



Hotspot

California

**National
Science Foundation
Advisors Meeting**

Oakland Museum of California
October 21 & 22, 2010

The Story of California. The Story of You.
Oakland Museum of California

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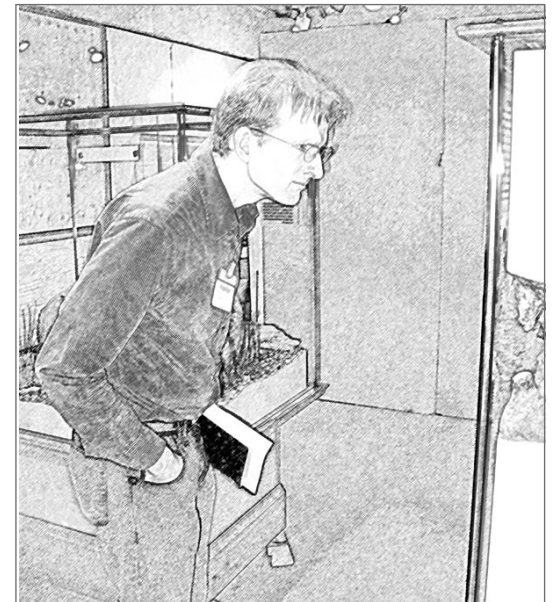


Cover: OMCA Koi Pond

*Right: Dan Rademacher inspecting
prototypes in the Natural Sciences
Gallery*

This unpublished document is intended to be a faithful synthesis of the presentations and discussions at the National Science Foundation Advisors Meeting for *Hotspot California*, held at the Oakland Museum of California on October 21 & 22, 2010. It is meant to serve as a resource for those who attended and for the Oakland Museum staff. It does not necessarily reflect the views of the Oakland Museum of California or individual meeting participants.

Participant comments have been paraphrased and the sequence of participant remarks have been reorganized. These are not exact quotes, rather they are an attempt to capture the content and meaning of the ideas presented.



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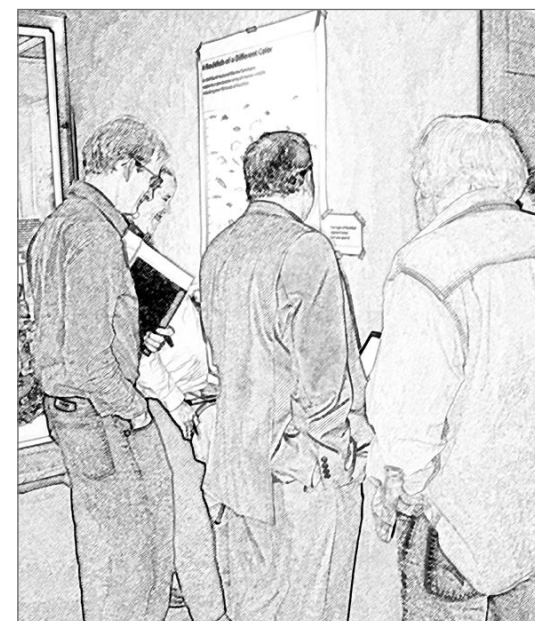
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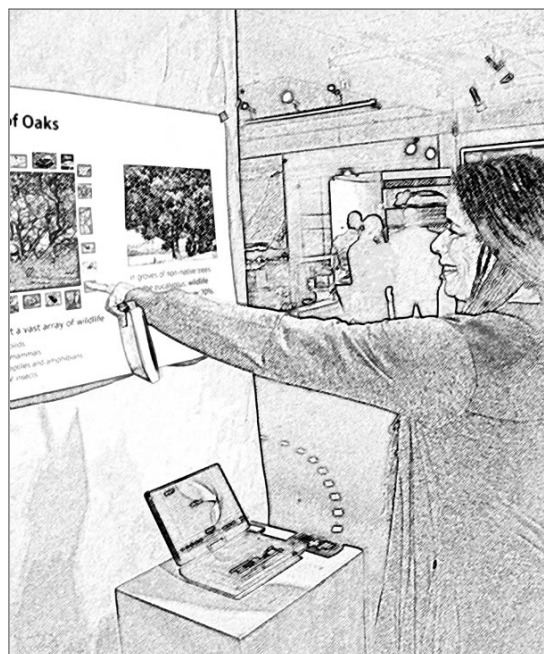
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Carolyn Finney in the gallery.



ABOUT THIS SESSION

Kathleen McLean, Independent Exhibitions

At the last advisor session a year ago, we asked you to talk about what your passions are and what you are interested in. In this session we are going to be talking a lot about what we have been doing on this project to date. We are at a point in this project where it is very open and fluid, the most open and fluid it will be because we are starting to narrow down and make decisions. We want you to speak your mind, be critical, and push us.

So these two days are a sort of problem solving session. We are going to tell you what we have been up to, we are going to tell you what our concerns are and what we've been grappling with, and we really want you to give us your advice and opinions so that we can make good decisions.

THE LARGER CONTEXT

Lori Fogarty, Executive Director, OMCA

Most of you are already aware of the big picture here at the Oakland Museum, but I will remind you of the highlights. We are in the midst of a sixty-two million dollar renovation and reinvention of the museum. When you joined us a year ago we were closed and

preparing for the opening of the Art and History Galleries as well as additional spaces, and that opening occurred on May 1. This is the first time that the Oakland Museum of California has undergone any major reworking or enhancement to its facility in its forty year history.

The museum opened in 1969 with very innovative landmark exhibitions for that time. The museum has a long history of community engagement and strong community programming as well as an active exhibition program. This was the first time the museum had the opportunity to think about the facility and address some of the challenges that we face now as museum in the 21st century.

There was an action plan in 1999 that primarily dealt with the facility and the infrastructure, addressing some of the physical limitations of the facility. In 2002 we received bond funding from the City of Oakland, and the focus of that funding was about making the museum accessible to the people of Oakland and telling the diverse stories of California. At that point it shifted and became much more than a facility project and was about making the museum more welcoming, open, accessible and relevant to the community.

We began in earnest on this project in 2006

Bringing the Advisors Up to Speed

- Is part of the agenda for today to give us an overview of where you stand in terms of the design process? • Matt Matcuk
- Yes. We struggled with this because a good meeting is one where the agenda is diverse and you all get a chance to talk. We have so much push content to bring you this morning because we have to bring you up to speed. We apologize for the one-way format, but I think you'll find it interesting. • Kathleen McLean

Lori Fogarty

with the design of the galleries, working with our architects at Mark Cavagnero Associates. The project is being done in phases and we have increased the goal for this project three times. We have now actually met the fund raising goal, but we are going to continue to fund raise because, of course, there are additional elements to the work we are doing on this facility that we would still like to accomplish.

The first phase, completed on May 1, included the Art and History Galleries. We also added the new Oak Street entry, which for the first time gives us street presence and visibility from the outside of the building. We also added the canopy that connects the three levels of the museum and did a lot of work involving visitor amenities, including our store, our restaurant and our theater space as well as a new ticketing hub. There was also a lot of infrastructure work. Again, this structure hadn't been touched for forty years, so the work involved everything from electrical and data to a new wireless system and a new fire alarm system.

We are now in the midst of the second phase of the project. The main focus of that is the Natural Sciences Gallery, but it includes all of the work that is happening on this level. We are reconfiguring the 10th Street entry to be the primary entry for school groups. We have about 50,000 school kids who come to the museum each year on field trips, so we are adding prep rooms and locker space. There is also a long corridor with lecture halls on this level

that has been described in the past as resembling the subways of Paris. We are redoing the corridor and lecture rooms and all of the common spaces on this level.

We have learned a lot from this process to date. All of you who have been through major renovations know that when you think it's the finish line, it just becomes the new starting gate. We have had great public response to the Art and History Galleries. We have done extensive evaluation of the Art Gallery in particular with Randi Korn and Associates, as well as general visitor surveys from the Morey Group. We are finding that people are staying a really long time in the Art Gallery. Beverly Serrell talks about the saturation point being twenty minutes, and that being the average length of time people spend in an exhibition. Our tracking studies so far show double that. Morey showed an average of 56 minutes in the gallery.

We are seeing that the addition of the new interpretive materials and technologies and the interdisciplinary connections are very effective in keeping people in the gallery. People who use the interpretive materials are staying three times as long as people who don't. We have also focused on seating and visitor comfort in the galleries, which has been very effective. So we have had great public response and very high ratings in terms of educational value and overall experience.

In the History Gallery we have done some evaluation. The History Gallery was deliber-

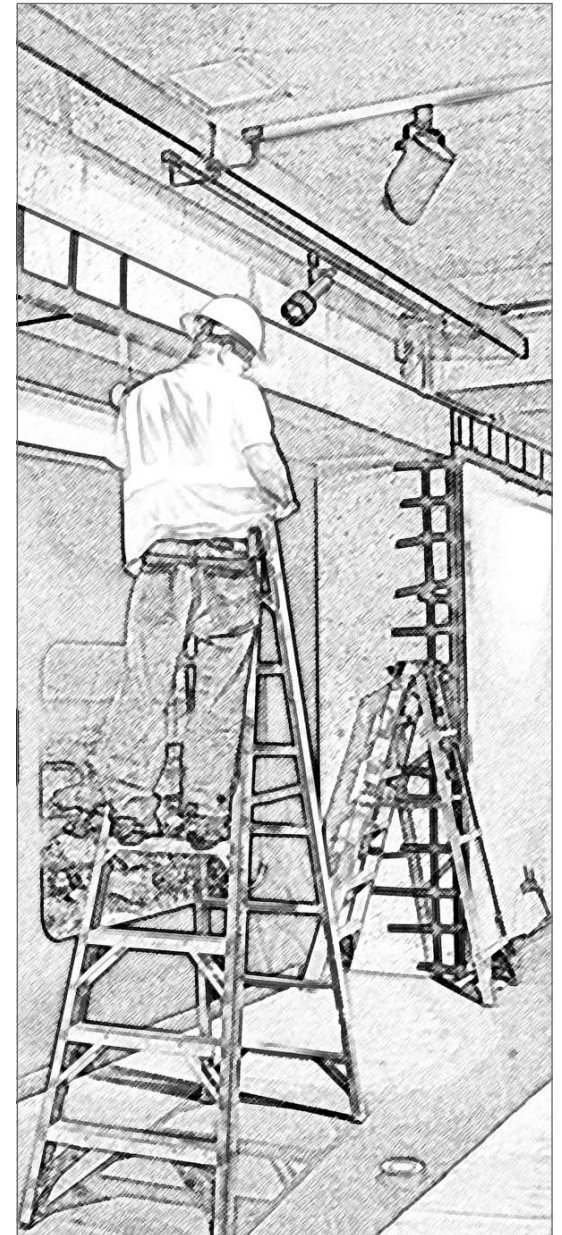
ately, or semi-deliberately, opened as a work in progress. We are still adding a good deal to the History Gallery. There are two sections in particular that are yet to be fully presented, and we are continually updating and adding to the presentation in the History Gallery, so we haven't done a full evaluation yet. That will happen this fall. But again, based on anecdotal evidence from our docents and our gallery guides as well as feedback we've heard from the public, people are responding to that gallery very enthusiastically.

As you know, much of what we are thinking about doing in the Natural Sciences Gallery builds on what we have done in Art and History. We will be continuing to emphasize the interdisciplinary connections and making connections between California's artistic and cultural history and its natural history. You will see lounge spaces and program spaces in the Art and History Galleries and we are planning on incorporating the same kind of spaces in the Natural Sciences Gallery. Some of the elements that we have in the other two galleries we will be taking to the next level in the Natural Sciences Gallery, particularly community cocreation of exhibits, and we will extend the work we have done on label processes, translation, and seating into the Natural Sciences Gallery.

You will hear from Douglas and other staff members about a lot of the work we have done to date in terms of developing the research and evaluation, the interpretive plan, the design, and the community partnership aspect. In the meantime we have all of the physical work as well, which is currently under way. The gallery is now being used as a prototype space. We will be moving the habitat cases that we will retain in the gallery up to one of our special exhibition spaces after *Pixar* closes in January. So that will be a storage space, but we will also have some prototyping happening right there on the exhibit floor so people can continue to see the work we are doing in the Natural Sciences Gallery.

We begin construction in the gallery in January, so there is some demolition work that will be happening. The initial work will involve creating a shell in that gallery with electrical, data, a new lighting system, and upgrading the HVAC systems. That work will continue to September 2011, and then we will begin the process of reinstalling the gallery. We are still looking at a September of 2012 opening of the gallery.

Work under way in the Natural Sciences Gallery



Hotspot California Overview



Douglas Long (foreground) and Dan Rademacher touring the Natural Sciences Gallery prototypes

HOTSPOT CALIFORNIA PRESENTATION

Douglas Long

Chief Curator of Natural Sciences, OMCA

I'd like to give you a general idea of where we are going with content and what the general themes and messages are, and more importantly, the mechanism that we are going to use to set out the gallery and explain what we are doing in the gallery.

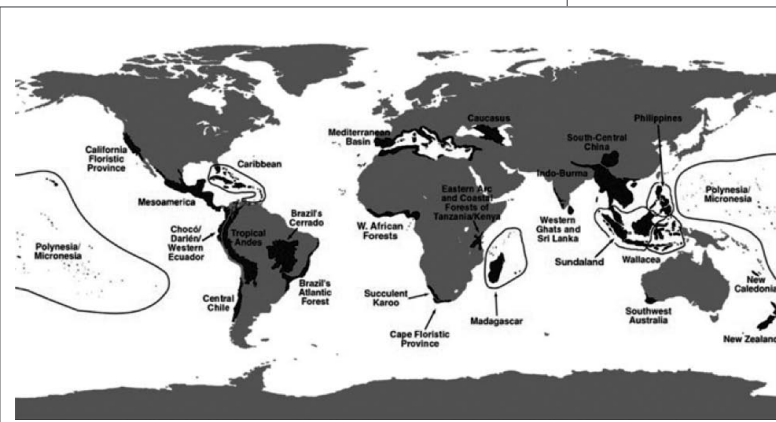


The working title for the project is *Hotspot California*. Later, during the prototyping presentation, you'll hear why we might drop the word "hotspot," but we are going to keep the concept. For a lot of you this talk will be basic information, but for some of you it may be new, so I'll try to maintain a neutral delivery in terms of specificity of the concept.

Basically, a "global biodiversity hotspot" is a term developed by Conservation International as a way of prioritizing protection and conservation efforts in different parts of the world. There are thirty-four different global hotspots that have been identified. Those hotspots combined represent only 2.3% of the land surface but contain at least half of all plant species in the world and more than half of all reptiles, amphibians, freshwater fish, and insect species.

So life is not evenly distributed on the earth and there are beautiful little nuggets where biodiversity is at its highest. California is one of those. California is the only biodiversity hotspot in the US and it is one of just a couple in North America.

What is biodiversity? You can measure it in many ways, define it in many ways, and argue it in many ways, but for the sake of what we are doing in the gallery we are looking at California's biodiversity in three major con-



Global Biodiversity Hotspots

The Diversity of Life is Not Evenly Distributed

34 Global Hotspots = 2.3 % of Land Surface, 50% of all Plant Species, >50% of Reptiles, Amphibians, Freshwater Fishes, Insects

What Is Biodiversity?

Diversity = Richness, Total No. of Species
 Endemism = Unique, Found Nowhere Else
 Density = Abundance, Total Biomass

texts. The first is actual diversity of species, the richness of different species, the total number of different species in California. We are also looking at endemism, those species that are unique and live only within California. And we are looking at density, the abundance, the total number of individual organisms living in a particular area. California excels at all of those.

Here is something to consider about California, and it's going to make more sense when I talk about the different types of biodiversity in California. California is only 19% of the total square mileage in the lower forty-eight states. It also has the most diversity of habitats; the most diverse natural geology, with more rock types and mineral types than anywhere else in the US; the greatest extremes in altitudes,

with the highest highs and the lowest lows in the Continental US; the greatest extremes of climate in any one state; a fossil history that goes back at least 1.2 billion years; and the seventh biggest economy in the world. There are also thirty-seven million people right now and it is expected to increase to forty-one million by 2020. We will revisit that last point in just a minute.

Hotspot California: Something to Consider...

19% total square
miles of Lower 48

37 Million Humans
(41 million by
2020)



Most Diversity of Habitats
 Most Diverse & Active Geology
 Greatest Extreme Altitudes
 Greatest Extremes in Climate
 1.2 billion year Fossil History
 Biggest Economy (7th in World)

The hotspot in California is called the California Floristic Province, and about 95% of that floristic province is in California. Some of it spills up into the cascades of southern Oregon and also into northwestern Baja as well as some of the offshore islands off northwestern Baja, Cedros Island and San Benito Island.

We can look at California two ways, as a floristic province and as a state. If we look at

One Top Ten Global Biodiversity Hotspots

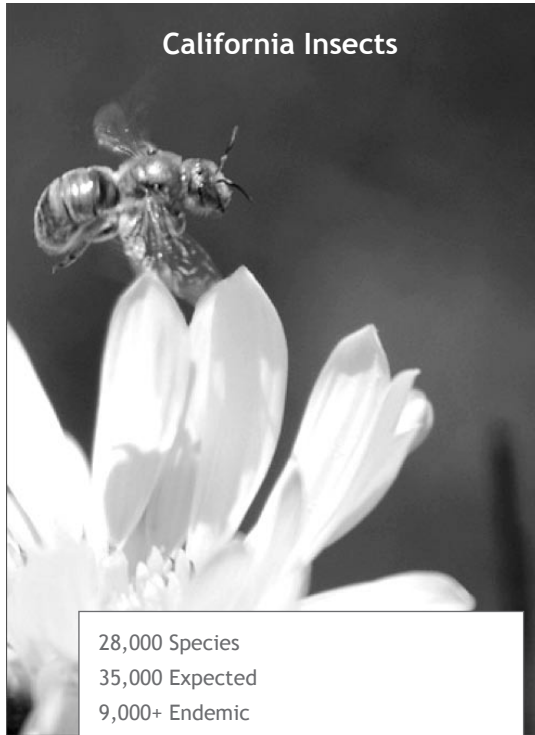
California Floristic Province:
 3,488 Native Plant Species
 61% Endemic (2,124)

California as a State:
 5,418 Native Plant Species
 28.5% At Risk
 53 plant species extinct



California Floristic
Province

California Insects



28,000 Species
35,000 Expected
9,000+ Endemic
>35% of ALL Known North American Insect Species
1,600+ Native Bees

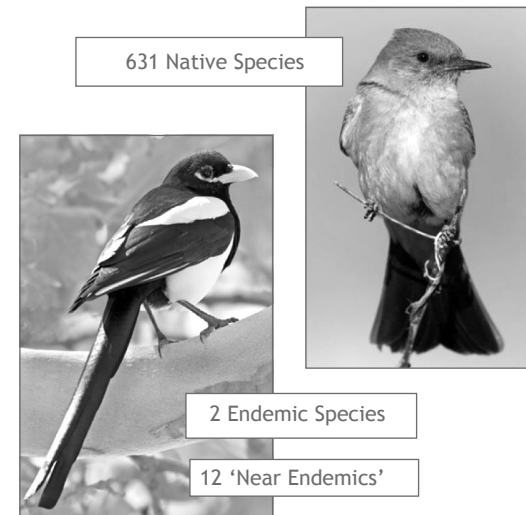
the California Floristic Province you'll see that it excludes the great basin and the deserts. Those are areas of very low abundance in diversity for the most part. Within the floristic province are 3,488 native plant species, with 61% endemic to the floristic province. If we include the deserts and look at California just in terms of its political boundaries, we see that California now has 5,418 native plant species and close to 30% of those are at risk, threatened, or in danger, or in habitats that are at risk. Fifty-three plant species are extinct or presumed to be extinct. I say "presumed" because sometimes the seed bank has a tricky way of sprouting things that haven't been seen in decades, but overall there has been a net loss of plant species.

It makes sense that insects, which have a close relationship to plants, are also going to be diverse. In California we have 28,000 named species of insects and at the rate of discovery and exploration it is expected that the total number of species of insects in California will reach at least 35,000. Nine thousand of those are endemic to California, and 35% of all known species of insects in North America, (that is, north of Mexico) have been recorded in California. And there are at least 1,600 species of native bees in California. Depicted here is a beautiful chrome green Halictid, one of my favorite insects in the world.

When we look at bird biodiversity we see something very different. There are at least 621 native species of birds recorded in Cali-

fornia. Of those only two are endemic to the state boundaries, but if we look at the floristic province we have twelve endemics. They're called "near endemics" because while they trickle outside of the state boundaries, they fit within the boundaries of the floristic province. So in terms of endemism, not very high, but in terms of diversity, very high.

