directly to us because even though it [the call] was for NMNH [downtown], they knew there was a person here who was going to answer the phone and get the answer for somebody.*



Another interviewee spoke about trying to identify a visitor's interests and then assisting him or her in pursuing it – “a lot of times people need guidance to get going; you need staff and docents to help them get started.” Another one said,

*in some age ranges some kids like to pretend that they are not curious. Some docents can get kids interested even if they are pretending that they are not. Looking at cabinets and being able to examine everything gets them more interested.*

One person described the difference between what happens at NMNH on the Mall and at the center:

*If you go into the Natural History Museum downtown, you can see the Hope Diamond. It is cool. You see the elephant, bones, some exhibits...here [at the center] you can actually talk to a docent who knows something about what that is. We have exhibits, but we also have people who will talk to you.... we will hand it [a specimen] to you and ask you, “What do you think it is?” People would go “I don't know...” You get them to think. I would say the niche is the interaction between the docents and the public, to try to get them as excited as we are about nature.*

### **One-on-one time with knowledgeable experts**

Another point that came out of the interviews is the importance of having enough docents:

*When people come, we have people to help them, and we are there for them, and we have enough people to help them. We are not just security guards. People come in and say they just want to look around, but when you ask them questions, they open up, and it is wonderful. They get engaged, they get interested. The docents are key to the experience.*

Availability of knowledgeable staff goes beyond providing a customized experience: visitors can get a one-on-one lesson with experts that can “open minds” or, even further, build mentoring relationships. A docent offered an example:

*Many like having a docent as a mentor. I had one woman who is a microbiologist, and another one was a geologist. She is here every Thursday, and I work with her. They enjoy having that mentorship because working one-on-one they can ask those questions, [we] get them involved in it and see somebody with an interest...*

### **Interaction tailored to individual learning levels, styles, and engagement preferences**

Interviewees spoke often about the variety of people who come to the Naturalist Center. Audiences differ in their interests, ages, levels of knowledge, learning styles, and ways in which they want to engage with the collection. Some prefer free engagement with the center, others need guidance in finding what they are looking for. For some, their interest is sparked instantly, while others need some sort of entry point to the collections. There are people who like staff to talk them through their quest, whereas others like to learn by doing. Some need to listen to staff, others to learn by themselves. Some want to see staff engaging with the collections or want to use the collection themselves. Some are attracted by “the familiar” specimens and want to further explore what is in their backyards, while others are attracted by “the new.” A strength of the center is its ability to respond to this range of preferences – staff are able to tailor their interaction to a visitor’s preferences. One docent talked about how she responds to different audiences:

*There is a difference in needs. Children are more used to visual stimulation. They don’t have the attention span that some of the older people do. The older people cannot talk for a long time. With kids you have to be quicker. You have to make your point quickly, or they lose interest.*

Said another interviewee about visitors’ levels of knowledge,

*Kids on the other hand don’t have a good appreciation for some of the historical aspects because they don’t know. They have not learned about the migration of people out of Africa into Europe and Asia and then across to the Americas. With students it is mostly an overview type thing. You can touch on a lot of different aspects. The adults, they would ask you questions. You either know the answer or you don’t and you look it up. It is a lot more interactive with adults. Then you get people that have a professional interest. They are a law enforcement officer or student anthropologist. For a lot of them this is the first time they work with such big collections.*

Yet another interviewee talked about managing students’ personality types:

*Here it is not a one size fits all, like in a standard classroom ... Most students thrive in it [that environment], but those who that are labeled “gifted” and “talented,” they do not do as well, because they come up and they want the answer, and we don’t give it to them, and they go ask someone else. In the “Unknowns” [activity at the center], they are put into groups that can help them learn. Also in the same category you have these very smart kids; they are the most likely ones to jump to conclusions. They say, “I have the answer.” They mistake a turkey drumstick for a deer radius. Because they are so smart, they do not have to pay much attention. And as a docent you have to ask them, “how did*

*you come to this conclusion?” The ones who know the answer first are the ones who fall into the traps.*

### **Empowering visitors – “drawing out,” not “pushing in”**

Since the center’s inception, one of the key operating principles has been to provide audiences an opportunity to learn through their own efforts. Staff are trained to encourage and guide visitors to own and control their own experiences. Interviewees pointed out that everything about the center encourages people to “think,” “ask and answer questions,” and be “inquisitive.” Visitors experience this *modus operandi* from their first interaction with docents. If they ask questions, staff are trained to help them find their own answers, their own solutions; activities are designed to encourage visitors to solve the puzzles by themselves. In short, the essence of the center is a process that encourages visitors to ask questions, become inquisitive, be creative, and solve problems while engaging with collections. As a result, people become more curious and feel motivated to learn more, and the center helps them “own” the learning. One docent described how the process works for both the docent and the audience:

*I like it because people can walk in here, and they would think; little kids find a rock or whatever, and they want it identified. We don’t simply give them the answer; we go through the process with them on how to identify ... [and] we learn so much from those [encounters] ourselves because we can’t possibly know everything in that back room, you know, we don’t know all the subdisciplines of the science, but we try our best, and going through that process with them we learn, too. It’s very satisfying, and it’s great to watch the kids, their eyes open up, the older adults... it engages them in the process. Once they’re engaged, they’ll come back. If we’re just giving them answers, they can get that anywhere; they can get that off the internet. Coming in here and actually working with the collection – that brings them back.*

Another interviewee explained her perception of how this process works for different audiences:

*The way that I would describe it is “inquiry with purpose.” The activities that we design are the ones in which we provide a motivation to want to study in more detail than they would without our prompting. What we find happening – and this was consistent regardless of age, subject area, ability level – was that the students wanted to be able to do something productive and challenging. It’s like trying to solve a puzzle. People like to solve puzzles. While in their mind this is what they were doing, the activities were structured as such that they [the students] were also learning basic core concepts in science like classification, biodiversity, animal adaptations, things like that.*

With respect to visitors “owning” the experience, an interviewee commented on how that happens:

*A few years ago, two seniors, husband and wife, came in with their shell collection. They'd been collecting it for years and finally retired and wanted to identify the species. So Richard sat with them, showed them how to do it. It's their collection. They take ownership of it. If you identify every shell [for them], what does it mean to them? It's just a named collection. It is more than giving them names; it is involving them in this so that they feel enabled, and they could do so much more than they ever thought they could, and the shell collections has so much more meaning that it ever could.*

### A “learning ecosystem”<sup>8</sup> for visitors

More often than not, staff indicated that the Naturalist Center recreates the learning ecosystem of the scientist, and, more importantly, of anyone actively engaged in any thought process. By offering the “hardware” (collections or “primary data,” activities, equipment, books), by empowering people to engage in inquiry, and by having staff offer guidance, the Naturalist Center helps people pursue any interest they have through whatever means they see fit.

Staff highlighted that this learning ecosystem allows for one particularly important attribute of the center: the flexibility to allow audiences to manipulate the space to have experiences, engage in learning and research, and be taught according to their preferences. One interviewee exemplified this in explaining how the center was used to teach a physics concept:

*Another one [activity] we created from scratch was “flying styles.” We took a field guide that had silhouettes of different birds in flight. We took 5-6 of those things with different shapes and said, “Based on what you see here, can you predict what they were built for (maneuverability and speed, rapid take off, sustained flight, etc.)?” When they [the students] went back and looked at aircraft and the different proportions of size of wing and build of body, etc., they began to see how humans have adapted the same sort of things, and [they were] saying that humans did not invent anything that nature did not invent already.*

---

<sup>8</sup> The Director of the Naturalist Center described the Naturalist Center environment as a “learning-centered ecosystem” composed of access, cognitive skills, and resources. R. Efthim, The Naturalist Center: proof that a museum can do more to maximize the learning potential of their collections, *Museum Management and Curatorship* 21, 2006.

## Appeal to local audiences

The center aims to be relevant to likely visitors by focusing the displays and collection on North America so that visitors can be attracted to the specimens and learn what's in their backyards, thus making the center more relevant.

*The collections were also targeted to mid-Atlantic natural history. They were not on display at the museum [NMNH] because the museum looks at the best, biggest, greatest, etc., more like the national audience, not the local one.*

## THE BUILDING BLOCKS OF THE NATURALIST CENTER

Staff listed the elements they thought are critical to fulfilling the purpose of the center: the activities and programs; staff; collection; center's space, design, display, and equipment; reference library; and outreach. However, interviewees insisted that no particular element by itself is especially effective. Rather, the way the elements work together is what makes the center effective. Interviewees' suggestions for improvements appear at the end of each section.

### ACTIVITIES AND PROGRAMS

The Naturalist Center offers a number of activities for everyone who comes to the center. Some are used by both the general public and classes (e.g., Museum Mysteries, Unknowns, and Drawing from Nature), whereas others are geared for elementary and high-school classes (e.g., Classification I, II, and III, Rocks and Minerals, Adaptations, and Speciation).<sup>9</sup> Still other programs and events are particularly suitable to outreach, such as Lectures, ID-Days, and Drawing Days. The center's activities are also used for docent training and teacher workshops.

The purpose of the activities is to “entice visitors,” “help them focus,” “get visitors interested,” and “provide an entry point” to the collection. They should also help visitors develop problem-solving skills and guide them on how to use the center's resources. Interviewees stressed that the activities are just one element of the center, along with the collection, the center's educational strategies, and other resources. The center's effectiveness, they said, derives from this combination rather than any single element.

Interviewee comments on some of the activities are summarized below.

#### Museum Mysteries

The Museum Mysteries activity has the visitor solve a puzzle about the condition or status of a specimen displayed in the Naturalist Center. Because the “mystery” generates interest, it is a particularly good way to entice visitors who came for no particular purpose to engage with the collection. It encourages them to pose questions, use equipment used by scientists, and solve problems:

---

<sup>9</sup> See a full listing and description at [http://www.mnh.si.edu/education/fieldtrip/planned\\_programs/naturalist\\_center/index.html](http://www.mnh.si.edu/education/fieldtrip/planned_programs/naturalist_center/index.html).

