



The **Bering Sea**
Abundance and Change

A Summative Evaluation Report

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Introduction

This report summarizes summative evaluation findings of *The Bering Sea: Abundance and Change* at the Alaska SeaLife Center (ASLC) in Seward, Alaska. Data was collected at the end of June 2003 on visitor demographics, total time spent and exhibits used, observable visitor behaviors, and visitors' perceptions of the exhibition's messages.

The methods used to gather feedback from visitors included an unobtrusive timing-and-tracking study and an uncued interview. Seventy-five visitors were randomly selected for both studies. (The study resulted in 75 interviews and 70 timing and tracking surveys.) Protocol for timing and tracking and uncued visitors followed Serrell (1998)¹. The purpose of this study was to determine how well visitors were using the exhibition and what messages they were taking away from it.

Data was collected over three successive summer days: two weekend days and one weekday. Subjects were adults and children 10 years and older. While more Seward residents might be expected during the weekends, summer visitation to the ASLC consists mostly of tourists. (The volume and demographics of visitation is governed more by whether there is a cruise ship in the harbor than what day of the week it is.)

¹ Beverly Serrell, *Paying Attention: Visitors and Museum Exhibitions*, 1998

Brief description of the exhibition

The Bering Sea explores current scientific research into environmental changes in the Bering Sea, and the many ways these changes impact animals and humans around the world. The exhibition introduces visitors to the Bering Sea and explores recent environmental changes there. The exhibition also examines some of the current scientific research into these changes and their broader effects.

The big idea for the exhibit is:

Through research, we are trying to understand the changes that are taking place in the Bering Sea and how these changes are affecting species.

The exhibition is divided into two sections: Meet the Bering Sea, which introduces visitors to the Bering Sea and the animals and people that live there; and The Bering Sea is Changing, which focuses on the changes taking place in the Bering Sea and the research being conducted there.

The Bering Sea is located upstairs from the entrance to the Alaska SeaLife Center. It is the first set of exhibits that visitors encounter after purchasing their tickets. After passing through *The Bering Sea*, they continue on to see the permanent ASLC exhibits.

What we learned from timing and tracking

Timing and tracking data was collected during three days in June 2003: two weekend days and one weekday. The 70 samples collected consisted of 32 females and 33 males (5 data sheets did not note gender.) 60% of the subjects were in groups of adults only; 40% were in social groups that included children.

Timing and tracking candidates were selected as they stepped off the escalator directly in front of the entry panel to the exhibit. The third visitor to cross an imaginary line was selected and followed unobtrusively throughout the exhibit. (Selected candidates were not aware that they were being observed.) Total time was kept of their time in the exhibition, and the following behaviors were noted: stopping at an exhibit element, reading, interacting with an exhibit element, pointing, and reading a label out loud.

Compared to 34 science exhibitions of similar square footage and number of elements, visitors to *The Bering Sea* averaged less time and had about the same percentage of diligent visitors. (Percentage of diligent visitors is defined as the percentage of visitors who stop at more than half of the exhibit elements.) The sweep rate index (square feet of exhibition space divided by average time in the exhibition) was a little lower than average. (Sweep rate allows relative comparisons of exhibitions of different sizes. Lower sweep rates indicate that visitors spent more time in an exhibition. Serrell 1998)

Comparison of *The Bering Sea* Timing and Tracking with other exhibitions

	<i>The Bering Sea</i>	Overall average for 34 science exhibitions
Average time spent	8 minutes	12.6 minutes
Sweep rate index	275	287.1
% diligent visitors	19%	19.6%
Square feet	2,200	3398.3
# Elements	34	34.7

The average time spent in the exhibition was 8 minutes with a range of 1 to 22 minutes. This is a little lower than other science exhibits of similar size and number of elements. (Serrell, 1998) The average time spent by groups with children vs. groups with adults was not significantly different.

The sweep rate index (square footage of the exhibition divided by the average time spent) was 275 square feet per minute. Sweep rates of less than 300 square feet per minute indicate that visitors are moving slowly, stopping often, or spending more than a few seconds at each stop. (Serrell, 1998) The more time visitors spend, the more engaged they seem to be with exhibits, and time and engagement are related to learning. (Borun, 1998). The sweep rate for *The Bering Sea* was a little lower than average.

The percentage of visitors who stopped at more than half the elements (percentage of diligent visitors) was 19%. Compared to other science exhibits of similar size and number of elements, *The Bering Sea* had an average number of diligent visitors.

Visitors stopped at an average of 9 of the 34 exhibit elements (26%). The lowest number of stops made by a visitor was 1, the highest was 29. Compared to other exhibits, the percentage of stopping is lower than average in *The Bering Sea*.

Only four exhibit elements (12%) were stopped at by more than half the visitors: The Fish of the Bering Sea tank, the Herring tank, Animals of the Bering Sea video, and Sounds of the Bering Sea.

Although they didn't stop at many elements, visitors seemed to be very engaged when they did stop. 81% of visitors were observed reading labels, 29% read at least one label out loud.

The five most popular exhibit elements (elements stopped at by the highest number of visitors) were Fish of the Bering Sea Tank, Herring Tank, Sounds of the Bering Sea, Animals of the Bering Sea Video, and the Fishing Boat. The five least-popular exhibits were the Bench near the Fishing Boat, the Conclusion: More Research is Necessary panel, the Credits panel, the Exhibition Introduction and the Conclusion: Tell Us What You Think. The most-and least visitors elements were located throughout the exhibit so visitor patterns do not account for some exhibits not being seen.

What we learned from uncued interviews

Data collectors recruited 75 uncued visitors as they exited *The Bering Sea* exhibition. They were interviewed and their verbatim responses were recorded on the interview sheet by the interviewer.

Similar to the timing and tracking study, eligible subjects were adults and children 10 years and older. Thirty-seven men and 38 women were recruited. Forty-nine of these were in groups with adults only, 25 represented adults with children. (1 data sheet did not record group type.)

We asked visitors if they had been to the Alaska SeaLife Center before, if they were Alaska residents and if they had any prior interest in the Bering Sea.

75% of respondents (56 visitors) were first-time visitors to the Alaska SeaLife Center.

35% of respondents (26 visitors) were Alaska residents.

