

= *Hunters of the Sky* =
Science Museum of Minnesota

Summative Evaluation Report

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February 1996

EXECUTIVE SUMMARY

This evaluation of the *Hunters of the Sky* exhibition at the Science Museum of Minnesota consisted of three phases: a remedial evaluation, a timing and tracking study, and a summative evaluation. It was conducted during the spring of 1995 and involved extensive observations of and interviews with casual visitors. Following is a summary of the primary findings.

1. Visitors to the exhibition tended to stay for relatively long amounts of time. More than half of the 46 visitors we timed spent more than 20 minutes in the gallery. The longest visit length was 1 hour and 27 minutes. About half of the visitors spent from 15 minutes to half an hour. Two of the visitors spent less than 10 minutes.
2. While visitors traveled slowly throughout the exhibition, most stopped at less than half of the 99 exhibit elements. Only four visited at least half of the units. This was likely due to the large size of the exhibition and the large number of units.
3. Visitors talked of many different roles that raptors play in their lives. These included practical ones, aesthetic ones, and spiritual ones. They also tended to use the exhibition as a tool for identifying birds they had seen.
4. Visitors described different relationships to nature. They spoke primarily as being caretakers and stewards.
5. Visitors appeared to recognize that this exhibition was about different perspectives about raptors and nature, and most appeared to appreciate being exposed to different ways of thinking. Others expressed anger and frustration with other people's viewpoints.
6. There was repeated evidence that critical thinking occurred in this exhibition. Visitors appeared to learn specific facts, some visitors explained they had gained a greater appreciation for raptors, visitors talked of personal connections they made with the exhibition, and they spoke of individual actions they might take. A few visitors spoke of feelings of helplessness.
7. The dioramas in this exhibition in particular appeared to elicit strong emotional responses in some visitors.
8. The *Spotted Owl Café* and the *What Do You Think?* computer interactives appeared to be successful at exposing visitors to multiple viewpoints and stimulating thoughtful conversation.
9. Overall, the exhibition appeared successful at presenting multiple perspectives and stimulating thoughtful discussions among visitors.

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INTRODUCTION

The Science Museum of Minnesota (SMM) is an educational and research institution devoted to the collection, study, and interpretation of objects of scientific significance for its audience. As an interdisciplinary museum, it is committed to presenting programs and exhibits which present diverse points of view, and which actively involve visitors. Over the past few years, an exhibit development team designed and developed a 5,000 square foot exhibition on birds of prey from the perspectives of both the sciences and the humanities. Jointly funded by National Science Foundation and the National Endowment for the Humanities, *Hunters of the Sky* opened to the public in St. Paul during the fall 1994 for a six-month venue. It is currently traveling to major science and natural history museums around the country.

As part of the exhibit development process, the development team was interested in conducting a formal summative evaluation of the exhibition to better understand the visitor experience. This evaluation report is based on data collected while the exhibition was open at the SMM during the spring 1995.

Description of the Exhibition

Hunters of the Sky consisted of 99 exhibit units including of a combination of stand-alone interactives; display cases with mounted bird specimens; large contextual dioramas; short video programs; three computer interactive stations; a *Hooting Booth* in which visitors listened to, imitated, and recorded different owl hoots; and the *Spotted Owl Café*—a replica of a small diner that was sometimes staffed by actors. Inside the *Spotted Owl Café* there was also an open three-ring binder in which visitors wrote comments in response to a question: “What do *you* think of the Spotted Owl Controversy?” Sprinkled throughout the exhibition were stanchions, each bearing a *critical thinking sign* with a bumper-sticker type question aimed at getting visitors to examine their own personal beliefs.

All computer and video terminals had stools in front of them for visitors to sit on. The computer interactives were all the same format, although there was different content on each one. Questions were posed to the visitor in the form of “What do you think?” questions after they viewed a short video clip of someone presenting a particular point of view on a controversial issue. After they answered, a pie chart showed how other visitors responded to the same question.

The exhibition had a rough U-shape with a loose expectation that visitors would tend to enter one leg of the U and exit the other. This appeared to be more for traffic control purposes as opposed to conceptual sequencing.

The Research Focus

While some of the original goals of the exhibit included numerous content-related themes such as *to provide an overview of the major raptor groups and the fundamental aspects of their*

biology, and to give our audiences an understanding of the survival prospects of raptors as a group and as individual species, the factors responsible for population decline among some raptor species, and the current strategies and techniques for protecting and restoring these species, the real challenge of this exhibit became to present multiple perspectives on controversial issues, getting visitors to explore their own values and beliefs about the human relationship to the natural world.

With this evaluation study we were particularly interested in this last goal, as well as the goal of getting visitors to *critically examine questions of economics, public policy, and environmental ethics related to the survival of raptors and their habitats.*

This evaluation study focused on the following issues:

- **Connection with Natural World:** To what extent did visitors make a connection between themselves and their natural world? Did the exhibit help visitors become more aware of their own personal relationship to raptors? How did they describe this relationship? How did the exhibit contribute to their relationship with raptors? Did it get visitors to become thoughtful about their relationship? Did it confirm their existing beliefs or help them develop new beliefs?
- **Critical Thinking:** What evidence was there of critical thinking about public policy, environmental ethics and alternative viewpoints? How did visitors respond to the presentation of different perspectives? What evidence was there that this exhibit touched visitors, not just about issues related to raptors, but to the larger issue of their relationship with nature?
- **Time in Gallery, and Units Visited:** We were also interested in finding out how much time visitors spent in the gallery and how many exhibit units they stopped at.

The remainder of this report describes the ways we developed a deeper understanding of these issues, and reports our findings. Because this was a naturalistic study, we have not limited our reporting of the findings to these three large issues. Instead we used a framework for reporting that reflects more closely the way the visitors talked about their experiences.

METHODS

This evaluation study was conducted using *naturalistic inquiry methodology*. Relying heavily on unobtrusive observations of and depth interviews with museum visitors, this type of research results in rich and descriptive narrative data in visitors' own words. Depth interviews are a specific type of interview often used by naturalistic researchers to elicit rich and meaningful information during the interview process. They are open-ended and rely on an informal conversational interviewing style. The strength of this type of methodology is that it allows us to gain a deeper understanding of the visitor experience in their terms, allowing issues to emerge that are not anticipated in advance.

Naturalistic methodology describes a wide *range* of visitor experiences rather than a description of the *average* or *typical* visitor experience. For this reason, the data is often reported using visitors' own words, and with a minimum of statistics.

The Evaluation Team

The evaluation team consisted of an outside evaluator who managed the project, and a staff of data collectors. Data collectors included the outside evaluator and one of her associates, as well as six museum staff members: two exhibit developers, an exhibit designer, a graphic designer, an assistant exhibit developer, and an on-the-floor visitor assistant. Different data collectors participated in different stages of the evaluation project. The summative evaluation data was collected by the outside evaluation associate, and two in-house exhibit developers.

Data Collection

Data collection occurred in three phases.

Phase One -- Remedial Evaluation

At the beginning of this project, we agreed that it would be worthwhile to conduct a remedial evaluation as a precursor to the formal summative evaluation. As a group, and based on our observations and knowledge of the exhibition, we identified areas that we believed did not work as well as they could. A list was drawn up and prioritized, and SMM staff members implemented the changes. Due to limited budget and time resources, a few changes were not made. After each change was made, further data was collected to assess the impact of the changes, and additional revisions were made as necessary. A *Remedial Evaluation Report* was written including a list of recommendations (see Appendix A).

Although the entire exhibition was designed to get visitors to think about their relationship with raptors, it was anticipated that three parts in particular would have the most potential to achieve this goal: the *Spotted Owl Café*, the three *What Do You Think?* computer interactives, and the numerous *critical thinking signs* sprinkled throughout the exhibition. In addition to the changes described in the *Remedial Evaluation Report*, we also observed and talked with visitors to the *Café*, to the computer interactives, and to the signs. We identified specific changes to make these three areas

more successful at stimulating visitors to think about their relationship with raptors (see Appendix B).

Phase Two -- Tracking and Timing

During February and March 1995, a formal tracking and timing study was conducted. A total of 46 randomly selected visitors were observed as they moved through the gallery. Data collection forms consisted of large floor plans of the exhibition on which data collectors recorded the stops that visitors made. Stops were categorized as: a) two feet stopped for at least four seconds, but only cursory engagement with the exhibit, b) a slightly more involved engagement with the exhibit lasting up to about 10 seconds, and c) significant involvement with the exhibit lasting longer than 10 seconds. The total amount of time each of the visitors spent in the exhibition was recorded, and a description of noteworthy social interactions as well as interactions with the exhibit were noted in a comments area of the sheet.

Phase Three -- Summative Evaluation

The third phase of the data collection comprised the major portion of this evaluation study. Using naturalistic methodologies, four data collectors spent a total of 60 hours during April 1995 observing and interviewing 69 groups of visitors. A visitor group was defined as a unit—usually family or friends—that operated more or less cohesively. The members tended to arrive together, participate in activities together, and leave together. A single individual was also considered a group.

The researchers observed visitors primarily in the second half of the exhibit. Using purposive sampling, groups were selected that demonstrated some in-depth engagement with the exhibition. An effort was made to select the fullest range of visitors, in terms of age, social status, racial/ethnic background, group dynamics, and exhibit experience.

After observing a group for a period of time to get a sense of their experience, the data collector approached them and asked if they would be willing to participate in an interview. Most visitors also consented to have the interview tape recorded. All tape recorded interviews were later transcribed. As we observed and talked with the many visitors to *Hunters of the Sky* a number of interesting themes began to emerge in addition to the ones we specifically set out to explore. As with any naturalistic evaluation, we pursued these issues as they emerged.

Following the interview, the interviewers completed a debrief form after which they returned to the floor to select another respondent.

Other sources of data for the summative evaluation phase included the comment notebook in the *Spotted Owl Café*, informal conversations with museum staff, and depth interviews with the actors in the *Spotted Owl Café*.

RESULTS AND DISCUSSION

In this section, we will describe our findings, and discuss their importance for this study. One of the premises of naturalistic inquiry is that it gathers and reports on information from many different sources. As we report on this information, we will relate our findings to the three issues articulated in the Introduction section, but will not limit ourselves to just these three issues. Instead, this section introduces six broad themes that emerged during our observations of and conversations with visitors:

1. the amount of time visitors spent in the exhibition and which exhibits they stopped at
2. how visitors discussed the role of raptors in their lives
3. visitors' perceptions of the relationship of humans to nature
4. visitor responses to the multiple viewpoints presented in the exhibition
5. evidence of learning, critical thinking, and attitude changes
6. visitors' reactions to the mounted specimens

As we present the findings, we will include direct quotes from visitors. The number of quotes under any point does not necessarily correspond to the percentage of visitors who shared that point of view. Sometimes a pervasive theme was never articulated very clearly; at other times, a relatively minor point was described particularly well by numerous respondents. When necessary, we have edited quotes to make them more understandable. We have adhered to the standards set by the American Psychological Association to indicate any deviation from the actual conversation.

Time in Exhibition and Units Stopped At

The amount of time a visitor or visitor group spends in any exhibition can often contribute to our understanding of their visitor experience. Usually we can assume that if they spent a very short amount of time, they did not get very much out of it. On the other hand, large amounts of time in an exhibition don't necessarily mean that the visit was successful. Visitors might have spent their time sitting on a bench resting, or playing a single game on one computer interactive ignoring other aspects of the exhibit. However, when we record how much time visitors spent in the gallery, it can help us understand the bigger picture.

At *Hunters of the Sky*, most visitors spent relatively long amounts of time, with over half of the visitors spending more than 20 minutes in the gallery. Six of the 46 visitors we timed spent more than 50 minutes in the gallery. As indicated on the graph in Appendix C, most visitors spent from 12 - 40 minutes, with 15% of the visitors spending more than 40 minutes. The longest visit length was 1 hour and 27 minutes. These numbers reflect comparatively lengthy visits to a gallery this size. Only two of the 46 visitors we observed spent very short amounts of time.

Although the data suggested that visitors tended to move exceptionally slowly through the gallery at an overall average speed of 172 square feet per minute (slower than 300 square feet per minute is desirable), this same phenomenon was not noticed or remarked on by the data collectors on the floor. It is likely that the very slow average speed through the gallery can be

partially attributed to longer than average visit times to the computer interactives and the video programs. At the same time, it might also indicate that visitors were particularly thoughtful and engaged as they proceeded with their visit.

In addition to the amount of time a visitor spends in an exhibit, it is also interesting to note how many of the exhibit units they stop at. We often assume that the more units they stop at the better. In fact, we are looking for an ideal balance between the amount of time they spend in an exhibit with the number of units they visit. Ideally visitors who spend short amounts of time will visit only a few units so that they can get something out of them. It is hoped that the longer a visitor spends, the more units they will visit.

The visitors we observed stopped at anywhere from 9 - 62 of the 99 exhibit units. No visitor stopped at all the units, even the visitors who spent almost an hour and a half in the exhibition. In interpreting tracking and timing data Serrell (1992) suggests that a desirable goal in a successful exhibition is for 51% of the visitors to visit at least 51% of the exhibit units. As can be seen from the graph in Appendix D, only four visitors (less than 10%) visited at least half of the units. In other words, almost all of the visitors we observed did not see over half of the exhibition. Most visitors stopped at between 10 and 30 of the 99 units. Again, this might indicate that visitors spent time with selected units that held their attention for long periods of time.

Interestingly, the two visitors who spent the greatest amount of time in the gallery, did not make the most number of stops, visiting 29 and 40 of the units respectively. Not surprisingly, the two visitors who spent very short amounts of time visited very few units, 9 and 14 respectively.

The Role Of Raptors In Visitors' Lives

As described above in the section on the research focus, one issue we were interested in exploring was how visitors talked about their relationships with raptors. Most visitors we interviewed expressed positive attitudes toward raptors. This was not surprising considering they were in a science museum and in an exhibition about raptors. We were particularly interested however in the many different ways they spoke about raptors.

Many visitors discussed raptors in terms of their beauty and the aesthetic enjoyment they provided.

Just seeing the beauty of these birds—it's just amazing to me. They are so beautiful. (V56)

Our world is so much richer because of the diversity and variety and the beauty of these kinds of birds. (R14)

We...like to watch them and see how they behave and stuff. (R1)

Other visitors talked of the human species' role in taking care of and protecting raptors and their environment.

It makes so much sense to protect these birds and to protect the environment. We are protecting the environment for the birds and for ourselves at the same time. (K28)

We have to live together and if we can get some pleasure out of having them around, obviously we have to look after them. (R14)

Some visitors talked of birds serving a useful or practical purpose for humankind.