California Bird Biodiversity



631 Native Species

2 Endemic Species

12 'Near Endemics'

Let's take a quick look at some other statistics. Sixty-eight percent of all North American bird

68% of All North American Bird Species

283 (45%) of Bird Species at Risk

1/3 of all birds in North America Hatch in Californias



species have been recorded in California. Of those, 283 or 45% of those bird species are at risk. Almost half of the native bird species in California are at risk. One of the most surprising things I have read recently is that a third of all the birds that are hatched in North America are hatched in California. So in terms of a biomass, California is a bird factory that supplies the rest of North America.

If we look at other organisms in terms of endemism, we find that endemism is very high in amphibians. We have the Rough-skinned Newt, native to California. It's not restricted to California but fits within the boundaries of the

California Amphibians

65 Species, 40 (61%) Endemic, 60% at risk



Rough-skinned Newt (Native)



Shasta Salamander



Arroyo Toad (Threatened)

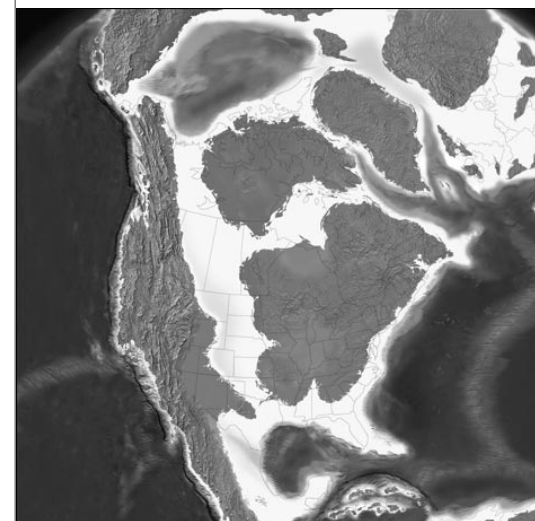


Bullfrog (Invasive)

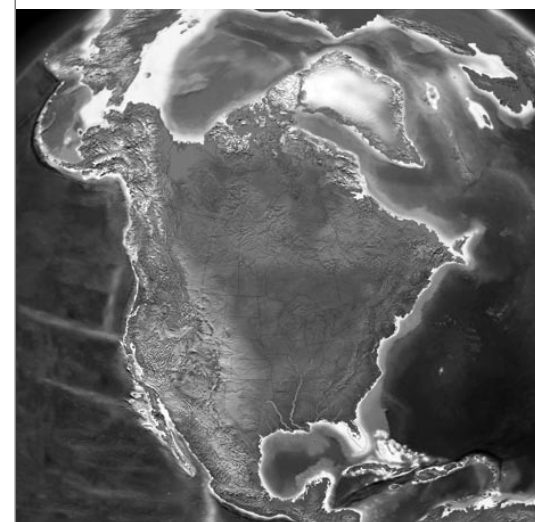
floristic province. We have some rare endemics. In this case it's the Shasta Salamander, found only in a few remote limestone outcroppings. Its closest relatives are in China, Korea and France, so it represents a distributional pattern probably since the Cretaceous. We have the Arroyo Toad, threatened because it lives in southwestern California in Orange, L.A. and San Diego counties. Eighty-percent of its habitat is gone. The remaining habitat is so fragmented that the populations cannot genetically mix any more. Then we have a major invasive amphibian, the Bullfrog, which has been eating or competing with native species and contributing to their decline. Of those amphibians, 61% are endemic but 60% are at risk.

How did we get to this incredible biodiversity? One of the major factors is time. California has been a land mass for at least 500 million years, even though in many cases the majority of land was under water. We had submerged and exposed land for a while. But as a continent, the major factor in terms of time is that California was a refuge during the Ice Age. During the Ice Age, or Ice Ages, much of the central US was under a mile-thick sheet of ice, which basically obliterated a lot of life in that area, and most of the East Coast and Gulf Coast were under sea water. California was relatively spared, so we see that in some areas where species and habitats were bulldozed by ice or smothered by the ocean, California went relatively unharmed. As a result we have many archaic species, and a lot of time has elapsed during

California Deep Time: Long-Term Evolution

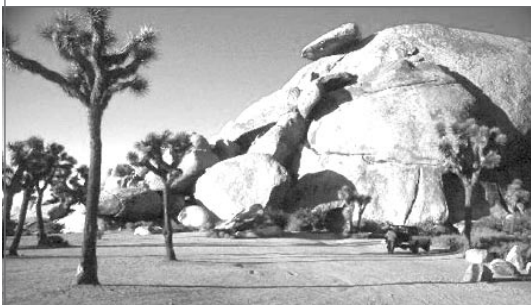


80 Million Years Ago



3 Million Years Ago

Complex Landscapes + Long Time Varied Ecosystems & Diverse Species



the evolution of those species.

We also have the complex habitats and ecosystems that are a major part of this. Because we have such diversity in altitude and climate and geology, we have major diversity in the plant communities, or plants that are especially adapted to certain rock types like serpentine, which comprise a major endemic group of plants. So we have diverse ecosystems, and each of those ecosystems has its own unique evolutionary pressures, which creates evolutionary dynamics that are very different in different parts of the state. We have evolutionary factors that are quite diverse, and a long period of time for that evolution to happen.

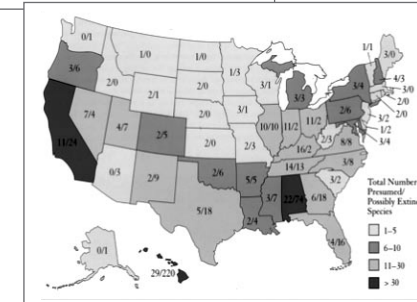
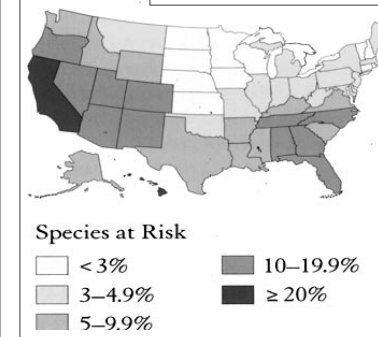
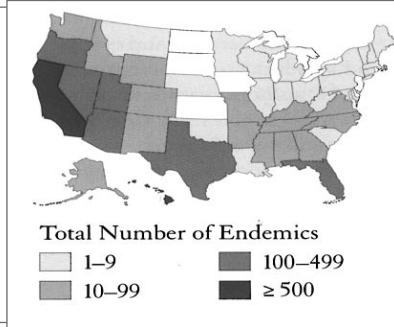
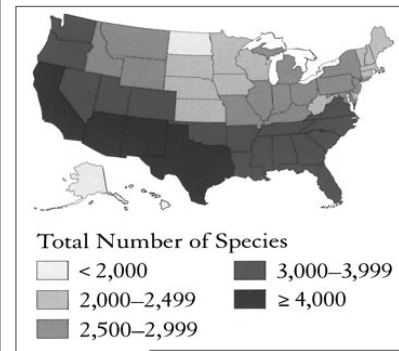
A hotspot isn't just about biodiversity, a hot-spot is also about the threats that biodiversity faces. In California we have major issues of land loss due to urbanization and agriculture. At least 75% of California's original habitats have been lost or very severely degraded.

A Hotspot Also Means Amount of Habitat That is Lost or Threatened



75% of California's
Original Habitats Have
Been Lost

Biodiversity by the Numbers



If we look at biodiversity by the numbers in California, we can look at a couple of ways in which biodiversity can be measured. We see that California exceeds all of the states and earns its title as a biodiversity hotspot. If we look at total number of species, California reigns supreme; if we look at total number of endemics, California is the highest; and if we look at species at risk, California is the highest. We come in third for total number of species that have gone extinct. Hawaii is the highest and I was surprised to learn that Alabama is the second highest.

What are these threats to biodiversity? They are many. Primary is habitat loss, fragmentation and degradation, basically the loss of places for these organisms to live. Invasive

What Are the Threats to Biodiversity?



Habitat Loss, Fragmentation, Degradation
Invasive Species
Pollution of All Types
Hunting, Trafficking, Incidental Killing
Global Climate Change
Poor Management & Enforcement

species are another major threat, organisms coming in without their normal predators or herbivores or parasites that control them in their native land. They are now here, basically disease-free, taking over the habitats and either eating or out-competing the native species. Then there is pollution—water pollution, air pollution, particulate pollution—which is also a very serious threat. There is hunting, poaching and trafficking. California's diverse reptile population is hotly traded as black market commodities throughout the US, as are bear gall bladders. We have the highest rate of bear poaching of any state. There is also global climate change, which is going to be a major spanner in the works that will obviously have impacts, but trying to predict how those impacts are going to affect biodiversity will be very difficult. And then there are also laws that are on the books, but sometimes those laws are not enforced, so lack of good management or enforcement of regulations poses another threat.

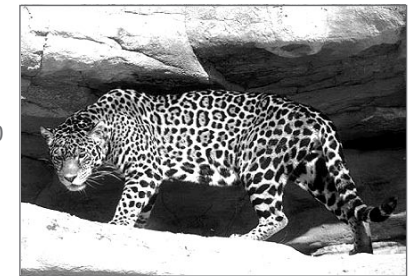
What have we lost in California? There are some charismatic megafauna that we have lost, including bison in 1820. Jaguars used to live all the way up to Grapevine and Tehachapi and were gone by 1860. We lost our grizzlies in 1922, more or less, and our gray wolves in 1924. These are extirpations, however. We've lost them from our state, but they still exist elsewhere.

The major problem are those less charismatic species that are gone for good. We have a

California Extirpations



1820



1860



1922



1924

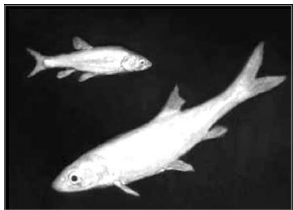
Lesser Known California Extinctions



Pitikin
Marsh
Indian
Paintbrush



Antioch Dunes Shield
Back Katydid



Thicktail Chub

Santa Barbara
Song Sparrow



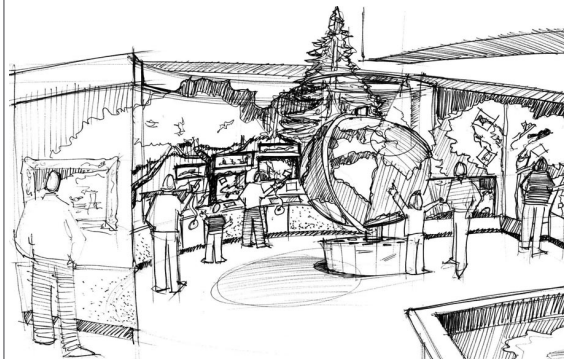
Berkeley
Kangaroo Rat

number of species, the Thicktail chub for example, which have now been completely eliminated. Here in the Bay Area we've lost the Berkeley kangaroo rat.



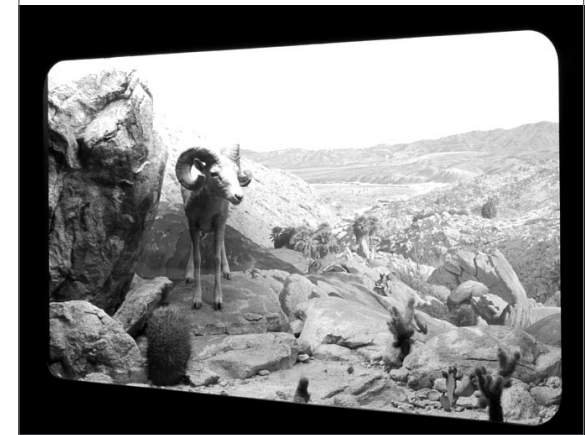
So what are we doing to present this information in the gallery, and how are we doing it, and what are our goals? What we want to do is be able to explore the beauty and diversity of California's nature and biodiversity in exciting and engaging ways. That is a goal.

Exploring the Beauty & Diversity of California's Nature in Engaging, Exciting Ways



We have a commitment to reuse the dioramas because each one of these dioramas has been meticulously created with, in most cases, the actual stuff: the plants, the animals, and even the dirt and the rocks from very specific places in California. These can be used as beautiful ways to illustrate biodiversity in terms of the species, the habitats, the communities in California. We have a commitment to reuse these as part of the story we are telling, as part of the content we are communicating, and as part of the visitor experience.

Retain Dioramas that Depict Real Places, Using Real Specimens



So we are going to use these dioramas but in new ways. We might overlay new types of technology, new ways of visitor interaction, new or deeper levels of content to make them more relevant to current day stories or current day issues and ongoing and real science.

Creative Re-Use Makes Dioramas More Relevant & Accessible



We are going to increase our diversity of experience by adding new elements. In our discussions we have identified habitats that we really need to add that are major examples of biodiversity in California.

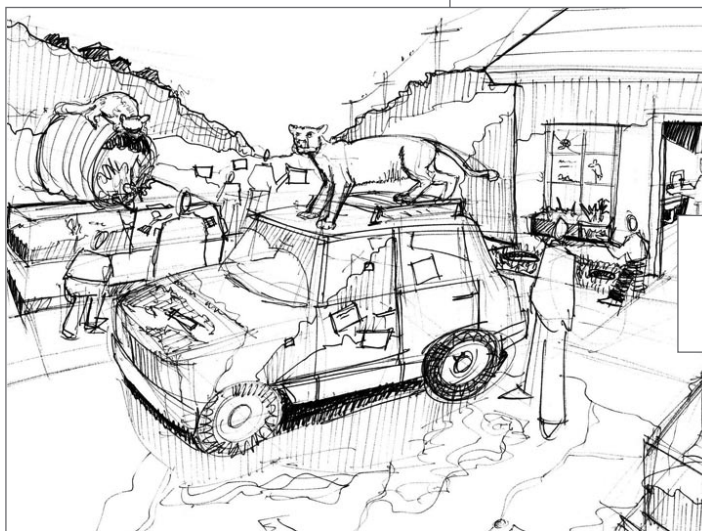
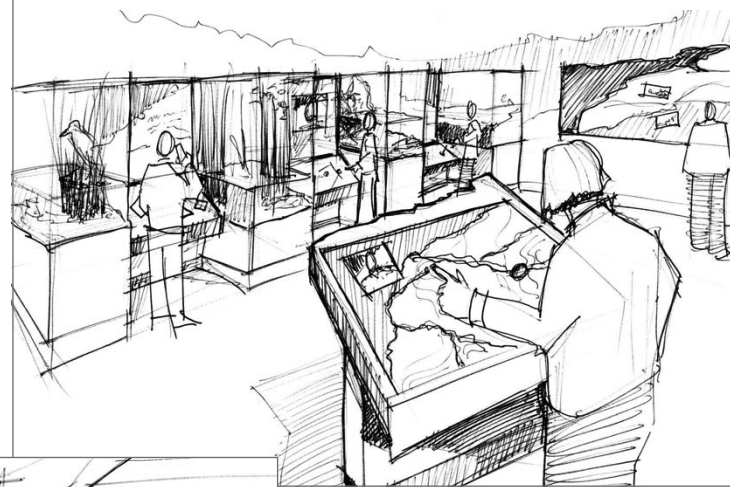
We also want to be technologically savvy. The main goal is not to have the technology compete with the dioramas or compete with the content. We want new technologies to be seamlessly integrated and used as vehicles to communicate the content and bring out the beauty and diversity in the exhibits.

Exciting New Elements Increase Our Diversity of Experiences



We want the gallery to be flexible and changeable. We want to be able to respond to crises that happen, to new discoveries, to questions that communities are asking us.

New Technologies, Interpretations, and Visitor Contribution Allow for Deeper Engagement



A Flexible and Changeable Gallery Presents Current Issues and New Discoveries

Featuring Real Science & Current Research



Showcasing Environmental Issues and Conservation Success Stories



Participatory Exhibit Co-Creation & Contribution Connects with Communities Throughout California



We're going to feature real science and current research in the gallery because we want to be able to show people that the biodiversity in California is this wonderful aspect that is being investigated, that there are new discoveries, there are new species. There are conservation issues, but there are also new ways that scientific research is being used to address those or even remediate those.

We want to be able to show not just the environmental crises that are happening, but those environmental stories that have been major successes, such as the tule elk shown here.

We are also going to rely very heavily on the communities being involved in what we are doing and being able to provide content, provide experience, provide interpretation. Not just our local Oakland communities, but communities in the different regions in California that we are going to be depicting in the gallery.



Fostering Connections with Nature

We want to foster connections with nature within and without the museum and within people's lives. However they connect with nature, we want to be able to strengthen those ties.



We want to also instill a sense of place. That is something we really noticed when we did some early testing about the gallery. When people looked at a diorama they wouldn't necessarily look at the plants or the animals. It would give them a sense of a place they had been before, or a place they want to go to, or a part of their childhood that they remember. We want to really communicate that sense of place and that sense of belonging in some way.

We also want this gallery to also offer ways to explore nature outside the gallery. We are not going to be able to recreate nature perfectly inside the gallery and we shouldn't be able to. What we want to do is inspire people to go out and explore more and do more.

Providing Access for Your Own Experiences in Nature



We also want to inspire a sense of action, of hope, of participation and responsibility, to get people organized to do something as simple as a beach cleanup or voting for the right politicians, or identify simple changes in the way that they live their lives so that they are living more sustainably and have less impact on nature.



Inspiring Action, Responsibility and a Sense of Hope

We are also going to feature major links with art and history in the gallery because the history of California is the history of the exploitation of these resources. Most of the conservation issues we are dealing with now have a historical basis, and it is the beauty of California that inspired so many of the artists. Most of those artists were immigrants to California and were so overwhelmed with the beauty and diversity that they had to sit and paint thousands of pictures of Mt. Shasta or Yosemite Valley.

This is one of the ways that we are going to use art as a vehicle for understanding. This is a mashup that Christopher made using a painting called *8th & Madison* that was painted around 1869. He superimposed the painting over a photograph of that very spot today, and that location is just a few blocks from here. When we did prototyping and showed visitors the painting and then a photograph of the place now, that was a real light bulb that went on. Most people said, "Oh, Oakland, I get it. Oakland was a land of oaks." This is a beautiful way to demonstrate the changes over time using the resources in our art collections.

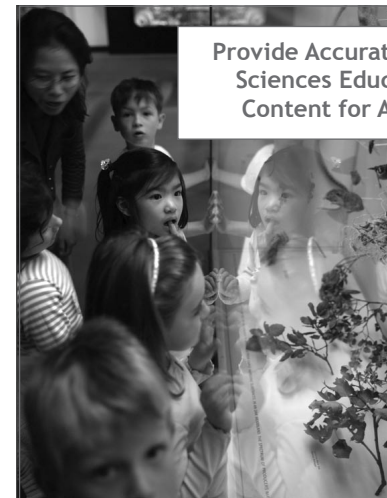
One of the major goals for me is using the gallery to provide accurate natural sciences

Links with Art & History



8th & Madison: 1869 and Today

Provide Accurate Natural Sciences Educational Content for All Ages



Featuring Seven Real Places in California



educational content for all ages, not just for school groups. We are going to be able to provide information on a variety of different levels for people with a variety of different

backgrounds and levels of experience and expertise, and provide each one of those groups information that they are going to find interesting, informative, rewarding, and intriguing.

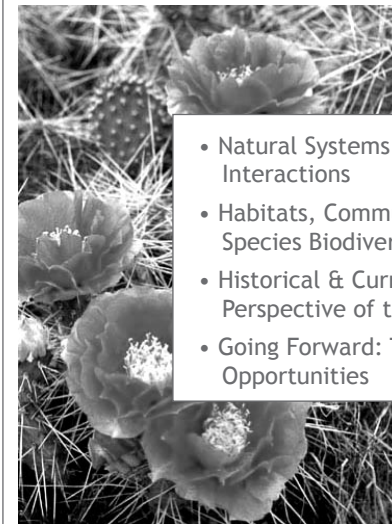
How are we going to do this? The previous iteration of the gallery was called “A Walk Across California.” It was a basic transect that went from the coast, up over the Sierras, and then took a sort of fork in the road and went either up to the cold deserts in the Great Basin or the southern deserts.

What we are going to do, instead of having a more general approach, is actually feature seven real places that depict the habitats, the biodiversity, the conservation, the science that is going on, and the stakeholders in those regions who can help tell part of the story. The cheesy analogy that I like to use is that biodiversity is this beautiful gem of California and each one of these is a facet of that gem that reflects that biodiversity. Each one of these is very different from the others, and each one has a different signature in terms of the look and feel, in terms of the geology, the plant communities, the animal communities, the way of life there. In many

cases the people who are living in these regions have that sense of place and are really striving to protect those areas.