27% of respondents (20 visitors) said they had prior interest or knowledge in the Bering Sea (only 8 of those were Alaska natives.)

Visitors with prior interest or knowledge about the Bering Sea said that they lived in Alaska, had visited the Bering Sea, had learned about the Bering Sea in school, or had a general interest in ecology or fish.

We asked people if they came specifically to see *The Bering Sea* exhibition. Most respondents said no, and many were confused by the question. Many visitors were not aware that they had just seen a discrete exhibition, possibly thinking instead that the first exhibits they encountered were an introduction to the Alaska SeaLife Center (see Discussion for more on this.) Given that the Alaska SeaLife Center hadn't done any specific marketing of *The Bering Sea*, and that visitor confusion with the question broke the flow of the interview, the question was dropped after about 35 interviews.

At some time during the interview:

69% of respondents (52 visitors) said they thought the Bering Sea was relevant to their lives, and 44% of respondents (33 visitors) gave reasons that related to the messages of the exhibition;

36% of respondents (27 visitors) talked about environmental concerns or the ecosystem in general;

29% of respondents (22 visitors) talked about fish; (Timing and tracking showed that the two tanks of live fish were the two most popular exhibits.)

28% of respondents (21 visitors) mentioned that the food they eat comes from the Bering Sea;

23% of respondents (17 visitors) mentioned change; (This included change in the Bering Sea in general, or specific mention about species increasing or declining.)

19% of respondents (14 visitors) mentioned the diversity of species in the Bering Sea;

15% of respondents (11 visitors) mentioned that the Bering Sea was an international water, including references to Russia and how close it is to the US;

9% (7 visitors) talked about scientific research.

The responses to the following questions represents a sampling of the data. For a complete picture of visitor responses, see Appendix B: Responses to Interview Questions.

In response to the open-ended question “**What would you say is the main purpose of the displays you just saw?**” most visitors answered that they were to educate people about the Bering Sea. When prompted “To make people... or to show people...”

- **36% of respondents (48 visitors) said something about fish, sea life or wildlife:**

- ...tell us what fish are there.
- ...learning about fish in the Bering Sea.
- ...teach us about the sea life.
- ...it lets people know how the animals in the sea are doing.
- ...all the fish can swim together and live together.
- ...to see the fish that are there; show people the sea life.
- ...fisheries, what kind of things they catch there, habitat of animals.
- ...get the younger generation to learn about sea life.
- ...to show people what the fish in the Bering Sea look like.
- ...see the different sea critters I guess; I hope to see some whales in here; the beauty of the sea.
- ...interest; see the different kinds of fish.
- ...to teach us about the fishes that live in the Bering Sea.
- ...different species of salt water fish in this area, education on different types of fish available in Alaska.
- ...to show us different sea creatures, fish.

- **24% of respondents (18 visitors) said something about the environment or ecology:**

- ...teach about the ecosystem and what's going on; how they're living and how to preserve it a little bit.
- ...to explain to us how it all came about and how the new world is affecting it.
- ...make us aware of the importance of marine life in general; the ecosystems, the effect on all of us on the planet.
- ...inform visitors the problems we have in our oceans; make us aware of our environment, the sad shape, where we're heading, too many people, too much pollution.
- ...teach people about the importance of the Bering Sea so it will be preserved. ...so people realize the history and culture and animals.
- ...inform people on the ecosystem in the Bering Sea.

- ...to make us more aware of what's happening in our ecosystem.
- ...educate people about environmental responsibility.
- ...to make people think about aquatic wildlife; to think about the environment and how things impact them.
- ...to make people understand what happens in the Bering Sea, as far as the food chain.
- ...I love seals and sea lions so their endangerment is important to me. Most people don't get to see this stuff (pointing at fish aquarium) they go out and catch them.
- ...what scientists are doing to help the environment.
- ...environmental issues, focusing on how things are changing and this is how we're contributing to how it's changing. What you do is affecting the earth type-thing.

- **12% of respondents (9 visitors) talked about change in the Bering Sea:**

- ...educate us how the environment has an impact on changes and how it is changing; the theme throughout is talking about animals and plant life [changing].
- ...awareness of the sea; the changes over the years and the decline of some of the species.
- ...studying change in Bering Sea.
- ...the relationship between the animals and the changes in the ice.
- ...focusing on how things are changing and this is how we're contributing to how it's changing. What you do is affecting the earth type-thing.
- ...teaching people generally about changes; animal life, fisheries.

- **8% of respondents (6 visitors) said something about scientific research in the Bering Sea:**

- ...measuring it all up and doing all these tests on the fish.
- ...emphasizes research, studying change in Bering Sea.
- ...give people more information about fish and research in the Bering Sea.
- ...there's more scientists there than I realized.
- ...tie to the research; what scientists are doing to help the environment; I like how it shows a lot of different points of view.
- ...helping us understand how fragile the sea is and how many unanswered questions there are.

- **4% of respondents (3 visitors) said something about the diversity of life in the Bering Sea:**

- ...inform people about sea life in the Bering Sea; show how rich an area it is, how it supports a lot of fisheries.

- ...the variety of fish and animals in the Bering Sea.

- ...awareness of how much activity there is in it; especially how much it supports.

In response to the question “**What is one new idea you are taking away with you?**”

- **23% of respondents (17 visitors) mentioned a fact about sea life, wildlife or a particular species:**

- ...that algae grew on ice, I was a biology major and never knew that.
- ...the rock sole has two eyes on one side of its head.
- ...didn't know that plants could grow so large in cold waters.
- ...names of some of the fish I never knew before.
- ...I didn't know about halibut, they're flat and lay on the bottom and their eyes are sideways.
- ...the fish looked weird, I've never seen that before; I never realize that there was such a fish as a halibut.
- ...never seen a halibut in its natural habitat.
- ...I didn't know what a right whale was.
- ...I didn't know a halibut was that ugly.
- ...the halibut, I didn't know what they looked like on the bottom of the ocean.
- ...I didn't know about the eider ducks, that was interesting.
- ...I never knew that halibut was like that and that mackerel was so fat.