[The exhibition] made me think about science in general, what we've learned from them to make airplanes and other scientific advancements. (R1)

Birds of prey are good. They kill annoying small animals. (K29)

If eagles are in stress, that is a good barometer for what is going to happen down the road to us as human beings. (L56)

[Birds of prey] are pretty important as far as the balance of nature goes, keeping down [the] rodent population, keeping populations in balance. (K30)

Many visitors talked about feelings of awe and respect as they described their attitudes towards birds of prey. Visitors said they held these feelings toward raptors because of the birds' abilities, their role in nature, or their appearance.

Seeing those claws sure made you respect them and want to stay away. Especially when the [staff member] was telling us how strong they are. (K21)

I probably have an awful lot of respect for those birds....It is just such a different world that they live in, soaring at these great heights. There is something almost mystical about them that kind of captures part of your imagination. (K30)

[As I was going through the exhibit I was thinking] just how awesome these birds are, how big they are....They hunt so well, they survive. They can accomplish things and kill animals on their own without an arrow or a bullet or anything like that. (K43)

Not surprisingly, many visitors shared how the exhibit sparked recollections of encounters with raptors in the wild, downtown, or at zoos, nature centers, or the Raptor Center. Data from our conversations with museum staff indicated that they were frequently approached by visitors who wished to share treasured, personal stories of bird sightings in the wild at summer cabins, lakes or along the road.

We had seen a real [eagle] when we were out fishing one time. [The exhibit] reminded us of that. (K45)

We just saw a bald eagle [on our way here] south of St. Paul, perched in a tree. Jenny spotted it. I didn't get to see it. I was disappointed. (K9)

Grandma has an eagle at her cabin. (K21)

For many visitors, the exhibit served as a tool to identify birds they had encountered in the past or hoped to see in the future. The bird cases, silhouette puppets, and the hooting booth were mentioned frequently.

The first time I was here I spent a lot of time in the Hooting Booth, trying to identify the [owl] that hangs around [my cabin]. I think it was a barn owl. (K25)

I liked seeing the birds themselves. Learning how to identify them. (K23)

Here's the one that's eating the birds in our yard. (K32.5)

I loved hearing the difference in the owls. I tried to recognize them. I have heard some of them out in the wild . Its fun. (V56)

[The bird silhouette exhibit] gave little clues on how you can identify the birds....My wife and I have always had this on-going joke on how you can identify...a turkey buzzard....This just proves that I was right all along!...I think coming to this exhibit gave me more...factual information about them—like the fact that the turkey buzzard teeters—confirming my suspicion that that is the way to identify the bird! (K36)

When I see [hawks]...and they are sitting in a tree, I often can't get close enough to identify what they are. So, it was nice to be able to see them up close and see what their distinguishing features were in color and in feather display. Its amazing how many of them are very similar in color, even to each other. I don't know how you would ever tell unless you had them that close. (K22)

Bird identification occurred on a spiritual level for one visitor, who talked at length about the bird she had seen and been in her dreams, and which had inspired her work when she was in art school.

I used to have dreams of being able to fly. [I remember] flapping my arms and [feeling] the air pressure underneath them. I would fly very high. You can't ever see yourself [in dreams so I never knew what kind of bird I was, but I could see my nest.] All the way through art school I used bones and sticks in my art. I was nesting or making a home. [In this exhibition] I saw the bird I was in my dream, the bird that makes its nest on the ground [out of buffalo bones and sticks]. A falcon or peregrine, I'm not sure. I think that's the bird I was. Birds really play a part in our spiritual energy or power. That's—to me—how we connect with birds of prey. (R14)

The Relationship Of Humans To Nature

One of the major goals of this exhibition was not only to get visitors to think about their relationship to raptors and birds in general, but to critically examine their own personal relationship to nature as a whole. Visitor comments revealed that they thought about their relationship to nature in a variety of different ways. Many of these comments referred to specific aspects of the exhibition that stimulated their thinking.

Some visitors talked about humans as being a part of nature.

[The exhibit reminded me of] the whole theory of the delicacy, the balance of life....We are all connected. (K26)

For other visitors, the exhibition appeared make them think about the alienation of humans from the natural world.

We don't cooperate with nature much. (K39)

I appreciate the Native Americans' view....I think they have...a very wonderful appreciation for living in harmony with the land. We lost that. (L56)

Many visitors expressed strong feelings about the responsibilities of humans to raptors and the natural world. Many people expressed concern and disapproval of any human infringement upon animal habitats or alteration of animal's way of life. The examples of the plight of the condors, the spotted owls, injured birds, and the use of DDT were cited as examples.

It is very sad to think that some of these birds and animals are becoming extinct because of things we have to have or do. (K22)

We need to highlight...careless handling of things like anti-freeze, and the other poisons....I have become particularly focused on...the environmental things that we do consciously or unconsciously, and the responsibility that we have to shape-up. (K22)

Other visitors spoke of the conflicts between humans and animals as inevitable and natural.

[As I was looking at this exhibition] I thought how people affect the habitat, but also thought about how some people seem to really care [and mend the destruction caused by humans]. I guess it goes both ways, and that birds of prey will get in the way a lot of times....I guess, it's just part of nature for that to happen. (R4)

Visitors offered differing opinions about what course of action is appropriate for humans to take with regard to the environment. Some people expressed support for strong action to reverse damage done by humans.

If you wreck something, you fix it! (K29)

I like the surgery. I like seeing people take time to take care of problems we make. (KGb)

Other visitors focused on the resources available to protect the environment, and whether we should employ public or private measures.

[As I was going through this exhibition, I was thinking about] the...question... posed by that Indian gentleman: What can we do now to protect and preserve some of [the] wildlife and habitat that there is, so that future generations can still be able to enjoy it? [I was] just trying to think of some of the different programs. All different government programs, even private....[I was thinking] how or what even individuals can do as far as helping get the resources going in the right direction; as far as keeping the habitats good and populations up. (K41)

One of the questions [on the What Do You Think? computer] was, "Do you think we should spend millions of dollars to save a condor?" Well, if it takes millions of dollars to save it, my response is, "Sure, but do all of us have to pay for it?" Or do 60 percent of the people on the survey that said that we should do it, should those 60 percent [pay for it]? Should it be mandated by the government, is what I am saying....I don't think we should all be mandated to do it....If the cause is out there and [you] let people know, individuals will respond. (K38)

Several visitors discussed the role of humans as stewards of nature.

Things we do affect not only us, but nature and the rest of the world;...it comes along with some of my theological training, too. [I believe] that the earth is God's creation and that we are here, not to take advantage of it, but to serve it, take care of it. God created everything good and so every part of nature and all people should be respected and valued. (K23)

[Humans are] keepers of nature...preserving nature as it is...taking care of nature. We talk about that a lot. Especially when we go camping. (K9)

A few visitors advocated an approach of noninterference toward nature, citing the process of evolution and "survival of the fittest."

I was touched by the egg hatching;...the fact that if you touch them too much, they are going to die; if you touch them too little, they will die. I think that is an example of probably everything on the earth. If you baby things too much and just let everyone survive, you may be taking away the natural selection of the animal....Our attempt to save them will actually make a weaker species and eventually have an animal that in no way could survive out in the natural [world]—even if there was an appropriate habitat for it. (K38)

Several visitors discussed human efforts to reverse the damage done to the environment, particularly the DDT ban, the Condor programs, and surgery.

Visitors also commented specifically on birds' adaptation in response to human encroachment. They appeared to interpret the response of peregrine falcons to human encroachment on their habitat in two ways. Some people interpreted the peregrine falcon exhibit as an example of the destructive impact humans continue to have today, and which should be addressed.

Seeing the birds on the buildings...we have expanded so much that the poor animals can't go anywhere.... I wish there was more room for them. (R3)

Other people seemed to view the peregrine falcons as an example of a success story, demonstrating how humans and falcons can live together quite well.

The peregrine falcon exhibit [made me feel happy]. There is hope for increasing the animal population. (R10)

It's kind of nice to see that the raptors are still being bred in the city to keep the pigeon population down....I like having the birds in the city....There is no reason why birds of prey can't live with humans because we have them living in buildings now and doing rather well, keeping down the annoying rodent population quite well. (K29)

Other visitors expressed a sense powerlessness, that neither they nor the birds have any power to control the destruction of the environment.

[Humans and raptors] are both trying to survive in an updated world. Like the peregrines and the city hunting. Just all trying to survive in what has come around to today. (K28)

One visitor explained how she felt sad that we are in a position where humans have to intervene.

When they showed that surgery, I felt bad that they have to get so high tech just to fix something. It's the same way we fix people. And when they have to use puppets to feed the chicks—they're practically extinct. I feel bad about it. It's sad they have to DO all that stuff. But I'm still glad they are going that far, giving surgery and feeding them. (KGb)

Responses To Multiple Viewpoints

During the exhibit development process, a conscious effort was made to present to the public multiple viewpoints on the issue of raptors and their relationship to humans. The exhibition addressed this issue on two fronts. It purposefully presented multiple viewpoints such as video clips of loggers, environmentalists, and Native Americans. In addition, and just as importantly, the exhibition allowed visitors themselves to share their own viewpoints. Specifically, the *What Do You Think?* computer interactives tallied and presented visitors' responses, and in the *Spotted Owl Café* there was an open notebook in which visitors were allowed to write their own thoughts.

As part of this evaluation study, we were particularly interested in finding out the degree to which these multiple viewpoints got across to visitors. There was much evidence to suggest that many visitors noticed these multiple viewpoints. In addition, a number of visitors also demonstrated that this exhibition elicited some strong responses and thoughtfulness to these differing viewpoints.

During our conversations with visitors they frequently talked about the variety of viewpoints people hold, and recognized how their own viewpoints differed. Visitors seemed quite interested to hear the perspectives portrayed in the videos, whether the information was completely new, or added to viewpoints of which they had been aware.

I didn't expect to see things [in a raptors exhibit] about the Indians or what they think about the birds and feathers....That is something that I would like even more of. (K21)

My bias almost always is to think how we can save the animals. It's good to know there is another side of some of these issues. (K23)

I am still not real fond of falconry because I feel it is not necessary for this day and age. At least I [now] have a better understanding of why falconry developed....I had never realized it was for hunting. So, at least, I see the value of it in prior times for hunting. (K32)

There also seemed to be a desire to discover what other *visitors* thought about issues and to compare one's own opinions in relation to the majority. Some visitors were surprised by the results tallied by the *What Do You Think?* computers.

There's at least a fourth of the population [responding to the computer surveys] that would just as soon chop [the old growth forest] down. And they're people that's coming to a science museum! (K9)

In looking at the percentages, I was kind of surprised that more people didn't answer positively. [I was surprised that so many visitors] disagreed with—in my opinion—what I think should be taken care of. (K41)

Aha! 60%! [agree with my answer.] (KGObs)

Some visitors expressed disagreement and frustration with viewpoints communicated by other visitors, and by people featured in videos or displays.

I can appreciate the fact that this is where [the loggers] make their living. But it upsets me when their opinion is so very narrow. (K28)

Like [loggers] can only do one job! I know it's difficult. But it's inevitable. (KGObs)

A sampling from the *Spotted Owl Café* comment notebook revealed some interesting debates among visitors.

- *I think environmentalists should quit worshipping the creation, they should worship the creator instead.*
- *I don't see the difference between creator and creation.*

- *It is harder for the owls to find new homes than it is for wood cutters.*
- *Jobs are way more important than a spotted owl!!*
- *Get real.*

- *In the Bible, the Book of Genesis says that God gave man control over all the earth. Therefore, we can cut down a tree and kill a spotted owl.*
- *What about the commandment "Thou shalt not kill?"*

- *I believe that humans think that they can get away with anything they want and most really don't care what happens to other species, as long as it is not them who are in trouble. I believe all species are beautiful and unique and they should be protected from unnecessary harm.*
- *The owls are not in any danger!*

A few times we experienced situations in which people visiting together seemed surprised to discover how their companions felt. The exhibit appeared to provide a forum for a discussion that might not have occurred otherwise. One young couple talked about how the exhibit made them think about humans' place in nature.

V1: *[This exhibit made me] more aware. You don't have to know the species and genus to appreciate the creatures. Simple appreciation.*

V2: *[It made me think that] we may not be the master species.*

V1: *What?! [To the interviewer] You have to know our history. We're religious. You wouldn't expect to hear that from her.*

V2: *I know we are [the master species] but they can come down and take your life....the power of the bird....We think we're the elite species but it takes us so much longer to become independent. Of course animals don't have souls.*

V1: *We'll have to talk about this later. (K10)*

Evidence Of Learning, Critical Thinking, And Attitude Changes

With an issues-based exhibition such as this it is important to look at the extent to which it affects visitors' attitudes, and encourages them to think more critically about something that they previously took for granted. During our conversations with visitors we were repeatedly surprised at the amount of and depth of critical thinking that occurred. Often during our observations of visitors we also overheard spontaneous conversations among members of various visitor groups, indicating that it was not just in response to our questions that visitors thought more critically.

Evidence of critical thinking occurred in numerous ways. In this section we will discuss a) specific information visitors said they learned, b) how visitors talked about how the exhibition affected their attitudes, c) individual and personal connections visitors shared, d) feelings of helplessness, e) how visitors talked of taking action, and f) ways some visitors talked of the importance of the exhibition.

Information About Raptors

Although a primary goal of the exhibition was not to teach specific facts to visitors, visitors often talked about what they had learned.

[It was] interesting to me...learning about how some [raptors] eat birds that are smaller or larger. (KGa)

I thought [the burrowing owl] was interesting. I didn't know birds did that. (R10)

I had no idea that they would live in cities. You don't think of seeing birds like that in a metropolitan area. (K23)

I liked seeing that people are taking the time to take care of what we have damaged. (KGa)

I didn't know some raptors ate snakes. (K29)

I knew there were peregrine falcons within a bunch of different cities, but I didn't know that they had taken hold as well as they did. (R15)

Several visitors said that the exhibit helped them to better understand the extent to which damage had occurred.

I had known about [the dropping condor population] before, so it wasn't a surprise, but I guess the lights [displaying condor habitats] kind of showed you a lot more. It was more dramatic than just saying all the condors are dying out. (L52)

Most people know that [raptors] are endangered but to what extent, they don't. (K29)

I knew [condors] were endangered. I didn't know that there weren't any left in the wild, or just a few left. (R10)

Changes in Attitudes

Visitors also talked about how the exhibition affected their attitudes towards raptors. Some visitors who said they had previously been uninterested in birds, indicated that the exhibit made them more aware and interested.

[After seeing this exhibition] I'm more interested [in birds]. (R16)

I didn't think I would be interested in this whole exhibit....I mean, so much of your life is put into raising five kids and you are working all the time and....I really hadn't thought about it. I'm 54....There is a lot of things that we have missed in nature that we don't enjoy or even think about. I'll definitely sit and wait and look at birds now, on the back of my deck. My wife would watch cardinals...and now I'll spend more time looking at it....I didn't even think about it before. (K27)

Some visitors explained that the exhibition helped them to think about raptors more favorably.