*Now, in Museum Mysteries, questions are asked. We have a dog skeleton. On the mysteries it says that “the scientist believes that this dog may have been hit by a car. Can you find on the bones the features that gave the scientist the clues that suggest it might have been hit by a car? A second question, once you find them, is do you think the animal survived the injuries or died?”*

One docent thought the Museum Mysteries activity is the key to the center’s effectiveness:

*Mysteries is probably the most effective thing we have in stimulating people’s thoughts. I don’t think just seeing the specimens will necessarily stimulate interest. Just looking at the horse skeleton won’t make you think. But the mystery associated with it will generate interest.*

Museum Mysteries and the Unknowns (discussed below) have also proven a good tool for training docents and for teacher workshops.

## Unknowns

The Unknowns activity comes in three versions. In one, two visitors, most often students, are asked to research a museum object using the identification keys and the center’s collection,<sup>10</sup> The second version, often called “ID<sup>11</sup>” by interviewees, is used when the object is something brought in by a visitor for identification, rather than something from the center’s collection. However, the visitor still uses the collection and the assistance of staff to identify the object.

The purposive visitor generally chooses to engage in the Unknown process, and the activity is often used for classes, docent training, and teacher workshops. However, interviewees said that often the activity is recommended for and used by other audiences, especially families, to enhance bonding and teamwork.

According to interviewees, about twice a year the center organizes an ID-Day when visitors are invited to bring in their own “unknowns.” Center staff and a NMNH scientist help with the identification by guiding visitors through the inquiry process. Interviewees indicated that the activity is popular. They believed that visitors learn more about what they bring in and, hopefully, more about the identification process.

---

<sup>10</sup> A detailed description of this activity as well as an assessment was written by Radise Segametsi in An assessment of the effectiveness of educational programs in relation to school curriculum needs – A Research Fellowship in Museum Practice, 2005 [unpublished paper].

<sup>11</sup> The initial Naturalist Center role in helping visitors identify their own “unknowns” is discussed in R. Eftim, Public Access to Museum Collections: the Naturalist Center, June 1989 [unpublished paper].

## Drawing from Nature

In the Drawing from Nature activity, members of art classes use the collections to practice observation and drawing skills by looking at the designs, colors, shapes, etc. of specimens. Although designed mainly for art classes, interviewees indicated that other audiences, such as families and scientific illustrators, also enjoy the activity as a hobby or as a learning style. Depending on the audience and its purpose for visiting, the activity can be adapted so that the person draws a specimen from memory and then compares it with the real thing. One interviewee emphasized how the activity can enhance skills: “It validates what visitors know and makes them attentive to what they don’t know, makes them curious.” Yet another commented,

*Somebody had kids, of any age, draw an animal from what they remembered in their head. Then they saw the real animal in front of them, and they saw all the stuff they missed. That made them curious, like, “why do they have that on them?” They learn so much from seeing it in real life.*

As with the ID-Days, the center organizes Draw-Ins Days, which it advertises in *The Washington Post* Weekend Section. At this event an artist or illustrator provides one-on-one feedback to about 10 participants who draw a specimen. Talking about the event, an interviewee noted,

*It might be fossils one day, or gems or minerals. They always had artists, and children were encouraged to come and draw. A lady would come and give them tips and critiques. It was always in a very helpful way. I learned a lot too, I really did.*

## Lectures

Lectures involves a scientist from NMNH coming to the center to speak on current or popular issues. Interviewees indicated that the activity has a dual purpose – it serves as outreach by attracting visitors interested in the issue being discussed, and it is especially effective for visitors who learn more by hearing about something that interests them. As one interviewee commented,

*[The lectures] function in a similar way to get people in the door. Scientists from the museum come talk about their research. They [the topics] are either popular things or current issues. For example, [if the scientists are] talking about forensic anthropology, we would pull a few things from our collection or we would encourage participants to go to the human osteology lab and open the doors and do some research on their own.*



## Other activities for classroom purposes

Several interviewees who assist the teacher naturalist spoke about the effectiveness of some of the activities used mostly with students, such as Classification,<sup>12</sup> Adaptation, Rock and Mineral, Speciation, and Biodiversity. Interviewees stated that the purpose of these activities, besides helping students learn how to use the collection, is to fine-tune their observations skills, engage them in the inquiry process, and have them learn scientific concepts such as classification and adaptation.

The Classification activity teaches students how animals are classified, which is a 5<sup>th</sup> grade standard for learning. According to one interviewee,

*Classification 1 is a very basic thing, looking at similarities and differences of three different organisms. Classification 2 uses insects to talk about classification in a little bit more detail. The kids get introduced to taxonomic keys in classification, and they try to identify these mystery insects using prepared keys. In Classification 3, they take that a step further; they are asked to identify what they see as the distinguishing characteristics between different insect orders and then to prepare their own key that says, if you find this particular feature on your insect, it is in this order; if you don't, go to the next line that is under this order. That is all tested by giving their keys to another student to try and identify a known insect. It gets a little bit more complicated in the level of problem-solving skills.*

Rock and Mineral is a structured activity aimed at introducing children to the basics features and characteristics of three main types of rocks and minerals. One interviewee pointed out that this activity

*is a little bit more directive than a free form or Unknowns exercise. It is a "sit down and follow the instructions." But there is a lot of self-assessment going on through the activity, and it is one of the most popular among the programs. From the feedback we've gotten from teachers, this is more about enhancing the cognitive processes in students and grasping what we talk about when we discuss inquiry-based learning, and how to recognize it from something else that is different. As we tweak this lesson to make it better, more student-centered, it is getting better and better, and we have a larger demand for this activity.*

---

<sup>12</sup> A detailed description of Classification II as well as an assessment of it was written by Radise Segametsi, An assessment of the effectiveness of educational programs in relation to school curriculum needs – A Research Fellowship in Museum Practice, 2005[unpublished paper].

## Suggested improvements for center activities

Interviewees had nothing but praise for the activities. The only comment they offered was “we need more of them.”

## NATURALIST CENTER STAFF

### Docents

About 50 to 70 docents help the Naturalist Center carry out its work. Interviewees described the team of docents as highly skilled and knowledgeable, with a variety of degrees, specialties, and experience. Some have degrees in zoology, botany, horticulture, anthropology, and other fields. Others are teachers or former teachers, gardeners or birders, artists or photographers. All spoke enthusiastically about their passion for the natural world, their continuing pursuit of their interests and increasing their knowledge, and their commitment to the Naturalist Center.

Some docents have been around since the center was envisioned; others have come on board more recently. According to the survey results, the average time a docent has been with the center is 12 years. On average, a docent spends 14 hours per month working at the center; some volunteer just a couple of hours a month, while others volunteer up to 36 hours per month.

The docents’ main responsibilities are interacting with visitors, working with the collection, and assisting with the activities and programs. However, not all docents carry out the same tasks: some are better at greeting visitors, others at interacting with children, others at maintaining the collection. Nor do they have the same number of tasks – some have just one, others more than one.

A staff member summed up the importance of what the docents do as follows:

*The Naturalist Center works because there are highly skilled volunteers who care about the collections, the museum, the visitors and giving them a good experience. We will either open [the visitor’s mind] up to look at who they are or give them what they need in a basic way or to the point where they can really do independent study.*

***Interacting with visitors.*** The degree to which the docents interact with visitors varies in intensity according to a visitor’s interests and reason for visiting, age, learning style, knowledge, and preference for interacting with the collection. In some circumstances the interaction may be as simple as a “hello” by the docent staffing the information desk, or may involve an introductory tour of the room and instructions on how to use the specimens. The docent may play

a much more active role, such as working to spark a visitor's interest, guiding visitors to find answers to their questions, getting them thinking, and enabling family interactions. They also serve as role models and mentors –

*I think we're role models, too, without realizing it. I've had that happen, where I was looking at one of the cabinets and writing something, and this girl came in with her mother and grandmother. They were Spanish-speaking. I could hear the girl telling them, "See, she's looking at the cabinet and writing down what she sees." I was telling the girl that she could have a career in science...Every day is like that.*

and as teachers –

*It's the teaching you bring to the children, provide some value to that experience, yes. The babysitting in the front [the Family Learning Center] is very useful, and some of the docents just take over. Their mothers sit there, but the children are entranced ... The younger interns are great with the little rug rats out front. That is a valuable asset to those of us who are here outside.*

***Assisting the teacher naturalist with teaching the classes, or teaching the classes themselves.***

The docents help the teacher naturalist and one another with classroom presentations, research, keeping order, cleaning the classroom, and so on.

*"Normally during the school year we'll have class and I'll help. We usually have two classes. One here [in the classroom] and one out there [in the center], and then we switch. So I will be teaching in the morning. In the afternoon I usually do some sort of research, development of either a program or an exhibit.*

***Working with the collection.*** The docents do almost all the collections care and management. They identify and organize the specimens, do taxonomy, top up the liquid in the containers of the wet collection, turn bird skins into study skins, complete the labels on the cabinets, prepare the signage, carry out inventory and repair, and perform many other tasks. Two interviewees commented on this work:

*There are several books on corals and on sponges. There are electronic copies. The books on the corals were written by other docents. I just redesigned them and added pictures and layout. Really, if the docents weren't there actively doing things, nothing would happen.*

***Research and development of programs, activities, and displays/exhibits, and outreach.***

The docents contribute to conceptualizing, designing, planning, and implementing most of the programs, activities, and displays at the naturalist center. In addition, they help with research on

specific topics, “updating labels” or with outreach to schools. Other functions such as updating books, designing booklets, photographing collections, and many other functions were also mentioned.

### Suggested improvements for human resources

Despite the docents’ strong satisfaction with the center and the work they do, they did talk of some potential improvements:

- More employees<sup>13</sup> and docents to answer questions from a demanding public
- More teacher naturalists
- More younger docents to attract audiences in that age group
- More training opportunities for docents
- More participation by scientists and the teacher naturalist in training docents and presentation of events

### THE COLLECTION

Open access to the collection, as well as its variety, quantity, and quality, are critical to the center’s purposes, according to interviewees. The collection “sparks interest for science,” “stimulates thinking,” “wows visitors,” “gives answers to questions,” and is the subject of “in-depth research.” It is used for all activities and classroom experiences, and objects are loaned to Loudoun County schools. One interviewee summarized what the collections do for audiences:

*They want to know where the specimen came from, how did we get the collection, they want to be able to make connections between other parts of the collection. We use the globe a lot [because] people want to relate to where the specimens came from, how a bone will work, and to make sense of the size of the animal. They also enjoy comparing similar bones. They just want to see more and more. They also like to put the parts together. For the people who have their own collection, they just want to look at our printed materials.*

---

<sup>13</sup> Many docents highly praised the Naturalist Center employees for their leadership, guidance, caring, and morale.