- **16% of respondents (12 visitors) mentioned changes in the Bering Sea:**

- ...decline in seabirds struck me most.
- ...how the ice is changing and melting so fast; the interaction between scientists and fisheries.
- ...we've got to preserve our waters and wildlife; no more of this pollution. We take it all for granted if we carry on like this there will be nothing left.
- ...surprising how much of the sea life has declined. How we don't really know what causes it.
- ...didn't realize that there's an increase in the right whale population. Our efforts are paying off in some areas.
- ...some of the increases in species, you always hear about the declines. I didn't know some species were increasing.
- ...that there is change.
- ...it's interesting, the decline
- ...that jellyfish were increasing and that they had such an effect. They seem to be the pigeons of the ocean.
- ...oh boy, I'd say the change in the numbers of animal population, how they've changed in the past few years.
- ...learning about the salmon numbers diminishing, predators on salmon.

...jellyfish amounts, also there is so much fishing, like the 70-80% of Americans fish trawling boats, could be/will be decrease in aquatic edible fish population.

- **12% of respondents (16 visitors) mentioned the diversity of life in and around the Bering Sea (including Native populations):**

...life, lots of life in the cold sea.
...uh, the fish here. I wasn't aware of all the different fish.
...surprised at how much there is in the Bering Sea. I didn't realize it was that abundant and fed that many different animals.
...that there were so many different animals that live in the Bering Sea and how many different Native groups there are.
...I probably didn't realize the diversity of marine life.
...lots of different animals and stuff.
...the size and all the different varieties there are; their size and what they do, the different fish species and different otters and different whales.
...the beauty of the country, I didn't realize the vastness of what goes on there.
...the life up on the Bering Straits; didn't realize so many people lived up on the Bering Sea. Didn't realize that many people lived in Alaska.
...that the Bering Sea had such a diverse ecosystem.
...the Native population between Russia and Alaska; so many similarities between the Native populations.
...didn't realize there were so many Native people living subsistence lives.

- **8% of respondents (6 visitors) recognized the international character of the Bering Sea, mentioning Russia:**

...I didn't know that Russia was 53 miles from Alaska.
...proximity of Russia; geographic, how close we are, the importance of the body of water between us and Russia; importance of cooperation between the two countries.
...the Native population between Russia and Alaska; so many similarities between the Native populations.
...I never realized that Alaska and Russia were that close.
...I knew Russia and Alaska were close, but 53 miles!

- **5% of respondents (4 visitors) mentioned that food products come from the Bering Sea:**

...I never realized how much frozen food I get is from the Bering Sea (laughs).

...didn't realize how many products we buy come from the Bering Sea.

...some of the products that come from the Bering Sea, I didn't realize that's where they came from.

...all the products and things that came from there.

When asked if they thought the Bering Sea **was relevant to their lives:**

- **69% (52 visitors) answered yes**, and almost all of them were able to articulate a reason the Bering Sea was relevant. 44% of respondents (33 visitors) gave reasons that related to one or more of the exhibit messages.
- **28% of respondents (21 visitors) mentioned that their food comes from the Bering Sea:**

...yes, we buy fish at home.

...it is, the fish that it supports thrive here, some make their way to California, food industry.

...yes, a lot of our fish products come from that area.

...more so now that it did before I came in the front door. The display about the products we consume and the connection between those products and how much we consume daily.

...sure, food supply.

...yeah, I eat a lot of products that come out of the Bering Sea.

...as a provider of fish, provides a variety of the fish I eat.

...yes, how much came from it, how much of the seafood I buy at the store.

...yes, food products.

...yes, interesting fish and seafood products, now they affect us.

...probably, I'm assuming that is what the basket is for, all the things we eat.

...relevant? Oh, I didn't realize how many products we buy come from the Bering Sea.

...well, I mean obviously we get a lot of products from it, and as a teacher, we teach about ecosystem ecology.

...close to where I live. I eat fish that come out of it.

...as far as food goes, I eat a lot of fish.

...I think so, certainly the fishing industry and saving the animals

...yeah, we just had halibut for dinner the other night. It's kind of neat seeing them in there.

...oh yes, food's fish.

...yeah, for sure. The foods I eat.

...I guess for the salmon, cod maybe, the crab legs or lobster that my wife likes. So I guess it's important not to over fish it.

Other visitors mentioned:

- **that the Bering Sea is changing (4%),**

...because I live here, I think so, yes. And sometimes you wonder if it's an indication of global changes.

...yes, relevant in the sense that I'm concerned with diminishing species

- **or the international aspect of the Bering Sea (6%) as being relevant to their lives.**

...because I live here, I think so, yes.

...[the] kid's relatives live there and survive with the whale fishing.

Discussion

The purpose of the evaluation was to establish the exhibition's effectiveness in engaging the public's attention and communicating the exhibition's messages. The evaluation data showed which exhibit elements were most and least popular, how thoroughly visitors used the whole exhibition, what visitors thought the main messages of the exhibition were and which parts were most memorable.

Timing and Tracking data show that *The Bering Sea* is average to below average compared to exhibits of similar size and number of elements.

The sweep rate is lower than 300, which is good. (The sweep rate represents the square feet of exhibition space divided by average time in the exhibition. Lower sweep rates indicate that visitors spent more time in an exhibition.) However, stops at individual elements is low. The lower sweep rate is probably accounted for by longer times spent at the video and at the live animal tanks. The three most visited exhibits were the Herring Tank, the Animals of the Bering Sea video, and the Fish of the Bering Sea tank. (Record of the time spent at each individual exhibit element was not within the scope of this evaluation. However, visitors were observed informally by data collectors spending a long time watching the video and looking at the live fish.) Exhibits with live animals are always the most popular, and an attractive video showing animals in their habitat is a likely runner up.²

The location of *The Bering Sea*—at the very beginning of the institution—was also a probably factor in the less-than thorough use of the exhibition. Many visitors arrive at the Alaska SeaLife Center with expectations of seeing live animals.³ Visitors were observed to move relatively quickly through *The Bering Sea* exhibits on their way to see the sea lions and harbor seals, and then return later to spend more time in the exhibition. Sometimes a visitor would show up hours later, reflecting either a long visit or a return to the Alaska SeaLife Center. (Admission to the ASLC is good for the whole day, and visitors can come, leave to do another activity like a cruise, and return before the ASLC closes at 8pm.) It was beyond the parameters of this evaluation to record time spent in the exhibition on a second visit, or to keep track of how many visitors actually returned.