From being here [in the exhibit] just a little while, I have a better understanding and appreciation and also admiration for the beauty of what is out there that we only see in the distance. And here, you have a chance to see them in a place of rest that is still creating a life-like feeling for who they are. (K44)

[I remember noticing] the [number of] mice they said that owl was eating. It made me appreciate the owl behind our house....He's noisy at night. Now we like the owl. (K33)

[I was surprised to find out that peregrines] looked at the high-rises as a cliff. To me, [having the birds around] was more of a nuisance. Now I can see why [they are here.] They can't help but substitute their habitat of cliff-dwelling. (K33)

[After being in this exhibit I will] try not to poison [condors]. Before I thought they were kind of ugly and stupid and stuff. [Now] I think they are not stupid. (R1)

[I was impressed with] the little magnifying glass show case of the little insects and [the label] commenting on how people are usually more concerned with animals that are of larger size....I haven't thought about that too much, why people kill bugs, you know? They are animals....But I kill bugs....It just kind of dawned upon me when I saw that. (R4)

That Indian tape made me see how people and birds can live together. They really respect the bird and it has a lot of spiritual meaning to them, and the birds aren't out there to hurt anybody....I would love to possess [an eagle feather] now. [My son] is a feather collector, too. (K21)

The birds vary so. [I'm amazed at] how ugly they can be, and how beautiful they can be...from a turkey vulture and some of those very...unattractive birds, to the prettier, smoother, nicer-looking birds. [After being in this exhibit] I guess I would try to remind myself that they are all God's creatures, and they are alike and that I am to value them equally, sort of like people. Because, I like only the pretty birds but [only] pretty birds would make a dull world. (K22)

Before this exhibit I didn't really care about owls. I didn't really know much about them, except for school. Now I know their situation and they have it pretty tough. I guess some people only care about money for trees. Owls need a home too! (SOCnb)

Other visitors explained that the exhibit did not change their attitudes.

[This exhibit did] not really [change my attitudes.] There was a lot I didn't know. I [still] feel neutral about [raptors]. (KGb)

There was a lot I discovered that I didn't know about birds of prey, but I don't think it changed my attitude. (KGa)

I have always been impressed with [raptors] but I didn't know as much information as I do now. (K36)

I've got some pretty strong beliefs. I don't think they will be changed very easily. (K41)

No, [my attitude has not changed] because I had always been a great admirer of birds anyway....I just learned more about really what incredible hunters they are. (K32)

As Rush Limbaugh says, "the only thing beautiful about a tree is what you do with it after you cut it down." And Rush is ALWAYS right. (SOCnb)

Some visitors indicated that the exhibit primarily reinforced knowledge and opinions they already had.

[The exhibit] just reinforced my value of birds, especially on the computer surveys. (K9)

I think [the exhibit] only reinforced the feelings that I have about the preservation of [raptors'] habitats, the need to preserve as many species as we can. (R11)

[I felt] disappointment with man's treatment of animals. But that's not necessarily derived from this exhibit. It's just reinforced. (K25)

[The exhibit] reinforced a lot of things I knew and felt. (K24)

Some visitors expressed ambivalent feelings, indicating that they saw both sides of some issues.

How do you choose between a bird that is about to be extinct and the livelihood of people. It's a difficult situation....I don't know that [the exhibit] changed my viewpoint. I'm not sure exactly what my viewpoint is, but [my livelihood isn't in timber, either]....I don't depend on the timber industry for eating. The condor exhibit raises the same issues, the money that is being spent on preservation of the condor versus home life. It is something to think about. Its a good thing to be able to see both sides. (K23)

As usual, [it's] difficult to formulate policy that balances economic survival vs. habitat. [There are] no easy answers. (SOCnb)

Personal Connections

We were concerned that the examples of the condor and the spotted owl may have seemed too distant for some visitors to make a personal connection. However, it appeared that many visitors connected the information presented in the exhibit to issues closer to home.

I was thinking about how honestly I was answering each question [on the What Do You Think? computer interactive.] I was reacting to some of the statements about the Northwest logging communities—how I would feel if I were there, and my family was out of a job. It's easy for me to say “save them”—but how would I feel if people from another state said “We don't like how you treat the Mississippi River.” It was thought provoking. (KGB)

We Americans think it is so terrible that they are destroying the rain forests in South America....I don't feel we can complain at all about them destroying the rain forests if we are destroying our old growth in the Northwest. It is very hypocritical to complain about them doing it in South America when we want to do it in the Northwest. (K28)

An excerpt from an interview with an actor in the *Spotted Owl Café* revealed similar conversations.

Some people in forestry talked about cutting down trees around the Boundary waters. One woman said she used to go to a forest to contemplate and one day it was gone! She couldn't believe it was gone because it had such importance for her. Another man talked about bringing back white pine trees to Minnesota....White pine used to cover Minnesota, then the forest industry came and cut them all down. People brought up things about stands of trees in

neighborhoods: there was a beautiful tree and a neighbor cut it down. The neighbors wondered whether it was legal, the tree meant so much to many people in the neighborhood. (interview with Spotted Owl Café actor)

Feelings of Helplessness

Some visitors expressed a sense of apathy or helplessness; they indicated they felt there was no action they could take to alter the current use of the environment by humans.

Well, to tell you the truth, when [the What Do You Think? computer interactive] was talking about cutting down forests....[I believe] there's not much you can do about it. If that person doesn't do it, then someone else will. That is a real big problem we have. (K42)

It's not the traditional things we tend to think of—air pollution, hunting, illegal or otherwise [that kill the birds]—it's something as innocuous as an anti-freeze spill on the highway. So, in some ways, it is really sad because we can't protect against every contingency....There is no way in our world that we can do that. Not that we should give up, but it just makes you appreciate that there is not any one thing we can do. We can't control industry, we can't control cars, you can't control the building of houses. There is just too many variables. Our world would be different than it is today. I [can't say] whether that is right or wrong. It's just change. (K38)

[As I was looking at the exhibit] I thought how people affect the habitat....I also thought about how some people seem to really care....I guess it goes both ways.... Birds of prey will get in the way a lot of times....It's just part of nature for that to happen. I think it will be a fact of life. As people encroach on [raptors'] habitat more and more, it is going to be a problem. I see this country growing every day. More and more land is being taken up. So, I think it is a fact of life. (R4)

Taking Action

A few visitors talked about specific ways they personally could make a difference.

We have to be careful that we don't just pay lip service without making changes in our lifestyles....You know, I grumble, "Why do I have to sort all of this trash?" and then I see something like this [exhibit] and...[I] get the connection. (L56)

I planted three trees in my front yard....I planted it wild...to attract a little piece of nature...because it is so rare in the city....[Planting the trees wild] is so minor; it is so minuscule that it seems pretty ridiculous....For my mom...it is leaving a spider web and not sweeping it away. (K49)

More visitors talked of things other people could and should do. A sampling of comments from the *Spotted Owl Café Notebook* reveals a wide range of possible solutions.

I think they should plant a tree every time they cut another tree down.

I think that the people should find another way to make a living. It's not like we don't have any other ways to make money. The owls don't have any other way to live.

The spotted owl is not a controversy and should not be regarded as one. The controversy is ultimately people not willing to give up their over-use of non-renewable (or not easily renewable) resources. People need to focus on reusing and reducing (recycling is a small fraction of the answer) and realize that spending more is really no longer a choice—it's reality. From here on out, due to our selfish over use, it will cost us more for less. We need to get used to this idea. It's not the "other-people-far-away-on-the-east-coast" losing their timber jobs, it's YOU—are you willing to use public transportation? Will you REALLY DO IT? Are you willing to buy a used house vs. a brand-new house? Will you REALLY do it? Are you willing to refinish or reupholster your old furniture vs. buy new furniture? Will you REALLY DO IT? Are you willing to not receive the daily paper until it's 100% recycled, or only buy the rougher, 100% recycled toilet paper? Will YOU REALLY DO IT!? Unless you answered "yes" to all of these questions, you need to think twice about saving the old growth forests—you may be the real reason they're disappearing.

Importance of Exhibition

A few visitors in particular explained that they felt they were quite fortunate to have interacted with birds in the wild, and expressed a genuine appreciation that "urbanites" were receiving some exposure to birds' appearance and habits. A few visitors inquired about the exhibit's future destinations and seemed pleased that the exhibit would be able to influence more people around the country.

I think an exhibit like this can really open people's eyes as to the number of creatures that are around them and how they impact those creatures. (R15)

[Knowing that] some people who have not been able to see what I have seen in my life are able to experience that in some way [in this exhibit] makes me feel good. I guess that is the biggest thing; that not everyone has been able to see what I have seen or appreciate these kinds of things. (K37)

I think in major cities that that is your audience. It really seems like [this exhibition] is a very effective teaching [tool]. (K24)

Visitor Reactions to Mounted Specimens

As described earlier, one of the primary goals of *Hunters of the Sky* was to get visitors to think about their relationship with raptors and with nature as a whole. As we began our interviews, we expected to find that the strongest feelings would be expressed in response to the *Spotted Owl Café* and the *What Do You Think?* computer interactives. These two areas were specifically designed to get visitors to think about controversial issues.

While visitors did talk—sometimes quite passionately—about the issues raised by both the *Café* and the computers, we were surprised at how often the mounted birds in the cases appeared to elicit strong emotional responses. In our conversations with visitors, we were surprised at how often visitors described the bird displays as being a particularly significant part of their visit.

The exhibit was really powerful—almost a spiritual experience with birds soaring overhead. (K30)

The specimens are [a very powerful part of the exhibition]. Humbling. Seeing it stuffed doesn't make me lose my respect, which is kind of weird. (KGObs)

I was really impressed with the displays of the actual animals; it brought a lot of reality to the exhibit. (K36)

There is often debate within the museum field about the right amount of context to include when displaying objects to visitors. There tends to be general agreement that we need to move away from the “stuffed birds on sticks” or “bugs on pins” often indicative of older, taxonomic displays in natural history museums. One current trend of exhibit development is to create a walk-through, immersion experience where a diorama surrounds you with all the sights and sounds of the setting, providing a rich context and many intricate details.

The dioramas in the *Hunters of the Sky* exhibition were of a different flavor. Each case stood by itself, and often had only a whisper of environment and narrative: the photo-mural behind the Condor case; the dry, deep snow which couldn't conceal a mouse burrow from an owl's senses; the mouse tail about to be sucked into the Barred Owl's mouth like a string of spaghetti; the rough pavement upon which a vulture's meal is consumed. The poses seemed to subtly reveal the behavior of the bird and convey more information and context than one might expect.

Another research report on visitor experiences at more detailed and intricate dioramas indicated that visitors tended to talk about feeling like they were part of the scene (Anderson, 1993). They talked about being impressed with all the tiny details, and hidden things that would suddenly reveal themselves after repeated observation.

Visitors didn't make these kinds of comments about the dioramas at *Hunters of the Sky*. Instead they talked about being impressed and awed by the individual bird. They talked of awe and power and respect. They often said things like “I didn't realize they were so big!” It seems there

was more of a sense of being in the presence of something awesome rather than a sense of losing oneself in the setting. These dioramas seemed to focus visitors' attention on the bird itself.

I never dreamed; I have seen pictures of condors but to see that one and how big and impressive and how beautiful they are....Seeing them...personalizes them. (K28)

It almost feel[s] like you can touch 'em. (R6)

It is a gift to be able to see them....It's just a very, very special feeling. I am not sure exactly how to describe it, but it is a special feeling...a beautiful treat. (K37)

Visitors also talked about learning about their behavior and habitat.

These [birds] are real. Well, they're not live, but there are live things out [in the wild]....I can relate more to them [here in the exhibition]. You get to see how they live and what they eat and how they grow and [you get to see the] different types [of raptors]. (K21)

The display that was set up with the eagle's nest...attracted my attention....It brings you more into the feel of the environment. You might actually be there, standing on the edge, watching. [It's] more realistic. (R14)

On the other hand, there were a few visitors who explained that they did not experience a sense of awe, and expressed a desire for a more realism.

The only thing that is missing from here is the experience of awe and sometimes fear we have when you are around birds, whether it's the size or the speed or whatever it might be. For example, when you are out at night and a great horned owl drifts over, it's a huge bird but you can't even hear it. If there were something in the exhibit to give you that sensation, whether it be of the power, fear or whatever. (K24)

Kids are very much influenced by tactile exhibits, and there is not a lot of that here. They couldn't stroke the feathers, they couldn't feel the claws, they couldn't feel the feet, they couldn't put their hands around the body and feel there is substance. Its all visual and audio. There might be some motion, but for kids...some kind of a tactile response...is important....I mean, if you get a cat, the first thing you want to do is stroke it and feel its toes and look at its face. You can't touch anything in the exhibit. (K14)

Visitor Reactions to Specific Exhibit Units

The focus of this evaluation was the thoughts and feelings of visitors as they went through the *Hunters of the Sky* exhibition. Due to limited resources, we were not able to spend time collecting data about visitors' interactions with and responses to specific units. We were able

however, to collect a little information about visitors' responses to the *Spotted Owl Café*, and to the *What Do You Think?* computer interactives.

The Spotted Owl Café

As mentioned previously, the *Spotted Owl Café* was designed to be one of the places in the exhibition where multiple viewpoints would be presented directly. For this reason, we were particularly interested in visitors' experiences in the *Café* and the degree to which this space appeared to stimulate critical thinking.

The *Café* Without Actors: One thing that stood out for the data collectors was that the *Café* experience for the visitors was very different depending on whether or not there were actors present. When there were no actors, most visitors wandered into the space, glanced around, and moved on into another area of the exhibition. Often they would also read a few of the labels on the wall.

Some visitors did sit and read or rest in the area for a longer period of time. One group of three women we observed sat around a table and engaged in a relatively lengthy conversation about logging and environmental issues. They (and others) seemed to be using the *Café* as a place to rest and discuss some of the ideas they had been exposed to.

Most visitors who spent time in the *Café* watched the video. They stood or sat, and looked at several clips at a time. For the most part, these visitors watched without commenting or speaking to one another. If someone did want to draw a friend's attention to some item, they seemed to speak more quietly than in other areas of the exhibit.

The atmosphere in the *Café* when actors were not present was generally very quiet. This may have been due partially to the many items to read including the cartoons and posters on the wall and the newspapers. The tables and chairs may have imparted a homey and relaxed message to the visitor. It was also a very "open-ended" environment, with few clues to the visitor about what they were supposed to do. A few visitors we talked with indicated that they were somewhat confused by the space. This may have led to some uncertainty about just how one was to participate.