So we’ve got what looks sort of like the Southern Cross. We’ve got most of California covered from north to south and east to west. The areas of content for these places are broken up into general categories. We’re going to look at natural systems and interactions: climate, geology, maybe tectonics, maybe fossil history in some ways, water, whatever is going to be a dominant factor in these areas. We’re going to look at the habitats, the communities and the species that represent the biodiversity. We are also going to look at historical and human perspectives of the region. We want to have Native perspectives, we want to have historical perspectives from the 1700s, 1800s and 1900s,

Areas of Content for the ‘Places’



- Natural Systems and Interactions
- Habitats, Communities & Species Biodiversity
- Historical & Current Human Perspective of the Region
- Going Forward: Threats & Opportunities

we want to have the current perspective of these regions.

We also want to look at what are the threats and the opportunities. I think this is important because there are a lot of depressing stories about what is happening to California. I think those depressing stories give you an opportunity to find solutions to fix or solve the problems. So going forward it is identifying the threats but also identifying the opportunities to deal with those threats.

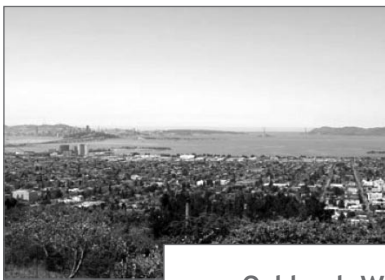
Here is our first place, Oakland, with beautiful diversity of topography. This is where we are going to feature the urban-wild interface. We are going to be able to tell that story of how

humans have adapted to the natural environment of the Bay, but also how animals are now dealing with that. What are the survivors, what are the success stories, but also what species are we losing?

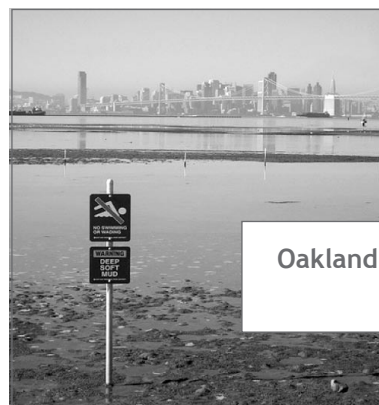
We also want to feature Oakland for its biodiversity. There are at least a dozen different habitat types going from the mud flats all the way up to the top of the hills where we have redwood forests. We are going to talk more about the content in each of these areas when we go through the interpretive framework.

Heading north there is Mt. Shasta, an iconic volcanic mountain. When we were working on

OAKLAND



Oakland: Where Urban Meets Wild



Oakland: a Surprising Diversity of Habitats



**Mt. Shasta:
An Iconic Volcanic Mountain**



the interpretive framework we were stuck on the idea this was a volcano. When we really started to think about what Shasta means in terms of diversity, we came up with the story of water because it's the volcanic nature of Shasta that really helps to shape the fundamental ways in which water is manifest in the environment—everything from the coldest cold springs in California to hot springs. We're looking at glaciers, rivers, lakes, ponds. We are also looking at how underground rivers have been able to carve some beautiful and diverse caves.

We're also looking at water in a climatic way. With Shasta you have a wet side with Klamath on the western facing slope. The eastern facing slope, because of the rain shadow and

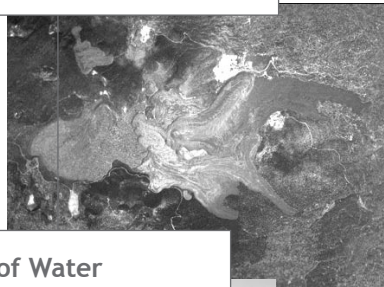
because this volcanic soil doesn't retain water very well, is very, very dry. One of the pictures [below] shows the vista facing its sister volcano, which is the Medicine Lake islands. It is a twin volcano but a very different type of volcano. We are going to feature both types of volcanism and also the human history. During the Modoc Indian Wars, this was an area where the Modoc hid out in the volcanic tubes. Those tubes are also very important to the story of water because they are where the water accumulates.

Below is one of the caves. This is a mountain born of fire, but it is also where we get the beginning of the Sacramento River, so we are going to be able to look at creeks, rivers, streams and different aspects of the story of water.

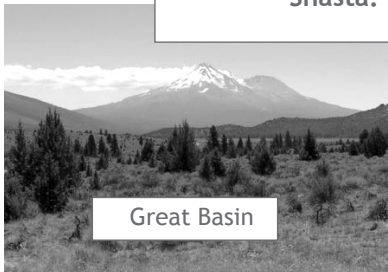
MT. SHASTA



Klamath



Shasta: The Story of Water



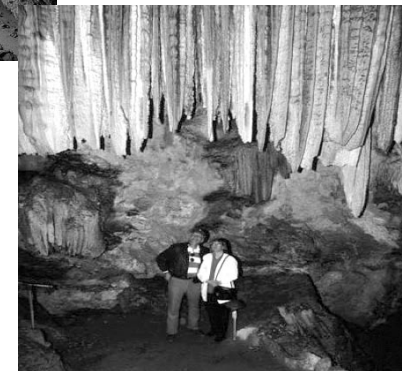
Great Basin



Facing sister volcano



A Mountain Born of Fire, and a Major Source of Northern California Water



Sutter Buttes is an interesting volcanic pock-mark in the Sacramento Valley. It is an island, literally and figuratively, in the Central Valley. Below is a beautiful Google map of the topography, where you can see the buttes sticking up over the valley floor. It is an isolated area that has agriculture all around it. This is a very interesting area we are going to use in that it is mostly private land and those private land holders understand the importance of this as a wild system.

It is also a microcosm of the Central Valley. All of the habitats we find in the Central Valley are found here, so it's "a small world after all" habitat. It's also where we can take the water story to a different level and talk about

the human interaction and the competition for water. It's not just competition between use of water for nature and use of water for agriculture, but even within agriculture, competition between the rice farmers and the orchard farmers, competition between municipalities that need water, competition between commercial fishermen and recreational fishermen and native needs for the salmon in these areas. These are very complex stories that we are going to be able to bring out. It's also the largest migratory flyway in North America.

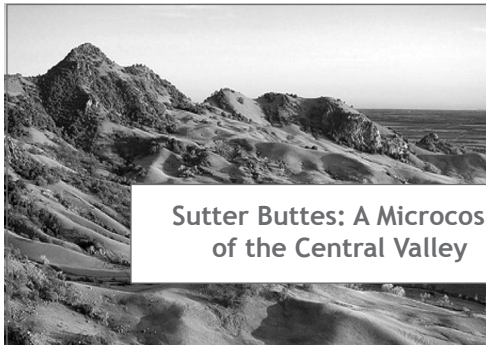
We got a chance to meet Dave Wyatt. He's going to be one of the researchers that we will be featuring. He did a study on these ring-tails. Sutter Buttes has the highest density of

Conservation Science: Ringtails

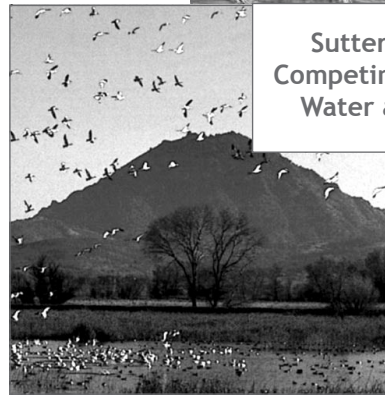
David Wyatt,
Sacramento City
College



SUTTER BUTTES

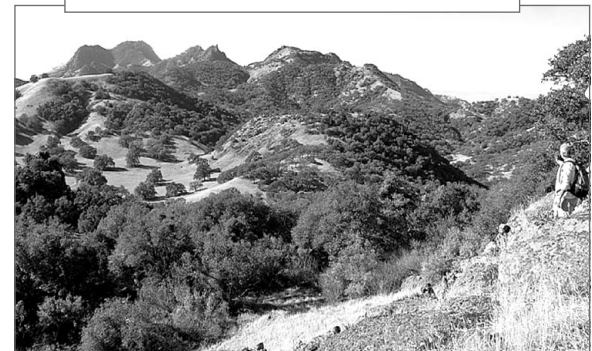


**Sutter Buttes: A Microcosm
of the Central Valley**



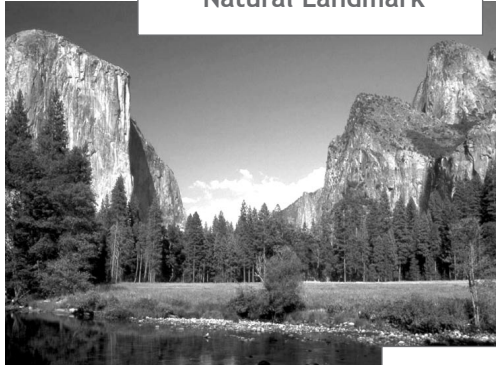
**Sutter Buttes:
Competing Needs of
Water and Land**

Sutter Buttes: It's About the Oaks





California's Most Iconic
Natural Landmark



ringtails anywhere in North America, and it's because of that flyway and because it's one of the areas where the oaks have been preserved. Migratory birds stop for the night and are nabbed in their sleep by these ringtails.

We are also going to tell the story of oaks here. There are more species of oaks in California than any place in North America, and oaks are one of the major keystone species of these habitats that provide food or shelter to literally hundreds of different species of animals. They have been of major importance to Native groups and are still of major importance to a variety of human and nonhuman organisms.

We picked Yosemite for a variety of reasons. It is the most visited place in California; it is the most familiar to people both inside and outside California in terms of its natural beauty and its iconic landmarks; it has unparalleled

biodiversity, with the highest number of mammal species recorded and the highest number of bird species recorded in North America and something like forty-three different vegetation communities; and it was the birthplace of the conservation movement.

We also wanted to feature it because people have that belief that because an area is protected, it is protected, when in fact even a protected and well loved place like Yosemite is under threat in a variety of ways. It is being loved to death.

This is also a place where we heard great presentations from people at UC Berkeley about the Grinnell Resurvey Project. For those of you who don't know, Joseph Grinnell was the head of the Museum of Vertebrate Zoology. He was raised in the Midwest on an Indian reservation and got to know animals very well. He was a

YOSEMITE

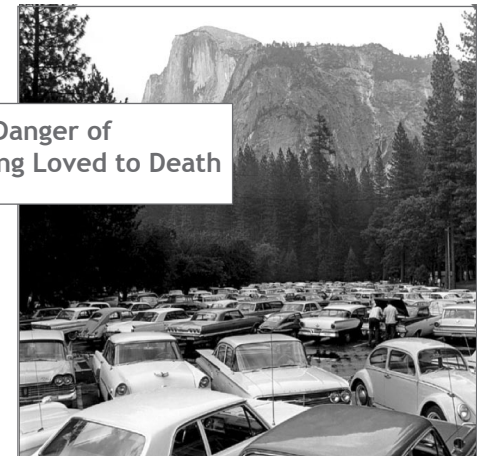
Birthplace of the
California Conservation
Movement

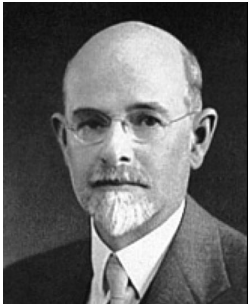


Unparalleled Biodiversity



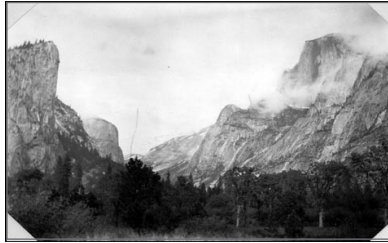
And In Danger of
Becoming Loved to Death





Conservation Science

Grinnell Resurvey Project & Climate Change



Yosemite Valley 1911



Yosemite Valley 2003

respected naturalist at a very young age and took incredibly detailed records and collected multiple specimens. His records are so good that researchers have been able to go back re-visit the places he sampled and photographed and sketched and have been able to see major changes in those habitats that are largely due to climatic change. Yosemite is one of those areas.

Further south we are going to feature the Tehachapis. People scratch their heads because they have no idea where that is, but if you've ever been over the Grapevine and I-5, as I suspect most of you from California have, you've gone through the Tehachapis. Millions of people a week drive along that corridor.

It is a very interesting place where you have this mashup of the Central Valley, the Coast Ranges, the Sierra Nevadas and the Mojave Desert, and there are little fragments of the Great Basin, little relics from past times in which the climate was different. This is where we are going to feature California as a Mediterranean climate, with the chaparral habitat featuring prominently in this area. This is a community ecosystem that was designed to burn. The problem is, we have tampered with that and have prevented a normal burn cycle to the point that now, when there is a burn, there might be seventy years of fuel and the fires are so great that they actually destroy the ecosystem.



Coastal Chaparral

Dry Summers, Mild Winters, Evolved to Burn

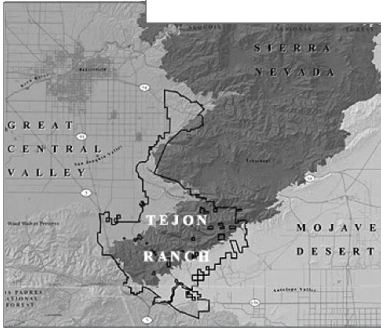


TEHACHAPI MOUNTAINS



Tehachapis: The Future of California

Tehachapis: Progress & Protection



Tejon Ranch: 270,000 Acres
Largest Private Land Holding in
California, Mostly Pristine Land

Because it is a Mediterranean climate it is also a place where people want to live, not realizing that historically, at least for the last three million years in terms of palynology, where they are living has gone up in flames.

We are also looking at Tehachapi as the future of California in two ways. We had a great lecture from Michelle Koo from the Museum of Vertebrate Zoology at UC Berkeley, who looked at where evolution is happening in California. She looked at areas where you have these mashups of habitats that are creating new evolutionary dynamics, where relatively young species are evolving.

We are also looking at the future of California in terms of how we are able to work with and protect biodiversity. A case in point is the Tejon Ranch, which is 270,000 acres and the single largest land holding in private hands in California. How are people, institutions, organizations and corporations going to balance the needs of the environment with the needs of human development?

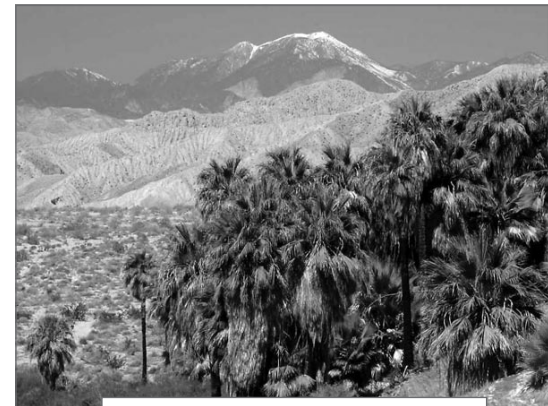
It is also where we are going to be able to talk about the tule elk story. Down to less than sixty, they have now been relocated to at least twenty-two areas in California and number in the thousands.



Return of the Tule Elk



PALM DESERT

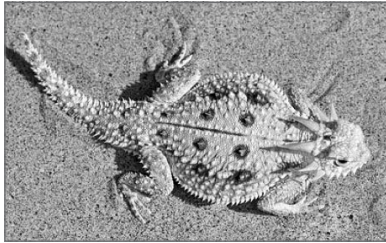


Oases of Water, and of Life

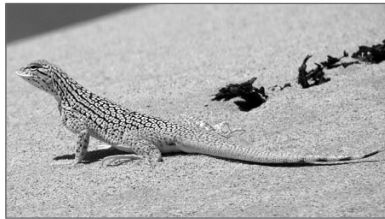
Palm Desert is at the southern end of the state. Palms are very iconically Californian. This is where we are going to tell the lack of water story, how organisms are adapted for life without water and how we have very unique habitats, like the sand dunes in the Coachella Valley. There are 127 endemic species just in those dunes, and only 5% of those dunes are protected.

Coachella Valley Dunes

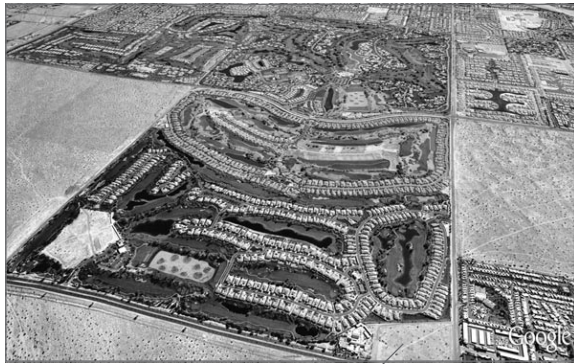
Saving Habitats to Save Species



127 Species
Endemic to
Dunes



5% of Dunes are Protected



We are also going to talk again about the human story. This checkerboard shows lands distributed to either Native groups and either mining groups or the railroad. We see development on the privately held lands. The Native lands turn out to be very important, however,

because those are now homes for relic populations and organisms, they are seed banks, they are also corridors connecting migratory routes for animals, and we want to tell those stories.

Lastly we have Cordell Bank. This is our underwater realm. It is a big granite mountain that is under water. It's very dazzling in terms of its beauty and diversity. Most people are surprised to find that we have these incredible coral reefs in California. Jennifer Stock sent us some of these pictures last week, showing the dazzling beauty of the place combined with a total pea-soup-abundance of organisms.

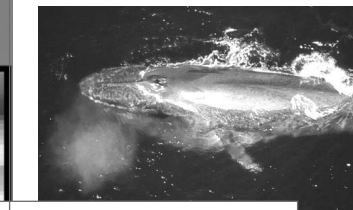
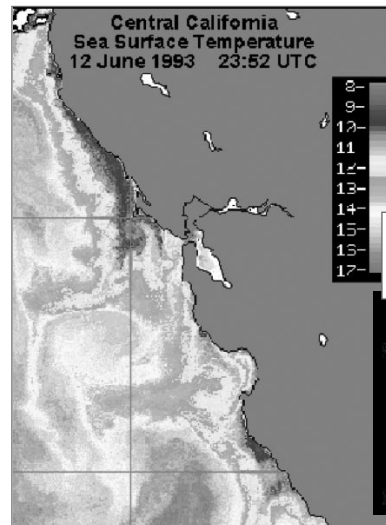
This is where we have coastal upwelling, a phenomenon in which nutrients are brought up from the bottom to the surface, kick-starting a food chain that attracts organisms from all over the world to feed here.



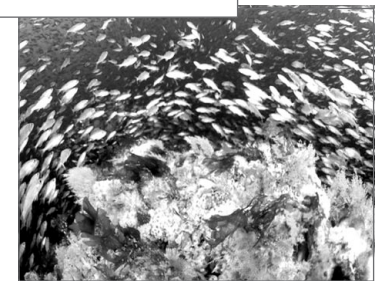
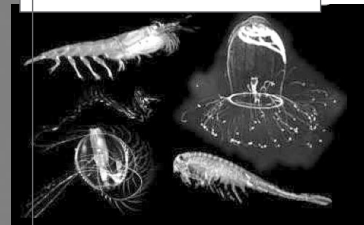
Cordell Bank: A Dazzling Reef
On an Underwater Mountain



CORDELL BANK



Cordell Bank: Coastal
Upwelling

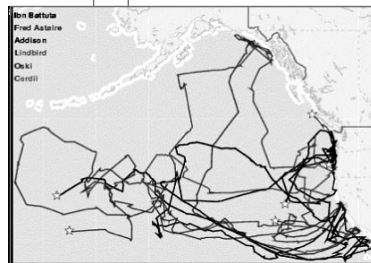




An Abundant Underwater Food Resource Feeding Animals from Around the World



Conservation Science:
Seabird Tracking



Albatrocity: Global
Conservation Stories, Local
Connections



We are also going to bring in some research about seabird tracking, and then try to tie that to some of our other areas, like the urban Oakland area, and talk about plastics getting washed into the bay and out to sea where they are picked up by albatross in the Pacific, brought back to their chicks on Laysan Island, and the chicks starve. So we are looking at global stories with local connections.

And finally, we have a number of partners we are working with, many of whom are represented here today.



Some of Our Partners



HOTSPOT CALIFORNIA: COMMENTS AND QUESTIONS

An Organizing Matrix and/or Cross-cutting Themes

Wayfaring via Cross-cutting Themes

- I see that you have these seven different hotspots and these four themes that cut through the middle: natural systems, species, history and future. That means you're dealing with twenty-eight things, right? Does that ring true—you have this double matrix with the seven hotspots and the four themes going across? • Doris Ash
- It's not across, but yes, we are going to deal with those things within those places.
• Kathleen McLean
- And each feature might not be covered as much in each place. Some features might be more prominent, such as tectonics, geology, and so on. • Douglas Long
- If the people walking through it could get those four things in their minds somehow—natural systems, species, history and future—that could be a mindset that people have. You're covering a lot of different places. If people could expect to see those themes in each of the places it could really help.
• Doris Ash
- A mental map. • Kathleen McLean

- Exactly. So they can expect it and look for it.
• Doris Ash

Using a Matrix: The History Gallery Example

- I too have these twenty-eight things in mind, which may be a lot and may not. Yesterday I spent a couple of hours in the History Gallery and really liked it. It really worked for me. So many of the things we've talked about for so many years are in there. The question that I have is, as a visitor I was not aware of any matrix, nor did I need to be. Was there one, and if so, can you tell us what that was so that I can think about how you pulled that off and how that might translate to this?
• Rick Bonney
- The History Gallery was designed chronologically. All three galleries are different and I think one of the interesting things is that rather than making them all the same, we are making them all different. Here, it is really thematic: people, place and wildlife. In History it is really the chronology. The organizing theme there is "Coming to California," starting with those who have always been here and going forward into the future to who is going to come tomorrow. That is the organizing element and it moves chronologically, which a lot of people don't get. Here it is going to be around these real places.