The fact that many visitors were observed reading labels (81%) and reading out loud is encouraging. If the exhibition were in a different

² Correspondence with Beverly Serrell, 7/21/03

³ Conversation with SeaLife Center staff, 6/03

location where visitors weren't feeling a pull to see live animals, they might spend more time.

Visitors did not always recognize that they were in a discrete exhibition. Because *The Bering Sea* exhibition is the first thing visitors experience at the Alaska SeaLife Center, it is likely that visitors thought the gallery was an introductory gallery. Adding to the confusion, they were given an outdated map indicating that an introductory video was located where *The Bering Sea* exhibition begins. The map describes "a repeating 3.5 minute film sets the tone for your visit with a series of images about Alaska's marine ecosystem." Further muddying the waters, *The Bering Sea* does have a video presentation in roughly the same place the "Encounter Video" is shown on the map, showing a repeating film with images of the Bering Sea marine ecosystem.

The number of visitors getting the exhibit messages is lower than we'd like. This is likely partly due to the location of the exhibition, and issues discussed above. It can also be partially accounted for by the fact that these were uncued interviews. Uncued interviews are parallel to timing and tracking studies, and tell us what visitors are actually getting out of the exhibition. (The average visitor is under no obligation to get anything out of an exhibition.) Cued visitors generally use an exhibition more thoroughly and their responses to interview questions reflect that more thorough use.

More than half the visitors said they thought that the Bering Sea was relevant to their lives. A positive response is not that surprising, as visitors might anticipate the answer based on the context (it is likely that an institution would create an exhibition that is relevant to the lives of its visitors.) However, almost all of the visitors responding positively gave a reason, and 44% of those gave a reason that related to the exhibit messages.

Given the evidence, it is likely that *The Bering Sea* would show more thorough use by visitors if it was in a different location. If future temporary exhibitions are planned, ASLC staff should consider finding a discrete space for these exhibitions, one that will not be confused with an introduction to the institution. In the near term, visitors should be given an up-to-date map that tells them the first exhibit they'll see is a special exhibition about the Bering Sea. Staff at the front desk could also inform visitors of this fact.

If time and budget allow, ASLC staff might consider conducting cued interviews to determine the exhibition's potential to communicate the

exhibit messages. In a cued interview, a candidate is recruited at the entrance to the exhibition, invited to spend as long as they like in the exhibition, and asked to answer a few questions when they're finished. (The uncued interview instrument could also be used for cued interviews.) Cuing provides a "best case" scenario; if cued visitors don't get the main idea or messages of the exhibition, it is unlikely that other visitors are getting them. Cued visitors show how much *can* be learned from an exhibition. (Serrell, 1998)

ASLC staff might also consider an institution-wide timing and tracking study to determine how visitors use the ASLC as a whole, and what total visitor time in *The Bering Sea* is. This would answer questions about how many visitors come back to the exhibition, and how long they spend there.

References

Borun, Minda, et. al. *Family Learning in Museums: The PISEC Perspective*. Philadelphia/Camden Informal Science Education Collaborative, The Franklin Institute, Philadelphia, PA, 1998.

Serrell, Beverly, *Paying Attention: Visitors and Museum Exhibitions*. Washington, D.C.: American Association of Museums, Technical Information Service, 1998.

APPENDIX A: Popularity Chart

Popularity chart showing percentage of visitors who stopped at each of the 34 exhibit elements, from highest to lowest

	Ele#	Name of Element	# stops	% visitors
1	34	Fish of the Bering Sea	63	90
2	2	Herring Tank	51	73
3	5	Video	35	50
4	7	Sounds	35	50
5	12	Boat	30	43
6	3	Map	27	39
7	10	Subsistence	23	33
8	16	Shopping	23	33
9	6	Ice	21	30
10	15	Fishing	21	30
11	19	Stellar Sea Lion Research	20	29
12	25	Atka Mackerel	20	29
13	9	Native People	19	27
14	17	Research	19	27
15	8	Topography	16	23
16	11	Life Jacket	16	23
17	21	Right Whale	16	23
18	27	Salmon	16	23
19	20	Changes in Marine Mammals	15	21
20	28	Jellies	15	21
21	22	Threatened Eiders	14	20
22	26	Changes in Fish	14	20
23	29	Changes in Invertebrates	13	19
24	23	Changes in Seabirds	12	17
25	24	Trad. Knowl. Seabirds	12	17
26	30	Zooplankton	12	17
27	4	Puzzle	11	16
28	18	Bering Sea is Changing Intro	10	14
29	1	Introduction	8	11
30	31	Tell us what you think	8	11
31	33	Conclusion	8	11
32	13	Credits	7	10
33	32	More Research is Necessary	6	9
34	14	Bench	4	6