It took me a minute to figure out what was going on. (K24)

The *Café* with Actors: The *Café* with actors present had a very different atmosphere. Usually there were two or three actors at a time. They would invite people in for some "food for thought" and engage them in conversation. A few visitors indicated that having the actors present made them feel uncomfortable.

Sometimes people...who had been reading quietly...would leave quickly after we got to the Café. (ACTOR2)

Although some visitors may have felt uncomfortable with the actors, other visitors appeared to enjoy participating in conversations with the actors and seemed to appreciate being able to

converse with real people about the important issues raised. Some visitors stated directly they felt that the *Café* was a good idea.

Just the fact that they are there...to dispense...ideas...I think it is a really good forum to have....I thought the guys in there are very good at doing what they do. (K24)

It appeared that the presence of the actors enhanced at least some visitors' experiences in the exhibition. The Spotted Owl Helper was often a conversation starter.

People noticed the Spotted Owl Helper....I started questioning people whether they thought it was pro or con. They were going to come in for a laugh or giggle and had the opportunity to think about it more deeply. (ACTOR1)

Most frequently, the actors engaged in one-on-one conversations with visitors, although sometimes they conversed with small groups of visitors.

Parents either instructed their children [how to respond to us] or stepped back and let us talk to them. It depended on how much parents knew. On a busy day, when there were only two of us there, we found ourselves in a lot of one-on-one conversations. (ACTOR1)

Once in awhile, the actors sparked conversations among members of a group or among strangers.

Some people came in and listened, then started discussing among themselves. (ACTOR1)

There were always people [who] wanted to look around the edges, watch [the] video but not be engaged, people who wanted to watch our engagement with other visitors. There were only a couple of times when we got a heated discussion among us and 3-4 people who had never seen each other before. It was great. Rather than one visitor directly encountering another visitor, they filtered the comments through us so they weren't offending each other. (ACTOR2)

Visitor Perceptions of the *Spotted Owl Café*: Most visitors we spoke with either had not visited the *Café* or had visited it without actors there. Most did not mention the *Spotted Owl Café* directly as being something that stood out for them. While a few visitors appeared to understand that it was a space that provided multiple viewpoints, some indicated they thought the area took a particular viewpoint; some said it was pro-owl, others said it was pro-timber. Others appeared to be confused by the space, not being quite sure whether it took a stand one way or the other.

Critical Thinking in the *Spotted Owl Café*: Most of the visitors we talked with did not mention the *Spotted Owl Café* directly. However, many did mention the spotted owl controversy, or spoke generally on multiple viewpoints about land use. They often supported their comments with information that was presented in the *Spotted Owl Café* video, indicating that they had been into the *Café*.

In our conversations with the actors, they explained that they felt unsure about whether any attitudes were actually changed in the *Café*. There was more indication that this part of the exhibit seemed to reinforce rather than change existing opinions.

Many people who came in knew the issues, and we just added to it. (ACTOR2)

I think we stimulated thinking. People told us, 'we're glad you're here.' But these were people who already had ideas. There was never anyone who came in without any awareness and said, 'You changed my life.' We always wonder how many we're reaching, as opposed to preaching to the converted. (ACTOR2)

Often we would take the other side to whatever [the visitor's position was]. [We were] never confrontational. The point was to enlighten. If a person stubbornly had a position, that was the way we left it. We didn't try to make them wrong. (ACTOR1)

We talked to one man for a long time, about a lot of issues, but when he left he didn't seem to make any connections. He thought it was cool to have wildlife, and said that when he first moved onto his property, there were so many animals and now there just don't seem to be as many as before. We talked a little longer and he told, with pride, about all the wildlife his dog would kill and bring back to the house. But he didn't realize that might be why there wasn't much wildlife anymore. (ACTOR2)

On the other hand, the actors indicated that they felt that some learning did take place in visitors, especially among younger visitors.

They did learn. Some [visitors] didn't know exactly what [old growth forest] was. We had a lot of success with younger visitors who didn't know about the controversy, food chain, diversity in the forest and what it meant. (ACTOR1)

Weyerhaeuser [company] gave us a list of products that involve wood and people were surprised about the amount of wood that is used in many different products. They accepted it, 'Yeah, we do use a lot of wood.' (ACTOR1)

Diversity of Opinion in the Spotted Owl Café: During our interviews with visitors as they were leaving the *Hunters of the Sky* exhibition, there were very few who indicated anything other than a pro-environment sentiment. In the *Spotted Owl Café* however, the actors encountered a greater diversity in opinions.

We got a lot of diversity in answers. We had loggers come through [who] knew the situation first hand and others who had relatives that were hurt. (ACTOR1)

We had a run of days with loggers who wanted to have their side of the issue heard in the Café. They felt that in the city, people weren't open to talk to them. They were glad to have the opportunity to voice their side. (ACTOR2)

The *Notebook* in the *Café* contained the greatest diversity of opinion (see Appendix E). A lively mix of pro- and anti-environment comments were recorded by both adults and children. It appears that the *Notebook* afforded some visitors an opportunity to share their thoughts and even participate in a dialogue that they may not have felt comfortable with otherwise. One actor described a situation in which he conversed with some individuals while a boy wrote in the *Notebook*. After the group left the *Café*, the actor read the written comments and realized that the boy had been responding to statements made in the conversation.

Food in the *Café*: A few visitors indicated they thought there was supposed to be real food in the *Café*, or stated that they wished there was real food. The actors discussed why there was no food.

Initially we served coffee and juice to get people in.... We found that most people were tickled pink to get a free drink, but then they'd just leave. The ones who were interested in being engaged came in without the drinks. We weren't able to monitor keeping the drinks inside the Café--some coffee was spilled on cases. So they stopped it. At first, we were disappointed, because it was so easy to invite people in with the drinks. But we were so busy serving beverages, we couldn't find time to talk. Also, the cups were tiny, so people didn't have to stand around long enough for their coffee to cool and to overcome their fear of engagement. And people had to have a big interest to battle the crowd.

The Actor Performances: The actors described this type of shared performance with the audience as a new experience. They talked of how the performances evolved.

At first we were doing characters and maintaining a point of view. Then it became more valuable to just be with people and talk to people. (ACTOR1)

Initially, we had set characters: a middle of the road character, an environmentalist, and a timber view. We had some good rehearsals. Once we got to the Café, we had to throw the characters out. If 2 actors got into a discussion, the visitors just watched and we couldn't get them involved in the conversation. Occasionally we would take an extreme point of view to get people thinking, but we ended up mostly listening to their view and trying to give the opposing viewpoint as a point of information. It was new to go to that extreme of shared performance and audience space. Maybe if this were more formal they'd have joined in after listening for a while. But no one stayed that long in the Café. Visitors pulled back and didn't engage. It was an experiment. We were concerned about it when we were rehearsing. When there's a clear division [between audience and performer], you can play an expert. But one-on-one you can't do that. The Café was so informal that people could catch you up on being an Oregon local when they'd been there and we hadn't. They could ask you about specific roads or areas. We got most of our information out of books and you could tell. Someone corrected my non-native pronunciation of 'Oregon.' (ACTOR2)

The What Do You Think? Computer Interactives

Another place where multiple viewpoints were presented directly was in the *What Do You Think?* computer interactives.

Visitor Perceptions of *What Do You Think?*. In our conversations with visitors they tended to refer to the *What Do You Think?* interactives either in terms of the “the survey” or “the quiz.” Visitors who referred to the survey often talked specifically about being able to pick out “the politically correct answer.” Visitors who talked of the interactives in terms of a quiz, often talked of the majority answer as being the right answer. While the intent of the interactives was to present multiple viewpoints and to convey the idea that all answers are right, visitors often appeared to respond in terms of a right and wrong answer.

Some visitors also indicated they felt frustrated or irritated with the questions and the format.

These questions are all the same, which is why the answers are all the same. Ask me a hard one! Oh, this one is hard....I'll never have enough information to make a blanket statement. (Observation, K49)

The whole point of the thing is how many agree and how many disagree. That is a completely worthless piece of information....The answers and questions have information in them, but I always personally rebel against that format. (K25)

There was one other poorly worded question, a loaded question. What was it?...The money question. Whether we should spend millions of dollars...on saving the birds....As opposed to spending it on what? It doesn't give you another option to spend the money on anything else. I would rather save a bird than build a bomb, you know. We've got enough bombs and we're losing the birds, although I don't have any particular emotional attachment to either one, so I guess I don't care. (K25)

Accuracy of Responses. Many visitors talked about the discrepancy between respondents' words and actions. There appeared to be a pervasive feeling among many respondents that visitors answered the way they knew they should rather than the way they really believed.

How many people overwhelmingly voted towards, "Yes, nature, conservation is good." How many people actually go to the polls like that, how many people actually campaign like that in their backyards, how many people actually do recycle? (K29)

It is predictable, the kind of answers they want. So, you can automatically say "yes" or "no" by the answer they want to the question. So, that gave an overwhelming percentage of "yes." I think a lot of people answered those rather untruthfully, the predicted answer. (K42)

I really don't know how much effort any of us are willing to put into our answer as far as living our answer. You know, I think we all answer it politically correct but I don't know how much we are individually willing to sacrifice. (KGa)

Evidence of Critical Thinking. Some visitors we observed appeared to use the computer interactives to engage in critical thinking and to converse with others they were visiting with.

Sometimes they read the questions silently; other times one member of the group read a question out loud and initiated a discussion about the issue. Some visitors talked directly and passionately to the person in the video.

SUMMARY

This summative evaluation set out to explore the ways in which visitors to *Hunters of the Sky* talked about their connection with raptors and the natural world, the ways in which they engaged in critical thinking and responded to the multiple viewpoints, and the amount of time they spent in the gallery along with how many units they stopped at. Following is a brief summary of our findings.

Time in Exhibition and Units Stopped At

Visitors to *Hunters of the Sky* spent relatively long amounts of time in the exhibition but used a very small percentage of it. While moving slowly through the gallery, most visitors stopped at less than half of the exhibit units.

The Role of Raptors in Visitors' Lives

Visitors talked about many different roles that raptors played in their lives. They talked of raptors as beautiful to look at and watch. They talked of them needing protection, and also of them serving practical purposes. Many visitors talked about using the exhibit to help them identify birds.

The Relationship of Humans to Nature

Visitors talked in broader terms about nature and humans' relationship to it. They talked of inevitable conflicts between humans and animals, the economics of being environmentally sensible, the role of humans as stewards of our environment, and humans' separation from nature. Some visitors expressed a sense of powerlessness.

Responses to Multiple Viewpoints

Most visitors we observed and spoke with appeared to perceive that the exhibit was trying to present multiple viewpoints, although there appeared to be the general sense that the exhibition was pro-environment, and politically correct. Most visitors expressed appreciation for being able to see another viewpoint. Others expressed anger, frustration, or impatience with other perspectives.

Evidence of Learning, Critical Thinking, and Attitude Changes

There was evidence that visitors to the exhibition engaged in critical thinking, especially when they were part of a social group and participated in a lively dialogue or debate. There was some evidence that some people changed their attitudes, particularly by developing an appreciation for another viewpoint.

Visitor Reactions to the Mounted Specimens

Many visitors talked enthusiastically about the mounted bird specimens throughout the exhibition, although expressed regret that they were not able to touch any bird specimens.

Visitor Reactions to the *Spotted Owl Café*

The presence or absence of actors seemed to make a big difference in how the *Spotted Owl Café* was used by visitors. Most visitors appeared to use the video and appreciate the different perspectives that were presented. Most visitors who conversed with the actors appeared to appreciate the opportunity to talk with someone.

Visitor Reactions to the *What Do You Think?* Computer Interactives

While many visitors used the computer interactives, and many expressed appreciation for being exposed to another viewpoint, many visitors seemed to think in terms of right and wrong answers to the questions. There appeared to be general agreement among many visitors that the questions were leading. Some visitors used the computer interactives to engage in lively family discussions about the interesting dilemmas posed by the questions. Others used them to see if they could get the “right answer.”

CONCLUSION

It appeared that while underutilizing the exhibition as a whole, many visitors to *Hunters of the Sky* engaged in thoughtful reflection and discussion of some important issues. For the most part, visitors seemed to appreciate that the exhibition helped them to see “the other side” although some visitors said they felt that the exhibition as a whole presented an environmentalist viewpoint. Visitors appeared to appreciate some of the humor sprinkled throughout the exhibition, laughing at the birds seated at the *Dinner Table*, chuckling at the *Spotted Owl Helper*, and smiling while reading the critical thinking sign asking visitors to image what a pile of their prey would look like.

Many visitors seemed to make personal connections with the exhibition, using it to help them identify a bird they had seen previously or elsewhere, using it as a background to tell a family story, using it to stimulate a thoughtful discussion with others. Some visitors said they learned some new and interesting facts, and many expressed awe for the birds they saw, especially in terms of size and beauty.

Some visitors appeared confused by the *Spotted Owl Café*, not being able to figure out whether it was pro-owl or pro-logger, and this confusion appeared to create an obstacle for them. Others used it as it was intended, to engage in thoughtful conversation, and be exposed to different viewpoints. The video appeared particularly well-used and effective at stimulating thoughtful reflection. The *What Do You Think?* computer interactives appeared successful with some visitors although there was evidence that at least some of the questions were too leading.

This exhibition, funded in part by both the National Science Foundation and the National Endowment for the Humanities, and created by a science museum, used a combined humanities and science approach, while conveying the voices of many different people and their often conflicting perspectives. The Science Museum is to be commended for embarking on such a potentially controversial journey. Overall, although under-utilized, the exhibition appeared to be quite successful for many visitors, stimulating thoughtful discussion, debate, and reflection, while exposing people to viewpoints different from their own.

APPENDIXES

Appendix A -- Remedial Evaluation Report

Appendix B -- Summary of Preliminary Site-Visit

Appendix C -- Time In Exhibit

Appendix D -- Number of Units Visitors Stopped At

Appendix E -- A Sampling of Comments from the *Spotted Owl Café Notebook*

APPENDIX A
Remedial Evaluation Report

Hunters of the Sky
An exhibit about raptors

Remedial Evaluation Report
for the
Science Museum of Minnesota

by

Kathy Glover, SMM
and Dr. Deborah Perry, Consultant

May, 1995

Project History

Hunters of the Sky is a 6000 square foot exhibit which includes approximately 105 components. Funded in part by the National Science Foundation and developed by the Science Museum of Minnesota (SMM), the show contains taxidermy mounts, large-scale dioramas, interactive exhibits, object displays and text panels. It opened to the public mid-November 1994, and closed here at SMM on April 17, 1995. *Hunters of the Sky* will tour nationally for a period of seven to ten years.

A standard part of the development process at SMM includes evaluation as it provides an opportunity for staff to reflect upon and improve the visitor experience.