In both the Art and History Galleries the content matrix is not apparent. The content matrix in history is about who was already

Size and Scope Reminder

- Just a reminder that each of the galleries here is at least 30,000 square feet, which is bigger than many medium-size museums. This Natural Science Gallery is not an exhibition. Early on a lot of our museum colleagues were telling us, "You need one story. Keep it simple." In fact, this is like designing an entire mid-size museum that might have ten different galleries and ten different topics. This is the whole story of California nature, and we might even think of it as different exhibits within that mid-size museum, that 30,000 square feet in the Natural Sciences Gallery. • Kathleen McLean

Striking a Balance

- I too am intrigued by the seven places that you've selected and I think they represent a great balance geographically and environmentally and they seem to offer something for everybody. Like Doris, I hope that it doesn't become too overwhelming in terms of what you decide to highlight in each of those places. In some regions geology might rise to the top and be the first thing you'd engage the visitors in. In another place it might be a specific type of ecosystem or the biology. So there's the need to strike a balance and fit it all in the space that you have, but I love the seven places. • Lisa White

Enabling Personal Interpretation

- Something I really enjoyed in the History Gallery is the exhibit where you walk in through the purple haze [Forces of Change Gallery] and see people's different interpretations. I think one of the things I enjoyed about that was how you were completely left to draw your own interpretation and pull your own experience from that. I don't know if I've ever seen that work in a natural history gallery before, but it was so powerful. I wonder if there are ways to think about that in this case.

I know from reading through your documentation from last year that you do want to try to feature different voices from these different places. In the Everglades National Park there is a very effective exhibit, in my estimation, about water use. You get the story of sugar cane told from the point of view of, say, Teddy Roosevelt, saying sugar cane is destroying everything. You also hear the voices of farmers whose whole livelihood depends on that. I'm just wondering if there's an opportunity to bring that sort of element in, letting people make their own choices in natural history interpretations as well. • Rick Bonney

here, who came, and what were the conflicting values and culture clashes over time and throughout the course of history.

Here, we are also going to be dealing with history. Pulling history and art into the science gallery is a pretty innovative thing. So there is going to be the history story and the art story as well, looking at it through different lenses, as you saw with the *8th & Madison* painting example. It is kind of mushy and all over the place and just as complicated as nature is. • Kathleen McLean

Personal Stories, Interpretations, Relationships

Relationships and Change

- I agree with everything Rick just said and I'm going to have to think a little more about that. When I was looking at everything Douglas was sharing with us, I was thinking about relationships. For me it was really about relationships between everything that is in the natural environment, as well as the built environment, as well as people, as well as wildlife. I don't know if there's a way to emphasize relationships as well as change because all of these things change over time. To me, that's what was implied throughout your whole presentation, and I don't know if that would get at what Rick was talking about in terms of those connections. I have to think about that more over this next day or two. • Carolyn Finney

Deep People Connections to Place

- In the Sutter Buttes area there are people who have lived there for over a hundred years and have these incredible connections. In fact, all of these places have people who have these deep, deep connections. Not just ecologists, but the farmers. We very much want that interpreted through farmers or ranchers who have those deep connections to these places. • Mary Jo Sutton

Projecting the Self Into the Scenario, Creating an Eighth Place

- What really worked for me in the History Gallery was that I was able to project myself into a lot of those different spaces. I've never really thought that much about Hollywood before, but when I stood there reading about the attraction of California to the Hollywood film makers, I could think and say, "Yeah, I get it. If I were a film maker, I would want to be here." That happened in a few other parts of the gallery as well. I was able to project myself in there somehow and you were really effective with that. I was finding my own personal story in that gallery.

I'm trying to think how you get people to find their personal stories in the Natural Sciences Gallery, especially for people who may not be that familiar with being outside. The slide during the presentation that really hit home for me was the one where the painting of the old oaks was superimposed over the photograph of development several blocks

away from here. I was thinking about that. I've lived in the same house now for almost thirty years. When I first moved there, there were no neighbors. Now we do have some neighbors. Some of them came in a few years ago, and when those houses first came in I hated them, but now I don't see them anymore, they're just there, and my kids don't remember them not being there.

That slide that superimposed what used to be over what is was very effective in snapping you. But there is still a "So what?" Especially for a kid who hasn't really thought that much about him or herself in nature. I'm trying to figure out how you get the personal story interjected into that change over time. The only thing I've thought about so far is an eighth place. The eighth place is what you come out of the gallery with. It may not be your own personal place, it may be your way of thinking about these places, but it's something personal that you take out of there. But I think you'd have to orient the visitor from the beginning toward helping them think about what that's going to be at the end, which is a huge challenge. • Rick Bonney

Why These Places? Issues of Relevance, Interest and Appeal

A Place as an Example of Wider Ranging Topics, Issues, Ecosystems

- There was some really great stuff in that presentation. One of the things that grabbed me

was that other than Oakland, you could do a dozen versions of seven different spots in California. I'm sure you had many struggles with which seven. I think the visitors would also have some of that reaction. Why Sutter Buttes? Why not my favorite neck of the woods? But I believe from what I saw and from past visits, the way through that is to use those as examples of ecosystems and keep it flexible enough that yes, this stands for these twenty other spots in California that have similar issues biologically and ecologically.

Then we can talk about changes through time, shifting baselines, and all of those other topics that they stand for, rather than get too focused in on Sutter Buttes for the sake of Sutter Buttes. It's much more powerful that way. And with Cordell Bank there's a whole bunch we could say about marine ecosystems off California, and obviously one spot isn't going to cover it, but it could stand for many issues.

You also mentioned the idea of flexibility, being able

One Global/Universal Issue: Encroaching Development

- Following up on what Rick and Norm said, when I saw that slide of the land encroachment with the checkerboard, where you saw the white section and the settlement there, it is exactly like flying over Florida. If you fly across Florida from east to west, it looks just like that. You can see it all disappearing. The land is white and the developments are all different colors. That picture is a universal iconic symbol. I'm sure it looks the same in other areas where there is encroachment on any kind of natural area. Just the picture itself is iconic. Flying over an area, seeing the land, seeing the encroaching development, seeing the bulldozers, is such a powerful view. That's certainly a global issue. • Doris Ash

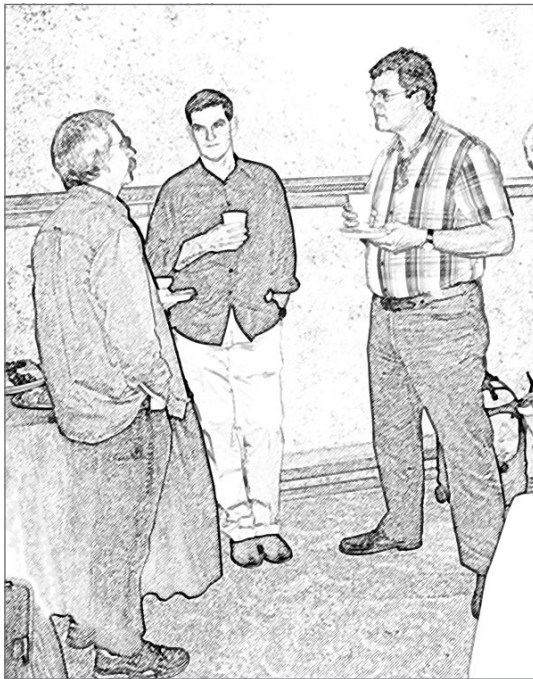
From left: Norman Miller, Richard Bugbee, Rick Bonney



Lasting Impressions, Take-Away Messages

- How do you want the next generation to walk out of this museum and feel inspired? What take-away sets of lasting impressions do you want them to have, other than a lot of diffuse pieces of information? There needs to be something that really pulls it together in different ways for different people, but something that has a solid set of common messages that are really clear and crystal. One that I see is the shift in various types of natural phenomena and how it is connected here. But regarding the art part, I have to walk through this and understand it better. To me that is the most intriguing aspect. • Norman L. Miller

From left: Rick Bonney, Scott Sampson, Kirk Johnson



to respond to current events, things like the Gulf oil spill. How does Cordell Bank suddenly shift for a few months to respond to an intense focus of public interest? As long as it's the ecosystem, then that door is open but as soon as it's the place, the door is closed. • Christopher Cogan

The Appeal of Specific Places, Stories and Personal Reflections

- I think the challenge with that though is that people tend to respond to specific stories of specific people connected to specific histories. Even if they are not my history, there are human elements there that I can identify with. I think that's a challenge. Maybe one way to do it is, as you are focusing on specific places or people, you pull out those bigger themes or ecosystem types, but then also ask the visitor, hopefully in multiple different places and ways: If this isn't your favorite place, how is it similar to your favorite place? What is the story of your favorite place and do you see it reflected in this or not?

If they don't go for Cordell Bank, they may go for Sutter Buttes and think it's similar to an area they know and they can reflect back, hopefully in a specific way, their own stories, so you get both the general and the specific.

• Dan Rademacher

Synechdoche and Personal Touchpoints

- I was thinking about the point Chris made in terms of the separate places. I think one

of the major ways that exhibitions function is, as you say, their synecdoche. You look at this example of one kind of dinosaur, one ecosystem, and hopefully you're intrigued by that enough that you're interested in following up on some of those processes and digging a little more. There's an art school saying that goes, "To make it more universal, make it more personal." The idea, of course, is that the better you are at coming in and really exploring that thing and making it come alive, the more likely you are to hit one of those touchpoints, and we can only guess at what they are going to be for the visitor. • Matt Matcuk

The Global Connection

- In thinking about what I heard in the presentation, what strikes me is the large global perspective that lends itself to California. We see these big changes going on throughout the world and we see flavors of that here. I would suggest drawing connections between that as you go and not just "Here's seven examples and here's how they connect to other examples in California."

At some point in the presentations, it's important to always drop back to the planetary view and how it is seen in other regions as well as here. There are many, many examples that are simplistic enough that it can be done, I think. There is a new intergovernmental panel on biodiversity and ecosystem services that is going to be announced in

about a month. This is very similar to the climate change panel. There are hotspots throughout the world that are bubbling up and being talked about. For example, the dropping water in northwest India, parts of China and the Central Valley is one common issue that we are seeing in many places, including California. How that ties into climate, how that ties into biodiversity and fragmentation, population and other stressors is a common thread in problems that are local as well as global. • Norman L. Miller

Social Science: Shifting Baselines, Environmental Generational Amnesia, and Human Interaction

- I already knew I love California, and Douglas, you helped me understand how. The shifting baseline is something we talked about last year. It seems like it's on the map now for what you guys are doing. Rick just posed the question, "So what?" I think that's a really important issue. It's one of the critical mechanisms or explanations for why we've gotten into the mess we are in. I spoke about this last year. I see it as cutting across generations so that each generation constructs a new baseline based on what they're experiencing. The crux is really at that generational shift as the younger generation comes of age.

We've all had that experience that Rick described, where we see stuff destroyed and we lose track of it or we get disappointed

and sad. But kids coming along don't have that experience, they just see that as normal. I think having that as the focus is critical, but then there is the "So what?" issue.

That's where I see connecting it with the focus on relationship that Doris and Carolyn and others mentioned. I think you've got that embedded. You've got the natural science parts and I think Douglas was highlighting the natural science side, and yet you've got a huge social science side, but I'm not sure if they're as well connected as they could be. As a metaphor for connecting them, Douglas's talk was so focused on the biodiversity on the natural science side. What if you just flip it and ask, what is the biodiversity of human interaction with all of these environments, and start trying to characterize what those interactions are that people are experiencing? It is a little bit of a different twist than just saying, "What's my story about this?" or "What do I love?" though often within that are accounts of the nature of those interactions.

Part of what we are trying to protect is not just this stuff that is important out there, we are trying to protect and preserve the richness of our own individual interactions. That's the connection to the shifting baseline and what I've talked about in terms of environmental generational amnesia. It's not only what have we lost and what can we analytically understand about what we've lost, but also what do we want to preserve,

Away from Universal Messages to Building Personal Meaning

- What Rick said made me think again about the focus on relationship. I was listening to Norm talking about scale and the relationship between planetary changes and statewide and local issues. What I would steer away from is trying to create a universal narrative. They are going to look at any of those places that Douglas showed us and you're going to get five people with five different experiences ranging from fantastic to terrible. By universal I mean one way to talk about all of these places in California and one way to talk about the human-environment relationship in California. It's going to be different for everybody. Mary Jo brought up a few examples. There are farmers, and there is the perspective of Native people.

I'm thinking about people's personal stories also because they have to have ownership over it, but they also have to know what it is. So again, how does the museum create that possibility for the visitor as soon as they come in so that they can say, "This is who I am in relation to this," and kind of work their way through the exhibit? • Carolyn Finney

not simply at the natural systems level but in terms of the human interaction level?

For example, you could imagine asking parents and grandparents, “What would most want your child to have in terms of the interaction level that you’ve had in your own life that you’d feel so sad if they lost it?” That’s the connection between the shifting baseline and what has been lost, to trying to project out into the future and what we

want to preserve.

That then leads to that question regarding the action item. Part of the action item is being able to characterize what it is we love in an interaction and what it is that we want to protect. So it’s a social science version of what Douglas just did on the natural science side. • Peter Kahn

Just-In-Time Learning, Non-functional Meta-narratives, and Nested Sets of Synecdoche

- I was trying to pull up an article on my computer that I just read last night. It’s a study that a guy has done over the last twenty years, looking at shifting epistemologies, how people learn differently now than they did before. The major thrust of his work indicates that we are moving towards an era of what he calls “just-in-time learning,” the parallel to just-in-time manufacturing. In the same way today that you can say that you want to buy a Dell computer and Dell doesn’t even start soldering until your purchase comes in, this is now more and more how people are approaching learning. They do not go into any situation attempting to methodically collect a storehouse of data that they will then piece together and use all the time. They don’t do that. They get only that information that they need just in time for when they need it, whether that’s a traffic report or a fact about history.

Thinking About This in View of Leiserowitz’s “Six Americas”

- Douglas, that was a fantastic presentation and we all clapped really hard. Most of us are scientists and natural historians. I’m going to say this and then duck under the table, and I’ll say it in two ways. The first is, at the Lab of Ornithology I have fought a twenty to twenty-five year battle with scientists who want to present to the public who we are as an institution, versus the vision that the public doesn’t give a damn what we are as an institution, they want to know what we can do for them. So our Web site used to say, this department does this and this department does that. Now the Web site says, here’s what you can do: You can join this project or take advantage of this opportunity. And because our gifts are going up and our membership is rising they finally acceded.

I’m wondering, if you made this presentation to a bunch of nonscientists or people who didn’t think about diversity and biodiversity, if they would just think, this is a mountain and this

is a volcano, and this is the Cordell Bank. Are there another seven ways of looking at this? I’m not sure if that’s what Peter was trying to get at or not. Going way out on a limb, are there seven kinds of people? Some of you may be familiar with the work of Tony Leiserowitz at Yale, who is the Director of the Yale Project on Climate Change, and his work that resulted in identification of the “six Americas,” in which he characterizes different ways that the public has of looking at climate change, from the alarmists to the dismissives.

Are there different segments of visitors here who would think about these environments in different ways and would want a completely different presentation about the different parts of California? This is where I climb under the table because I think you’re pretty far along with your seven places, but I think a marriage of the two ideas may be possible.

• Rick Bonney

There are a couple of things I'd like to throw out for the team to think about that are independent of any ecosystem that you depict. The first is, in my experience we run into problems when we try to take a narrative structure that applies to media that play out over time, such as turned pages or film frames, and apply that structure onto a physical place. By and large, people do not perceive their movement through space as being equated to any sequential narrative, much less the accumulation of knowledge into some kind of overarching theme.

This was what I was talking about last time in terms of this grand meta-narrative. The

Matt Matcuk



grand meta-narratives, if we ever had them, are basically nonfunctional today. What we have is a change in the scale of narrative. Now people like my father look and this and say, "People today have no attention span. Everything's got to be shorter and shorter." Yeah, it's true, and I don't know that it's necessarily a bad thing, but it's something that we absolutely need to contend with when we are constructing an exhibition experience.

So if you can imagine your exhibition as continually nested sets of synechdoche I think your chances will be better. By all means, sure, create a grand overarching narrative for the space. No one will get it, that's okay. But every major zone is a seventh of your exhibition. Put your narrative arch there, and for this portion of that section, and for this case, and for that label. At every level that you go down, you need to imagine the exact same story arch. It's not the same story in every place, but it's the same dramatic function. Then you can be sure that people who construct meaning at all different scales of narrative will get it. • Matt Matcuk

Problems with the Just-In-Time Model for Biologists and Natural Historians

- There's an often discussed dichotomy between biological science and physical science, and it's usually stated that the highest point of a physicist's career is his dissertation. It's a young man's game. You're hard wired for a specific insight, you think a

Just-In-Time Learning as Inspirational Nuggets

- You have to have a realistic goal for a museum exhibition. You're not trying to create natural historians in one fell swoop. As I edit a nature magazine, I find that just-in-time learning is not necessarily a terrible model when you're trying to inspire people with those digestible nuggets of character or fact or story that are most inspiring.

I still remember when I suddenly had an insight that the paleobotanist up at the UC Botanical Gardens could look at the same landscape I would look at and see all that was lost or all that was no longer there. I don't know what any of those things are, I didn't memorize the plant list, it was just this sudden flash of insight that he sees a totally different landscape than I do, and it has inspired an ongoing curiosity about paleobotany that I probably wouldn't have had, and yet I still don't know much of anything about paleobotany. But I feel like that was a useful insight on a personal level that you could get with a narrative about the way that this particular individual researcher sees the landscape without having to memorize facts or anything really. • Dan Rademacher

Capitalizing on Younger Generation's Penchant for Just-In-Time Learning and Networking

- If you're talking about fostering people who are interested in biology and want to become biologists in the future using that style of just-in-time learning, there's also the fact that people have a greater sense of network and a greater sense of connections. So you could foster that within the gallery. Say you have a connection to this place and somebody else has a connection to a different place, and you can collaborate and connect with each other. I think that's a way that science might move forward in general from now on for people in younger generations. So make those connections and give those opportunities for somebody to say, "Look at all of those cool things that other people are doing, here's what I can offer." That may be the way to go about it. There are these short little bits of learning that everybody has and it's when you bring it all together that it really makes a difference.

• Lauren Palumbi

certain way, you grab aspects of the nature of the universe, and boom, there it is. Versus biology, where it is late in people's careers that they assemble a big enough body of data, a big enough mind map of biological systems so that they can make the big integrations that then produce the gems of insight. In the context of the change that you've just mentioned about the just-in-time learning concept, what does that bode for biology/natural history, which to me does not fit so well with the just-in-time data acquisition model, or whose needs are not met by the just-in-time data acquisition model?

• Christopher Richard

Timeline and Overarching Segments as Cohesive Factors

- I hope my career didn't peak twenty-something years ago. It's a little discouraging to think there's such a difference. I think things are continually evolving. One of the things that stuck with me from last year is the concept of having a timeline moving through everything as a cohesive factor. I really like the idea of having these separate, clear, overarching segments that were brought up for each of these areas, so whether the viewer knows it or not, there's something cohesive in each of these things. I don't really want to say much about the difference between a biologist and a physicist other than that there has been a lot of work recently to bring these varying disciplines together and it has been very successful. • Norman L. Miller

The Best of Just-In-Time and Nuggetizing, but Highlight Synthesis and Integration

- Lauren made a good point, and I think Christopher's point is also really important. I think making a distinction between biologists and physicists is unnecessary. It may be true and it may not be true, but the larger point you're making is crucial. I do think there's an issue, whether philosophical or ideological, that needs to be resolved. Matt was saying kids are moving into that world and it may or may not be a good thing, but I think one needs to commit. Probably something is gained by it, but is something lost?