## Open access

By offering unrestricted access to its collection, the Naturalist Center occupies a distinctive niche in the museum and school worlds. According to interviewees, allowing visitors to find the object of their interest, pick it up, contrast and compare it, and have a direct experience with it makes a visit to the center unique. While some schools provide access to natural specimens, they do not offer the same free access at the same level of quantity and quality.

One interviewee explained how open access allows visitors to pursue their own interests:

*In the Naturalist Center, families were not restricted to what was on display... We give them the ability to customize their experience, as they can wander and look at things in a much more intimate sort of way. They [the specimens] were not behind glass, they were not at a distance that they could not touch [as in a museum]. That in itself would allow them to see from different perspectives, to be able to sit down at the table to work with objects, and work with books.*

Another interviewee described how open access to the collection can inspire learning:

*They go and look at the polar bear as it is kind of hard to miss. They are going to start asking questions about the polar bear. What is the polar bear's closest relative? Well, there are the grizzly, the brown bear. We start pulling out bones and the skull. The skull of the bear is like a dog's. Well, they are close relatives. People don't know that. It is one of those things where you can ask me something, you may want to know what this is, but before you leave here, you know what a great deal of other stuff is. You don't get that downtown because ... nobody touches it. Here you can do that.*

## Variety

The variety of the collection was seen as critical to being able to respond to everybody's interests.

*You "get" the person interested. This is a wonderful resource, although it is not very scientifically arranged, so people can do more research on their own. When we have a poop thing up front, it is called "scat." The kids love it, and the mothers know that the kids love it. The moms even learn about the poop they see every day. The kid is getting interested because it is drawing them in. The poop is on an elementary school level, whereas the shark tooth exhibit is not as popular with the children. There is a tortoise shell, and I have them hide under the tortoise shell to get them excited and understand the shell on a more visceral level.... Sometimes when the child gets interested, the parents*

*start getting interested and read the brochure and actually start learning something themselves.*

## Quantity

Several interviewees who had been with the center since it opened pointed out how critical the size of the collection is. The large number of objects is especially important to the serious researcher.

*[A key point was reached] when the center reached a critical mass of collections and books where a visitor felt that they had a better than 50/50 chance of finding the information they wanted. Because the center was continuously adding to its collection, books, etc. When that number hit probably 10,000 specimens, people started coming in. It was a gradual increase that was quite noticeable.*

## Quality

Many interviewees spoke of the importance of the quality of the specimens: it makes for an inviting, “wow” place. Some interviewees expressed concern that the quality of specimens is likely to decrease as a result of use.<sup>14</sup>

## Suggested improvements to the collection

While generally the docents advocated for the breath, depth, and quality of the collection, some suggested:

- Replacements for fragile specimens
- Duplicate specimens for multiple classes
- More user-friendly objects for classification activities
- Better access. According to one interviewee, “The access to the collection is a negative. It is organized scientifically and taxonomically, which for people who are not familiar with or comfortable with, they might find it more difficult to navigate.”
- More collections for handling
- Resources for preservation

---

<sup>14</sup> According to R. Efthim less than one percent of the Naturalist Center’s collection becomes unaccountable due to misplacement, wear and tear, insect damage, and theft annually. R. Efthim, Public Access to Museum Collections: the Naturalist Center, June 1989 [unpublished paper].

- A more open policy. As one person said, “We have had to lock things up over the years; it could have been over-enthusiastic collectors, or it could have been an out and out theft. Shark teeth go missing, and that could be a collector. That was not under lock and key, but it is now. There are sticky fingers out there – “This is pretty, I’ll take this for myself.”

## **CENTER’S SPACE, DESIGN, DISPLAYS AND EQUIPMENT**

As described in the introduction to this study, the Naturalist Center’s public space is divided into two areas based on visitors’ ages: the Main Study Gallery is for visitors 10 and older, while the front Family Learning Center is for children under 10.

### **The Main Study Gallery**

The collection in the Main Study Gallery is organized into sections based on the departments at NMNH. Cabinets have representative displays on top and user-friendly labels indicating their content and a photo of the species, and typically each section has its own reference library. Collections can be taken out of the cabinets; tables and chairs are available for their study, along with microscopes and measuring tools.

Some interviewees praised the center’s design, displays, and layout, particularly given the size of the collection and limited space, saying that they help visitors find what they are looking for intuitively, stimulate their motivation or interest, offer multiple entry points, and encourage a variety of uses. One interviewee commented, “There are so many different ways to explore the [Main Study Gallery]; that in itself gets visitors very excited.”

Certain displays that convey a message are especially effective according to staff, for example, “a display of whelk eggs that is effective. Also we have a whale baleen, and a bottle of krill. Once you see those things together, it clicks, and you see how this works.”

### **The Family Learning Center**

The main role of the Family Learning Center is to “introduce younger children to natural history objects” by allowing them to fully engage with the ones of their choice, explore topics of interest at a deeper level, enhance the interaction between child and caregiver, and have fun. The room is also equipped with books for children, structured activities, and inspiring displays.

A docent talked about how the room caters to younger children: “In here there is a skeleton that they can pull out ... a major difference here is that things can be banged around, and the books

are geared for the little kids. Another person discussed the role of the displays and activities, saying that the Toys of the World discovery box, for example,

*compared toys of different cultures, and the children liked it because they could see the differences in culture ... We would talk about it; we would tell them that the people lived a long way away. Then we would ask them, "What do you play with?" You help them see that there is another world besides Loudoun County.*

The Family Learning Center, although specifically designed for children under 10, has another very important role – it is the first room into which new walk-in visitors come and where they decide whether to go on to the next room. “Sometimes when you get them hooked [in the Family Learning Center]. Then they go into the back to examine The Mysteries,” said one docent.

Many interviewees talked about the rule of restricting children under 10 to the Family Learning Center. Generally the docents agree with and abide by the rule, offering several reasons:

- Having younger children in the Naturalist Center might interfere with its “study atmosphere”
- Children “do not know how – and it is hard to teach them – to properly handle the collection”
- The potential for younger children benefiting from a research-focused room not designed for them is

*questionable in a room like that where you have cabinets and books, and it is more of a research facility... It wouldn't be the Naturalist Center if the age limit was not in place because what could they get out of it.*

- The presence of children in the Main Study Gallery might deter serious researchers: “if you have small children running around, you will not have PhDs.”

According to some docents, the age limit is not an issue for families.

*The Family Learning Center handles the family pretty well. I could go into this and this is for younger children ... A mother said to me, "Can I just bring him into the door? I just want him to see what he can do when he is older."*

However, some docents believe the center should be for everybody, whatever their age – children below 10 “are open and they want to learn.” Some thought the age rule is applied too rigidly, because a younger kid might know more about a particular aspect of natural science than



an adult. Once you start making exceptions, however, it becomes hard to draw the line and problems can result.

One interviewee commented that in a few instances they've brought relevant items from the Main Study Gallery to the Family Learning Center for children who were especially interested and curious.

### **Suggested improvements for space, design, and equipment**

Some docents thought the design and displays of the center could be more inviting. One described the Naturalist Center as old and run-down and said, "I would put a lot of thought into making the cabinets nicer. It seems like it is a hopeless job to keep this place uncluttered; it should be cleaned up and made better looking." Specific suggestions included:

- More Museum Mysteries
- Rotating displays
- Rotating collections
- Better signage or directional guidance so a visitor "can better align with an area of interest"
- Improved lighting
- More life and color, for example, with "butterflies, mainly moths, if you display them, they lose color, [but] if you have something overtop of them, they do not lose color. It is another reason why we should have colors.
- Modern cabinets and shelving
- More and better equipment such as microscopes and measurement tools

Almost unanimously, interviewees thought more space is needed for laboratory work, books, drawing activities, schools, research, collections, and displays. They also lamented that the lack of adequate space for school groups:

*The biggest mistake that we made in moving to Loudoun County was not providing enough space for more students to come in. Right now we can handle a max of 50-58 students at a time ... [but] our audience is middle school and high school, where a single teacher can have 110-150 students. For them to come requires a lot more logistical planning because they have to leave half their class at the school and then find a way to request 2-3 field trips to get everybody to participate.*

Others mentioned the need for multiple classrooms either to allow larger school groups to come in or to accommodate smaller groups of children for a higher impact.

*Today, for instance, it was a fair-sized group, and they didn't have very many chaperones. I would have liked to get to every group and help them, ask them questions, but I couldn't get to every group today. If we had smaller groups, that could be managed better.*

Some interviewees mentioned the need for more space for the Family Learning Center

*because it provides a huge opportunity to engage young minds in the interest of natural history objects. As it is, this area is not large enough for many people/families to use at once. And because of its placement, it serves essentially as the foyer of the whole center, which everyone has to pass through constantly.*

Some docents suggested creating a space that “could be arranged to facilitate both Drawing and viewing of scientific illustrators.”

## **REFERENCE LIBRARY<sup>15</sup>**

Interviewees agreed that the reference library is critical to positive experiences for visitors, and most believed that its location alongside the relevant sections of the collection is a good idea. Besides being a place to study, the library is also used to teach students to understand and how to use an index.

### **Suggested improvements for the reference library**

Interviewees suggested that more books and more up-to-date books would make the center more effective.

## **MARKETING AND OUTREACH**

Most interviewees noted several problems that were limiting visitorship:

---

<sup>15</sup> Further details on this topic are available in J. Madden, Bridge Between Research and Exhibits – The Smithsonian Naturalist Center, *The Curator* 21.2, 1978.

- The Naturalist Center’s location and lack of access to public transportation means it is not a walk-in destination and has little visibility.
- The center has a hard time attracting visitors, in part because of competing activities in the region, and in part because of lack of resources to regularly advertise its presence in the local media.
- The operating hours are an impediment for students conducting school projects; a suggestion is to open the center on Sundays.