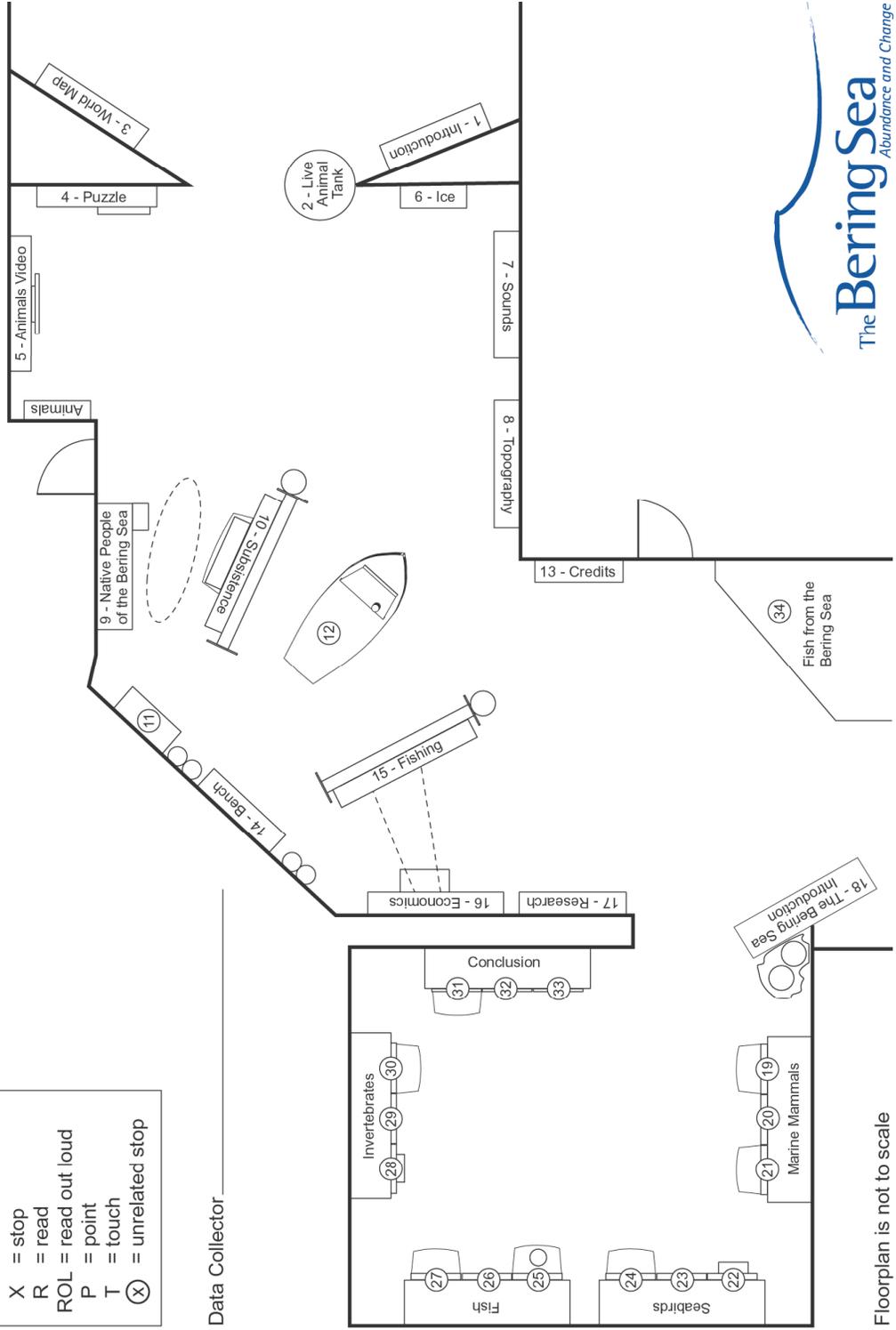
APPENDIX B: Evaluation Instruments Timing and Tracking

Day _____ Date _____ Sheet # _____ Time In _____ Time Out _____ Total Time _____ Exhibit Stops _____

Age: 10-15 16-19 20s 30s 40s 50s 60s+ Gender: M F Group Size: 1 2 3 4 5+ Group Type: A only A+K

- X = stop
- R = read
- ROL = read out loud
- P = point
- T = touch
- (X) = unrelated stop

Data Collector _____



Floorplan is not to scale

APPENDIX B: Evaluation Instruments
Uncued Interview

Date _____ Time _____ Interviewer: _____ Sheet# _____

Gender: M F Age: 10-15 15-20 20s 30s 40s 50s 60s 70+

Group type: A only A+K

Hi, my name is _____. Today we're talking to people to figure out how well these exhibits are working. I'd like to ask you a few questions. It will take about 5 minutes. As a thank you for your time, we'll give you a little gift.

1. Is this your first visit to the SeaLife Center? Y N

2. Do you live in Alaska? Y N

3. Did you come today specifically to see the Bering Sea Exhibit? Y N

4. Do you have any special interest or knowledge about the Bering Sea?
if yes, what? _____ Y N

5. What would you say is the main purpose of the displays you just saw?
prompt: "To make people..." or "To show people..."

6. What is one new idea you are taking away with you?
prompt: "I didn't know..." or "I never realized..."

7. Does Bering Sea seem relevant to your life in an way? (relate to your life?)

8. Is there anything you'd like to tell the people who made this exhibit?

9. Anything else?

Thank you for your time. Here is a token of our appreciation.

APPENDIX C: Exhibit Messages

Big Idea

Through research, we are trying to understand the changes that are taking place in "use pattern change, fishing technologies, research technologies, political policies—US and Russia and International. Change is not all bad. IS change caused by humans?

Bering Sea = Aleutian Islands, North to Bering Strait, Russia to Alaska

Species = mammals, birds, fish, humans, inverts, zooplankton, plants

Affecting = good and bad

Messages

- I. Introduction
 - The Bering Sea is important to us because it effects global economics and biodiversity.
- II. Meet the Bering Sea
 - The Bering borders Alaska and Russia.
 - Climate, geology and currents are three of the factors that make the Bering Sea unique.
 - The Bering Sea is one of the most productive ecosystems in the world, supporting a wide variety of habitats and animals.
- III. The Bering Sea is changing
 - Researchers are studying changes using different methods.
 - Changes in the Bering Sea affect people and animals.
 - Different people have different points of view on why the Bering Sea is changing and what that means.
- IV. Conclusion
 - Policies and co-management are being developed to try and better manage human impact on the Bering Sea.

APPENDIX D: Responses to Interview Questions

What would you say is the purpose of the displays you just saw? prompt: "To make people..." or "To show people..."