The value of Christopher's point is that I do think something is lost. I think he's right about that. I don't think we want to just give ground. I think we want to capitalize on the best of what the technology and just-in-time learning and nuggetizing of information can give. We want to capitalize on that and leverage it, but we don't want to do that at the expense of what Christopher has nailed because the problems that we have are big, integrated, synthetic problems and if we can't get that across, we are not going to solve the problems by nuggetizing. How that translates into an exhibit is difficult, but I think as a large, overarching view, one needs to hold that out as a vision, and then you're highlighting this notion of synthesis and integration, and that needs to be embedded into this vision of a museum space. • Peter Kahn

Meta-narratives and Personal Reality

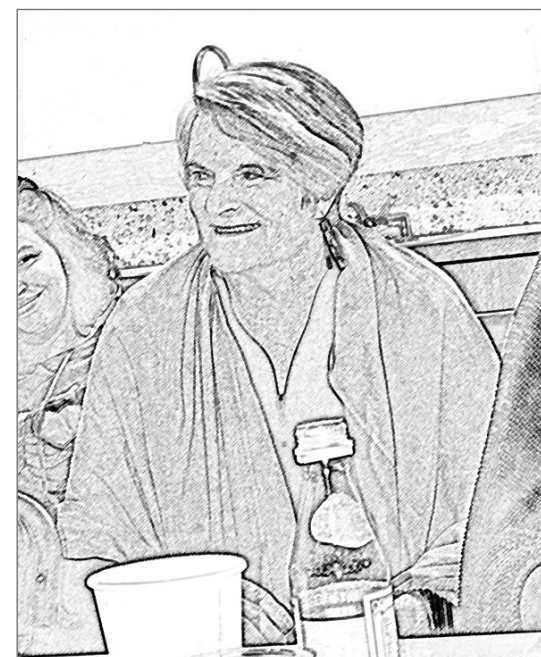
- I'm a learning scientist. I look at learning for a living, and I'm just laying that on the table. I do take exception to the fallback of just-in-time. People do know meta-narratives. We know from all the research and all the learning that people can be taught meta-skills and strategies. I'm hoping Peter will back me up on this. I don't want to fall back to "lite" learning. We can do some of both but we can't just descend to just-in-time because people like to do networking. I think you can use networking well, but it's not the only thing going on in town. People can get meta-narratives and they can be taught. Please remember that.

Another thing is, I am really struck by this whole notion that a number of people have mentioned of personalization. I teach a course on learning right now and I'm very struck with the notion of your personal reality of where you are *vis a vis* learning (for me, learning and teaching). I want my students to locate themselves in the world I'm asking them to inhabit. It's like a personal mandala. You surround yourself with all of the things that really inform you. For me it's being informed about learning and teaching. For someone in the museum it would be about the place and those meta-narratives. There is an article about personal reality that is not related to this kind of work at all but to teaching, by Maxine Greene (Maxine Greene, "Teaching: The Question of Personal

Reality," *Teachers College Record* 80, no. 1 (1978): 34). I want us to think about that.

To be able to think about that, we need to talk with more social scientists. There are a lot of people out there who deal with this business. I don't know who they are right now, but I totally agree with the idea of wanting people to be in the space. The best exhibits do that. You imagine yourself in the Mojave Desert and you see that rat or something, that little piece of transcending time and space. It's something besides the physical stuff of signs and colors, which we always talk about at these meetings eventually. Someone always brings up signage. I don't want to do that. That's not where I want to go. I think you want to find a way for people to actually inhabit that space. You want them to see the things around them. Peter's suggestion about identifying the things that you wouldn't want to give up is a good way to do that because then in your mind you can see that grocery store, you can see those animals. • Doris Ash

Doris Ash



Diorama Literature Review and Research Projects

LITERATURE REVIEW AND RESEARCH PRESENTATION

Cecilia Garibay
Principal, Garibay Group

What I'm going to present is not so much the evaluation piece but the research component that is embedded in the project itself around the broader question of dioramas in general. This particular research thread had a couple of phases. The first was a literature review to try to find some comprehensive information, regarding the question: What we can say are actual outcomes of visitor experiences at dioramas?

Cecilia Garibay



Literature Review

What do we know about the outcomes of museum visitors' experiences with dioramas and how those outcomes are achieved?



There is a lot of literature out there, but it hadn't come together in any specific way. I

will emphasize that we were really looking at outcomes. In other words, if a visitor has an experience or a group has an experience, at the end of the day what can we say they took away from that experience?

Here is some of the literature we looked at. As you can see, it was all across the board. We looked at a lot of the published literature and a lot of the gray literature, which was essentially evaluation. What we were looking for here was, what do we know about the specific outcomes and what is the strength of those outcomes?

Literature Reviewed

Research about or within dioramas and diorama halls	22
Evaluations of dioramas and diorama halls	48
Scholarship about dioramas and diorama halls (did not involve visitor research)	14
Research/evaluation in other (non-diorama) exhibits	57
Research, evaluation, scholarship in non-exhibit settings	34
Research/scholarship on learning related to museum settings (to help define the outcomes)	14
Total	189

If we go to the next slide, what we essentially found is that there are four major buckets, if you will, of outcome types.

Outcome Types

- Emotional
- Attitudinal
- Cognitive
- Other



There is an affective component, there are some pieces related to attitude, there are some that are the more traditional, cognitive take-away, and then there is this bucket of “other.” We have copies of the actual literature review that runs to some eighty-plus pages that you may peruse. There is also a second component, which I’m not going to go into in detail.

What you can see [*at right*] is that we took all of these different studies and developed a coding scheme for these four buckets. So, for example, any outcomes that related to having a sense of psychological flow and immersion would be referenced with a code that you can see. We have one called “understanding” that would be in the cognitive bucket. We indicated the different levels, though that doesn’t show up very well on this slide.

We looked at the relative strengths of these particular outcomes in both traditional diorama halls and those that had been renovated, meaning that some sort of interventions had

been added. Sound, for example, was frequently an added element, or maybe there were things you could touch and feel outside of the diorama itself. You can see that the farther down the list you go, the less evidence there is of a particular outcome. For the ones at the top, the literature shows fairly strong evidence across the board that that outcome is achieved. The ones in the middle section are those for which there is some evidence, but it is unclear how much of that is true.

We expected that what we would see is a high, a medium, and a low category, but what we found is that there is a high, a medium, and a “not really studied” category, which are the ones at the very bottom. Even though people have made claims about dioramas from these perspectives, we didn’t see evidence in the literature in terms of any kind of true measure of outcome.

This helped the team in a number of ways. I think it really synthesized

	Traditional diorama halls	Renovated diorama halls
Feel immersed, feel psychological flow (IMMERSE)	●	●
Gain knowledge, facts, identifications (KNOW)	●	●
Understand concepts, explanations (UNDERSTAND)	●	●
Develop inquiry and science processes skills (PROCESS)	●	●
Retain complex memories (REMEMBER)	●	●
Feel disgusted, repulsed, fearful, sad (NEGATIVE)	●	●
Feel restored, refreshed, relaxed (RESTORE)	●	●
Reflect on or develop new perspectives (REFLECT)	●	●
Feel excitement, awe, wonder (EXCITE)	●	●
Develop appreciation, value (VALUE)	●	●
Develop positive conservation attitudes (ATTITUDE)	●	●
Develop caring attitude towards nature (CARE)	●	●
Develop interest, curiosity, motivation (INTEREST)	●	●
Internalize a mental model (MODEL)	●	●
Develop a sense of place (PLACE)	●	●
Develop a sense for a particular time (TIME)	●	●
Learn about/cement bonds with family/social group (SOCIAL)	●	(NS)
Declare an intention to act or actually change behavior (BEHAVIOR)	(NS)	●
Become aware (AWARE)	(NS)	(NS)
Work on personal identity, e.g., related to science/ conservation (IDENTITY)	(NS)	(NS)

Q: So you were studying both evaluation studies and research studies? • Doris Ash

A: Yes. It was everything that we could find that was out there. I'm sure that there are pieces that we missed, but we put a call out there and Mary Jo was instrumental in getting so much of that coalesced in some kind of cohesive way that we could then take a look at.

• Cecilia Garibay

Research Question

In what ways and to what extent do traditional habitat dioramas contribute to visitors' developing sense of place? Which dimensions of sense of place are they most apt to contribute to?

the literature for them regarding what the specific outcomes are that we know are strong in current dioramas and what implications that might have for this project.

There was also an appendix, probably the same size as the literature review, when we looked at the literature and sliced it according to what we know about different components of dioramas. For example, what was the function of labels? What was the function of immersive-type experiences? What was the function of sound? That was a completely separate piece that the team can use as reference. If you're trying to develop different interpretive strategies or ways to develop a project, what might that tell you?

So that was phase one and I don't want to spend a lot of time on it because I think the next piece is the most pertinent to you. After we did the literature review the question on the table was, where are the gaps? What is it that we maybe don't know? Where is there some evidence that dioramas may lead to certain outcomes, but we are not really clear if it's true or not?

"Develop a sense of place" was one of the potential outcomes that we looked for. There was some evidence in the literature that was true, but not enough that we could say yes, that is a definitive piece. This became our research question. This is something that was discussed and honed with the team. Essentially, what we were beginning to look at with the second phase of this research after the literature re-

view was this gap. We think the dioramas elicit a sense of place and foster ideas around that, but it is not clear. What we have developed is a study that looks at that particular question. What is it that we can say about the ways in which dioramas contribute to the visitors developing a sense of place, and what are those dimensions of place?

When we look at the sense of place literature, what you will find is that there are two camps. There is what we may call the very simplified way of thinking about sense of place, which is that it is about attachment. But a lot of the literature about sense of place talked about it as a fairly complex concept.

One of the folks whose literature inspired us quite a bit has agreed to be an advisor on this project. Nicole Ardoin is at Stanford and has done a lot of work on sense of place in terms of physical places where people live. Most of her research is actually about living in a particular ecology or place. You can see that the way she describes sense of place is a fairly complex concept. It incorporates a number of different dimensions including cognition, affect, and some sort of relationship to place.

Sense of Place

"Sense of place describes the complex cognitive, affective, and evaluative relationships people develop with social and ecological communities"

Ardoin, 2006

To develop this research study we have been looking at a lot of the theoretical constructs around development of a sense of place and what that means.

Sense of Place Model

Hammitt, Kyle, & Oh (2009)

- **Place identity** – individual's personal identity in relation to the physical environment (Proshansky, 1978).
- **Place dependence** – perceived strength of association between a person and a specific place. (Stokols & Shumaker, 1981).
- **Place familiarity** – pleasant memories, attribute and cognitive meanings, and environmental images. (Roberts, 1996; Stedman, 2003).
- **Place belongingness** – feeling of affiliation with place, a social bond where people feel as though they are connected and hold 'membership' with an environment (Mesch & Manor, 1998; Milligan, 1998).
- **Place rootedness** – strong and focused bond that "in its essence means being completely at home" (Tuan, 1980; Hammitt et al., 2009).

The one that we found that is the most comprehensive and has looked very specifically at the literature was Hammitt *et al.*'s work on what sense of place actually involves. You can see that a lot of it has to do with these five different constructs. There is the notion of identity. In other words, part of your personal identity is related to the physical environment in one way or another.

Another is this notion of place dependence, which is when you have some sort of association between yourself and a particular place. Another construct, place familiarity, is just as it sounds. How familiar are you with the place and do you have positive memories of and attitudes about a particular environmental area or place? Place belongingness is one of the other constructs that Hammitt *et al.* pulled from the literature. Do you have a sense of affiliation with a particular place? Often it is talked about as a sense of bondedness with a particular place. Then there is this notion of place rootedness, which is really a sense of being so rooted that you feel comfortable.

Now remember that most of these constructs and sense of place models come out of studies that have been done with people living in a particular place. For example, with Nicole Ardoin's work, she interviewed and did a lot of work with people living in the Galapagos or in Chesapeake Bay. So a lot of these constructs are done with people living in a place, which is important to know because we were trying to figure out how to take these concepts and apply them to a museum setting.

What we did is look at different sense of place scales, most developed by Hammitt et al. They validated them in a number of different ways. You won't be able to read most of these, but I wanted to show them to you. Again it is place familiarity, belongingness, identity, dependence and rootedness. They developed several instruments. The first was an in-depth instru-

Factored dimension Item
Place Familiarity
I could draw a rough map of the Chattooga
I have trout fished the Chattooga many times and I am quite familiar with it
I know the Chattooga like the back of my hand
Place Belongingness
I feel connected to the Chattooga
I am fond of the Chattooga
The Chattooga makes me feel like no other place can
When I am at the Chattooga, I feel part of it
I feel like I belong at the Chattooga
Place Identity
The Chattooga is very special to me
I am very attached to the Chattooga
The Chattooga means a great deal to me
I identify strongly with the Chattooga
Visiting the Chattooga says a great deal about who I am
I feel like the Chattooga is part of me

Place Dependence
The Chattooga is the best place for trout fishing
Trout fishing on the Chattooga is more important to me than trout fishing any other river
No other place can compare to the Chattooga for trout fishing
I wouldn't substitute any other area for the trout fishing I do at the Chattooga
I get more satisfaction out of trout fishing the Chattooga than from trout fishing any other river
The trout fishing I do at the Chattooga I would enjoy just as much at a similar river or stream
Place Rootedness
The Chattooga is the only place I desire to trout fish
I rarely if ever trout fish any place other than the Chattooga
If I could not fish the Chattooga I would stop trout fishing
I consider only the Chattooga when I go trout fishing

About the Parsimonious Model

Basically what Hammitt et al. did was begin with an extensive questionnaire with different subsets, and then they kept scaling that back to see if the shorter version with less questions still got them fairly good data.

They found that it did, which is good for us because we want it short and sweet.

The sample questionnaire [sidebar, page 35] gives you a sense of the way that it's set up, though a few questions were removed before they reached the parsimonious model.

Research Design

Two Phases

- Pilot: Field Museum
- Phase II: Denver Museum of Natural History

Methods

- Observations (intact group)
- Interviews (adult and child - separate)
- Survey (adults)

ment that had tons of questions on it. Then they did what they called a medium, where they pulled some questions out and tested that. Then they developed what they called their parsimonious model, which was even shorter. After testing them they came to the conclusion that the parsimonious model was just as good as the extensive instrument, so that is what we based a large part of our study on, taking this particular instrument and seeing how we might adapt it to a museum setting.

Our challenge, of course, was to figure out how to adapt this kind of scale in a museum setting, where you are talking to visitors from a lot of different places with a lot of different experiences that aren't necessarily rooted in that particular place, which is where a lot of the sense of place work has been done. But we did do it, and I'll share that with you.

First I'll share our research design. Once we looked at a lot of the theoretical constructs and figured out what some of the validated instruments were that had been used over time and felt pretty robust, we then had to figure out what the research design looks like. What we came up with is two phases. There is a pilot study that we have been doing at the Field Museum and are still in the middle of, and then a phase two that will be done in Denver.

Our phase one piece at the Field Museum is allowing us to do several things. It is allowing us to test these instruments as we've adapted them to see if we are getting any data that feels reliable and allows us to pursue the kinds

of constructs that we are finding in the literature. Second, we wanted to pilot two different kinds of methods to see how they were working, and it was important to us to have both a qualitative and quantitative measure. So that first phase was pretty much a testing ground, figuring out whether this was working and whether it gave us the kind of data we might expect. Phase two will be a much larger sample at Denver.

One of the things you will see when I get into some of the very preliminary results from the Field Museum is that they are two very different types of institutions. The Field Museum's dioramas really cover a range and aren't really set in terms of doing interpretations of a very particular bioregion. There are some that have to do with the Midwest, but you also have Africa Hall, the Amazon, and so forth, so it's not a cohesive space in the way that the Natural Sciences Gallery here is or is planned to be.

Kirk can describe Denver.

Dioramas at the Denver Museum of Natural History

- There are several halls about Colorado that are based on exact spots. You can go back and stand in those spots now and see that exact view, even though the dioramas were installed in 1938 • Kirk Johnson

That was one of the reasons for using Colorado as the larger research piece. It has more similarity to the Oakland Museum in that there are a lot of place-specific dioramas that we will be able to look at.

The methods that we have use for the pilot study include observations of intact groups. What that means is whatever the social dynamic of that group is. Often it's families, sometimes it's two individuals who know each other or couples. A team of two researchers work with each group. They are instructed to go through what we call a nature walk, and basically we are doing observations in this very discreet area. It is cued and the participants are miked with wireless recorders so we can capture their conversations as they are going through the gallery.

After they go through that space they are asked to complete a survey, which is essentially that sense of place scale, and then they are interviewed. The interview is a very important piece for us, and again that is recorded. So we can look at what we get from the observation data and the recorded conversations there, and what we get from the interview that may help us look at parallel conversations, what we heard, what visitors talk about in the course of the visit, and what we didn't see during the observations but may get as we interview visitors and ask them to reflect on their experience.

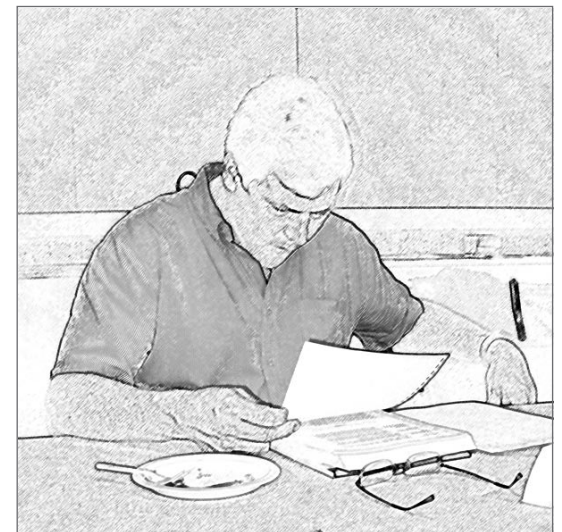
We do interview both adults and children, but separately. The adults get the survey, which is the sense of place scale, and then we go through a fairly standard, semi-structured interview. With children, we actually give them photos of the dioramas we've selected and use those as prompts to ask questions. For example, a question might be: "Which of these

remind you of a place that you've been to before?" After they circle it we ask them why or what kind of place. We have a fairly open-ended question at the beginning where we say, "What do you call those places?" That is just so we use the terminology they might use rather than a more technical term for a type of place.

Again, we are right in the midst of all of this research and what I'm presenting to you is very preliminary. The sample size at the Field Museum is fairly small. We are doing about eight to ten groups, mostly to try to get a range of different people. They are actually recruited. They get an honorarium, free admission to the museum, and parking.

We've had really good luck, and what we've been doing is trying to select a sample where we get very different social configurations. We have also tried, through our network, to recruit people who seem to have very different kinds of experiences with and relationships to nature. For example, we might select a group that we know does a lot of outdoor kinds of things, so their relationship to nature is the outdoors in an urban setting. It doesn't mean they don't do nature-specific things within that urban setting, but it would be very different from the family that we chose that has a cabin in northern Wisconsin and goes there three or four times a year to a fairly rustic nature area where they fish and so forth. The idea was to get that kind of range so that we could see how the instrument was working with very different kinds of groups.

Kirk Johnson scans the phase one literature review



Note: The survey instruments shown here are still under development, being shared for purposes of discussion during this session.



1. Do you recall seeing this diorama during your visit?		Yes			No	
2.	How often have you visited the specific place shown in this diorama?	Never	1- 2 times	3-4 times	5 times or more	
3.	How often have you visited a place that looks similar to this one?	Never	1- 2 times	3-4 times	5 times or more	
		Strongly Disagree			Strongly Agree	
4.	I am very familiar with this place.	1	2	3	4	5
5.	I am very familiar with a similar place.	1	2	3	4	5
6.	I am very familiar with the animals and/or plants that live in this place.	1	2	3	4	5
"Place" below can refer to <i>either</i> the place depicted in the diorama <i>or</i> to a similar place that you may have visited. You may agree with some statements even if you never visited that place.						
7.	I feel connected to this place.	1	2	3	4	5
8.	I feel like I belong at this place.	1	2	3	4	5
9.	This place is very special to me.	1	2	3	4	5
10.	If I visited this place, I would feel like I was part of it.	1	2	3	4	5
11.	I identify strongly with this place.	1	2	3	4	5
12.	I am very attached to this place.	1	2	3	4	5

Here is a peek at the instrument that we developed. There are a couple of questions that we added. For example, number one: "Do you recall seeing this diorama during your walk?" We wanted to make sure that they had seen that particular diorama. The one thing I should mention is that when they are cued, they are told they are going to be in this area and this is the only area we want them to be in. They can go anywhere they want but are asked to be sure to stop at specific spots. They are given a sheet of paper that has all five dioramas, each with a small color photo. What

we are finding is that even though they have been cued, people don't necessarily go to all of those places and they don't necessarily methodically go to each of the five. Some people do, but some people wander and maybe make their way to three of them. It has been really interesting. So the first thing we want to know is, did they see this particular diorama.