### **Suggested improvements: marketing and outreach**

Many interviewees indicated that the center could benefit from more marketing and outreach. The docents saw partnerships as a key approach to outreach, citing the importance of the relationship with the Loudoun County public schools. Such initiatives draw visitors to the center and are critical to building an audience base and repeat visitorship. Interviewees suggested partnerships with other schools or universities. College students would benefit from the teacher training.

Interviewees had other suggestions as well:

- Making the center a “central learning campus for after-hour classes” for the general public
- Better advertising – “many visitors say that they didn't know the center exists.” However, despite a fair amount of advertising for the lecture series, such as using pamphlets, local papers, schools, etc., “people still don't seem to know about us.”
- Better signage – “We have a little tiny brown sign, and people pass it all the time. Some more exterior signs, signs and arrows.”
- Distribution of pamphlets door to door, either through more partnerships, including schools, colleges, and hospitals, and organizations that could themselves benefit from the center
- An extended lending program to schools
- An improved website that helps people find things, since they so often use internet searches. Said one person,

*teachers can use this place as a resource even if you cannot bring your kids. It is a place for science. I tell my teacher friends, you come, just for your own pleasure.”*

Some wanted the website to say which audiences visit the center and would not use the word “learning” because when you say “learning center,” everyone will think that it is for children.” One interviewee said:

*People need to be made aware that all people of any age need to do is make an appointment and come in any time. I can't get that response from them. But I haven't had the help to really do that. It is a different audience who come to the Drawing Days. People like to draw and come with their sketch pads and do watercolors.*

### **Other suggestions**

Interviewees made other general recommendations:

- More funds
- More support from downtown
- Online catalogue of the Naturalist Center's collection
- More and better computers
- Internet access

## EVIDENCE OF EXPERIENCES THAT SUGGEST THE IMPACT OF THE CENTER

Interviewees talked about the experiences visitors have at the center, which they also cited as evidence of its effectiveness.<sup>16</sup>

### Gaining information and knowledge

Gaining information and knowledge was cited the most often. The amounts and kinds of information and knowledge visitors gain vary a great deal based on their ages, interests, learning levels and styles, preferences for engagement with the collection or staff, and purpose of the visit; they range from learning simple facts like what a specimen looks like to understanding the intricacies of biodiversity. One interviewee described the kinds of knowledge people take away – “appreciation of the wide natural world ... facts and a tactile experience ... how heavy something is ... what color it is. Something they were looking for and something that surprised them. And that is the Smithsonian experience.” Another docent spoke of a botanist from Kosovo who came in on a regular basis for a number of months to study grasses. “Oracle experiences” was how another interviewee referred to the experience of gaining knowledge. The Smithsonian was seen as the “*oracle of mythology*.” Because the Smithsonian “knows everything,” people come with their objects to see if what they have is valuable or not.

*The information desk would see that and would direct them to the Naturalist Center. Once they found the place, we would encourage them to come back and do that [again]. The visitors would come back and use the resources on their own ... you have the long-term effect.*

Another interviewee highlighting the relevance of the kinds information that visitors take away from the Naturalist Center said:

*The purpose of it is to bring something to the people that they can't get anywhere else. The center can expose them to the real world. We have everything here that if they were living 50 years ago on a farm they would see. They would see the insects, the animals, the bones, plants, birds, mammals. Kids don't see that anymore. They don't know where milk comes from. They know it comes from a cow, but they don't know how it gets from the cow to their door. So I think our purpose is to bring nature alive to people who are looking for it.*

---

<sup>16</sup> An assessment of the Naturalist Center activities Classification II and Unknowns was written by Radise Segametsi, An assessment of the effectiveness of educational programs in relation to school curriculum needs – A Research Fellowship in Museum Practice, 2005.

Another interviewee, making the point that science is fun, spoke of *visitors coming with artifacts or materials to identify. The process of discovery and incursion back into history (time machine backwards) is an eye opener and a profound joy to the people.*

## Critical thinking skills

Docents generally agreed that one of visitors' biggest gains is exposure to the cognitive process that interviewees variously called the "scientific process," "inquiry process," "thinking process," "knowledge construction," "learning how to learn," or, simply put, "the process." Whether an adult is trying to identify a shell picked up on vacation, or a 35-year-old woman who stumble into the center found an object she could not identify, or a student is taking to a 2-hour class on "adaptation," all are "guided" by a docent/staff and/or activity along a process to discover the answer. The degree of exposure depends on a variety of factors, such as the question at hand, type of activity, learning style, and nature of the interaction with staff (free form vs. directed learning). When asked what visitors get out of exposure to the "inquiry process," interviewees mentioned several cognitive benefits:

- Ability to focus
- Ability to ask questions
- Observation, comparison, assembly, matching, manipulation, pattern recognition skills
- Generation of evidence, argumentation, reasoning, problem-solving skills
- Interpretation, judgment making, decision making

One docent described the process:

*One young woman was trying to find a particular bird, and she thought she had found it. I had to very carefully point out how she was incorrect, but let her figure it out and notice it by herself. This is a way of training people in a vocation or an avocation. When you have them in a small area, you don't have interruptions, like people coming up from behind. That is the nice thing about the Naturalist Center. Visitors are focusing on a specific thing.*

The modified form of the process is used with children:

*We are here to stimulate their excitement for science and also to teach them some fundamentals about what science is ... [science] teaches you how to identify a problem, how to research, how to solve the problem, how to come up with an answer. If a kid comes up with the wrong answer, I don't say "that's the wrong answer." I ask them what makes them think it is the right answer, and chances are they went through a good*

*thinking process. Maybe they didn't, and then you talk to them about the process ... They misinterpret something, or do not measure something right. It is the process.*

Through the process, visitors learn how to think for themselves, get validation, and gain self-confidence, which are especially important for middle- and high-school students. Said one interviewee,

*Years ago I had two kids come in. One was from the DC public schools; the other was from a parochial school. They asked, "Is there evolution?" I took them to the human area, I showed them the fossils, the human skulls. I did not tell them anything. They were there the entire day talking about it, using the collection. It is not about giving answers. It is about showing them how to get the answers and think for themselves, make critical decisions that can help them in life.*

### **Understanding scientific concepts<sup>17</sup>**

Interviewees argued that audiences exposed to classes such as Classifications or Adaptations are likely to learn both general life concepts and specific scientific concepts such as evolution, adaptation, what is a mammal, and evolution. Because scientific concepts and processes are standards of learning, it is very important for school-age children to learn them. The experience at the center also reinforces and helps cement the knowledge, concepts, and processes students learn in school: "If you don't know about classification, or why you need to know how to classify, well, go to a grocery store. If everything were in the middle in a big pile, how long would it take you to shop? Same thing with the museum." Interviewees cited instances where teachers used the center to teach other scientific concepts and languages.<sup>18</sup>

Some docents noted that kids come to the Naturalist Center to prepare for the resumption of school – "as school starts, people bring in their kids to get them into learning again."

### **Creativity and innovation**

Visitors engage in creativity and innovation at the Naturalist Center. One staff member put it this way:

---

<sup>17</sup> Understanding of scientific concepts by students as viewed by their teachers is discussed in R. Efthim, The Naturalist Center: proof that a museum can do more to maximize the learning potential of their collections, *Museum Management and Curatorship* 21, 2006.

<sup>18</sup> R. Efthim provides a detailed description of how teachers have used the center to teach topics other than natural sciences in R. Efthim, The Naturalist Center: proof that a museum can do more to maximize the learning potential of their collections, *Museum Management and Curatorship* 21, 2006.

*This place inspires a certain level of curiosity and creativity ... to come up with our own solutions and our own answers ... a lot of creativity goes into coming up with answers ... [the center is] an outlet for being kind of creative and inquisitive.*

### **Working like a scientist**

The center allows visitors to experience at some level what it is like to be a scientist by freely engaging with the exhibits or, as students, participating in structured activities where they play the role of museum scientist.

*[Students] have an expectation that they get to act in the role of a scientist. When they are prepared [for their visit,] it is very exciting because you see kids participating in a scientific role ... Treating the kids as young scientists sets up the chance that they could work as a scientist.*

### **A “WOW” experience**

For some interviewees, the biggest charge comes from “wowing” the visitor. An interviewee used these words to describe the experience: “people would come in by mistake, and they would open big eyes. It was a marvel to them. It was almost like magic.”

### **Immersing visitors in the “real thing”**

According to interviewees, the vast majority of visitors have a direct experience with the collection by looking, touching, and smelling. This multisensory experience gets visitors excited, interested, and engaged; it helps them look at the details and inspires learning. One interviewee described what happens:

*They want to see real things, not books. That is what really excites kids. If they are able to touch a coyote, then they get really excited, or the nutria ... How do I know that they have learned? It is their reaction to the reality of the samples and the matching – for this one 3-year-old, she was into the activity.*

One interviewee describing visitors’ immersive experiences said:

*I know that museums are important as entertainment, but you want 1% [of visitors] to get a spark and become interested. What you are trying to do is not have a hit or miss thing. You are trying to provide something to people that they don’t have in their lives or*



*anywhere else, the WOW factor they get when they can be up close, and sit on the floor with a pile of books.*

## Changing visitors' perceptions and attitudes about the natural world

The center leads to changes in some students' attitudes and beliefs regarding nature. This experience is very important for children. For example, the center gives students the opportunity to overcome phobias at an early age: "You get the child that shrinks back because they see the rat or the spider, but then they would hold it, and their whole attitude would change."