Respondent

- 1 none
- 2 Educate people about the Bering Sea
- 3 Education and awareness of what's going on
- 4 Helping us understand how fragile the sea is and how many unanswered questions there are
- 5 To appreciate the Bering Sea
- 6 Don't know, didn't read too much
- 7 Tell us what fish are there
- 8 Educate about fishing industry and importance of sea to people outside Alaska
- 9 Learning about fish in the Bering Sea
- 10 Teach us about the sea life
- 11 It lets people know how the animals in the sea are doing
- 12 Teach about the ecosystem and what's going on; how they're living and how to preserve it a little bit
- 13 Educate people; what's happening with wildlife
- 14 All the fish can swim together and live together
- 15 To display wildlife
- 16 education; sea life here, how it's surviving, some say populations are going down, that effects everyone, especially fishermen and Native people
- 17 to explain to us how it all came about and how the new world is affecting it; measuring it all up and doing all these tests on the fish
- 18 inform people about sea life in the Bering Sea; show how rich an area it is, how it supports a lot of fisheries
- 19 to see the fish that are there; show people the sea life
- 20 make us aware of the importance of marine life in general; the ecosystems, the effect on all of us on the planet
- 21 educational; to educate about sea life
- 22 educate us how the environment has an impact on changes and how it is changing; the theme throughout is talking about animals and plant life [changing]
- 23 inform visitors the problems we have in our oceans; make us aware of our environment, the sad shape, where we're heading, too many people, too much pollution
- 24 see the wildlife; enjoy the wildlife adventure
- 25 educational; aware of the variety of fish and animals in the Bering Sea
- 26 awareness of the sea; the changes over the years and the decline of some of the species

APPENDIX D: Responses to Interview Questions

- 2 7 environmental concerns, awareness, emphasizes research, studying
change in Bering Sea
- 2 8 teach people about the importance of the Bering Sea so it will be
preserved. How to educate people about...so people realize the history
and culture and animals.
- 2 9 inform people on the ecosystem in the Bering Sea; recreation
for young people
- 3 0 don't know
- 3 1 education, to make us more aware of what's happening in our
ecosystem
- 3 2 fish; I don't know
- 3 3 give people more information about fish and research in the Bering
Sea
- 3 4 fisheries, what kind of things they catch there, habitat of animals
- 3 5 get the younger generation to learn about sea life
- 3 6 make them realize it's mother nature, you know?
- 3 7 as outsiders, we have an understanding about what the Bering Sea
holds, what it produces, how it affects our life
- 3 8 educational, lets you know about the creatures in the sea and the
artifacts; shocking how close Russia is to us
- 3 9 education, hands-on, children's education; most exhibits indicative
of simple learning where children can grasp what's going on easily
- 4 0 education, info to understand what's happening
- 4 1 to explain to people the importance of the Bering Sea
- 4 2 educate people about environmental responsibility
- 4 3 to teach us about how the animals live
- 4 4 education, seems to be a big focus on elementary grade level. I'm a
teacher so I'd like to take a class through here. It's visual not too
much to read
- 4 5 to show people what the fish in the Bering Sea look like
- 4 6 See what's in there
- 4 7 educate us, we take things for granted, there's more scientists there
than I realized, sad at my age, I know
- 4 8 to show people the natural wonders
- 4 9 the change in the Bering Sea sea life, animals, fishes, birds
- 5 0 knowledge; aware of sea life, what's there
- 5 1 to educate; to make people think about aquatic wildlife; to think
about the environment and how things impact them
- 5 2 see the different sea critters I guess; I hope to see some whales in
here; the beauty of the sea
- 5 3 educational, to make people understand what happens in the Bering
Sea, as far as the food chain. The relationship between the animals
and the changes in the ice
- 5 4 interest; see the different kinds of fish

APPENDIX D: Responses to Interview Questions

55 to educate people more about it; I love seals and sea lions so their
endangerment is important to me. Most people don't get to see this
stuff (pointing at fish aquarium) they go out and catch them
56 awareness of how much activity there is in it; especially how much
it supports
57 to teach us about the fishes that live in the Bering Sea
58 education; so everything that is set up is set up to teach you about
the life in the Bering Sea, not just cool tanks; displays are giving you
information via word.
59 to exhibit various sea life in the Bering Sea
60 different species of salt water fish in this area education on different
types of fish available in Alaska
61 public education; tie to the research; what scientists are doing to
help the environment, like how it shows a lot of different points of
view
62 environmental issues, focusing on how things are changing and this
is how we're contributing to how it's changing. What you do is
affecting the earth type-thing.
63 make people more aware of what's going on
64 educate people as to species; get them to see the live species
65 to give an overview of people and animals in the area
66 to show us different sea creatures, fish
67 education and enjoyment
68 these are to teach the kids; good all around education
69 to educate people, we went pretty quickly
70 to educate the public
71 to educate concerning the problems, seems there is quite a lot
72 informative and uh, yeah I guess teaching people generally about
changes; animal life, fisheries
73 pretty educational
74 it's supposed to familiarize your people with what's in the Bering Sea,
not interested on what you got on that wall - just fish and stuff
75 to show people who don't live here a little about here

APPENDIX D: Responses to Interview Questions

What is one new idea you're taking away with you?

prompt: "I didn't know..." or "I never realized..."

- 1 none, his family fishes and he hears all about it
- 2 no
- 3 decline in seabirds struck me most
- 4 How the ice is changing and melting so fast; the interaction between
scientists and fisheries
- 5 life, lots of life in the cold sea
- 6 no
- 7 no clue
- 8 algae grew on ice, was biology major and never knew that
- 9 not really, Discovery Channel shows teach a lot
- 10 that Alaska and Russia are so close, I didn't know that
- 11 the rock sole has two eyes on one side of its head
- 12 don't know
- 13 puzzle thing, I think it's good. The kids played with that a lot. I didn't
know that Russia was 53 miles from Alaska
- 14 I want to come back and get more
- 15 didn't know that plants could grow so large in cold waters (looked
back at the fish tank for inspiration)
- 16 I live near the aquarium in La Jolla. Names of some of the fish I
never knew before
- 17 We've got to preserve our waters and wildlife; no more of this
pollution. We take it all for granted if we carry on like this there will
be nothing left
- 18 surprising how much of the sea life has declined. How we don't really
know what causes it
- 19 I don't know, just started looking a couple minutes ago
- 20 proximity of Russia; geographic, how close we are, the importance of
the body of water between us and Russia; importance of cooperation
between the two countries
- 21 uh, the fish here. I wasn't aware of all the different fish
- 22 didn't realize that there's an increase in the right whale population.
Our efforts are paying off in some areas
- 23 I knew we were in this state of affairs as far as anything new, not
really
- 24 I didn't know about halibut, they're flat and lay on the bottom and
their eyes are sideways
- 25 surprised at how much there is in the Bering Sea. I didn't realize it
was that abundant and fed that many different animals
- 26 I never realized how much frozen food I get is from the Bering Sea
(laughs) Never realized how big it was
- 27 haven't looked closely enough