Items two to six represent that notion of familiarity, so it's about "I know this place," "I'm familiar with this place." Seven, eight and ten are adapted from Hammitt's belongingness dimension, so it's about "I feel somehow connected to these places."

And nine, eleven and twelve are the identity dimension. I can give you more detail about this later if you'd like, but this is really more about giving you an overview.

When visitors get the questionnaire, there is a photo of the diorama at the top of the page and then these questions they are asked to answer. They do that for all five dioramas, so we are working with five pages.

Nature Connectedness Scale						
		Strongly Disagree				Strongly Agree
1.	I often feel a sense of oneness with the natural world around me.	1	2	3	4	5
2.	I think of the natural world as a community to which I belong.	1	2	3	4	5
3.	I often feel disconnected from nature.	1	2	3	4	5
4.	I often feel a kinship with animals.	1	2	3	4	5
5.	I often feel a kinship with plants.	1	2	3	4	5
6.	When I think of my place on Earth, I consider myself to be a top member of a hierarchy that exists in nature.	1	2	3	4	5
7.	I often feel that I am only a small part of the natural world around me, and that I am no more important than the grass on the ground and the birds in the trees.	1	2	3	4	5

In addition to that, the survey instrument also has what we call a Nature Connectedness Scale, which is adapted from Mayer *et al.* The reason for this is that while we had the sense of place scale, what we couldn't find within the construct of that scale was something that helped us understand how people self-identify as being part of nature or being connected to nature. So again this has is based on a validated instrument and we pulled the questions

that seemed strongest and most adaptable to a museum environment. So they also answer these questions, and what we anticipate we will be able to do is then disaggregate the data by this kind of thing.

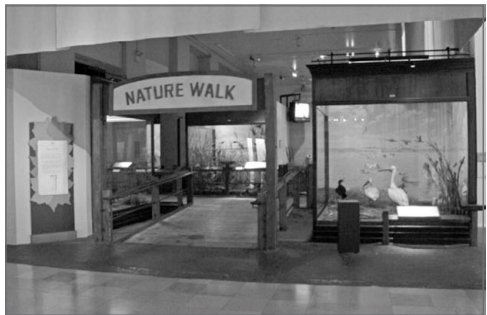
This is Nature Walk [below], the area of the study, and the different dioramas. Some of these depict more local places near Chicago, but we also tried to pick some places that were not nearby but were somehow iconic. For example, for some people the Amazon Rainforest might be an iconic spot. The reason we did that was because while these places may not be close to home, people might be familiar with them. In our front-end study we found that Yosemite is such a strong iconic spot that evokes

strong reactions that we wanted something similar.

This shows you that Ham-mitt scale again and different ways that you can think about it. Some questions are about visitation: I have been to this place, I know this place. There is this notion of familiarity: I am familiar with this place, I connect with it in some way. And then the last is place bondedness, which is also about the connectedness piece. This is the survey, and then the interview probed these concepts.

Relationships Among
Sense of Place and Dioramas

2	How often have you visited the specific place shown in this diorama?	Visitation
3	How often have you visited a place that looks similar to this one?	
4	I am very familiar with this place.	Familiarity
5	I am very familiar with a similar place.	
6	I am very familiar with the animals and/or plants that live in this place.	
7	I feel connected to this place.	Place Bondedness (using term from Hammitt <i>et al.</i> , 2009)
8	I feel like I belong at this place.	
9	This place is very special to me.	
10	If I visited this place, I would feel like I was part of it.	
11	I identify strongly with this place.	
12	I am very attached to this place.	



Fox Lake, Illinois



Iron County, northern Michigan



Lake Michigan, near Chicago



Rio Branco, Brazil
Amazonian Rainforest



Deep River, Indiana



Grand Canyon National Park
Kaibab Plateau

What I am going to show you are very, very preliminary pieces from about ten adult respondents, just so you can see what we've been doing. We took these three dimensions: visitation, familiarity and place bondedness.

You see here, with familiarity and visitation, that the line is what we would expect. What you can see is that we chose dioramas that we hoped had a range of familiarity, a range of visitation, and even bondedness, and that is

true, you do see that. There does seem to be almost a linear relationship, but you can see that "Prairie," for example, is well below the line. What is interesting is that prairies are visited, but they don't seem to have that same level of familiarity.

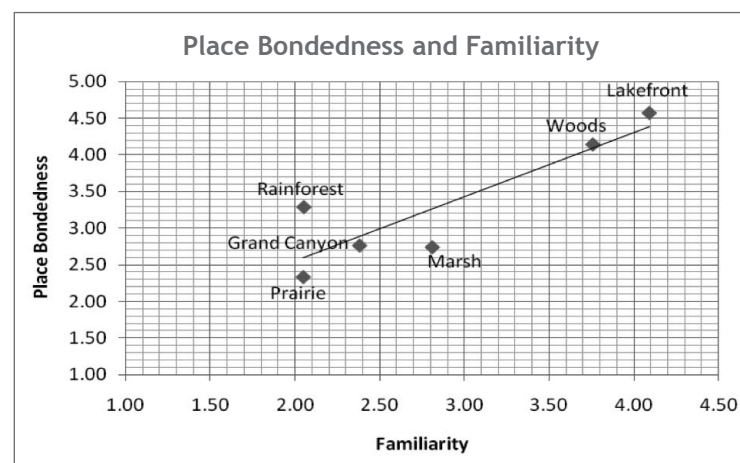
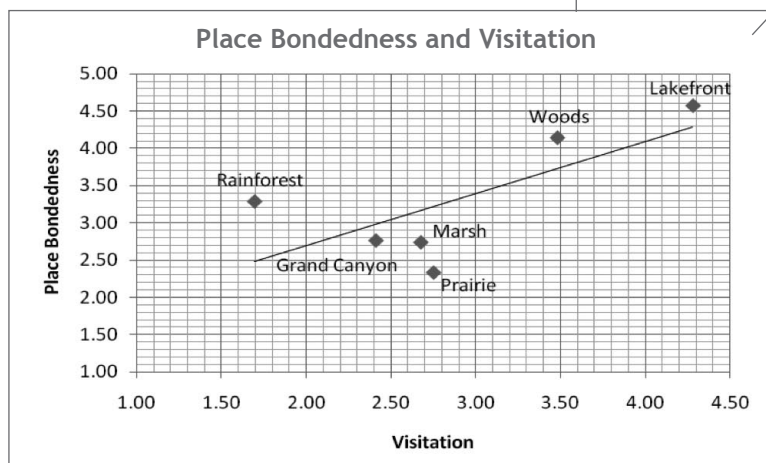
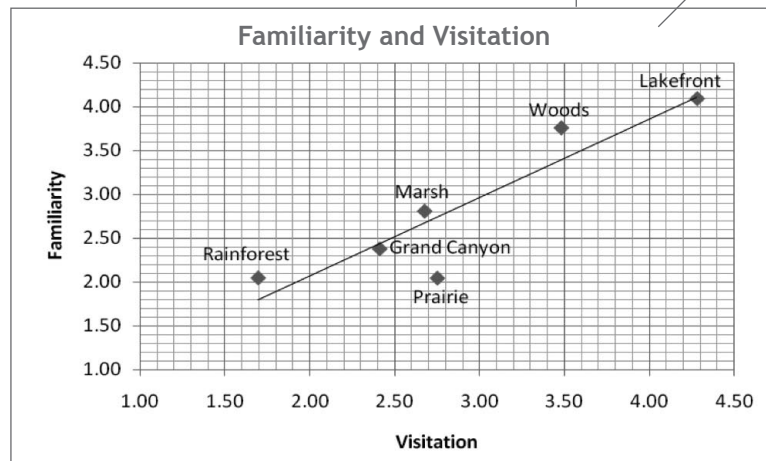
Next we have place bondedness and visitation. This is how often you visit and how

bonded you are to it. You can see again that "Prairie" falls well below the line. What is interesting, if we look at "Rainforest" and at "Woods," is that they fall well above the line. It's interesting to think about. What does that mean? It seems to be that you can actually create place bondedness with places that you've not visited before. The reason why would be interesting to find out. Some of the researchers that I have heard talk about it have ventured that perhaps places like rainforests have gotten such play in the media and so forth that you actually feel potentially very connected to it, even if you do not go there. If it works for rainforests it might work for Yosemite.

This is Chicago and I want to point out that "Lakefront" is high on the scale. I want to highlight that because I feel the contextual piece is important.

Again, these are very preliminary, but I wanted to whet your appetite a little. If we go to the place bondedness and familiarity, which

involves questions regarding how familiar you are with a place and how bonded you feel to that place, we can see again that "Rainforest" is above the trend line.



“Marsh,” however, is well below. I don’t know what that says about marshes.

The piece that I don’t have time to go into is some of the rich qualitative data from the interviews. What we are finding is that it matches pretty well with what you see on these graphs. What you don’t see here is the amount of emotional things that come out in interviews, memories for example. One of the interesting things that we’ve learned is that the conversations that are happening between visitors during the observations are not necessarily reflecting what is happening with visitors internally. You get a lot of conversation about shared memory of a place, for example, but if you have an individual memory or attachment, you’re not necessarily sharing that with the rest of your group.

This shows you all three variables. It does show you that there is a fairly specific relationship between all three constructs, except maybe

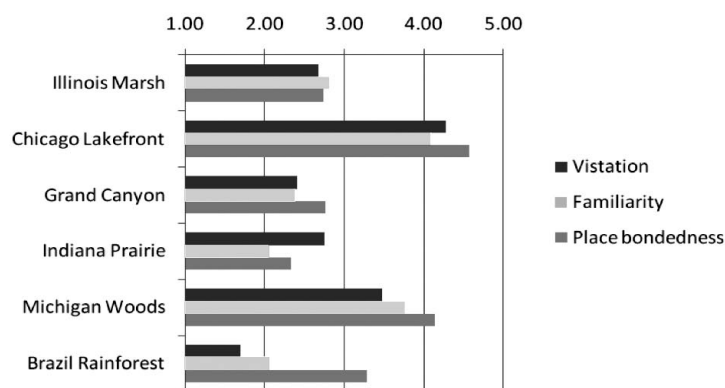
with the rainforest. With the rainforest, and a little bit with the Grand Canyon, you see that a place can evoke that bondedness even when familiarity or visitation are not one-to-one.

Aspects of Place Connectedness

- **Personal place** - Memories of places person has visited/spent time.
- **Shared place** - Memories of places group has been to together.
- **Community place** - Members of a community enjoy this place regularly enough that it becomes shared by a larger group (e.g., Chicago area residents and Lake Michigan).
- **“Touchstone” places** - Members of a larger community - a state or a nation- share this place in certain ways, even if they have never been there (e.g., Amazon Rainforest and Grand Canyon).
- **Ecological place** - Place that looks and feels familiar because it reminds a person of other places she has spent time in (e.g., similar plants, landscape, animals).

The last piece I’ll talk about is a few of the other things we are finding. Not surprisingly, memories come up a lot though as I mentioned, they’re not always shared in conversation. We find that personal place memories are shared more in interviews whereas shared place memories are shared more at the group level.

Comparison of Mean Scores for All 3 Variables



What About the Prairies?

- It’s hard to get Illinois people excited about the prairies. The reason I think it’s more familiarity than bondedness is that every kid has to take a field trip to see the prairie, but it’s fragmented, it’s tiny, it used to be everywhere and now it’s gone. The kids are like, “Okay, it’s grass. When do we go to MacDonalds?” • Matt Matcuk

Keeping Mum on Metacomments

- You’re saying that the metacomments they make during interviews aren’t being shared in the conversations they have with their companions? • Doris Ash
- Yes • Cecilia Garibay

Habitat and Place

- It seems like it’s confusing habitats and place. The Grand Canyon is a place; all the rest of those are habitats. • Kirk Johnson
- We gave these habitat names on the graphs, but in the dioramas they have very specific place names. Just to make sure that didn’t get lost we took the place label, put it on a big sheet of paper, and stuck it on the diorama itself. What we’re finding though is that people don’t really pay attention to that. • Cecilia Garibay
- People having an affinity with “the woods” or their woods is a pretty different thing. • Kirk Johnson

There is also this notion of members of a community enjoying that space, which is really about something you do as a larger group or as part of a community you belong to. We saw that a lot, for example, with the Lake Michigan diorama. It's a scene of the lakefront in winter and you heard over and over people sharing this idea of the lakefront. There seems to be data coming out about communal place.

Then there are these places that, for lack of a better word, we are calling "touchstone places." We wrestled with whether we should

call them "cultural places," meaning part of a shared culture. The notion is that as a larger group, as a country, as a state, as a city, you seem to relate to places in a certain way. The Grand Canyon might be one of these. As Americans you have this notion of the Grand Canyon as a particular touchstone place. Finally, there is one that we are toying with and are not one hundred percent sure about that we are naming "ecological place." These are places that look and feel familiar because they remind someone of another place that they've spent time in. This is where they might talk about those animals or those plants and so forth. And sometimes it's not the specific place in the diorama, but it elicits ideas about their familiarity with a particular type of animal.

There is much more I could say, but we would like to have time for conversation. We are wrapping up the Field Museum study in the next two weeks and go to Denver in early December. We have been doing preliminary data analysis and will do another deep dive, and then revise some of the instruments as needed before going to Denver. What we are planning for the Denver study is something similar to this, where we have huge groups that come in and do a sort of deep dive with them. Then, because we are finding that the survey instrument is fairly robust, it means we can potentially use that instrument with visitors who are walk-by visitors—in other words, as they are leaving a gallery—so we can have a fairly high end for the survey and then a smaller end for the qualitative piece.

A Cultural Cross-section of Interviewees

- Are the people you are going to be interviewing both at Denver and here a full cultural spread of people, including those who wouldn't normally visit a museum? • Doris Ash
- Yes. In the Chicago study we purposely sampled to get a range. In the Colorado study we'll need to figure that out for the survey piece in particular because that might involve just the visitors on-site, but for the qualitative study we will be able to do more specific recruitment. • Cecilia Garibay
- Can I just give a little background on why that's important? Most evaluation studies in museums have classically been done with people who go to museums, so it will be the white European museum-goers who go three to four times a year. Most of us who are doing this kind of work are trying to change the balance on that and work with bilingual families or recruit from different community programs and see what they do with the museum going experience. Most evaluations studies are totally skewed in the other direction. • Doris Ash
- That is an important dimension in this project, which is partially why, as we recruit families, we are paying them \$100 a shot to come, on top of the free parking and so forth. But we are asking for about two hours of their time, total. They're not spending two hours in the gallery, but by the time they get to the museum, walk in the door, get oriented and so forth, it's about two to two-and-a-half hours. • Cecilia Garibay
- But back to the question: Are you tapping non-museum-going families? • Doris Ash
- Absolutely. That's an area I'm huge on. Most of my research involves non-museum-goers. • Cecilia Garibay

Sense of Place and Global Connections

- It's great seeing this work. My sense of the sense of place literature in the research field is that it has traditionally been quite weak. The concept is very provocative and you want good research out there. It hasn't been there, and it's hard to know what to make of the literature that is there, so it's nice to see this and the way that you're working the qualitative and quantitative to address these sorts of issues.

When I try to connect it to the dialog I heard earlier about how important sense of place is to what is happening here at the Oakland Museum, one meta-question I have is, why is sense of place important? I'm trying to understand the answer that the Oakland Museum has to that question.

When I spin it, I'm thinking two things. First, it's part of the sustainability story. Having a sustainable global and local society and world is potentially connected to having a strong sense of identity to sense of place. Then on a more psychological or social science side, I think of it as tied to an account of human flourishing. I wouldn't go quite as far back as Scott goes (billions of years), but from an evolutionary standpoint, we have always had very deep sense of place, and that has changed quite recently in human evolution.

Now it connects to discussion that Matt and others had on the nuggetizing of information. There is a similar structure of the argument that is happening. In that account, sense of place is important, but many of the people coming in are potentially saying, "Sense of place isn't that important to me because we are in a global world and all of my friends live all over the country or all over the world and we're IMing and texting." It's like, "Who cares?" if we're talking about the younger generation and the shifting baseline and the younger generation constructing knowledge and saying sense of place isn't important.

If it's true and there's a commitment to it, that sense of place is important and it's part of human flourishing, but visitors aren't necessarily recognizing it, it's partly because there needs to be this new integration. In the same way that we are trying to integrate the nuggetizing of information on the one hand with synthesis and integration, I feel there's a need to integrate the importance of sense of place with this reality that in order for us to solve problems we are in a new place, a global world. Just a sense of place focus is not going to solve the problems.

The exhibit commitment needs to be about how to draw out sense of place and connect it globally. I think you've got some ways. You're doing it bottom-up almost, from the data, and you're starting to see it emerge from the data. What I would suggest is continuing to work that, but to also work the

Sense of Place: A Story in Motion

- I'd like to spin off a little on what Peter said. Part of how I think of sense of place is not just connectedness to a natural place but connectedness to a story that you tell. The way people feel belonging is often related to the story, and that changes and there is motion in that. Part of what might break us out of this issue of sense of place becoming static is thinking about it being in motion and thinking about the story that we are telling. I'm thinking about a book that won an award in Australia a while back called *My Place*, by Sally Morgan. She is part aboriginal and part white Australian, and it's about gaining a sense of who she was and connecting to how she discovered what her place is. • Carolyn Finney

The Power of Popular Representation

- I was thinking about representation and why the Grand Canyon and the rainforest strike a chord with people. I think it is absolutely because they have been represented in movies, in music, in popular culture. I wouldn't underestimate the role of popular culture in exposing people, particularly the younger generation, to these places. Yosemite is going to be on Oprah's show next week because she just went camping there. I know one of the park rangers there, Shelton Johnson, who was just on Ken Burns's show about Buffalo Soldiers. Not to use that is an oversight, whatever you might think of Oprah or popular culture. That's going to get a lot of attention, and that's how I think what "touchstone" means changes over time as well. • Carolyn Finney

top-down from a philosophical or conceptual side. • Peter Kahn

Reflections from Denver Dioramas

- We have 104 dioramas, one of the largest collections of dioramas in the country. It is both a treasure and a challenge because it takes up literally 200,000 square feet of space. A lot of them are based on actual spots you can go back to. We have been trying to relocate those spots. Thirty-four of them are in Colorado, and most of those are places that are hard to get to, so relocating them is a real challenge.

What I was thinking about when we were talking about this exhibit and these seven places is that most of the people who walk in here will have been to one of those places—at least to Oakland and maybe Yosemite. We have this scientific concept of what constitutes California as a place, but we find in Colorado that most of the kids in the city have never been to the mountains, for example. You can see the mountains, but they've never been to the mountains.

I'm processing this as we go, but I think it's very curious. These things we are trying to build people's love for are actually quite remote places to them, even though they're right nearby or quite important to our message. I'm really psyched you're doing Oakland because that's going to hit your audience. Our problem in Denver is that we're at

the edge of the prairie and the mountains, but I would bet that a lot of people are unfamiliar with both of those kinds of landscapes. They're going to be familiar with the urban, with the ash tree, elm tree, city park kind of place that has grown in the last hundred years.

What really struck me about Cecilia's presentation is that there is this affinity to certain types of places; not places but habitats. As primates we kind of like forests. We're really rooted to climbing on stuff, and there's not that much difference between the Amazon forest and a forest to a primate. It's a place where you can go and get some nice apples and stuff. I'm really curious. I'll bet when all of the data is pulled apart, it's skewed unintentionally for a particular type of place. One example is our Smokey Mountain, Georgia diorama. It's a beautiful forest, but it has no animals in it. People will walk by it and say, "Oh, it's empty," and keep walking. So the presence or absence of animals is an important element there too. • Kirk Johnson

A Sense of Place: Then What?

- I just want to make sure I understand the big picture. You did the literature review and you saw that sense of place was not really sufficiently or well explored. You looked at how these different factors affected a visitor's varying degree of sense of place. I'm missing the rhetorical end point there. Is there an assumption that if you do a good job

of generating a sense of place in your dioramas here, therefore—what? An appreciation will occur and therefore an attitude change, and from that attitude change...? I'm not sure where all of that is headed.

• Matt Matcuk

- This goes back a little to what Peter was talking about. First, can dioramas and to what extent do dioramas elicit that sense of place. Then there is literature that looks at the possibility that when you have connectedness, when you have attachment, you begin to care more about the place. It's difficult to claim that from an exhibition or from a gallery you're going to turn out a bunch of conservationists, but there is this notion that place attachment makes you think about it more, makes you care about it more, and potentially leads you to think about it in a different way, and to think of it as an important place that you don't want to lose.

• Cecilia Garibay

- So that research exists, that's out there?