## Hooking visitors

Many interviewees agreed that probably the most important visitor experience, especially in the case of children, is getting someone so hooked that they come back for other activities and bring other people with them, or consider becoming a scientist. Some visitors get "hooked" immediately, but usually that experience follows being wowed, engaged, and immersed. According to one docent, "we did have one child who put together a skeleton and wanted to be a doctor." Another one, talking about the long term effects of having such experiences said:

*When you hook people, they might be a third audience, people who get shown the back room and come back when they get older. We have more of a local audience; it might be different downtown.*

## Evidence that suggests a long-term impact

When asked how they know whether the center is effective, interviewees listed several indicators that suggest the long-term impact of the center:

- ***Becoming a scientist.*** The ultimate evidence of success for interviewees is if a child exposed to the center becomes a scientist. Some people mentioned anecdotal evidence of cases they knew of where this appeared to have happened. One student docent was introduced to the Naturalist Center on a school trip, later visited with her family and friends, then became a student docent, and currently is majoring in science.
- ***Return visits to the center.*** Having children come back with their parents after a school visit in which they got "hooked" is an indicator of success, and some docents suggested that 25% did so.
- ***Recommendations that others visit the center.*** One interviewee commented, "We may have fewer visitors [than downtown], but they stay longer, and they come back, and they bring their relatives." Another interviewee said that "We see the same people bringing

other people back. We know that what we are doing works at least for a certain population of the public because they come back.”

- ***Development of personal collections.*** Some docents spoke of visitors becoming inspired to develop their own collections of specimens – “there are several kids who come back regularly, and they have somewhat extensive collections.”
- ***Signing up to become docents or getting more involved with the program***
- ***Higher scores on standardized tests.*** Although not hard proof, some interviewees had heard from teachers that the students who went to the Naturalist Center got higher scores on standardized tests.<sup>19</sup>
- ***Difference in knowledge of visitors between entrance and exit.***
- ***Increases demand.*** Some interviewees remarked that an increase in demand for classes or events is evidence of the success of the center.
- ***Time-based evidence.*** Interviewees cited two indicators of engagement related to time – the amount of time spent at the center and students wanting to linger after a class has ended.
- ***Other indicators***
  - Some interviewees mentioned thank-you notes. One person wondered if the center followed up with these people: “Here they are enthusiastic, they are sending thank-you letters for allowing them the opportunity to see real things as opposed to what is on the computers or on the TV.”
  - Students gained exposure to a different language
  - Visitors taking pictures

---

<sup>19</sup> Student’s performance in schools as a result of their visit to the Naturalist Center is discussed in R. Efthim, The Naturalist Center: Proof that a museum can do more to maximize the learning potential of their collections, *Museum Management and Curatorship* 21, 2006.

## DOCENT RECOMMENDATIONS FOR THE NEW LEARNING CENTER

Interviewees were asked what recommendations they had for the new Learning Center. The range of recommendations varied tremendously. Some simply said “keep everything as it is” or “expand the size and scope of all that is available,” while others were reluctant to see the center move to the Mall, in part because it is a high-traffic area.

There were also extensive specific suggestions from docents. Some related to general principles that should underlie the new center’s planning and design; others addressed the key building blocks for the new center.

### FUNCTIONS

Most interviewees would design the center to reflect the current one’s main functions of access, teaching, enhancing learning, in-depth research, and getting people “hooked” to learn more about science.

#### A venue for teaching, learning, and in-depth study

The educational aspect of the center was a dominant theme in the recommendations. One interviewee eloquently described the desired purpose of the new center: “to demystify science as a way of learning and understanding.” Another said it was to

*do classes that would develop more of the skill sets that people will need to know – how a museum operates and how they themselves can benefit by using the resources in the museum. I can help you develop a science project that focuses on scientific research method, and we can have a scientist come in and talk about the research method and allude to it with the speciation exercise ... what would you [the visitor] be interested in, and here is what we have here at the Naturalist Center... We will provide them with access to collections/materials.*

#### A venue for research

Most docents recommend that the center continue to serve visitors who want to do research or have their questions answered. For example, “If you put a Naturalist Center downtown, it should be a destination for people who want to learn, and [it should] provoke questions. Can they answer these questions because they have been in the museum?”

Another interviewee emphasized that the center should not

*be another tourist thing where people wander through. Then you won't have people do research. I would love to see it as a public research place for people to come over, draw, go through photographs. In other words, bring children up through the research, not just [have] children pawing through drawings.*

### Inspire, WOW, engage, hook

A common recommendation is that the new center should inspire visitors to be engage further in learning science, or hook people into science. For example, “Make people think, make people ask questions about what is around them. I would like this place to capture the sense of wonder that was with us as a child and even as an adult.”

### CORE STRATEGIES

Many interviewees believed the center should provide a unique experience within the museum. It should help visitors answer questions that arise while visiting the museum or “satisfy the sparked interest” and provide extended learning opportunities using the same strategies as the current center.

- **Offer a visitor-driven experience.** Allow visitors to pursue their own interests and come up with their own visitor experience, and provide a venue where they can freely engage, explore, discover, learn, and interact. One interviewee contrasted that approach with the kind of hands-on science that involves “dictating what and where you’re going to learn,” that doesn’t afford the opportunity for someone to learn what he or she never expected to learn. The greatest enjoyment is “watching the people and seeing the possibilities and having a brain in front of you that is all of the sudden going ‘this is what is possible, and this is what I can do with it, and things that I would not have thought of.’”
- **Offer a unique, but complementary museum visit.** This means providing access to collections and staff, opportunities for “touch and feel” experiences.

*This new center would enhance the existing [NMNH] galleries (Mammals, Ocean, etc.) by providing access to specimens [and] books for researchers. [The] existence of the new center should be signaled in each gallery – along with the theme that “if you wish to learn more about mammals, the ocean, etc., visit the Learning Center at... and provide its location.*

- **Empower visitors through guided inquiry.** Some interviewees were adamant about the importance of guiding visitors through the inquiry process. Visitors who go through the

process develop priceless critical thinking and life skills and concepts that they can apply in everything else they do.

- **Provide highly personalized/customized visitor experiences.** One of the most common recommendations was to “focus on quality and not quantity.” That is, the new center should continue to provide tailored experiences with the help of the docents. Doing so will allow the center to meet visitors needs, satisfy their interests, answer – or help them answer – their questions, and allow people to come away with a highly relevant, one-of-a-kind, personalized experience.

## STAFF

### Docents and staff

Interviewees believe that the role of docents and staff should remain the same as they are critical to providing a personalized experience to visitors and to managing and caring for the collection.

Interviewees also suggested that the new center make a concentrated effort to assure that the make-up of its staff reflect its audiences, even while commending the diversity among current docents.

One interviewee suggested a junior docent program that might inspire students to consider science as a career:

*I would have a junior docent program ... like a junior ranger program. When we have kids giving tours to other kids, it's a lot more interesting than when you have adults giving tours to kids ... I think it's kids seeing their peers doing something. It strikes them as funny that kids could do stuff like this. Nobody told the visiting children that they could have a career in science. Maybe Mom and Dad are not science people. But seeing another kid tell you about science – it's a mentoring/leadership program.*

### Access to scientists

Access to museum scientists was highly recommended, especially by interviewees who had been with the center since it was founded. Access to scientists provides two critical benefits: helping with docent training; and keeping docents abreast of scientific knowledge. Ideally, scientists would be available to assist visitors identify specimens on daily basis and during events such as ID-Days. Interviewees also thought the scientists might themselves benefit from interaction with visitors, who might be willing to donate specimens of scientific value.

Docents at the new center should get similar training to that provided to the downtown docents, where the scientists play a role. They would then be better equipped to work with visitors. One docent who had been with the Naturalist Center since it was established explained that “docent training was considerably enhanced downtown – we got tours, we saw the attic.” When asked whether access to scientists made a difference in their training, one docent said yes, “because if the docents wanted to know something, it was more likely that someone would know the answers, and explain things so beautifully. We were very, very lucky to have people who could explain things.”

## **AUDIENCES**

A majority of interviewees argued that the center should target all audiences, especially people who have an interest in nature. A common theme was that “the place should be for anybody interested in natural objects who wants to get an intimate look at things and is interested.” That said, interviewees also often emphasized a particular audience based on age, needs, the functions of the center, or the niche it occupies within NMNH.

### **General audiences**

Currently the Naturalist Center’s Main Study Gallery only serves audiences 10-years old and above. Most interviewees thought that if the research function is kept, the new center should similarly be limited to visitors over 10- or 12-years old. The reasons paralleled those made at the existing center. In contrast, other docents believed that all of the center should be for everybody, especially children and visitors with special needs. Again, their reasons were the same as those cited earlier for the current center.

### **Students (elementary and high-school)**

Many interviewees chose students as the main audience on which the new center should focus. Some reasons included:

- Greater need for “exposure to the natural world”
- Greater likelihood to be hooked into developing an interest in learning science
- More “open to learning”
- Addressing the age when the school system fails to keep students interested in science. Said one person,

*the center is best suited for middle-school and high-school students because they are still curious about nature. But it also the spot where, from a problem point of view, most students lose interest in science. So how do you avoid that drop in interest? [The answer is] to find way that would encourage them to want to continue learning about science.*

- Addressing the age when students are starting to think about possible careers. Making this point specifically for teenagers, one interviewee argued that “they would benefit the most, and they are in the learning stage, and this may influence what they are going to do with their lives.”

The interviewee said that in order to accommodate these audiences, there needs to be more classroom space and equipment. For example, “it would be nice to have enough teaching collections in the room so you don’t have to bring collections back and forth for the study. To make it easier for the teachers you can have teaching cabinets right outside the classroom.”

## Teachers

Several interviewees saw teachers as one of the main audiences: the center is critical for training teachers in science concepts and how to bring them into the classroom. One interviewee explained that “Most teachers in elementary school don’t know science ... The goal would be to demystify science as a way of learning and understanding.”

## Amateur naturalists

Many interviewees wanted the new center to be designed especially for amateur naturalists, regardless of age, but they also expressed concern that their numbers might not be large enough to justify the costs. Reflecting this point of view, one interviewee said, “I don’t think I would focus on amateur naturalists; I don’t think that audience is large enough. I’m not entirely sure the audience would use the facility in a quantity that would justify it.”