APPENDIX D: Responses to Interview Questions

28 that there were so many different animals that live in the Bering
29 Sea and how many different Native groups there are
30 the Native population between Russia and Alaska; so many
31 similarities between the Native populations
32 phones, didn't realize that the two phones were there
33 didn't realize there were so many Native people living subsistence
34 lives
35 the fish looked weird, I've never seen that before; I never realize that
36 there was such a fish as a halibut
37 the sounds that animals make, that was very cool
38 all the products and things that came from there
39 can I pass
40 it's fun for kids, I'd like it if I was a kid
41 never seen a halibut in its natural habitat
42 it's just all of the facts are interesting. We'll come back with other
43 family to talk to them about it
44 I probably didn't realize the diversity of marine life
45 some of the increases in species, you always hear about the declines.
46 I didn't know some species were increasing
47 that we should pay attention to the quality of the Bering Sea and
48 protect it so we don't have another Exxon Valdez
49 don't know, didn't realize how many products we buy come from the
50 Bering Sea
51 Lots of different animals and stuff
52 some of the products that come from the Bering Sea, I didn't realize
53 that's where they came from
54 no
55 he's never seen halibut (referring to partner with her)
56 that Alaska was so beautiful
57 nothing
58 that there is change
59 surprised that there was an aquarium there
60 no
61 The size and all the different varieties there are; their size and what
62 they do, the different fish species and different otters and different
63 whales
64 the beauty of the country, I didn't realize the vastness of what goes
65 on there
66 the life up on the Bering Straits; didn't realize so many people lived
67 up on the Bering Sea. Didn't realize that many people lived in Alaska
68 from growing up here and being on the water in boats out there, you
69 don't realize what's going on. You see boats throwing stuff in the
70 water and that makes me mad, oil spills, popcorn holders
71 it's interesting, the decline; I didn't realize how much research is
72 going on here. I didn't know what a right whale was

APPENDIX D: Responses to Interview Questions

- 57 I didn't know a halibut was that ugly
58 I don't think, there isn't a specific new idea; I never realized that
Alaska and Russia were that close
59 how big the Bering Sea was
60 no
61 A quote comes to mind: "besides traumatic disasters like oil spills,
there's no such thing as a healthy or unhealthy ecosystem, it is
what it is"
62 that jellyfish were increasing and that they had such an effect.
They seem to be the pigeons of the ocean
63 The halibut, I didn't know what they looked like on the bottom of the
ocean; animal's habitats, where they live
64 That the Bering Sea had such a diverse ecosystem
65 I didn't know about the eider ducks, that was interesting
66 Well, I liked the herring; it would be nice to bring the kids
67 I knew Russia and Alaska were close, but 53 miles!
68 Surprised to learn of bone fish hooks
69 I don't know, I'm with a two year old
70 Oh boy, I'd say the change in the numbers of animal population;
how they've changed in the past few years
71 Learning about the salmon numbers diminishing; predators on
salmon
72 Jellyfish amounts, also there is so much fishing, like the 70-80% of
Americans fish trawling boats, could be/will be decrease in aquatic
edible fish population
73 I never knew that halibut was like that and that mackerel was so fat
74 nothing
75 I didn't really look at it; we just looked at the fish

APPENDIX D: Responses to Interview Questions

Does the Bering Sea seem relevant to your life in any way?

- 1 no
- 2 every sea is important
- 3 (illeg) sense of what is going on with our earth
- 4 the environment is general is relevant
- 5 everyone's life - Russia to Alaska - the sea is important to them
- 6 yeah
- 7 no
- 8 yes, buy fish at home
- 9 no
- 10 no
- 11 no
- 12 no; maybe, my husband likes to fish, I'm new at this
- 13 not really. I'm from Texas so it's kind of "out of sight, out of mind."
- 14 no
- 15 not really
- 16 It is, the fish that it supports thrive here, some make their way to California, food industry. Whales come through California on their way to Baja
- 17 yes. We're all surrounded by water. I'm from Australia, an island with water all around it; makes you more conscientious
- 18 yes, a lot of our fish products come from that area
- 19 yes, we lived right next to it for a long time, on Crystal Bay
- 20 more so now that it did before I came in the front door. Display about the products we consume and the connection between those products and how much we consume daily
- 21 sure, food supply
- 22 yeah, I eat a lot of products that come out of the Bering Sea
- 23 not really
- 24 ancestors, they taught us how to encounter wildlife and how to live as a provider of fish, provides a variety of the fish I eat
- 25 yes, how much came from it, how much of the seafood I buy at the store
- 27 yes, part of the planet I live on , one of the homes to the beginning of the food chain - plankton to whales, we fit in there somewhere
- 28 yes, food products
- 29 yes, interesting fish and seafood products, now they affect us
- 30 yeah, I used to live in Russia. Learned a lot about it in Social Studies last year
- 31 absolutely, part of our universe. So close to Russia; very important in getting along with our neighbors
- 32 just the water
- 33 not really

APPENDIX D: Responses to Interview Questions

- 34 probably, I'm assuming that is what the basket is for, all the things
we eat
- 35 yes, working on a cruise ship
- 36 no
- 37 very small picture, so distant from where we're at
- 38 my wife's parents are from Russia, so it's amazing how close Alaska is
to Russia, 53 miles
- 39 sure, it's part of the ecosystem; every part of the ecosystem affects
every other part
- 40 because I live here, I think so, yes. And sometimes you wonder if it's
an indication of global changes
- 41 yes, all those things are relevant. Global ecosystem is important to
all humankind. If we don't pay attention to these things, our life will
go away as well, very important
- 42 relevant? Oh, I didn't realize how many products we buy come from
the Bering Sea
- 43 no, not really
- 44 well, I mean obviously we get a lot of products from it, and as a
teacher, we teach about ecosystem ecology
- 45 yes, but I don't really know
- 46 is that where they get crab? So sure.
- 47 no
- 48 Kid's relatives live there and survive with the whale fishing
- 49 sure, something in the way we life is changing our environment
- 50 no, I've been there, it's beautiful. I didn't realize we were so close to
Russia
- 51 yes, it's part of Alaska that needs to be protected
- 52 no
- 53 it should be something that should be preserved for every
generation to enjoy
- 54 not really
- 55 I don't know that yet
- 56 It's interesting. I like to know what's going on around me. I take care
of the fishermen who hurt themselves
- 57 close to where I live. I eat fish that come out of it
- 58 no
- 59 Yes, I work on a cruise ship; if there were to be an environmental
disaster it would be horrible
- 60 yes, for the employment opportunities for people in Alaska, not just
oil and lumber
- 61 as far as food goes, I eat a lot of fish
- 62 yes and no. Don't have a great interest. Affects my life because if
something goes wrong there it affects the rest of the world. I was
upset by the walrus thing around. My interest is on how we're
treating the wildlife and the animals in every place