Don Pohlman (the *Hunters* exhibit project leader), Robert Garfinkle, Kathy Glover, and Liza Pryor met with Deborah Perry (an external evaluation consultant) on January 6, 1995 to discuss the goals of the remedial evaluation for the *Hunters* exhibit and how the evaluation team would organize its work.

The group decided that Kathy Glover would work under the supervision of Deborah Perry to coordinate the work and design an evaluation strategy for each of the components to be evaluated. Between the dates of January 23 and March 27, the remedial evaluation team (Adele Binning, Kathy Glover, Ejoyo Katagiri, Dick Leerhoff and Liza Pryor) evaluated and modified several exhibit components in the *Hunters of the Sky* exhibit. (See Appendix A for a description of the components evaluated.)

Project Goals

Our overall goal in doing this evaluation was to assess the effectiveness of the components in their current state and, if necessary, devise ways in which the visitor experience could be improved upon. The project was also an opportunity for SMM staff to develop the kinds of skills required to evaluate and improve exhibit components.

Project Design

The exhibit team believed that every component in an exhibit should try and create a relationship or connection with the visitor through the use of accessible language and relevant images, objects and information. In the case of interactive exhibits this is especially true as they are typically very popular; that is, a lot of visitors will use them. Interactive components also

require an increased level of commitment from the visitor which will hopefully be rewarded by a positive experience. For these reasons, our team focused much of its energy on evaluating interactive components.

An evaluation plan outlining a focus and methodology was designed for each component. Work was divided among the team members. In general, the plan for each component included the following:

- A Question—What exactly do we want to know about the component?
- Comments from Deborah Perry—Her thoughts and insights after having spent some time with the components.
- Procedure for collecting data, making recommendations and getting authorization to make changes.

A data collection worksheet was developed for each component. (See Appendix B for sample worksheets.) Over a period of nine weeks, data was collected, modifications were made and the impact of the modifications were observed.

Results

Of the original 36 suggested revisions, 37 were completed or are pending completion. Follow-up observations and interviews showed that the changes we made either had no observable effect (as in the case of re-formatting copy or tightening a layout) or had an observable positive effect on the visitor experience. (See Appendix C for a detailed description of the modifications made and the visitor response.)

Conclusion

As a result of this study, the team feels that many important modifications were made that significantly improved the quality of the exhibition for visitors to our museum, and for the many visitors who will see the show during its tour.

By spending significant amounts of time in the exhibit hall systematically observing and interviewing visitors, we came to know our audience better. We also developed an improved understanding about how we as developers and designers can produce exhibit components that are exciting, comprehensible and satisfying to visitors.

Appendix A

Description of Components Evaluated

Components Evaluated

- **Wind Tunnel** - An exhibit that lets visitors play with wing shapes in a wind tunnel and get an understanding of the aerodynamic principle of lift.
- **The Alula Advantage** - Visitors operate models that show the aerodynamic effects of a the alula.
- **Soaring Makes Sense** - Visitors operate models that demonstrate thermals and how geographical features like ridges displace wind.
- **Shadow Puppets** - Visitors operate shadow puppets in the shapes raptors in flight. A partner on the other side of the screen can make a guess about which bird they see.
- **The Hooting Booth** - Visitors listen to various hoots and record their own impersonation of an owl.
- **Condor Feeding Puppets** - Visitors pretend to feed a young condor chick using puppets modeled after those used in the breeding programs.
- **Peregrine Nest Box and Graphic Panel** - Visitors look at a small diorama of Peregrine Falcons and notice the background of the diorama changes from a city-scape to a country-scape.
- **Red-Tailed Hawk Mounts and Panel** - Visitors look at Red-tail Hawk mounts and read copy about flight adaptations.
- **Color Phase Mounts and Panel** - Visitors look at several mounts showing color variations in raptors and read related text.
- **Raptor Pellet Magnifying Lenses** - Visitors use magnifying lenses to view the components of raptor pellets (bones, fur feathers).

Appendix B

Sample Data Collection Worksheets

Alula

Question: Are visitors understanding what an alula is and how it works?

Evaluator: Glover

Date : 2-20-95

Evaluation strategy: Observe visitor for about 1/2 hour, record what they do and say. In the next 1/2 hour, ask visitors who have just finished using the exhibit what they got out of it. Is copy clear? Are the interfaces working? Are people understanding what an alula is and what it does? Based on those observations and interviews, try some simple re-works of graphics/labels. Continue observations and talks with visitors and see if visitors experience seems to be improving.

Evaluation time:

- Initial observing—1/2 hour /visiting 1 hour
- Interviews - 1/2 hour
- Prototype graphics as necessary.
- Follow-up observations and interviews 1-2 hours

Visitor observations

Time (start) 11:00 (stop) 12:00

•*Boy, appr. 11* turned dials indiscriminately. Stopped moving the knob, looked at abstract and the kestrel photo. Looked at the Try This, his lips were moving so I assume he was reading. Pushed start button a few times. Never went back to knob to see the demonstration.

•*Woman with approx 5 year old* - Woman said, “see, you can move the wing shapes”. Little girl moved the knobs, pushed the start button a few times, and looked at the swirls they made.

•*Man with boy approx 12*, the man said something about stall out, the man looked at copy and the boy moved the wing shapes indiscriminately, pushed the start button several times. The boy walked away after a few moments. The man continued to read for about 10 more seconds, then followed the boy.

•*Woman with approx 10 year old boy* read the abstract aloud. She looked at the Try This for a moment—then there was a really loud noise from another exhibit that seemed to startle her and she left.

•*Woman with two young girls, approx 5-7*, read the abstract aloud. Pointed at the alula on the photo and said “that must be the alula”. The girls played with the knob, pushed the start button and looked at the photo of the alula.

•*Girl, approx 13* moved knobs and looked at graphics. She appeared to see the phenom.

—Made modifications listed below—

•*Man with 2 boys, appr. 12 years old* - the man looked at the graphics for a few moments. The boys asked what the exhibit was about. The man moved the wings into a position to see the “stall-out” effect and said “See here is where the stall out will be” - pointed to area - “and here is where the air flow is good” - pointed to alula. They looked at it for a moment, the boys moved the knobs again, and left.

•*Woman with girl approx 10* - “These represent the wings - see how it flows around it?”, then left.

•*Man approx 20* looked at graphics, moved knob slowly - alula shape stuck. He looked from one window to the other, and left.

•*Three boys, appr 13-14* came up to exhibit - one said - “wing shape with alula” - the others moved the knob around.

•*Woman, approx 25* moved wing shapes into angle position - looked at them. She moved the knob slowly, and the alula stuck a bit. Looked at the Try This copy and illos, moved knobs again, then left. I think she lost interest in it.

•*Elderly man* looked at copy from a few feet away, had been watching previous group. Looked at copy for about 45 seconds, then left.

•*Two boys, apprx 13* - one said -"see this wing has all this turbulence - the other one doesn't cuz of this" - pointed at alula, then both left.

•*Man with boy, apprx 5*, The little boy played with the knob. The man said looked at graphics and said "see the smooth flow here - pointing to alula wing, and its rough up here - pointing to wing w/o alula - the little boy said "now it goes wild!" and started moving the knob back and forth quickly. - man laughed.

Visitor Interviews

Time (start) 2:00 (stop) 2:45

•*Couple, approx 30* looked at "Try This copy while waiting to use the exhibit. They talked and pointed at the differences between the airfoils. (They said they did understand what was happening and were able to explain what was going on to me.)

•*Man, approx. 40* looked at copy, moved knobs. Looked at copy again, then left. After a moment he returned with woman. He showed her the exhibit and explained what was going on to her - he moved the wing shapes slowly - the alula shape sticks a bit - pointed out differences in the effects of the airfoils - moved knob again, got better alignment with the alula. Pointed at the illustrations.

•*Man about 50* - looked at exhibit, moved knobs, looked at Try This. Called over to woman, approx. 50 and explained the exhibit to her - pointed out differences in airfoils.

•*Man, approx 25* and *woman, approx 25* - looked at flowing chamber, she turned knob. He read instructions. He said - "oh see, see the flow break away?" She said, "Oh, yah, you can really see it. Look at the alula one - it looks smoother."

•*Girl, approx 15* turned knobs, watched the swirls, turned knobs again, glanced at the copy, turned knobs, left (She said she didn't get it, was kind of embarrassed)

•*Man with boy appr. 4* - Man looked at graphics for few moments, the boy turned the knobs. The man was not really paying attention - the kid was asking what it was about - the man did not answer, then they left. (I did not ask them if they got it - it was clear the man did not invest enough time in the exhibit to get it.

•*Two boys - approx 14* - One turned the knob back and forth. The other pointed at the wing - see this one has turbulence - the other kids kept turning the knob. They stayed about 15 seconds. (One kid said he got it, but that he had studied it in school - the other did not get it)

•*Man and woman with two small (toddler age) kids*, he looked at the Try this and explained the effects of the airfoils to the woman and the kids. Pointed out differences in airfoils. She got it - he got it, kids too young to get it.

•*Woman, approx 35* turned knobs, glanced at "Try this" copy, then looked back at windows, turned knobs a couple times and left. (did not interview - she did not spend time necessary to be able to get it)

•*Kids, approx 10* turned knobs and made swirls, then left. (no interview, could not have gotten it in time spent.

Notes:

- It appears to take around 20-30 seconds to “get it”.
- The best teams are adults who read with kids and follow the instructions - it seems to almost always work well in these cases.
- If people don't look at the graphics, they probably won't get it.
- The graphics (Try this and Illos) appear to be very important in helping people see the effect. People who do get the exhibit almost always look at them.
-

Modifications

(record any changes you try)

Changed “push to start” to “Push to start flow chamber”

Put “Wing shape” labels right on glass

Added graphic that says: The flowing water represents wing moving over a bird's wing.

Labeled alula on the graphic

Recommendations for final changes (*Write on the other side if necessary*):

- Add/ change graphics as noted in Modifications
- Write final copy - correct mistakes - maybe get it a little more brief?
- I don't recommend any further changes - people can really get it if they take about 20-30 seconds.

Condor Puppets

Evaluator: Adele
Date: 5/19

Question: Do visitors understand the connection between the puppet activity and the condor breeding program?

Evaluation strategy: Evaluator observes visitors use the puppets for about 1/2 hour on a busy day. Record what they do and say. As the puppet-users leave the activity, ask them what they understood about the puppets and why they think they are there. Record what they say. Next, Adele and Ejoyo prototype labels with info important to have at the puppet stand, and install. (Condors are fed by puppets, why this is, and what they eat. A "Try This" — "Put your hand in the condor puppet and imagine feeding a mouse to this baby condor.") Observe visitors using the puppets again, and record what they say. As they are leaving the puppet station, ask them what they understood about the puppets.

Evaluation time:

- Initial observation and interviews 1/2 hour - 45 minutes
- Produce and add graphics, 1 1/2 hours
- Follow-up observations and interviews — 1/2 hour - 45 min.

Initial visitor observations and interviews — *in general area*
Time (start) 1:00 (stop) 1:45 *1 w/ 1 without*

- Adult male read graphics & then tried puppeting. When female companion came he said "Do you see what they use these for?" Both stopped to look at graphics panels.
- Dad w/ toddler sat w/ child & used puppet. He explained puppet was so that the ~~dad~~ ^{boy} thought the ~~dad~~ ^{mother} was feeding it.
- Mother & 7 yr. old girl used unlabelled puppet. Mother looked across at other label and read aloud. "Imagine your a zookeeper.."
- Two adults sat down — one at labelled incubator, one at unlabelled incubator. Labelled incubator person initiated conversation about purpose of puppets based on copy.
- While kids (4 & 8) played w/ puppets dad looked at panels. Explained from panels, not incubator copy.

Follow-up visitor observations and interviews (Write on back if necessary)

Time (start) _____ (stop) _____

Modifications (describe the prototype panels)
— added small copy to ^{inside} back of incubator
Folks could read while puppeting.

Will add photo & permanently mount copy/photo to each puppet incubator

Recommendations for final changes (write on the back, if necessary):
Photo of Ejoyo using puppets.
Hold the raptor silhouette flat against the screen. A friend on the other side will try to identify it as you make it fly

directions to identify the puppet?

Evaluator: Adale

Date: 2/23/95 / 3/19/95

Evaluation strategy: Observe and listen in on visitors. Record what they are saying and doing for about 1/2 hour. Next, for another 1/2 hour, do some informal questioning of visitors you see trying to work with the exhibit, and find out what they are getting out of it. Do they feel like they understand what they are supposed to do and get out of it? Do they understand how to make connections between the puppet and the silhouette? Based on those observations and interviews, work with Eyjo to prototype some new graphics and illos/photos. Do follow-up observing and interviews to see if visitors experience seems to be improving.

Evaluation time:

- Initial observation 1/2 hour
- Initial interviews - 1/2 hour
- Produce prototype graphics/illos as necessary - 1 hour
- Continue observing/visiting and graphic changes as necessary, 1-3 hours.

Visitor observations

Time (start) 11:00 (stop) 11:45

Didn't know how to manipulate puppets. Held away from screen.

Didn't know which bird was which. Became frustrated/disinterested when the puppeteer couldn't identify the bird he/she chose.

Visitor Interviews

Time (start) 12:00 (stop) 12:30

- "I like to make them fly — girl ~ 9
- "It's hard to tell the difference (between species) teenage ♀
- "The condor is huge" dad ~ 45
- "I like how you can see the shapes because that's how they look when you see them." mom(?) ~ 32
- "I'm making it fly, mommy" "What is it?" "An eagle" (It was a peregrine)
- "If they were labelled it would be more fun. You'd know." Oh well she knew it was a bird

Modifications

(describe any graphic changes you try) Added holding containers for puppets. Added simplified, large instructions (laminated) just beneath screen. Added id labels to puppets. Also made joint

Recommendations for final changes: (Write on back if necessary) between puppet holder stick flat like (Eyer's main)

- Will add photograph and attach to permanent instruction graphics just beneath screen. Make i.d. labels permanent
- Hold the raptor silhouette flat against the screen. A friend on the other side will try to identify it as you make it fly across the screen.

Soaring Makes Sense

Question: Are visitors understanding the concept of updrafts and thermals

Evaluator: Glover

Date : Feb. 25, '95

Evaluation strategy: Observe visitor for about 1/2 hour, record what they do and say. In the next 1/2 hour, ask visitors who have just finished using the exhibit what they got out of it. Is copy clear? Are the interfaces working? Are people seeing the thermal effects? Based on those observations and interviews, try some simple re-works of graphics/labels. Continue observations and talks with visitors and see if visitors experience seems to be improving.