## Walk-in visitors

Interviewees thought that with the center on the Mall and in NMNH, the number of walk-in visitors with a variety of interest levels (from the “regular” museum-goer to the “wonderment” type) and time available (some having flexible time and others on a schedule) will increase. In anticipation of the “mood” of these audiences, one docent opined that “It will be hard to get

people to switch gears from passive museum-going to the hands-on aspect.” Docents also envisioned problems keeping the collections in order with larger crowds and offered several “coping” strategies:

- Entice walk-in visitors with interactive activities such as Museum Mysteries, presentations, or media
- Restrict direct access to the collection – “It would be great to draw in huge crowds, but then the specimens may have to be put under glass and not handled. The specimens are just in trays in drawers and have been cataloged. It is easy with big crowds to get everything out of order in one day.”
- Institute crowd control policies, for example:
  - “Decide on maximum number of people the center could accommodate, yet still fulfill its promise to teach.”
  - “Give priority to the researchers, visitors with questions, projects, and then the walk-ins”
  - Control access through tickets, and limit the amount of time visitors can spend in the new center

Interviewees were split on whether the center should be advertised in the museum’s exhibitions. Some believed that that would attract the really interested visitors, others that it would just add to the already high number of people.

Some interviewees suggested that extended hours will be critical to accommodate more diverse audiences. One person suggested that “Active teachers could be a good resource for staying later. Downtown I would schedule evening time.” Extended hours would also allow the center “to touch other groups, conservation groups, environmental groups [for example,] who could have their annual meeting at NMNH.”

Another interviewee made a recommendation along those lines:

*I would extend the hours, too. The new space of the new center is right off the Constitutional Avenue lobby ... If the primary audience for this space is students, and particularly local students, they are not going to come during school hours, and we will be closing it about the time that they could get there if they came right after school. So access would not be available. But if you would open until 9 pm, even if the rest of the museum would be shut off, you would be there to do school programs, lectures, or just be open for the general public to come in. [This is] something that you can do that would not require additional staffing significantly, or resources.*



## Families

For some, families are the ideal audience, while others see them as an unreliable one. For example, one person thought that families who wander in from elsewhere at NMNH won't

*spend as much time in it as families who now visit the center in Leesburg. This is because we are their destination, not part of a large museum trip. I think you will get more visitors at the new center, but the average time they spend in it will be far less than at the current center. Also, many visitors to the new center may never have the chance to return for a second visit, whereas the existing center has very many return visitors, some who come weekly.*

## Researchers

Serious researchers like the amateur naturalists were a top choice of docents. For example, one saw the center as supporting “longer term projects. People should be more willing to sit down and examine things. They can bring in their laptops and compose papers.”

## ACTIVITIES AND PROGRAMS

Most interviewees believed the activities and programs offered at the Naturalist Center are of great quality and would offer them as they are currently conceptualized, or as expanded versions. In addition, interviewees believed the activities and programs could be even more beneficial if they were “rotated” within the center to address issues that are current and relevant to visitors. The activities, according to one interviewee, should be “for all the different ages so that they get engaged and interested. They should want to complete the activity.”

Interviewees specifically recommended Museum Mysteries, Unknowns/ID-Days, Drawings from Nature, and Lectures. For example, one docent explained that Museum Mysteries gives “visitors something to do if they are not coming for their own specific research purpose. These should be kept and possibly expanded.” Another docent recommended expanding the Drawings from Nature activity. An interviewee who recommended expanding the “I Wonder”<sup>20</sup> workshop for teachers talked about the importance of teacher workshops –

*[I Wonder] has turned things around since we've moved to Loudoun County ... all the teachers there were saying “I want this and this. This is what we should be teaching, and*

---

<sup>20</sup> The I Wonder activity prepares teachers to guide students in the use of artifacts and specimens and to engage in authentic scientific inquiry. [http://www.mnh.si.edu/education/professional\\_development/workshops/index.html](http://www.mnh.si.edu/education/professional_development/workshops/index.html)

*I'm doing this in my classroom." So I think teacher workshops are very important and perhaps doing more of that [is important].*

Some interviewees recommended new activities and programs, for example:

- Demonstrations and cart programs would, along with Museum Mysteries, would be one way to adapt the center to walk-in visitors.

*To adapt it more to walk-in people I would add more things to do with the resource so that people can interact with it. Generally what people do with the museum downtown is they walk in and walk out. Having the materials, the Mysteries, makes people stop and think ... I would push something like that for walk-in people. The other thing you could do is something along the lines of people demonstrating things, and have people draw people in.*

- Lectures by scientists or knowledgeable docents on relevant issues are excellent as long as they are done well, as one person explained:
- *Lectures serve a purpose to transfer information from people to people ... But when I go to a lecture, it has to be something I really care to hear about ... There are people who learn naturally, and you have to serve the whole public. Not everybody wants to touch a dead thing.* “Expanded activities for home scholars”
- “Expanded programs and activities over the weekend”
- “A learning trail where students can independently learn a lesson about the natural world. Equal emphasis on all aspects of natural history.”
- “More art programs combined with wildlife.”
- Weekly or monthly programs that

*Highlight different aspects of the Naturalist Center ... a mammal program every Monday ... an amphibian program every Tuesday ... an insect program every Wednesday. I would give it to the docents and say “come up with a program.” It would be a small introduction, and it would be hands-on.*

- A time capsule –

*A recollection center where people who come in, especially older people, would say, “when I was a kid, we used this object to button up our shoes.” You can have objects sitting out that were used 100 years ago, and ask people how was this used and record [their comments]. And you can play that back. It's chronicling what people know about how we did things 100 years ago ... You [then] need to look to the future.*

*What is the impact of what we are doing to the planet today? How will it look in 20, 30, 100 years? It would be like a time capsule.*

## Outreach

Staff thought deeply about how the new center could reach wider local, national, and international audiences.

- Partnerships with local and national schools, colleges, and other organizations was mentioned frequently – “The outreach should be able to go way outside of the District. In DC there should be a separate section that focuses on DC needs,” one interviewee said. From another, “I suppose we really would like to attract more college and graduate students to do their research here.”
- The center in every state – “There should be a Naturalist Center in every state. What the center provides for young and old needs to be made available to everyone across the [US].”
- Expanded teacher naturalist program –

*I would get more teachers like the naturalist teacher. I would have a national competition, and I'd open it up. It's like the teacher space shuttle program: why not a teacher at the museum? ... I'd open it up to the nation and to the world. Why not South America, Africa, Asia?*

- Programs that take NMNH out to the public, such as the bug program that insect scientists at the Smithsonian take on the road, even to

*someone's house. It was in the dark ... He [the scientist] showed these kids how to hang up a sheet and put a light behind it. And all the bugs came and went down in this sheet, and you would collect them and mount them. It was fantastic. You could not do it in the museum, but you could do it at Rock Creek Park. So I would have an outreach program to take my museum collections out to the public.*

Another person suggested a loan program for specimens when needed and requested.

*We have a Loudoun collection that's been very successful, and I have worked hard on that. Loudoun County gave money towards that just in case we ever moved back [to the Mall]; they wanted something to remain to use for hands-on inquiry-based learning.*

But the interviewee also had questions about the feasibility of such a program when considering the logistics of transferring the collections back and forth and the labor involved, the repairs, supplies, etc.

- Increased online presence by offering
  - Distance learning, the most common recommendation in this area. For example, one docent talked about distance learning applications that replicate to the greatest extent possible what happens at the center and that “could be accessed by schools, home schoolers, etc., people around the country/world.” A few interviewees specifically suggested that the center offer a virtual I Wonder activity. For example, one staff member suggested “that a concerted effort be made to get the collections used in school programs onto a website so that students unable to actually visit the Center can participate in ‘distance learning.’”

Along the same lines,

*It would be great to be able to do the I Wonder workshop for teachers anywhere so that we can have multiple workshops at the center during the summer and also offer it to teachers who cannot come to the center. They could teleconference ... They could have the same interaction going on with mentor teachers but remotely.*

- “Posting lessons online”
- “A virtual orientation for teachers prior to attending programs at the center.”
- “Webinars”
- “A web comic that is very informative. Then it brings back the science in little snapshots.”
- “Electronic newsletter”
- Digitize the collections and put them online both to study and so that “someone planning their visit could ask ‘do you have a robin into your collection?’ and we can say ‘yes, we have 3,’ etc. ... Or after they come by, they can go back and check what they saw.”
- Use social media – “integrate technology, more technology, for instance, the white board. The Smithsonian should belong to everybody, and with technology we can pull in what happens in Galapagos ... the technology and the outreach need to be amped up.”

### Availability of technology

The new center should have new computers. According to docents, a computer is needed for each collection section to enhance the identification process, cataloguing, and referencing. Other points are that computers are needed to enhance the research (catalogue, collections, pictures) and to share findings. Some docents want a dedicated computer room; others want the computers in the research space on the tables. Said one person,

*I would have more computers, computer programs, that tie into the collections, because you can do the Unknown sitting at the computer. That would be a good lesson to have kids do –an Unknown at the computer, and [do] one in the Naturalist Center in the old-fashioned way.*

Staff talked about using other technology both for educational purposes – e.g., “a flat screen TV that would loop a visual reinforcement of a concept ... showing the life cycle of a frog” – and to provide an introduction to the center, something that lets “visitors know how the Naturalist Center works and the potential that it can have for them.”

Two other suggestions were an audio-tour and a “small movie theater (like the ones in art museums) that shows short documentaries on animal behavior, anthropology, geology, etc. that would both be educational and entertaining. The same might be true for lectures on identifying specimens or how species adapt.”

## COLLECTIONS

The docents believed that the collection’s current quantity, quality, and variety are key to the Naturalist Center experience. One interviewee highlighted this point:

*The activities are really neat, but you need the collections for the answer. Many people want the answer right away, and a docent will go, “let’s see, how we can figure this out together.” I don’t want it so that the visitors can get the answer immediately. You really want them to see the science as a process. How do you work through this? How am I going to think about it?*

Another person commented, “It isn’t about the activities as much as it is about the collections. When you open a drawer for them when they first come in and it has hundreds of specimens on the shelf, and they are like [docent makes a face lighting up]. That is all what you need to do.”

The docents offered several ideas for improving the collection at the new center:

- More dramatic specimens because “that is what grabs people’s attention.”
- Live collections

*We have a very small plant section with a lot of dead stuff. I think we need to have a live model with insects and plants that is totally enclosed ... I would put in a biological, live science like an ecosystem. We saw it in the Science Museum in San Francisco. It had four-tier ecosystem. It was rainforest.*

- Increased security such as closer care and monitoring of the open collection and age criteria for handling fragile objects
- Availability of a lot of specimens all the time, duplicate specimens, better maintenance or replacement of heavily handled specimens

*You need a lot of collections available all the time. What if somebody interested in rocks comes to the museum when the rocks are not out? It's the spontaneity... it's knowing, "Oh, wow ... do you have this?" It's getting the curiosity to peak at the moment. It's not going to happen if you say, "Oh, come back in a couple of days."*

This interviewee also said books need to be readily available.