APPENDIX D: Responses to Interview Questions

- 63 no
- 64 Yes, because I live here and I like fish
- 65 I think so, certainly the fishing industry and saving the animals
- 66 Yeah, we just had halibut for dinner the other night. it's kind of neat seeing them in there
- 67 Yeah, since my husband works in a related field
- 68 Yeah, probably. I am going fishing out there in some way or another
- 69 Yes, well land should really be an interest of everyone, it's can advocate for itself, I mean water in this case
- 70 Oh yes, food's fish
- 71 Yes, relevant in the sense I'm concerned with diminishing species; there's cyclic then there's human cause. Course it has effect on the villagers
- 72 Yeah, for sure. The foods I eat and, I guess the whales migrating from San Diego - my animals
- 73 no
- 74 I guess for the salmon, cod maybe, the crab legs or lobster that my wife likes. So I guess it's important not to over fish it
- 75 uh, not sure

APPENDIX D: Responses to Interview Questions

Is there anything you'd like to tell the people who made this exhibit?

- 1 no
- 2 get a new job; you did well
- 3 no, enjoyed it very much
- 4 thank you
- 5 nice job
- 6 not really, good for kids; lots of facts for kids and things to do
- 7 no, enjoyed it
- 8 good job
- 9 good job, it's nice
- 10 excellent job
- 11 it's neat; we can see the sea without going there
- 12 it's great; its' wonderful. I think more people should come with kids
- 13 I think it's very good. Wakes you up when you don't live around these things. We don't have any of these things in the Central US
- 14 did an excellent job
- 15 they did a good job
- 16 Done a fabulous job; hands-on learning; exhibits are wonderful, easy, nice to the eye
- 17 they've done a darn good job, brilliant, very interesting
- 18 well done and informative
- 19 not really
- 20 very well done, very easy to understand
- 21 yes, good job, good exhibit
- 22 yeah, it's good. I enjoyed it, its very educational
- 23 it's a very nice exhibit
- 24 I think it's fabulous, very interesting
- 25 more towards a younger group, could be a little more in depth
- 26 did a great job, I'm walking away more aware
- 27 I haven't looked closely enough.
- 28 did a great job; having a variety of things, pictures, reading , interactive
- 29 I think it was well done
- 30 did a really good job, it's amazing
- 31 done a good job
- 32 it's cool
- 33 they did a good job, I love the boat, it was so fun to take pictures
- 34 it's very nice and very very kid-friendly
- 35 looks good
- 36 good setup, nice idea
- 37 enjoyed it
- 38 excellent job, interactive stuff, like to bring my granddaughter lots so she can touch/feel/see

APPENDIX D: Responses to Interview Questions

- 39 good use of materials as far as coming into, as far as where I've been.
I'd like to see more live animals, but I know what they're trying to do
40 interesting. I was surprised it changed. I was looking for the other,
but I think it's good
41 good job, not too long or short; understandable for even people from
Holland, not too scientific
42 good job, liked the whole thing
43 I think it's a really good way to let people know about the different
species
44 no, seems pretty straight-forward, well-organized
45 good job
46 good job
47 they did a good job
48 go
49 point well made concerning change
50 thank you
51 nice job
52 I think it's going to be very interesting and educational; done a great
job, laid out, I'm sure we're going to find out more as we go along
53 did a nice job, I'd recommend it
54 seems pretty nice
55 it's amazing; it's the coolest thing I've seen in Alaska and I've been
here all my life. If (only) I had more time without my toddler to read
everything...
56 I think they did a good job, very informative
57 the aquarium is nice. Bigger and more fish, better. Monterey has a
huge aquarium. We have a huge ocean here. I'd like to see bigger
aquariums
58 no
59 good job
60 they need something like this up in Fairbanks
61 nice job
62 more critters, bring in the otters!
63 Great job, new experiences for people who come to Alaska
64 It's a good nice exhibit
65 It's been really good so far, I'd like to see the rest of it
66 I think they did a good job. I like the animal noises. I think we'll
bring the kids down
67 pretty good, for both adults and kids, user friendly
68 It's all we've seen. It's a good idea for people to take the time to stop
and read. People need to stop and take it in. They run through like
they don't have the time.
69 I don't think so
70 It was very nice. I enjoyed seeing the fish
71 It's fascinating and I don't even remember all that

APPENDIX D: Responses to Interview Questions

- 7 2 Great job, really creative, whole setup really hands-on, I went into it.
- 7 3 very informative
- 7 4 you've all done very well, keep up the good work
- 7 5 my daughter enjoys it

APPENDIX E: List of Exhibit Elements

List of Exhibit Elements

- 1 Introduction
- 2 Herring Tank
- 3 Map
- 4 Puzzle
- 5 Video
- 6 Ice
- 7 Sounds
- 8 Topography
- 9 Native People
- 10 Subsistence
- 11 Life Jacket
- 12 Boat
- 13 Credits
- 14 Bench
- 15 Fishing
- 16 Shopping
- 17 Research
- 18 Bering Sea is Changing Intro
- 19 Stellar Sea Lion Research
- 20 Changes in Marine Mammals
- 21 Right Whale
- 22 Threatened Eiders
- 23 Changes in Seabirds
- 24 Trad. Knowl. Seabirds
- 25 Atka Mackerel
- 26 Changes in Fish
- 27 Salmon
- 28 Jellies
- 29 Changes in Invertebrates
- 30 Zooplankton
- 31 Tell us what you think
- 32 More Research is Necessary
- 33 Conclusion
- 34 Fish of the Bering Sea