Evaluation time:

- Initial observing—1/2 hour /visiting 1 hour
- Interviews - 1/2 hour
- Prototype graphics as necessary.
- Follow-up observations and interviews 1-2 hours

Visitor observations

Time (start) 11:00 **(stop)** 11:45

- Woman, 30 and little boy - She said - "it's about soaring - this is what sunlight does (pointed and read copy, pointed at picture— moved to ridge lift demonstration) "Oh, see, the birds can come along these ridges and fly on the air currents. Birds can fly on that."
- 2 boys, approx 10-12 - pushed buttons, didn't seem to see thermal effect. Saw ridge effect, said "oh, cool" and left.
- Man, approx 35 - pushed button, saw thermal effect, called boy over, showed him effect, pointed and read copy. Moved over to ridge lift. Read copy and pointed at effect.
- Woman approx 45 with boy, approx. 7 - She read copy about ridge lift aloud. He pushed button. She said, "birds can ride a wave up - cuz the wing is energy. The bird doesn't have to use a lot of energy to fly. Next, she read thermal copy. The boy pushed the button. She said "flying in this gives their muscles a rest."
- Little girl, approx 7 - looked at copy, pushed thermal button. Watched effect. Left.
- Man, approx 25 with male friend - pushed thermal button, watched effect. Said, "check this out" to friend "it's how air rises and birds use it". He pushed ridge lift button, watched effect and left.
- Woman approx 50 - pushed thermal button, watched effect. Appeared to read label copy. Pushed ridge button (let go), looked at copy. Looked at the condor photo and copy for a few seconds, and left.
- Woman with little girl, approx 2 - woman pushed thermal button, said to girl "see how the air rises?" and left.
- Woman - pushed ridge lift button (let go), watched effect for a moment. Looked at label copy for a few moments, and left.

(staring cont)

Visitor Interviews

Time (start) 2:15 (stop) 2:45

•Woman, approx 35 - pushed thermal button, looked at copy, looked at effect, and left. During interview, she said " yes, I think I got it - it's about rising hot air and how it gives birds areas to fly—they can fly in the rising air."

•Woman, approx 50 - pushed thermals - looked at effect - got a friend, showed him. Pointed at rising water. During interview, she said "I understood it pretty well - it shows you how hot air rises and it tells you birds can float on the hot air."

•Man, approx 35 - pushed thermals button - looked at the box, let go of the button, looked confused, left. (did not ask for an interview - it was pretty clear he didn't get it.)

•Boy, approx 15 - pushed ridge lift, looked at effect only a moment; saw alula exhibit and went right to it.

•Woman, approx 35-40 - pushed button for ridge, nodded to herself, looked at ridge lift copy.

(During interview, she said "I saw how the wind hits the edge of the cliff and shoots up. The flow up creates wind the birds soar on.")

•Woman, approx 50 - pushed thermal button - looked at effect. Pushed ridge lift button, looked at copy. She was then joined by a woman friend - The first woman said "This is really interesting - "See the warm air rises and birds use it - and this one shows the drafts and how birds use them to fly."

•Woman, approx 40 - Pushed thermal - looked at effect, looked at abstract, looked at condor photo, looked back at effect. During interview, she said " Yes, I think I got it - picture this (effect) as a 3D core - the sun heats the earth and creates these spiraling rising air - birds rise up on them and then fly to the next one."

•Man, approx 50 - pushed ridge button, looked at effect, called a friend over and said "look at this - when the wind hits the edge it shoots up - that air can keep birds in the air - keeps them soaring." (no interview required)

•Man, approx 18 - pushed the ridge button, looked at effect, left. During the interview, he said "it's about how they can soar - this blowing air - the birds use it to fly on - to soar on."

Modifications

(record any changes you try)

•Changed ridge lift button to say: Push and hold down.

Recommendations for final changes (Write on the other side if necessary):

Buttons should say - Push and hold down

Add credit line, a few changes in copy

Tighten layout

Appendix C

Description of Modifications Made and Visitor Response

Recommendations, Modifications and Visitor Response

<u>Components</u>	<u>Recommendations</u>	<u>Action</u>	<u>Problem/Modification/Visitor Response</u>
The Alula Advantage	<ul style="list-style-type: none"> •Change alula illustrations so they look less abstract 	done	<p>We observed that visitors were not looking at the illustrations on the panel. Interviews with visitors and staff working on the floor revealed that visitors did not see the connection between the alula models and the illustrations. After installing the new illustrations we observed visitors pointing at them and then to the actual models. Visitors were using the illustrations to interpret the models.</p>
	<ul style="list-style-type: none"> •Change graphic layout 	done	<p>Based on our experience and judgment, we decided to re-organize the layout so that the instructions on how to use the exhibit were separate from the interpretation of the effect. Observations after the change showed that visitors are using the exhibit successfully.</p>
	<ul style="list-style-type: none"> •Re-write <i>Start</i> button label 	done	<p>We changed the button to read, <i>Push to Start Flow</i>, rather than <i>Push to Start</i>. Before we made the change, visitors would push the button even if the water was flowing. We observed visitors were confused about what exactly the button was supposed to "start". After the copy change, we observed visitors saying to each other - "You only have to push the button if the water isn't flowing" etc.</p>

(Alula cont.)

- Add interpretive label about wing models

done

Based on a conversation with an outside consultant, we were encouraged to try and include text that would help interpret the model for visitors. We added text that read “*The flowing water represents air moving over a birds’ wing*”. We heard visitors read it to each other and to kids. It may be clarifying the model for some.

- Add missing credit

done

n/a

Peregrine nest box

- Add more light

done

In the staff’s judgment, the lighting inside the diorama was too dim. After light levels increased, we observed more visitors spending more time looking at the mounts.

- Shorten time each image is up

done

Initially it took about 20 seconds to dissolve from one image to the next, and we observed all visitors missed seeing it. We shortened the dissolve time to about 4 seconds and noticed a significant increase in the number of visitors who saw both images.

- Add graphic about the scene in the diorama

done

There was no information about the scene that was easily accessible to a visitor looking at the diorama. We added a short graphic explaining the scene in the diorama, which also included a brief statement about the background images. We observed visitors reading it, and reading it aloud to kids.

- Add a step for kids to stand on

pending

Kids were constantly dragging stools over to get the height they needed to look inside the diorama. A step is safer and more kid-friendly. Step won’t be completed in time for us to do follow-up observations.

Soaring Makes Sense

- Re-write button label for ridge demonstration

done

We observed visitors pushing this button and releasing it right away, which is not the best way to see the effect. After we added *Push and Hold Down*, more visitors saw the effect in the optimum way. Interviews with visitors showed that most understood the relationship between the models and how birds use ridge lift and thermals to soar.

- Add missing credit

done

n/a

- Tighten up layout

done

n/a - Looks tighter and cleaner.

Pellet Magnifiers

- No changes recommended

n/a

The underside of the lenses had to be cleaned a few times each day. We wanted to know if putting flaps along the edges of the magnifiers would discourage people from putting their fingers under them, thereby keeping them cleaner.

Observations revealed that many visitors touched the top of the lenses and that they required frequent cleaning. We concluded that it would be a waste of resources to modify the lenses because frequent clean-up will be necessary, regardless.

Red-Tailed Hawk

- Add copy about flight adaptations pending

We had planned to include text about the flight adaptations of birds with the mounts, but were unable to complete it before the opening. The initial plan had been to install the text on a panel adjacent to the mounts. After some preliminary observations and interviews with volunteers who interpret the mounts with visitors, we decided to place the text on the slant surface under the mounts instead of the adjacent panel. The slant surface will allow visitors to stay right in front of the mounts while reading the related text. The adjacent panel will include the ID label for the Red-tailed Hawks and a large photo of a Red-tail in flight.

- Add x-section of raptor bone pending

The x-section of the bone shows that raptor bones are hollow. The bone will aid in interpreting the mounts.

- Add photo of hawk pending

We decided to add this image to fill out the graphic panel.

- Add range map pending

Range maps were a standard part of the ID labels; it was missing from this panel.

- Re-format copy pending

Prototype label had not been formatted according to the style sheet and will be re-done.

Condor Puppets

- Add copy about puppets and how they are used

done

Visitors didn't appear to understand the main idea of this exhibit. No copy was available to help them understand how or why the puppets are used. After we added prototype copy, we observed visitors reading the text to themselves and to kids. We observed visitors discussing how the puppets are used in the breeding facility and why.

- Add photo showing real puppet in use

pending

A photo will help visitors see that puppets are really used in the breeding program and also shows them how to interact with the chick model in the incubator.

Shadow Puppets

- Re-write copy about how to use puppets

done

We observed that visitors did not always understand how to use the puppets effectively. We added copy that stated that puppets should be held against the screen. All visitors we observed after the copy was installed used the puppets effectively.

- Add photo showing a puppet in use

done

In addition to the copy about holding the puppet against the screen, we added a photo showing a person correctly using a puppet. After this, we did not observe visitors having any difficulty with the puppets.

- Create a box for puppet storage

done

There was no home for the puppets! Consequently they were getting dropped on the floor and broken, and making the surface of the exhibit look untidy. Creating storage containers for the puppets keeps them safer and makes the exhibit looking less cluttered.

- Make sturdier labels for puppets

done

Initial labels were not very legible, and tore easily. We created another system that was sturdy and legible.

(Shadow cont.)

•Make flexible stick/puppets interface

done

Our first puppets were connected to a stick by a rigid piece of plastic and we found they broke easily. We designed a flexible tubing that connects the puppet to the stick, making it less likely to break and easier for visitors to use.

Color Phase Mounts

•Add range maps for mounts

pending

The mounts show that there is great plumage variability within the same species. This variability is often based on geography. After watching people look at the mounts, we decided that it would be easier for visitors to get a sense of the geographical differences more quickly if we used range maps in addition to the labels. Range labels were not done in time to do follow-up observations.

•Re-do entire graphic panel because it too text heavy. Install text on slant panel

no action

We did not feel that re-doing the entire panel would be worth the expense. While the information about the mounts is not the optimum location, it is still accessible.

•Add photo to panel

done

The panel is very text-heavy. Adding a photo may make it easier on visitors' eyes. We will not test this assumption, however.

•Add critical thinking question to knee wall

done

The summative portion of the evaluation looked for ways to add critical thinking questions that got visitors thinking about their connection with nature. We decided to include a critical thinking question here.

Hooting Booth

<ul style="list-style-type: none">•Let's Hoot button changed to read <i>Press here to record your own hoot</i>	done	<p>We observed that most visitors did not realize they had the option to record their own hoot. Interviews revealed that changing the wording on the button would make the option clear.</p>
<ul style="list-style-type: none">•Change button that says <i>Play</i> to read <i>Press here to hear the (blank owl) hoot</i>.	done	<p>Visitors did not understand what the <i>Play</i> button meant. Interviews revealed changing the copy made the option unambiguous and we observed visitors using the component effectively.</p>
<ul style="list-style-type: none">•Change other <i>Play</i> button to read <i>Press here to listen to your own hoot</i>.	done	<p>Here again, visitors did not understand what this button (labeled the same as the other button!) would get them. Changing the copy made the option unambiguous, and we observed visitors using it effectively.</p>
<ul style="list-style-type: none">•Delete <i>Clear</i> button and program the game to automatically delete a recorded hoot after it goes back to start-up screen or after 2 minutes.	done	<p>Some visitors left obscene hoots on the computer for unsuspecting fellow visitors. The program was re-written so that any hoot would be deleted automatically by pushing the <i>Start over</i> button. We did not conduct follow-up observations on this change, but in speaking with floor staff, found out that they noticed almost no obscene hoots being delivered to other visitors.</p>
<ul style="list-style-type: none">•Remove the line that tracks the sonogram.	done	<p>We observed that visitors were confused by the fact that the tracking line over the sonogram did not always coincide with the sound the visitor heard. We removed the tracking line and observed visitors using that portion of the program effectively.</p>

(Hooting cont.)	<ul style="list-style-type: none"> •Change Record to read <i>Recording for 15 seconds</i> 	pending	We observed that visitors know when to begin recording their hoot, but don't know how long they have to do it. We will change text to read <i>Recording for 15 seconds</i> .
	<ul style="list-style-type: none"> •Include a <i>Start over</i> button on every screen. 	pending	We observed visitors not being able to navigate back to the beginning of the program. A start over button will always give visitors a starting point.
Wind Tunnel	<ul style="list-style-type: none"> •Re-write graphics to include explanation of Bernoulli effect. 	pending	We observed that visitors did not understand the Bernoulli effect. We will add a graphic describing it. The graphic won't be done it time to do follow-up observations.
	<ul style="list-style-type: none"> •Add a third wing; an airfoil on a string that would show lift. 	pending	The puppet has been prototyped successfully with paper and string. A more permanent prototype is being worked out and will be completed for the next venue.
Feathers and Wentzscopes	Removed from to-do list		Casual observations revealed that visitors were using the microscopes successfully.
Burrowing Owl	Removed from to-do list		We decided not to evaluate this component because casual observation revealed that visitors were finding the female owl mount with no trouble.

APPENDIX B

Summary of Preliminary Site-Visit

**Summary of Preliminary Site-Visit
= Raptors Exhibition =
Science Museum of Minnesota
March 14, 1995**

Karla Niehus
Deborah Perry, Ph.D.

Overview

During the weekend of February 11-12, two days of meetings, training discussions, and visitor observations and interviews were held. Participants in this process included Kathy Glover, Liza Pryor, Don Pohlman, Karla Niehus, and Deborah Perry in addition to numerous unidentified visitors. During this weekend, a significant amount of time was spent identifying various revisions that might be made to the Raptors Exhibition prior to conducting a formal summative evaluation. Following is the list of suggested changes.

Strategy

The following points are a result of initial conversations among museum professionals, and observations of and interviews with museum visitors. They are intended to assist exhibit developers target exhibit improvements that could be made before the formal summative evaluation begins. Kathy and Liza examined the exhibit as a whole, to identify several components that could carry stronger messages. Deborah and Karla focused more specifically on the two components that more explicitly attempt to stimulate an examination of values: *What do you think?* and *The Spotted Owl Cafe*. The following list summarizes our suggestions.

Recommendations

What do you think?

- Make the title work harder for you. Do you want the title to emphasize that it's *your* opinion? That you can compare options? That you should approach this exhibit as a topic-starter for a group discussion? Does the title need to encourage honesty? Communicate that there is no right or wrong answer?

The following list is offered only as a springboard for your own brainstorming.

Brain Stretchers	Challenge Your Opinions
Think and Share	Contemplate and Compare
Honesty Challenge	Truth or Consequences
Think it Over	What would YOU do?
What do you <i>really</i> think?	Opinion Poll
Talk it Over	Talk Among Yourselves
To tell the truth: No wrong answers	Challenge to Think

- Mix up answers, so "PC"/majority isn't always YES.
- Check to see if there are an equal number of conservationist/timber quotes in the computer. Rewrite questions so they are less "leading."
- Add some local issues that relate to nature/culture conflicts in land and resource use. For example: Native American land/fishing rights; BWCA limits on recreational use; wolf population; wild animals as pets (falconry, ferrets, etc.)