## DESIGN

How to design the new center was probably the most challenging question for staff.

- Most recognized that the design will have to take into account a number of factors, such as the center's functions, types of audiences, levels of interaction with the collection and staff, and time spent in the center.
- Some staff argued that a replication of the current center at NMNH will not work. The main reason is that, with the larger volume of visitors and different audience types, providing the same level of personalized experience as the Naturalist Center does is unrealistic. As stated earlier, museum visitors who wander into the center are unlikely to spend as long, and many will not be in a position to return.
- Some staff based their design ideas on how best to serve a particular audience type or function; others tried to accommodate multiple functions and audiences. Most staff agreed, however, that whether priority is given to a particular audience or function, or all audiences, multipurpose rooms are critical. For example, a space that is used for general visitors during the day can be used by students with special projects at night.
- Many staff emphasized the importance of making the center a very distinctive, more serious part of NMNH, since the museum, as a whole, is designed for general visitors and families looking for "edutainment." The center should serve more interested and serious visitors.

Many docents advised that NMNH design the new center to support educational functions that mostly serve purposeful visitors. In that context, the recommendation was to call the room a "Study Area" or "Research Room" to help "weed out" visitors who come to the museum for "entertainment purposes." Other staff would divide the space to accommodate multiple

audiences and functions, with rooms for quiet study, classroom activities, laboratory work, drawing and photography, computers, etc. Cautioned one person, “just don’t make it into one of those hands-on kid museums . . . I don’t want them to turn science into a playground. Washington has so many tourists – do you go with what they want, or do you maintain your standards?”

Many interviewees used the “library analogy” when talking about the center’s design.

*The person who designs it needs to understand how a library functions, how it works. That is what we are really talking about here – a database of information that an individual wants to access. So a library has to be efficient use of space. You need a room for people to study on their own, information desk for guidance and reference, access to collections/stacks, access to the internet for things that they find in the stacks, and activity surrounding it.*

Most staff agreed that a “study atmosphere” is critical to the new center. Such an atmosphere is the antithesis of the entertainment atmosphere. For example,

*This shouldn’t be just an entertainment venue. If the nature of the center changes, this place would be destroyed with that kind of audience. We do have people that come here with children, and they work together, but they understand that it is a research environment. It would be for longer term projects. People should be more willing to sit down and examine things. They can bring in their laptops and compose papers.*

In that context, staff considered a reference library to be a critical element of the new center.

When asked how the center could serve both the accidental and purposive visitor, one docent suggested that information on the nature and role of the center should be clearly explained in a brochure, so

*people will eliminate themselves, and we don’t need to worry about it. You could also have different stations integrated with the museum section. But have kind of a separate area, like quiet rooms in the library. The Naturalist Center is Hands on Library Science Museum, the confluence of those ideas is interesting.”*

### **A layered approach to design**

Most docents suggested a layered approach to the design of the new center to satisfy all types of audiences. The most common suggestion was a two-room space, with a Family Learning Center for children under 10 and a Main Study Gallery for older visitors, mirroring the current center. Because families might be uncomfortable separating their children among different spaces,

transparent walls should be used between the rooms. Not only could family members see one another, it might be “inspirational” for the little ones to see what the older ones are doing.

One staff member envisioned an even more layered approach, with multiple purpose rooms that divide the audience according to cognitive skills, interests, and levels of interaction with the collections.

*Imagine the center being the place where more people could come in and browse, and school kids could come in and learn, whether in a set program or a guided [activity]. Outside of this large circle you would have another circle with classroom space. This classroom space might be physical or conceptual ... Outside of that circle you would have another circle that would have an undergraduate laboratory space. This would be a space where kids in undergraduate school would have internship space, working stations, where they will be getting basic science instruction, labs with opportunities for extending outside and working with scientists. The next layer would be visiting researchers who come in to do high-level research on temporary basis. Outside of that you have the resident scientists who are busy doing detailed investigations. And surrounding it all is the raw data ... So you are talking about lower level cognitive skills to higher level cognitive skills, with gradations between, and talking about high volume visitation, moderate levels of interaction with collections and data, to the outside extreme where the number of users is significantly smaller because the demand is higher and the level of interaction is much more intimate. If you are talking about modeling that thing into NMNH, you have the same thing. You have the main museum with 7 million visitors who are having interactions with the collections at the lower intellectual level. You have the facilities [Family Learning Center] where they would have a little bit more in-depth experience. Then you have the center where there is an opportunity for more extended learning opportunities. That will be the place where those who would want to do undergraduate-level research experiments or high school-level science experiments could be doing something there. Outside of that door are the scientists who are actually doing that sort of thing. Each layer is a little bit more restricted to the types of people who could come in and use it simply by the nature of the beast of volume and time/visit.*

## Lighting

Several staff stressed the importance of lighting. It affects the tone and atmosphere of a room, and it supports or detracts from particular functions such as using microscopes, drawing, and taking photographs.



## Equipment, cabinets, and shelving

Equipment is critical to a well-functioning center. Some staff recommended:

- Modern cabinets and shelving
- Sufficient equipment such as microscopes, measurement instruments, other adds-ons
- “Furniture and everything you need for the working area such as tables, chairs” and “smaller tables for a more personal experience”
- Fully equipped working laboratory areas
- Computer rooms
- Space for drawing and photography
- Color printers and other equipment.
- Office supplies
- Support for signage

## Other design considerations

Other suggestions were:

- An information desk
- Full accessibility for the handicapped
- Parking
- Notices that people should not stick gum on specimens and should wash their hands

## AFTERWORD

Several major education-related environmental changes have taken place in the United States that are relevant to the future of the New Learning Center.

- The notion that “education” is something for the young and restricted to a formal setting to some degree has been replaced by the recognition of “life-long” and “life-wide” learning that emphasizes learning over an entire life across a variety of personal and professional topics. This observation relates to prioritization of activities, expansion of audiences, resource availability, and change management.
- With the increased attention to the inadequate education students in the public school system obtain, there has been a shift in emphasis from the accumulation of knowledge to the cultivation of 21<sup>st</sup>-century skills, such as creativity, problem solving, and other life skills that underlie success in education.
- There is strong concern nationally that students are not choosing careers in science, technology, engineering, and mathematics in sufficient numbers to meet the nation’s economic needs.
- Learning in informal environments is getting more and more attention nationally as a supplement to learning within the formal education structure. This is evidenced by the US Secretary of Education’s recognition of the importance of out-of-school activities, increased resources allocated by the Department of Education for research on the role of informal education and informal education programs, and the study of informal education supported by the National Academies that resulted in a report, *Learning Science in Informal Environments: People, Places, and Pursuits*, in 2009.

Interviewees for this study believed that the current Naturalist Center and the new center are favorably positioned to meet the needs of the life-long learner, cultivate 21<sup>st</sup>-century skills, and stimulate students’ interest in learning science and pursuing careers in science. They pointed out that the Naturalist Center has been responding effectively to the challenges presented by the external environment. Visitors to the Naturalist Center are being exposed to an environment that maximizes three elements critical in providing a quality informal learning experience: (1) personalizing the experience (with respect to visitors’ knowledge levels and learning styles and preferences); (2) providing a suitable physical environment (offering a multisensory experience

in a facility conducive to learning); and (3) offering a positive social context (i.e., visit group and opportunities for social interaction).<sup>21</sup>

Further, the activities and approaches the interviewees say the center uses are aligned with the 21<sup>st</sup>-century critical thinking skills<sup>22</sup> framework:

- Critical thinking and problem-solving skills – visitors are encouraged to think effectively, use systems thinking, make judgments and decisions, and solve problems
- Creativity and innovation skills – visitors are encouraged to think creatively and innovatively and to work creatively with others
- Life skills and career skills – visitors are encouraged to work independently, and a goal of the Center is to enhance self-confidence

When comparing informal science goals with interviewees’ descriptions of what goes on in the center, it appears that the center’s operations support most, if not all, the informal science goals. For example, relative to the framework provided by the National Academies in *Learning Science in Informal Environments*, what the interviewees said about how visitors engage with the center, especially students, and the outcomes of the visits meet the criteria for informal learning.<sup>23</sup>

Strand	Learners in the Naturalist Center
Developing an interest in science: experience excitement, interest, and motivation to learn about phenomena in the natural and physical world.	Visitors experience excitement, interest, and motivation to learn about the natural objects in the center
Understanding science knowledge: come to generate, understand, remember, and use concepts, explanations, arguments, models and facts related to science.	Visitors understand, remember, and use concepts such as classification and mammals
Engaging in scientific reasoning: manipulate, test, explore, predict, question, observe, and make sense of the natural and physical world.	Visitors “manipulate,” “test,” “explore,” “question,” and “observe” the objects in the Center
Reflecting on science: Reflect on science as a way of knowing; on processes, concepts, and institutions of science; and on their own process of learning about phenomena.	Visitors question processes, concepts, and their own process of learning

<sup>21</sup> These are the elements of “Interactive Experience Model” framework developed by John Falk, *The Museum Experience*, Whalesback Books, Washington DC, 1992.

<sup>22</sup> Partnership for the 21<sup>st</sup> Century Skills, <http://www.p21.org/>.

<sup>23</sup> P. Bell, B. Lewenstein, A.W. Shouse, and M.A. Feder, (2009), *Learning Science in Informal Environments: People, Places, and Pursuits*, Washington DC: National Academy of Sciences.

Strand	Learners in the Naturalist Center
Engage in scientific practice: participate in scientific activities and learning practices with others, using scientific language and tools.	Visitors participate in scientific activities and learning practices alone and with others
Identify with the scientific enterprise: think about themselves as science learners and develop an identity as someone who knows about, uses, and sometimes contributes to science.	Visitors imagine themselves as scientists by engaging in scientific activities in a scientific environment

In their comments about the center, the interviewees raised a number of questions and issues that merit consideration as part of the planning for the new center. There are discussed below.