• Matt Matcuk

- There is some of that in the studies, yes. As Peter said, sense of place literature is sort of all over the place, but there does seem to be at least some notion that would be helpful.

• Cecilia Garibay

Action Versus Attitude

- Environmental studies have been doing this for a long time, trying to figure out how attitudes and practices are linked. As far as I can tell from the literature, they are very loosely coupled. There's no predictor really about how people are going to be acting. An anthropologist, Dorothy Holland, has some interesting papers on this, basically making the argument that attitude doesn't change

Research Goals and the Focus on Sense of Place

- In the beginning we essentially said, there's not much research out there about dioramas at all. There are lots of people out there making decisions about whether to get rid of them or not because they take up a lot of room. There are lots of camps of people who say dioramas are our most powerful nature experience in a museum, and others who say dioramas do nothing and we need everything to be hands-on. It is very polarized. What we proposed to NSF is that we were going to start the conversation. We were going to look at what we know, which is some stuff, we were going to look at what we don't know, and then start in bites and chunks to look at this more closely.

I think the understanding on this project is that we are starting this research, we are not ending it. We are hoping that we get other people, like those of you here, involved to do more, to go deeper, to come up with your own questions and continue this work. Coming back to what

some of you around the table do, there is also the idea of combining this with social science work that is going on to get a better sense, about people's feelings about nature and connectedness to nature, and what people need in order to care.

That is the bottom line. I don't think we will get there just with this research, but it is building a body of knowledge that we can use going forward. • Kathleen McLean

- And the literature review is a way to synthesize what we know, at least from the evidence base. You saw that there were quite a range of research questions that fell into that medium or not studied range. We could have taken any one of them I think, but the reason sense of place made sense is because of the particular nature of the project and the way that in the NSF proposal, there was a hypothesis that essentially seeded the proposal. • Cecilia Garibay

Delineating the Borders

- One aspect of place that I have never seen mentioned has been a real problem for us in our discussions here. How do we draw a border around it? In picking those seven spots, is Yosemite the national park boundary? Is it Yosemite Valley? Is it everything you can see from Mount Dana? In Oakland, is it the city limits? You've got Piedmont situated inside of Oakland. Is that part of it? It's a much broader question than that, but it's where the rubber has hit the road for us in development here.

• Christopher Richard

Rick Bonney



participation, participation changes attitude.

• Doris Ash

Using Research to Guide Perspectives and/or Development

- I know you want to get to the prototypes, but I feel I need an ending here before I'm able to do that. I appreciate what you are saying about this being in some ways the beginning of an extended and fascinating research project, but I need to know if you, the project team, have any preliminary conclusions or lenses based on Cecilia's research that you want us to look through as we look at the prototypes. • Rick Bonney

- We are just hearing about this research for the first time as well. I don't know about the rest of you, but I need time to digest this. We could try to huddle and see if some of the things Cecilia talked about can help to hone questions for this afternoon. From the beginning we said that we don't know what the field doesn't know, so we can't say in our grant that we are going to concretely take what this research does and use it to inform our development work. We hope it does. We hope that what Cecilia and her colleagues find out will help us make some decisions or steer our ship in terms of what we are developing. We are not sure yet whether they will. • Kathleen McLean

Marketing Critical Places

- For me, the most interesting thing out of the many findings there is that some aspects of sense of place can be marketed. Clearly the rainforest and the Grand Canyon were marketed. One of the things that might mean is that some of the dioramas of certain places that are essential to the sustainability of the environment in California, but may not have a sense of place with the visitor now, can be marketed. They shouldn't be given up on.

• Rick Bonney

- Yeah, like save Sutter Buttes! • Kathleen McLean

- Exactly. • Rick Bonney

PROTOTYPING OVERVIEW

Mary Jo Sutton

Lead Exhibition Developer/Designer, OMCA

I want to share some write-ups with you about some of the prototyping and then we are going to go into the gallery and look at a few. To follow up on Cecilia's presentation, when we did our front-end evaluations a couple of years ago, some of those questions actually came up in the front-end interviews, and it's interesting to hear how it is coming up in some of the formative evaluations as well.

For a lot of people, California is a fabulous place but a little bit mysterious. I think the emphasis during this formative process has been to say, "Okay, we have this idea about this project conceptually. Does dividing California up into these seven places make sense to you? Does diving the gallery up into seven places make sense to you?" We have been asking questions about people's understanding of what dioramas are and what nature is in some ways. Sense of place is this very big umbrella behind it. By dividing the gallery into these seven places, we are hoping to increase visitors' intrinsic motivation to pay more attention to what we are offering.

I am going to very quickly review some of the things that we have looked at. We have looked

a lot at hotspots, the term "hotspot," global hotspots, and what that brings up for people. Do they understand it or not? We have looked at whether people get the notion and definition of diversity and threat in California versus the term "hotspot."

Recently we have been looking a lot at habitat loss and what there is about habitat loss that people can connect to or understand. And on a base level, with our places, what is happening with habitat loss that we can communicate successfully?

Right now the museum is open on two floors. The lower floor is closed. We've been snagging people, bringing them down to our gallery, cueing them, and spending fifteen minutes with them. We've been going through different rounds of conversation over a period of about three months.

A few big things are percolating up. One is, if you have prior knowledge about nature, what you see is completely different than if you don't. That is huge. Also, people have this deep fascination with how things are made, and the artistry of the cases we have has bubbled up as something people are very interested in.

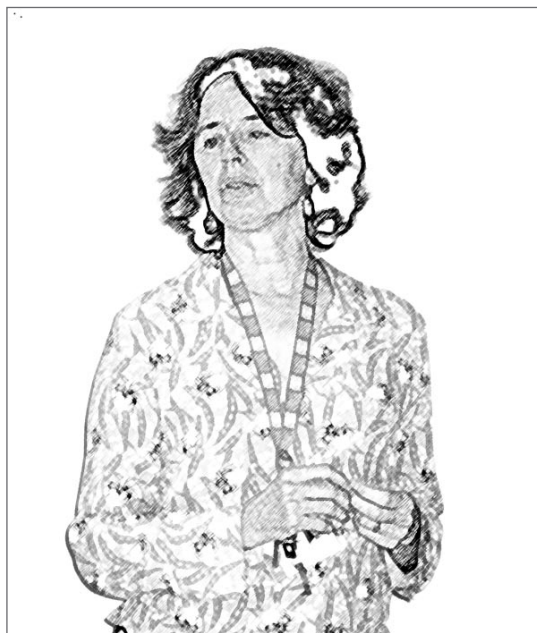
Most recently, we are looking at how to link what is in those cases, that megafauna as well as the smaller animals, with these big,

Mary Jo Sutton





Tisha Carper Long



abstract ideas of habitat loss and nature as a valuable resource in California.

That is a quickie, shorthand version of what we have been doing. Tisha has been working a lot with the team, interviewing what Cecilia referred to as “intact groups.” We snag them, bring them down, and pair each group with an interviewer and a note taker. She will tell you a little more about that.

Tisha Carper Long
Exhibit Developer, OMCA

As Douglas told us, the idea of hotspots is sort of a convergence of three different criteria. One is how diverse species are in an area, the second is the number or percentage of endemics in the area, and the third is how much loss has occurred in the habitat. For those of you who already knew that definition of hotspots, I’d love to know whether any of you have walked into your local MacDonalds and tried to explain that concept to the person at the counter. Welcome to our world—this is what we have been working on.

I have made a comic book about how difficult this is (*Prototyping “HOTSPOTS” at the Oakland Museum of California’s Natural Science Gallery: A Nonliteral Story about the Process of Prototyping with Real Visitor Comments, July-August 2010*). It is a very limited edition, and is about what it is like to prototype the concept of hotspots with people who don’t have prior knowledge, or even people who are

quite environmentally aware.

Briefly, we’ve interviewed about 300 visitors, and not only on the concept of hotspots. We’ve interviewed people about hotspots, we’ve interviewed people about the idea of seven places and whether they get that is what we are going for, that we want to show them these seven places. We have the habitat cases clustered around signage, so these are very, very basic concepts. Another prototyping session was on “California: Diverse and Threatened,” and the convergence of those two ideas, without bringing in too much about the idea of endemics because that’s even a little bit harder.

We’ve also talked about some really specific interesting concepts, including the idea of upwelling and how that happens. You’re going to be able to see examples of all of these when you visit the gallery in a few minutes. We started our upwelling prototype as a series of pictures and just about everybody we tested said, “Gee, you ought to make this into a video,” so we then made it into a sort of animation. Then we found out that the user interface presents its own problems.

We then had a full month of prototyping on the idea of loss: habitat loss, species loss, and the loss of diversity itself. You can see all of the loss prototypes in our Oakland section. We decided to just focus on Oakland because so many of our visitors are from Oakland. A more detailed report on these prototypes is available for you to read at your leisure.

A lot of people thought it was global warming no matter what you did. People would look at the map and see these areas in red [*denoting hotspot areas in the world*] and ask, “Well what about the polar bears? There’s no red up at the North Pole.” And, “What about the Amazon?” Some of South America is red, but for people who understand a map of South America, the red area is not the Amazon Basin. They kept coming up with questions and we kept trying to show them that it was the convergence of these three ideas that makes the hotspot.

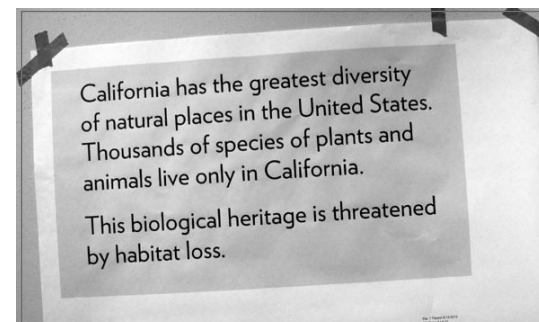
It became clear that actually trying to communicate the convergence of three difficult concepts may not be the way to go with our visitors. We can bring those in in all sorts of interesting different ways on a case-by-case basis, and we can even talk a little bit about the convergence of those, but in trying to introduce it as a founding idea to the visitors we got a lot of blank stares. “California Floristic Province” is a strange name for people and it doesn’t fit the shape of California. Everything about it was hard for people, which is what the comic book is about.

I’m going to back up a minute and talk about logistics. The idea of our prototyping is that we would like to be able to try a new singular idea every month, unless it demands more. We prototype every week on Thursdays and Saturdays. We try to come up with something truly new every two weeks, and in the interim weeks we do a tweaking and try to make that concept

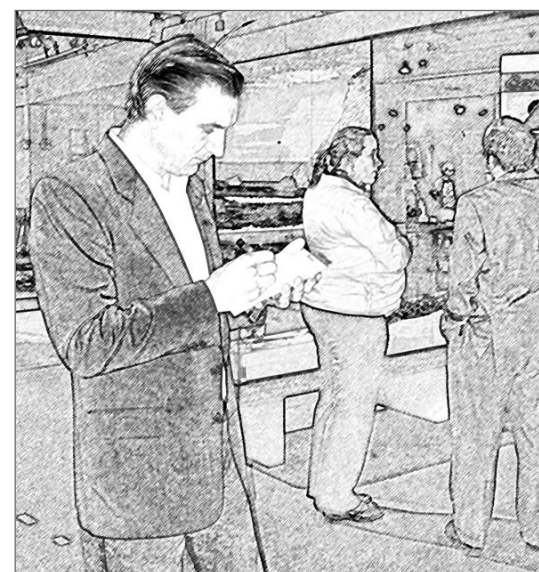
clearer. It’s a very aggressive schedule and we are working really hard to come up with these prototypes.

Regarding the prototyping teams, we have a number of staff people who have been trained in prototyping, though we may need a new training session since new people have come on. We also have volunteers as well as some contract folks who come in. We have hired people who speak Spanish as well as Cantonese speakers. We prototype in teams, so there is typically one person who does all of the questioning, and both people try to write down as much as they can. After we’ve talked to the guests and escorted them back out and give them a small museum gift to thank them, we sit down and have a discussion between the two of us about what we have learned. We have instruments for doing all of this.

We have the backup concept document and a sheet of questions that were derived from that concept document. We have a debrief sheet on every single set of guests that we’ve just interviewed, and we do a debrief on them. At the end of the day the teams come together and talk about the threads that they are picking up from guests for that particular prototype.



In the gallery: Matt Matcuk (foreground), Jennifer Stock and Douglas Long (background)



Challenges and Questions

- The prototypes speak for themselves, so rather than having me talk more about them, I would like to hear your questions and comments. A lot of thought went into them and what we want people to get out of them and whether they are getting what we intended or not.

There are a number of challenges. The challenge of having outdoor nature indoors is still on the table. The challenge of how to connect to habitat loss and what that means for the future is still on the table.

The prototypes that you saw are not final. They are obviously rough, and we are trying to go into places and figure out the interpretation and the approach. For example, the Temescal video [in the Oakland section] was a piece done locally by a school. It talks about the past environment being not so developed, the current environment being familiar, and the future being a time when maybe people can do things to make a difference so that, for example, not all of the trees are gone.

The questions we are asking are still very broad for this project. Do they understand certain things that we think are core to this project, which is really about changes in this environment over time and how people relate to the environment and those changes? • Mary Jo Sutton

POST-GALLERY-VISIT DISCUSSION

Temescal Video: Replicating Local Perspective Videos for Other Places

- That video is really cool. I was wondering whether it would be possible to do a video like that for each of the seven places. Maybe not from the first-grader perspective, but certainly from a local perspective where you have: This is how we understand it once was, this is now, and this is what we imagine in the future. But possibly it could be directed a little more to creative solutions, not just the jet packs on the animals. • Rick Bonney

The Human Connection and Timing Delivery of Depressing Facts

- The main thing that I was looking for was the human connection, and some human connection other than “Boy, we really screwed stuff up.” We are doing an exhibition right now on conservation and our scientists, who are mainly biologists and anthropologists, go out and do these rapid inventories. They are very big on reinforcing the idea that humans are a part of nature.

I’m also mindful of the research that was done a while ago now, probably a decade, indicating that the last thing in the world you want to do is show children how endangered everything is. You start them off by showing them how beautiful it is, you make them care, you get them excited, and then when

they are a little older you introduce those messages of danger and threat and extinction and so on, so you don’t scare them and depress them. Dealing with those two issues is a tricky thing for me. How do you do that while telling some of the stories you want to tell? • Matt Matcuk

Modalities for Storytelling

- What do you see as the major modality for telling a story in this space? We saw one in that Temescal video, but how do you see those stories being told? • Scott Sampson
- I don’t think we’ve talked a lot about that yet. We heard about that video through one of our educators and because we thought it was so rich and because it tells some of the story that we want to get at about that place, we used it. I did notice that when this whole advisor group went into the gallery, like the visitors, you focused on the habitat cases first and then went back to the boring, flat graphics. So I don’t think we are necessarily going to develop those flat graphics. That wasn’t the intent behind those studies. It also depends on the difficulty of the story. A lot of this talks about change over time, and there has to be some sort of way to show that change. • Mary Jo Sutton
- So what are you thinking? • Scott Sampson
- Certainly animations can help do that, certainly things that are on a slider of time

can help do that. Then there is the mashup that we saw of how one place has changed over time. I think as the image morphs from one point in time to another, people will get that. It doesn't have to be a collage with one image, it could be a transition between two images. • Mary Jo Sutton

Imagining “What If” Futures: UrbanSims and the Human Connection

- While we were in the galleries Peter and I were talking about the idea that the future isn't set. If you can imagine the future being a certain way, how people visualize that in the gallery can be very powerful. • Mary Jo Sutton
- What I was initially talking about is a type of visualization they have now that is used with faces: Here is your face now and here is your face twenty or forty years from now. When I first heard about that I thought, imagine an exhibit that said: Here's your face, and if you have this lifestyle, here's what you'll look like twenty or fifty years from now. If you smoke and eat at Wendy's and so forth, here's your face. • Peter Kahn
- They do that at the Denver Museum. • Scott Sampson
- It's going back to the discussion we had this morning with the shifting baseline. I think it's very important to be able to establish shift-

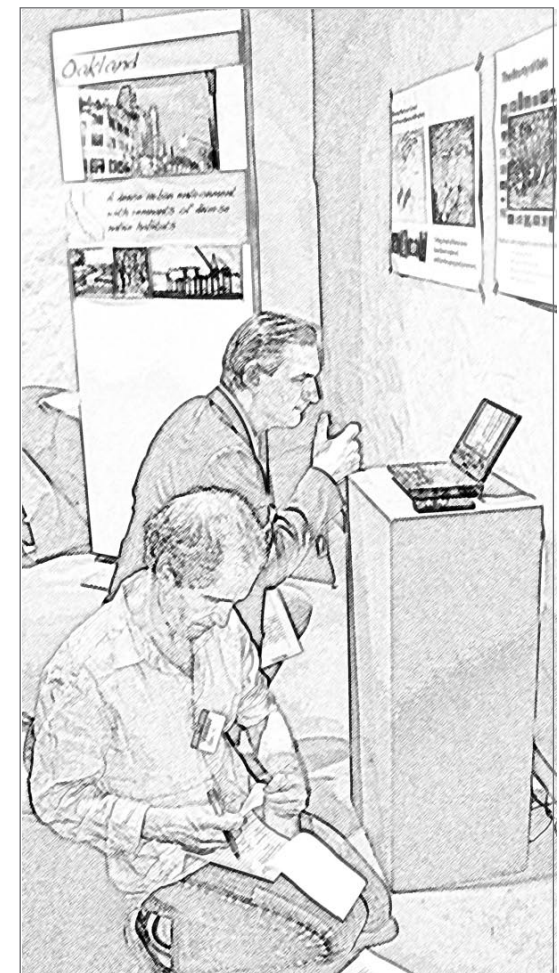
ing baselines historically, but the question that came up this morning is, well so what? How does it move towards the future? One way to do that is to ask us to imagine the future, and I think that's what the Temescal video was starting to do. It was successful to some extent, but how can it go further?

One way it can go further is to build on the idea of modeling. During last year's advisor session Mary Jo and I talked about involvement I had with UrbanSim, which is a land use transportation modeling software developed by Paul Wadell and Alan Borning. Paul was at University of Washington, but he is now at Berkeley and could be somebody to think about contacting as well. It is a system that has been used in many major transportation land-use decisions on very large levels and on city levels internationally.

The software is kind of value neutral. What it does is say: If you put in this freeway, here are the outcomes and this is what it is going to look like. It isn't saying do it or don't do it. And then what are the outcomes? That is where you have to ask, who are the constituents and what sort of outcomes do you want to project out? It's very powerful because most people think, put in a freeway and it solves the congestion problem. Well, it doesn't solve the congestion problem and it opens up a huge host of other problems,

So it's a technological tool for imagining the future. What if we take that concept and connect it to the shifting baseline that we've

Peter Kahn (foreground) and Matt Matcuk in the gallery.



Missing: Engaging with the Environment Through Work

- Again I am hearing the idea of connecting the natural science of a place to people's experience of that natural environment and what they think of it. I'd just like to open that up. In my opinion we use two frameworks when we think about human-environment relationships. One is recreation and leisure. That is the primary way we often talk about the way in which people engage. The other is the natural environment as a supermarket of resources that we use. The problem is that sticking with just those two frameworks is limiting.

One whole other way that people engage is through work, and we don't talk about that enough. There are plenty of people who understand our natural environment through work. It's a very different way of understanding and of engaging. They are not necessarily thinking about climbing trees or how you're going to use the fish from the river, they're thinking about it differently. I don't know how we would get to that, but I think it's really important. It may also lead us to some more innovative and positive ways of thinking about what the future may look like in terms of that natural environment and the relationship people have with it. • Carolyn Finney

talked about and environmental generational amnesia and how to correct for that? We say to visitors, here are different choices and if you make these choices, here is what the future looks like based on modeling and scientific expectations.

Then you try to connect it back to the human part rather than just the natural science part. The oak thing that Christopher did is really beautiful, but now you imagine the future. The question is, at what level do things change at the interactional level? It's not that I simply don't get to see an oak tree. That's sad if I don't get to see it, but it's pretty passive. Kirk mentioned earlier that we are primates and we climb trees. Well, climbing is an interaction pattern. It has been with us for a very long time, kids love it. Well, imagine if you don't get to climb trees. That is one very small example, but it is one that is trying to take it from a passive viewing standpoint to what is the story: Tell us a story about you climbing trees.