- Rephrase questions so they are less confusing and more direct. Unfortunately, this probably means further simplifying what are really quite complex questions. One possible solution might be to set up the screen to ask the really simple question, and then present the information needed in order to answer the question. For example, in large letters at the top of the screen:

Will you cut down the 500 year old tree?

Video Clip and accompanying text: e.g. When people cut down old-growth forest we lose valuable natural resources. On the other hand, by cutting down the forest we provide people with a living, and supply people with the wood necessary to build their homes.

- Add some consequences. For example if someone indicates that they will sacrifice standard of living, perhaps a brief statement listing a few of their chosen sacrifices would appear. Or for more immediacy and some humor, a video clip of Joe at Joe's Auto Recycling saying "OK, you're scheduled to drop off your car on Tuesday; we'll pay you the blue book value. The bus stop's just two blocks away--bundle up, it's chilly out there."
- Can the pie chart be brought back to zero in case you wanted to see if the results are different after the questions have been changed?
- Fix the variable audio. Some of the video clips are very difficult to hear because of the audio level.

Spotted Owl Cafe

- Put the *graham crackers for thought* out at all times to stimulate conversation. This will make it more obvious that conversation is supposed to go on in this area, and will also occupy a kid's attention while parents browse.
- Add some very simple questions to the graham crackers to provide stimulus for inter-generational conversations. For example: What do you have in you house that is made of wood? Where does wood come from? What is a forest? The actors had some great questions they used.
- If it is important to you that people realize that both opinions are represented in the Cafe, you might want to make it more obvious. Perhaps putting signs over the wall information, e.g. Logger's Bulletin Board, and Forest-Saver's Bulletin Board.
- Add a table and chairs underneath the TV monitor. Visitors tend to stand while watching the video which is not conducive to stimulating informal conversations. By having chairs and another table, visitors can sit and converse.

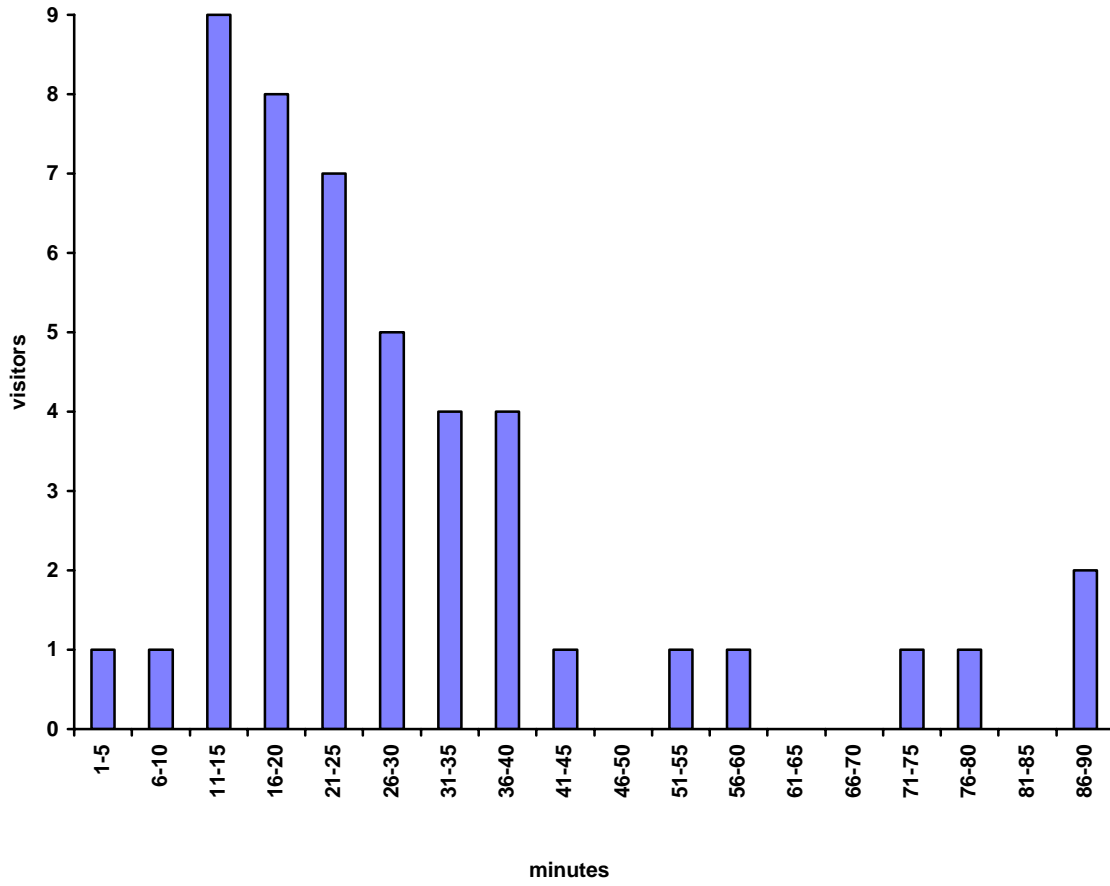
Critical Thinking Labels

- Sprinkle "bumper sticker" labels throughout the exhibition that have questions on them to get visitors thinking about bigger issues.

APPENDIX C

Time in Exhibition

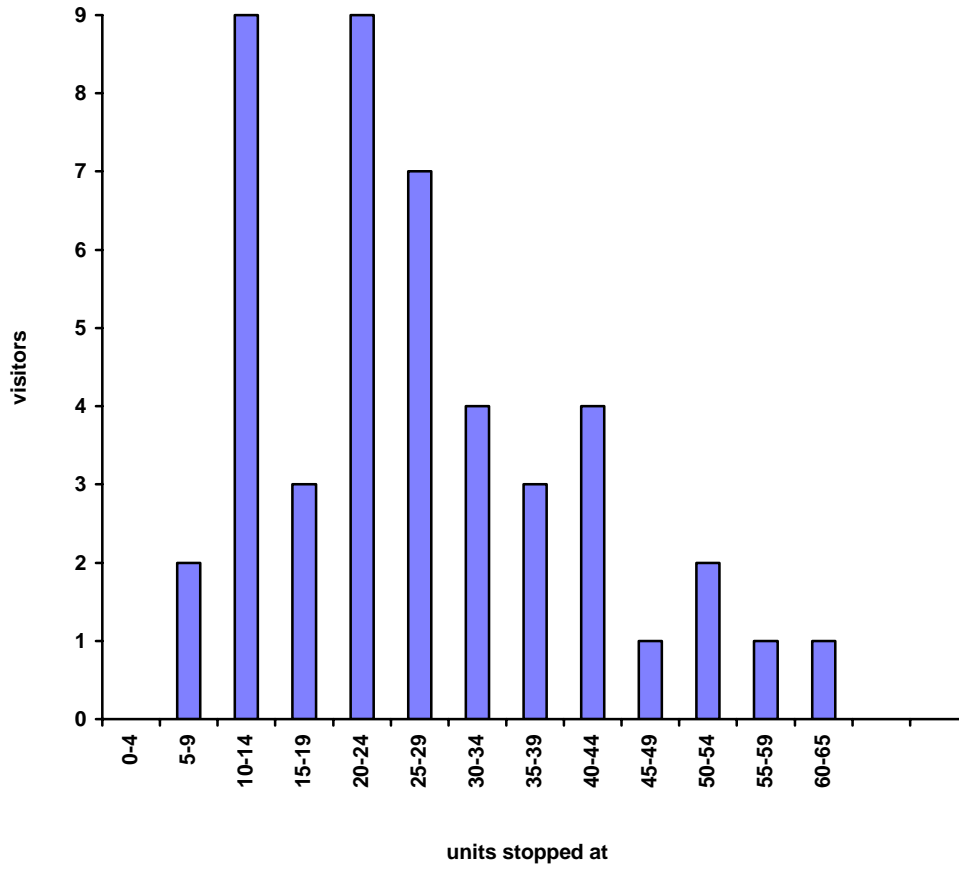
Time in Exhibition



APPENDIX D

Number of Units Visitors Stopped At

Number of Units Visitors Stopped At



APPENDIX E

A Sampling of Comments from the *Spotted Owl Café Notebook*

Please sign our guest book

What do you think about the Spotted Owl Controversy?

2/18/95

They have a right to be here.

A now we have to think about the
owls and if we dont than we won't have
any owls, and we dont want to be
unhappy. SAVE THE OWLS.
Kelly Claussen 2 grade Watertown M.N.



Please sign our guest book

What do you think about the Spotted Owl Controversy?

It would be just like burning
Somebody else's home down.

If you cut down those trees they
will not have a home.

And it's not just the Spotted Owl
thousands of other animals not have
homes, unfortunately Nature doesn't have
welfare!

Caroline
Schmitt

Please sign our guest book

What do you think about the
Spotted Owl Controversy?

it's Harder
for the owls
to find New
Homse then
it is for wood cutters,
alethea

~~the~~
Jobs are WAY
more important then a
spotted owl!!

↑
get real

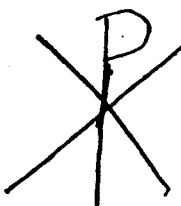
Please sign our guest book

What do you think about the Spotted Owl Controversy?

I REALLY DON'T FEEL AS IF
THE SPOTTED OWL IS FEELING CONTROVERSIAL.
THAT WOULD IMPLY THAT THEY HAVE
FEELINGS THEY DON'T !!

My good friend mandy needed a house,
but she is poor Her parents were
going to build a house because her dad
can build. But they couldn't build because
the wood costs alot !!

IN THE BIBLE, THE BOOK OF GENESIS SAYS THAT
GOD GAVE MAN CONTROL OVER ALL THE
EARTH THEREFORE WE CAN CUT DOWN A
TREE AND KILL A SPOTTED OWL

CHI  RHO

What about the
commandment
"Thou shalt not
kill"?

Please sign our guest book

What do you think about the Spotted Owl Controversy?

AS USUAL, DIFFICULT TO FORMULATE
POLICY THAT BALANCES ECONOMIC
SURVIVAL VS. HABITAT. NO EASY
ANSWERS. VERY EFFECTIVE DISPLAY.

12/3/94 P. MORRIS

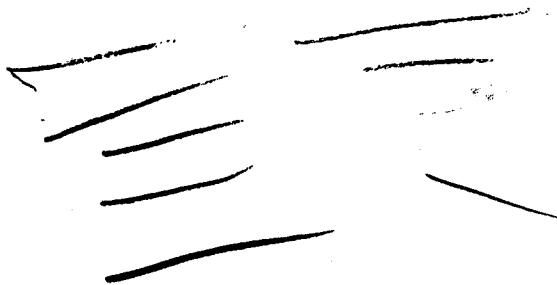
WORLD
PEACE

Please sign our guest book

What do you think about the Spotted Owl Controversy?

I am very sick and tired of the "tree-hugging liberals" I think the jobs of those loggers and the economy is more important than some stupid owl!

- A hunter/DNR member



I think owls are nice I don't think people should cut down their homes

Please sign our guest book

What do you think about the
Spotted Owl Controversy?

Treat them like you
want to be treated
God made these
creatures

In the scientific perspective, The perpetual
significance of life itself is priceless

Animals don't compare
to human jobs

Gabe McDonald
Muscatine, IA

319-264-0645

Please sign our guest book

What do you think about the Spotted Owl Controversy?

Animals are our equal!

Animals are pretty and cool we want live with out them

I like pretty birds

If we don't protect the environment everything will be lost



-Breann Nelson
Brittney

cool
High

Please sign our guest book

What do you think about the Spotted Owl Controversy?

The spotted owl is not a controversy; it should not be regarded as one. The controversy is ultimately people not willing to give up their over-use of non-renewable (or not easily renewable) resources.

People need to focus on reusing; reducing (recycling is a small fraction of the answer) and realize that spending more is really no longer a choice - its reality. From here on out, due to our selfish overuse, it will cost us more for less. We need to get used to this idea. Its not the "other-people-far-away-on-the-east-coast" loosing their timber jobs, its YOU - are you willing to use public transportation? Will you REALLY DO IT? Are you willing to buy a used house vs. a brand-new house? Will you REALLY do it? Are you willing to refinish or reupholster your old furniture vs. buy new furniture? Will you REALLY DO IT? Are you willing to not receive the daily paper until its 100% recycled, or only buy the rougher, 100% recycled toilet paper? Will you REALLY DO IT!?! Unless you answered "Yes" to all of these questions, you need to think 2^{ce} about saving the old growth forests - you may be the real reason they're disappearing...

Please sign our guest book

What do you think about the Spotted Owl Controversy?

QUIT TELLING LOGGERS AND THE
TIMBER INDUSTRY TO CHANGE! YOU
CHANGE! Start making more environmentally
responsible decisions. Teachers, teach
your students how to make these
decisions. Parents, teach your children
respect and stewardship. Governments,
help fund community education programs
about environmental concepts. Empower
yourselves to make a difference. Do
NOT wait for someone else to make
things happen...

Please sign our guest book

What do you think about the
Spotted Owl Controversy?

I think that they should set
aside enough land for the birds
and have us pay more for lumber.

Who are we to
claim the earth for
ourselves? It is
not only our home!

- M. S. P.

Animals were made for
us to eat!

- Britt

S/

Please sign our guest book

What do you think about the Spotted Owl Controversy?

I would like to taste and eat a spotted owl burger!!!
Spotted owls are important, yes, but not as important as the human species.

Before this exhibit I didn't really care about owls. I didn't really know much about them, except for school. Now I know their situation and they have it pretty tough. I guess some people only care about money from trees.

Owls need a home too!

12/30/94

Megan Lozur '94

You go Megan!
what a goody-goody!

Please sign our guest book

What do you think about the
Spotted Owl Controversy?

I think that you should
save 5,000,000
ACRES for animals

I think they should plant a tree
every time they cut another tree
down

Re: Spotted Owl Cafe -

This was a wonderful exhibit to show both sides
of a controversy & help visitors decide what they
think.

Please sign our guest book

What do you think about the Spotted Owl Controversy?

A different point of view!

Sure, animals are being hurt, I don't like that either, but without logging, 1/2 the people in the U.S. would be out of jobs. Printers, carpenters, loggers, etc. Sure its not good to cut em' all down, but look at everyone's things painted yellow the owls don't see them.

after reading please think about how you like would be without food

Im from Olympia, Washington

Alissa

WYAND

14 yrs. old
at 5 M.B.M.

Please don't move there—

but if you visit, drive out U.S. Hwy 101 and take a look to see what clear cutting does. its ugly and makes flooding more prevalent in the area. Sustainable forestry please!

Joey Smith

Please sign our guest book

What do you think about the Spotted Owl Controversy?

I believe that humans think that they can get away with anything they want and most really don't care what happens to other species, as long as it is not them who are in trouble. I believe all species are beautiful and unique + they should be protected from unnecessary harm.