### Visitor-driven experiences

Many interviewees thought the Naturalist Center is effective in part because the results of each visit vary almost as much as the number of visitors. The two most critical aspects for a successful visitor-driven experience are, they said, opportunities for hands-on access to a sufficiently large and varied collection that visitors can explore according to their personal interests, knowledge levels, and learning styles, and the option of engaging with the collection in a guided or unguided way. Some interviewees argued that public spaces in museums typically are designed in such a way that visitors are exposed to a more limited set of experiences (e.g., one can look and read, but not touch or explore with an expert guide). Interviewees recommended that NMNH design the new center to allow for diverse visitor-driven experiences.

### Center as (a)part of NMNH

Staff of the Naturalist Center believed that they are part of a unique venue within NMNH that offers audiences one-of-a-kind, personalized experiences not available elsewhere in the museum, or the museum world more widely. In general, the new center should provide opportunities for deeper engagement than the rest of museum offers, should further visitor learning and engagement, and satisfy the interests that are sparked elsewhere in the museum. According to interviewees, these experiences can only be furthered by keeping all the elements that make up the present Naturalist Center: free and direct hands-on access to a critical mass and variety of collections; sufficient numbers of high-quality and knowledgeable staff that allow for a highly personalized visitor experience; sufficient and varied infrastructure that allows visitors to construct their own experiences; and an environment that maximizes the chance of “hooking” visitors to become nature lovers, future science learners, and perhaps future practitioners. Interviewees distinguished the environment of the Center from that of the more traditional

design of some museums as a place that exposes people to a series of artifacts with arguably limited possibilities of interaction or further exploration.

### **Offer personalized experiences**

The docents stated that their approach is to assess the needs of visitors when they arrive at the center in order to help them come away with the experiences they want. This initial assessment and the permanent availability of staff to answer questions, discuss topics of interest, and guide with the inquiry process, along with the other building blocks of the center they think make it so effective, are critical to visitors feeling that they can take full advantage of the environment to pursue their own interests and get a highly personalized experience. This approach stands in contrast to a more general museum experience that does little to tailor the visit to what a person wants and needs.

### **“Drawing out” not “pushing in”**

The center’s staff say they have embraced the strategy of providing visitors the opportunity to learn through their own efforts, a strategy that is especially encouraged by staff who “guide” visitors through the process of satisfying their curiosity and by the displays that “entice” visitors. The approach of equipping visitors with an “inquiry-based” process and tools to answer their own questions contrasts with the more typical exhibition design of information on the wall for visitors to take or leave.

### **A study atmosphere**

The atmosphere of the new center will strongly influence how visitors use it and the type of experience they will be encouraged to have. Interviewees tended to agree that a “library-like” atmosphere is important to enhance the kinds of experiences interviewees find critical, such as deep immersion, gaining knowledge, engaging in the inquiry process, gaining self-confidence, and being hooked by science. More often than not, interviewees contrasted that kind of atmosphere with the more entertainment-like one that does not support the kinds and variety of high-quality, enjoyable experiences now possible at the center. It is also worth mentioning that interviewees believed that for many people “science is fun!”

### **School-children and life-long learner audiences**

Interviewees repeatedly pointed out that the center works for anyone who is curious. However, there was some divergence of opinion as to whether the target audience should be school-age children, as they are most in need of exposure to nature and the joys of science, or life-long

learners, who want to pursue their interests at a deeper level than is easily available at NMNH, which sees a need to satisfy both audiences equally.

### **Niche audiences**

NMNH has a variety of niche audiences, such as amateur naturalists (e.g., birders); artists (i.e., graphic illustrators); special learning groups (e.g., the vision-impaired); and researchers (e.g., participants in science fair projects and visitors seeking answers). Some interviewees warned that there might not be sufficient numbers of some of these niche audiences to justify investment in serving them. That said, interviewees thought the center should serve these types of audiences rather than be just another venue for general museum-goers. In that case the center would need to provide designated places for study and research, drawings, photography, etc.

### **Directed and free-form interaction**

Interviewees noted that some visitors need more structured activities while others do not, depending on personal interests, preferred learning levels and styles, and preferences on ways to engage with displays and collections. Most docents thought that the ideal is a balance between the two.

### **“Hooking”**

Interviewees spoke about the trade-offs between reaching a high number of visitors or having a deeper impact on a smaller number of people. Overwhelmingly, interviewees favored the latter. They talked about the large amount of time visitors spend at the Naturalist Center and how that, in combination with the other aspects of the center such as the ability to engage with “awe-inspiring” collections as a person chooses, thought-provoking and attractive displays, stimulating staff, and an encouraging environment, gives visitors the opportunity to get hooked.

### **Local and national audiences**

Because of the nature of the Naturalist Center collection and the audiences it serves, the displays showcase objects from the Mid-Atlantic region. Since a majority of visitors to Loudoun County are locals, the nature of the collection helps them make a connection with the natural world around them, thus making the experience more meaningful and relevant. With the new center to be located on the Mall, the visitorship will be more national and international. Nevertheless, if local schools are a target audience, local displays will still be important.

### **Onsite and offsite audiences**

Interviewees suggested that the center should not only focus on audiences that can visit it, but should also consider taking its collection, programs, and activities to the rest of the nation, either by organizing lending programs or by providing a model that can be replicated nationwide.

### **Physical and virtual audiences**

Similarly, interviewees agreed that offering distance learning programs, posting center programs and activities online, and digitizing and making the collection accessible are important means of outreach. Some suggested the use of social media, especially with amateur naturalists.

## APPENDIX A: INTERVIEW GUIDE

*About docents and the docent program:*

### **Background:**

For how long have you been volunteering at the Naturalist Center?

Why did you volunteer to work at the Naturalist Center?

### **Responsibilities and experiences:**

What were some of your main responsibilities as a docent at the Naturalist Center?

As a docent at the Naturalist Center, what did you mostly enjoy doing and why?

Please describe your experience with the remaining of your responsibilities.

What was the most enjoying experience you had as a volunteer for the Naturalist Center?

Which experience was least fun for you?

What are some of the best aspects of the docent's program implementation and administration?

Is there anything that you would change or improve?

*About the effectiveness of the Naturalist Center:*

### **Overall understanding:**

In your opinion, what is the main purpose of the Naturalist Center?

What do you see as the Naturalist Center's strengths in fulfilling its purpose?

Thinking about your experience observing and interacting with visitors...

For what category of visitors/audiences does it work best and why?

What do you think the visitors mostly enjoy doing at the Naturalist Center? Which aspects of the Naturalist Center enhanced those experiences? Can you give me some examples?

What do you think visitors were getting out of a visit at the Naturalist Center? How do you know that? What were some of the most common questions that visitors raised with you?

### **Lessons Learned:**

Thinking about the Naturalist Center's conceptual organization, display, layout, docent program, and impact on visitors...



Describe a situation in which you think the Center was effective for its visitors? Or that it had the most impact?

What are some of the most effective aspects of it for its visitors?

What are some of its less effective aspects?

Is there anything that you would change/add to better meet its purpose as well as to increase its effectiveness?

### **Reallocation to NMNH**

As you know, the Naturalist Center is going to be reallocated at NMNH and thus open to the Mall audiences. If you would be in charge of the reallocation of the center and the design of the new one...

What aspects of the Center in its current state would you keep and why?

What would you add or change and why?

Is there anything you would do to adapt it to the Mall audiences ?

## **APPENDIX B: FOCUS GROUP QUESTIONS**

What is the best part of being a docent at the Naturalist Center?

In your view, what is the purpose of the Naturalist Center? What is it set up to achieve?

For what audiences does the Naturalist Center work best and why?

Please describe some situations in which the Naturalist Center was most effective in achieving its purpose and why. (What experiences did you recognize as critical for its visitors to have while at the Naturalist Center? What approaches are critical for the Naturalist Center to take to enhance the visitors' experiences? What are the key elements of the Naturalist Center that foster those experiences?)

The National Museum of Natural History will develop a 12,000 square foot learning facility at the Museum on the National Mall. From your experience with the Naturalist Center, what advice would you have for the Museum in support of planning and design of the new Learning Center?

## APPENDIX C: SURVEY FORM

### Survey of Docents' Experiences with the Naturalist Center

**Thank you in advance for answering the following questions.**

*About you and your experience with the Naturalist Center:*

For how long have you been volunteering at the Naturalist Center? \_\_\_\_\_

Why do you volunteer at the Naturalist Center?

\_\_\_\_\_

When and how many hours per month do you volunteer?

\_\_\_\_\_

What are your two main responsibilities at the Naturalist Center?

1: \_\_\_\_\_

2: \_\_\_\_\_

Are you involved in any projects that you initiated and/or that were assigned to you by the Naturalist Center staff?

No

Yes. If yes, please describe the project(s) and your involvement in it/them.

What is the best part of being a docent at the Naturalist Center?

What is the least rewarding part of being a docent at the Naturalist Center?

*About the effectiveness of the Naturalist Center:*

Please describe in one sentence what you see as the main purpose of the Naturalist Center.

What category of visitors/audiences does the Center serve best and why?

From your experience, please describe a situation in which the Naturalist Center was particularly effective for its visitors.

Which experiences do you regard as critical for visitors to have while at the Naturalist Center so that the Center fulfills its purpose effectively?

Please identify the elements/patterns/approaches that you consider most important (e.g. specific activities, resources available to visitors, etc.) when the Naturalist Center has been most effective for visitors.

What would help the Naturalist Center better meet its purpose and increase its effectiveness?

***Your advice for the new Learning Center at the National Museum of Natural History:***

The National Museum of Natural History is planning and designing a new 12,000 square foot Learning Center in the Museum. If you were in charge of planning and designing the new Center...

What aspects (layout, features, activities, programs, etc.) of the Naturalist Center would you recommend including in the Learning Center and why?

What would you add or change and why?

Are there any parts of the Naturalist Center experience that you think would not work effectively in the new Learning Center?

Please add other suggestions or comments on the design of the new Learning Center.

**Thank you for taking the time to complete this survey.**