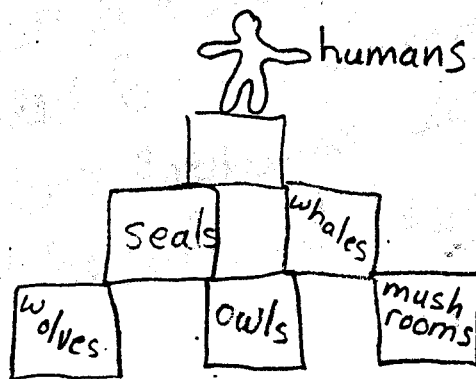
Jarey Brown

The owls are Not in any danger!

Please sign our guest book

What do you think about the Spotted Owl Controversy?

Thanks for showing both sides of the issue. We must try to save the spotted owl. When the species underneath us fall — WE FALL!



Please sign our guest book

What do you think about the Spotted Owl Controversy?

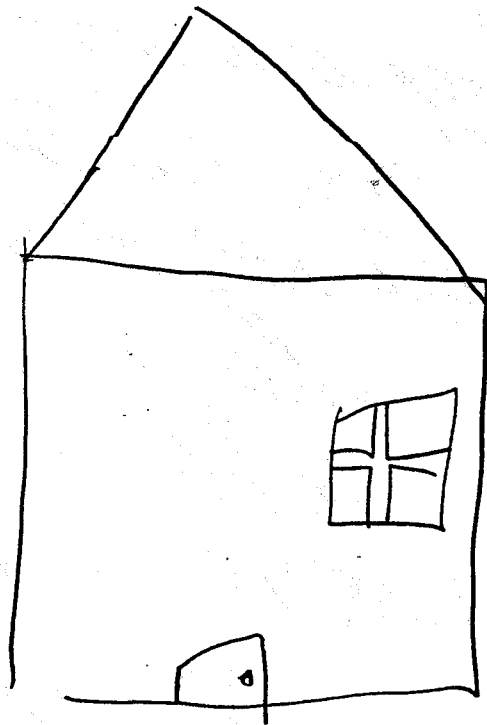
I think owls suck. The only
people that want to protect
them are ^{non}straw-hugging, bleeding
heart liberals that want
to protect them in hopes
to being elected to public office for
their views. As Rush Limbaugh
says "the only thing beautiful about
a tree is what you do with it after
you cut it down". And Rush
is ALWAYS right

Rush Limbaugh

Please sign our guest book

**What do you think about the
Spotted Owl Controversy?**

*The most beautiful thing about a
tree is what you do with it after
you cut it down.*



Please sign our guest book

What do you think about the Spotted Owl Controversy?

I think environmentalist should quit worshipping the creation, they should worship the creator instead. 4-2-95

I don't see the difference between creator + creation. 4-2-95

Please sign our guest book

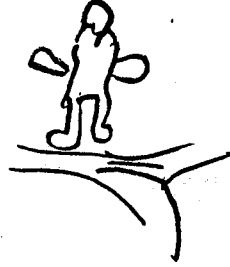
What do you think about the
Spotted Owl Controversy?

I think it is possible for
human beings to remember
the animals and even to
appreciate them for their
inherent value, but it is
highly improbable simply
because we are all too
corrupted by greed.

Elisa Axiotis
4/1/95

Please sign our guest book

What do you think about the Spotted Owl Controversy?



the loggers are being exploited, too, by the big guys. → the only ones w/ something to gain by killing old growth.

see cartoon on wall to left.



We, you + I, all of us buy, buy, buy... we create the demand.

We need to make the first move, take responsibility!

Please sign our guest book

**What do you think about the
Spotted Owl Controversy?**

I don't really care.
Because owls don't
really help us in
any way. We shouldn't cut
down forests for the
heck of it, but if
we need trees, just
cut them down!

Rachelle
Hall

Please sign our guest book

What do you think about the
Spotted Owl Controversy?

PROMOTE ENGINEERED
WOOD PRODUCTS MADE
FROM SMALLER TREES
(ie. WOOD I-BEAMS, LVL,
LSL LUMBER)

Job Creation, ENVIRONMENTALLY
SOUND FACTORIES, AND
USE OF UN-WANTED
TREE SPECIES.

Don Martens
UOF I FORESTRY '85
1977

Please sign our guest book

What do you think about the
Spotted Owl Controversy?

I think we
should respect them
Amanda

Please sign our guest book

What do you think about the
Spotted Owl Controversy?

SAVE THE OWLS!

Save the Owls!
They're harmless
and they help keep
nature in balance
as all predators do.



Save the owls

Please sign our guest book

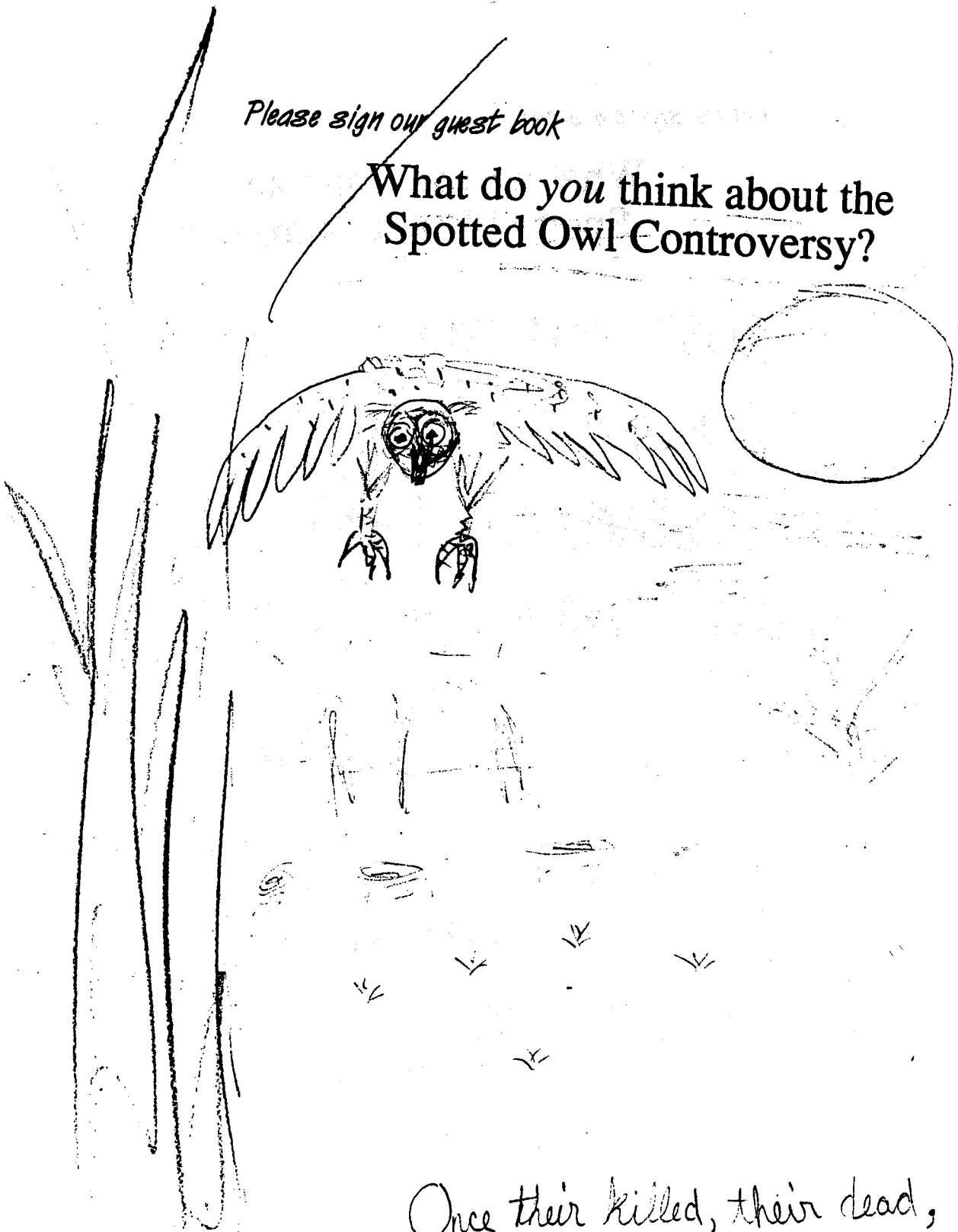
What do you think about the Spotted Owl Controversy?

IMPORTANT POINT:

The issue here is not owls vs loggers although it may seem this way - the issue is saving an entire ecosystem from being destroyed by our selfish attitudes. The owl is just used as a tool to save the ecosystem! The owl is important - but the ecosystem is even more important. Destroying the old growth forests will signal the end of hundreds of species - not just one.

Please sign our guest book

What do you think about the
Spotted Owl Controversy?



Jessica
Simmons

Once their killed, their dead,
And once their gone, their gone
forever!

Kitney Payne

from

Please sign our guest book

**What do you think about the
Spotted Owl Controversy?**

Owls are very interesting
creatures + they should
be protected. After all,
they have feelings too!

♡ Becky

Resenius

8th grader

Isanti, MN

Please sign our guest book

What do you think about the Spotted Owl Controversy?

spotted owls 'r' pretty
cool but they don't
effect me personally
Where are the menus?
I want French Fries!

a visitor

God told
us to take care of
the earth. But
this is like people
worshipping BIRDS!!

this is ridiculous

Kretien

Please sign our guest book

What do you think about the
Spotted Owl Controversy?

I don't care about

owls ||| Charles H.

Dowling

Owls have rights too
you know.

Caitlyn Cornell

Please sign our guest book

What do you think about the Spotted Owl Controversy?

✓ 1 2 3 4
+
K R L R L

3 4 5 6



Please sign our guest book

What do you think about the Spotted Owl Controversy?

THE SIMPLE REALITY IS
"ANIMALS" HAVE A RIGHT TO
LIVE IN PEACE. AND IN THEIR
OWN SPACE. "HUMANS" HAVE NO
RIGHT TO DETERMINE HOW
ANOTHER COMPANION SPECIES
LIVES ON THIS PLANET.
WE SHARE THIS EARTH.

They don't
have rights!
Amny

It really
Doesn't
matter!
Humans are
more
important!
.....
Listen to
Limbaugh!!

Please sign our guest book

What do you think about the
Spotted Owl Controversy?

Thear cutting
DOWN all Thear
Taree's so thear
loosing Food
to HUNT

Please sign our guest book.

What do you think about the Spotted Owl Controversy?

I think we should spend a little more time worrying about people dying than owls.

How would you like it if someone cut down your home just for nothing? But greed?

Cathlene D.

Please sign our guest book

What do you think about the
Spotted Owl Controversy?

I think that people
are too selfish to realize
what they're doing. All that
they can think about is:
"Oh, we're losing our jobs
it's not fair." It's not
fair to the owls either.

Please sign our guest book

What do you think about the
Spotted Owl Controversy?

WHAT'S ONE
OWL more or less?

OWLS ARE A VERY
IMPORTANT PART OF
OUR WORLD'

Please sign our guest book

What do you think about the Spotted Owl Controversy?

~~XXXXXXXXXX~~

We are stewards of our environment,
but we must remember that we cannot
ignore human needs and make "causes"
our priority... they will survive or evolve
as have all other species..

Please sign our guest book

What do you think about the
Spotted Owl Controversy?

I think you should let
Nature Take it's course -
if they die they die if they
live they live.

Casey Foster

I say cut down the loggers
habitat and see how they like
it! Evan
Juro

I agree with Evan!

Joe Sumner

Please sign our guest book

What do you think about the Spotted Owl Controversy?

Humans are a greedy
Species,
Owls are innocent
and have no way to
protect themselves

SAVE THE
BEAUTIFUL JUNGLES!

Molly
HARRIS

Golden Valley

Please sign our guest book

What do you think about the Spotted Owl Controversy?

E

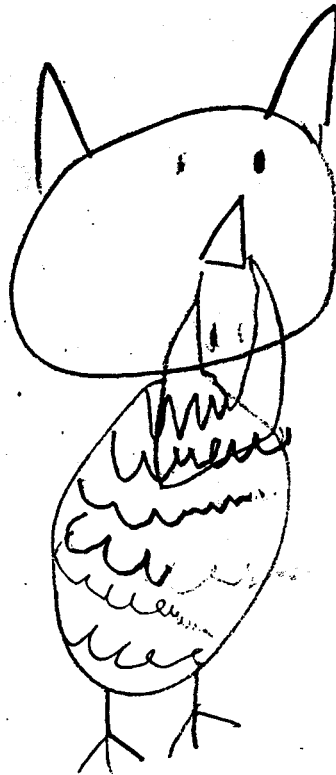
L

Z

A

B

E



age 10

Please sign our guest book

What do you think about the
Spotted Owl Controversy?

I think we
should keep confidence
and keep on trying

by: Tracy talor

Please sign our guest book

**What do you think about the
Spotted Owl Controversy?**

would you rather save a human race
or an owl.

Think About It!!

Elaine
Farley

Please sign our guest book

What do you think about the
Spotted Owl Controversy?

I think Each American should
be held personally accountable for
a small wilderness area.

I think the owls should be saved.
Last summer I worked at an osprey
watch and I really loved watching the
birds, I would feel the same way
about owls. I would like to save more
trees too by recycling.

P.S. I'm a vegetarian so I think the
Spotted Owl Helper looks really gross!

Please sign our guest book

What do you think about the Spotted Owl Controversy?

I'm a logger & I am beginning to realize that the long time consequences of logging, as it is practised today, will wipe out my own livelihood. Sure I want to ~~be~~ be a logger forever, I feel we should more carefully protect, by not clearcutting. Wood should be more expensive so I can cut less trees & still survive. If not, all trees will be gone soon. 90% of trees are gone already.

Please sign our guest book

What do you think about the
Spotted Owl Controversy?

I think that the people should find
another ways to make a living. It's
not like we don't have any other ways
to make \$ - the owl's don't have any
other way to live.

C. Coddington

* Mitakuye

Owasim - all my relatives /
this ancient indian belief needs to be
followed by everyone nowadays. It says that
not only are all of the people in this world
related, but we are ALL related, human,
animal, plant, living + non-living

C Coddington

Please sign our guest book

What do you think about the Spotted Owl Controversy?

I have a couple points
1. Suicide rates have been going up much higher

2. When they lose their jobs ~~the~~ are put on welfare (that's your money their using).

3. No person should have to always go to stores like goodwill all the time.

4. You know the dinosaurs are extinct in order for us to be in the world so I believe that Mother Nature or God or

~~to~~ how ever you want to believe in might need some species to go extinct in order for ~~to~~ some other species to come on earth.

5. People might be able to help ^{save} the world more than snow oaks can :-)

Quality & Good