When I interviewed inner-city African American children in Houston, one of the questions we talked to them about was their interactions, and climbing trees was a big one. Sometimes they couldn't, and why didn't they climb trees? They didn't climb trees because there is glass and stuff underneath the tree and they're afraid they're going to fall. Now we have an interaction pattern that has been taken away because of a harsh

urban environment. It is the discussion on that level that is part of the imagining of the future and connects the natural science and the social science. • Peter Kahn

Cordell Bank: Visualizing Upwelling via Video Using Numerical Simulations

- I particularly liked the offshore Cordell Bank exhibit. The reason is that it triggered something very closely related to what I am doing. There may ways in which exhibits like that can offer viewers the opportunity to drill down further and get more information that is not in words but in a visualization. One of the things that we have completed, interestingly enough, is "Numerical simulations of Future Climate and Upwelling Processes." It's a paper we are just getting out right now, but you can easily take all of these kinds of numerical outputs and make videos in API or MPV flavor and transfer it into something that could be put into that as an embedded piece. That would be something to think about. • Norman L. Miller

Drilling Down: How Deep?

Opportunities to Drill Down and Pursue a Topic via Links to Other Resources

- I don't know if you're aware of a report that came out about the emerging storm of our K-12 education being so far behind other nations. We are something like fortieth, compared to Finland, which is first, and most of the Asian K-12 equivalents. It seems

to me one of the main functions here is to try to create opportunities for people to do the opposite of dumb down their experience. There may be places where you can give a spectrum of opportunities for a viewer to be able to go further and further and find places where they can go after here to get more information.

That said, there are all kinds of opportunities for understanding the fragmentation/ biodiversity/climate change equation. Right around the corner, there is this new Biodiversity and Change Initiative that we have now and it is up on the Web and can be linked to this very easily. That would be one way to do it, create those pieces of information that would drill down further for those who are interested, so your typical K-12 experience would have maybe a K-12+ experience (or a K-10 Finland-style experience). That would be the way that NSF could look and say, your outreach is working.

• Norman Miller

- You've hit on something really important. For most museum programs, both the exhibit people and the education people tend to think they've got to create something from scratch. In fact, the stuff from scratch is usually not as compelling and interesting as the data that scientists are working with, which is why there has been such a willingness in the last five to ten years for people to think about citizen science programs at all because the data coming out of the scientific world

is much more interesting than the simplistic stuff that tends to get distilled down into a simpleton statement. • Kathleen McLean

The Museum Can't Do It All: The Value of Good Introductory Experiences

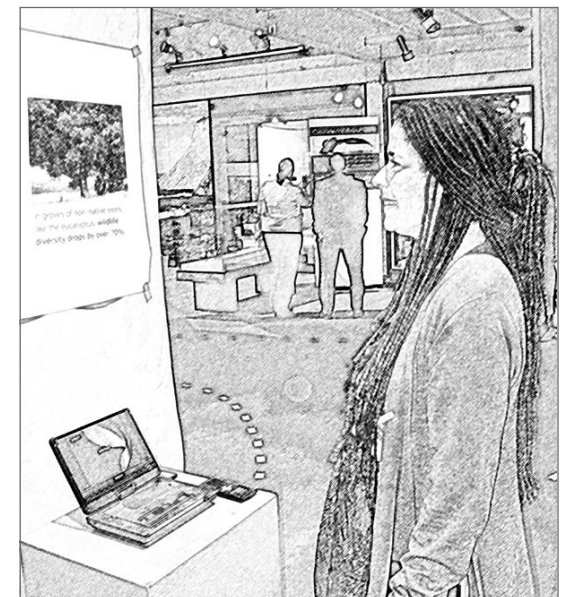
- There is something I'm struggling with, and I know that's why we are all here, to share our impressions and experiences. I keep coming back to this point that we can't do everything in a museum. We can't do as much as we'd like to do in a single experience that an individual or school group or family has. We certainly can't hope to close the achievement gap by making one part of the exhibit more scientific or opening up opportunities to drill down more and find out some of the science behind the exhibit. I'm not sure what my summary point is here, but I don't want us to overdo or overthink how deep we should go with each exhibit.

I think there is a lot of value in just making the introduction to these places and allowing the individuals or groups that are using the museum to make their own connections. We always know that through the book store or through a docent or teacher who might be leading them through an exhibit, questions might come up that call for a lot more in-depth science than can be done, but I don't know that the Oakland Museum should be responsible for all of that. • Lisa D. White

Juxtapose Community and Scientist Views

- I appreciated the video with the students talking. What would balance that is a part with scientists talking: Here is what we have been doing, here's how we do it, here's what needs to be done, here's what you can do. This is the next generation's needs and where it needs to go, and here's where you can find that information. • Norman Miller

Carolyn Finney in the gallery.



Thoughts About Drilling Down and the Importance of the Spark Experience

- We looked at this issue of drilling down a lot. One of the problems that you get in a museum environment is that whereas in a book you can have a large volume of printed material and people self-select through using the table of contents or whatever, in a physical environment when there is a whole lot of information there the visitor doesn't say, "Okay, let me see how deeply I want to go here," and work their way through it. They get intimidated and they're not sure what they should invest their time in, and they get this very limited amount of time in the museum. It costs money, it's a special time and place, the parking meter is running, dad wants to get home to his baseball game.

They need help and they are looking for that kind of thing. We've addressed this many ways. Do you put that material in a kiosk? My experience is that a museum is not a place where people drill deeper. Yes, you can make all of that available. It should be available as part of your education curriculum, as part of school curriculum. But if we try to create too much richness of messages we run the risk of losing them completely. I made a note to myself earlier: "We don't want to reach the future scientists in our museum, we want to create them." The way we create them is through the kind of spark experience that every single scientist that I have ever talked

to has described to me as their first experience with science.

I believe it was Julie Johnson, during the last advisor session, who described an experience she had in childhood in biology class. They were dissecting a cow skull and the biology teacher got fed up and threw an eyeball at some kids who were talking and it stuck on the ceiling, dripping this viscous goo. Another teacher in the room started vomiting into the trash can, the other kids were all grossed out, and she looked at it and went, wow, that's so cool, and why am I not grossed out by that? And she went on to study science.

I was in Cambridge a couple of weeks ago. The *Encyclopedia of Life* folks asked me and a bunch of other people to talk about how the *Encyclopedia of Life* might be used in an exhibition medium. Our basic answer was, it wouldn't. You created a product and now you're looking for a consumer rather than the other way around. We launched the meeting by going around the table and having each of the scientists pick their favorite species. That was the get-to-know-you question: What is your favorite species and why? Let me tell you, none of those scientists had a really complex, coherent, well thought out, theoretical support for the thing they liked the most. It was: We picked these flowers when I was a kid; this animal reminds me of so-and-so; this guy was just funny looking so I liked him. There were all of these points of connection that our visitors make as well.

Richard Bugbee touching bases with a favorite species in the gallery



If we can make those points of connection, we will hope to spark that fire that will get those kids to go deeper into science of their own accord. • Matt Matcuk

The Role of the Museum as We Go to Hell in a Handbasket

- I'm going to take the opposite view. It comes down to the question: What are museums for? I know some people are thinking, oh god, are we still asking that question? If museums are just for starting sparks, okay, that's one thing. But if museums are about something bigger, a larger meta-narrative, well then that's something else altogether.

I think you have to ask, what is our task at this moment in history? The way I would answer that is firstly to say that we are going to hell in a handbasket. All of the best indicators say that civilization as we know it could collapse within a century if we don't radically change our behavior, and we've got something like a generation to turn this around.

So we can't do the same old thing, and to my mind it isn't sufficient to get a few "sparks" going. Instead, we need to play our part in changing things. Most importantly, humanity must shift its perspective of being outside of nature, and of treating nature as resources, and turn things around so that we see ourselves as embedded fully within nature, with the natural world full of relatives rather than

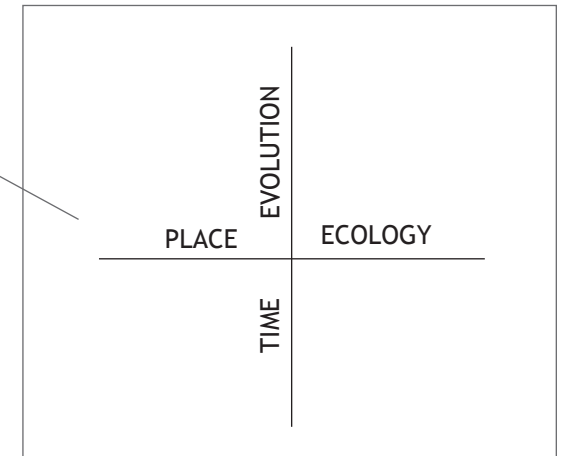
resources, objects rather than subjects.

Obviously this transformation is a gargantuan task, arguably the biggest challenge humanity has ever faced. Yet I think natural history museums have an important role to play, in particular through communicating two key concepts: place and story.

I asked Douglas, "What are the four points you want to get across in each place in the gallery?" Very quickly they were: 1) systems, how they work today and where they come from; 2) biodiversity and habitats; 3) the human story, both past and present; and finally 4) current issues and future solutions. I think that all of this can be condensed into two themes. I'm going to use the iconography of a cross, which may offend some people, though I hope not.

First is the theme of place, which makes up the horizontal axis. What is this place? How does it work? How does it function? Then you have the vertical axis of time, which is story. The horizontal axis can be thought of as ecology, whereas the vertical axis is evolution, change over time. Right now, people in this society are alienated from both place and story. I think if you can re-attach people to those two their native places and deep time stories, you then have a shot at transforming their view on nature and actually seeing themselves as embedded inside it.

Can museums do this? I think so. Consider the present themes you are considering: systems,



Scott Sampson



biodiversity, the human story, and the future. My suggestion is to condense this into the primary pair of axes: ecology and evolution, place and story. Communicate how things work in each of these places today and build the awe and the wonder about these places, But every instance also tell the deep time story of how that place came to be. The geology story should mix with the biology story, which in turn should mix with the human story. It's not separate, it's all one thing. And the past should go right off into the future, demonstrating that this story is unfinished, that every decision we make has an impact on the future.

People currently don't feel invested in the places they live, and until they do see themselves as part of a narrative, they are never going to care about the future. Why would you ever care about the future if you don't see yourself as connected to the past?

So my suggestion is to start this entire gallery off with an introductory video. We need to tell our common cosmology story, the universal scientific story of the earth's history that we all share, from the Big Bang to the present day. The introductory video ends where each of the seven snapshots in the gallery begins; each of the seven places then becomes a sub-plot of the larger Epic of Evolution, the Great Story, taking us up to the present day and considering what may happen in the future.

Studies show that if you want somebody to

give money, say to stop a genocide somewhere, the worst thing you can do is give statistics. The same is true for climate change or anything else. You can talk about the hundreds of thousands of people killed and few people will help. But if you tell them a story of a single young girl and her family, money starts to pour in because you are tapping into people's emotions.

Each of the seven places in California to be featured in this exhibition can be thought of as a metaphorical little girl. We need to engage people in these places, even if they've never been there. The reality is, most visitors will not have been to most of these snapshots that you have around the state. That's okay, because you can still engage them with the stories of these places, including how they got to be where they are today and therefore where they may be going in the future. And make sure that people get that dual sense. Every time visitors enter a different part of the gallery, they are going to learn about how that place works, how that place came to be, and where it is headed. • Scott Sampson

- So it's a sense of time as well as a sense of place. • Mary Jo Sutton
- Absolutely, we need to foster a sense of both place and story. And they are inter-related, able to feed back on each other in positive ways. Indeed I think the sense of place arises in part from this interplay. I would argue

for this strongly and would actually say, if we are not here doing that level of work then what's the point? We may as well pack it up and go home. We don't have time to get sparks going, we have to take it beyond that.

I don't know if we accomplish this goal. I know it's a great challenge, but it needs to be done, and who better than natural history museums to take on this role of synthesizing the science and the culture? These museums represent some of the only institutions on the planet that have anthropology and biology and paleontology and geology all under one roof, so we need to be the voice that synthesizes these diverse threads. We also need to engage with the education system, K through 12, to give them classroom-ready materials, since much of this work is beyond the capacity of most science teachers, many of which lack formal training in science.

• Scott Sampson

Studying Exhibit Use by Nondominant Families from Mixed Urban Populations

- I've done a lot of research in informal learning settings in the last ten years. The last round of research was with nondominant families from a mixed urban population in Tampa. What we found was that the families first had to figure out what it was that was going on that they were supposed to be doing. There isn't necessarily the cultural norm of doing museums that European Americans have, where the dad says, "How many teeth

do you see? One, two, three, four." There is no frame for being able to get into the space itself.

What we found in our research is fascinating. Often the family coopts the curriculum and totally makes it their own. I'm thinking you should do some of this with nondominant populations here before you set everything in stone because things happen that you just can't anticipate. I'll give you an example from the Museum of Science and Industry in Tampa, with an exhibit about how you're supposed to put teeth in a dinosaur's head according to carnivore, omnivore, herbivore. One family came in and said, "Oh, this is about dental hygiene, and if you don't do this your teeth will fall out."

It was a perfectly good curriculum for that family, but it wasn't the curriculum that the museum had in mind. What happens sometimes is a hybrid of what the museum wants and what the family wants. If you don't see that or look for it and that's not part of your mental framework, things happen. • Doris Ash

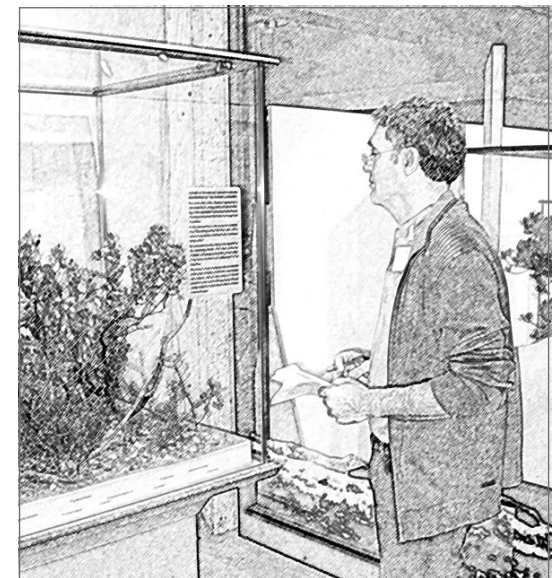
Emphasize Beauty and Diversity, Clarify Endemic and Threat, More on Coastal

- I agree with Scott's ideas, but my goals would be much more modest because I don't believe we can solve all of our problems in this small space. My goal would be to have people walk through and recognize how

Visitors Making Meaning of Their Own

- A family in our museum was looking at a case of meteorites in this really dry, dusty display from the 1960s filled with text but no meaning. A family of visitors from Indiana stood there in front of it dutifully for five minutes, silent, just desperately grasping for a point of connection. Finally the mother says, "Oh! Look at this Billy, this meteorite here, it fell on your birthday." If you don't create a really graspable, coherent message for them, they'll create one of their own. They'll do that even if you do create a coherent message. • Matt Matcuk

Norman Miller in the gallery



Beauty v. Doom and Gloom

- That brings up something that we are going to try to tackle a little later in the day when we break up into smaller groups. We spent some time looking at what are our questions or tensions. One of the biggest ones is this beauty versus doom and gloom story, and people actually characterize it as that polarized though it actually isn't. It is something we need to grapple with. • Kathleen McLean

The First Stage with Far More to Come

- One of the things we should have mentioned to you is that the prototyping is just getting started and what you see in the gallery isn't representative of what's planned. It's the first piece, one piece of something like thirty pieces that are going to get added over time to get to the complexity of stories that we are talking about. We haven't fleshed out all of the ways that we are going to be incorporating narrative and story and scenarios about how things are threatened. That is all coming up. What we are really looking for you to help us with are directions to go in or things to remember. What we haven't shown you is our intentions, and with many of the things you are talking about, we have some kind of intentions, but have characterized them in terms of dilemmas we are facing—which way to go on these issues. • Kathleen McLean

incredibly diverse and beautiful parts of California are, how threatened or changed some of those parts have been, and wouldn't it just be nice to maintain what we have. The hotspots idea kind of goes to that.

What I saw in there was the idea of diversity. Maybe you can't use the word "endemic," but idea of endemic needs to somehow come across a little better than it does. Threat is not clear either. If you don't want to call it "threat," call it "change."

And finally, I like the seven places. The part of California that is actually a biodiversity hotspot is not all that well covered. It is the Mediterranean environment, the coastal area that includes the Bay Area and Oakland and runs down the coast. That is really where our biggest collision has been with endemic species and development by people. Oakland can definitely fit into that and those ideas can fit into the Oakland piece, but it's not currently picked up in there in the same way.

• Stephen R. Beissinger

Staff Thoughts on Recreating the Look and Feel of a Place v. Sense of Place

- In our conversations about look and feel I always hear stories from people about what it's like to be in that place. Everyday when I go home and go over that hill and I see the ocean, it brings me back down to earth. I was reading a message this morning in my e-mail from a Zen blog about the idea that

people need to focus on some of the natural environment around them. For example, if you're working in an office building, take a moment and focus on that mountain range ten miles away. That's something I think about in terms of these spaces, being able to get people reconnected to that sort of environmental thing. • Dirk Dieter

- One of the big challenges is that we are in the gallery, we are not in those places. I think sense of place happens in a real place with people who have real relationships to those places. What we are doing is a versioning. There are aspects of what is measurable as sense of place. But I'd say there are pieces of what people have in real places that is different from people who haven't been there. I worked on an exhibit on the Amazon with a curator who had never been there but had read a lot about it. I will never believe that is the same as being in a real place. No matter what can be measurable in terms of aspects, reading about Paris is not the same as having been in Paris. What we are doing is not the real place, we are doing aspects of it. How we translate is a trick of the project. • Mary Jo Sutton
- And one of the things we are saying is that we are not going to try to be literal about it. Dirk was one of the designers on the History Gallery as well, and one of the things we also tried to do there was not to be so literal. But inside the habitat cases and dioramas it is

About the Layout, Adjacencies, Sequencing, Look and Feel

- Can you tell us more about the entry experience and the floor organization? That seems like it's really important. • Anon
- We have a floor plan here and we've just been doing look and feel and sequencing, what happens first, second and third. It's still in its bubble concept stage. We haven't really nailed it in terms of exact experience. • Kathleen McLean
- We have spent a lot of time looking at the gallery space and considering the shotgun layout of the space and asking what is going to be next to what. We also spent a lot of time trying to hash through whether these places we've chosen are going to be adequate to cover the stories we want to cover. Are these the right places? We are about 90% settled on these being the right places. Right now we've settled on the adjacencies, which might not seem like a lot but required a lot of conversation, and the idea of how to sequence the experience as you go through the gallery. It is not like a walk across California but more like, who are these birds that go flying from place to place?

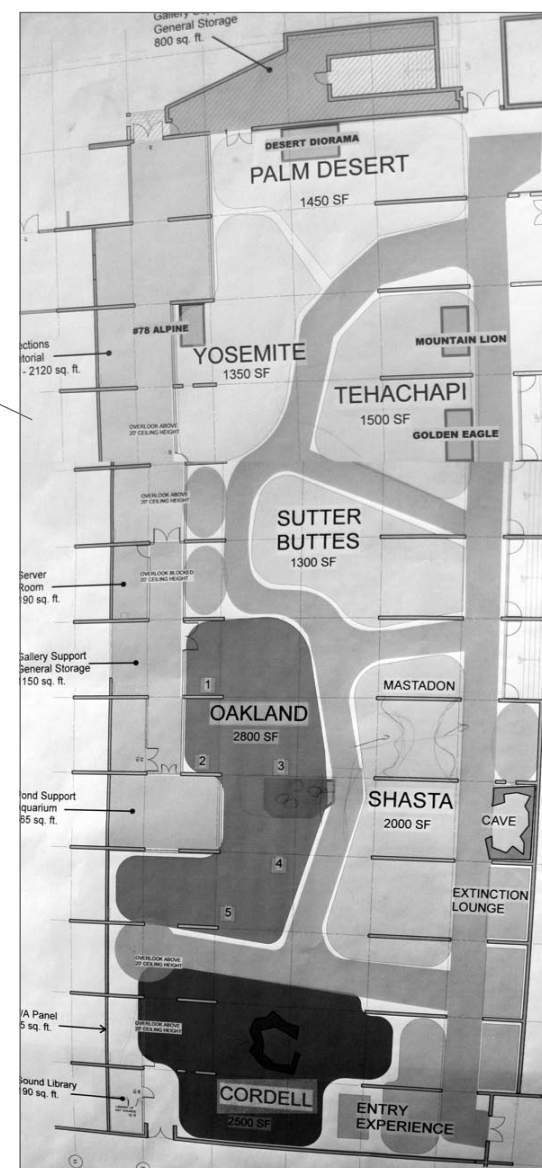
Right now the entry experience will really be about California superlatives: the incredible diversity that Douglas talked about, the biggest trees, the oldest trees, the highest elevation, the lowest elevation, the most amount of organisms. There will be a lot of superlatives pointing to why California is amazing in terms of natural science, and a little bit of an overview of the systems that make it that way. We are also looking a little bit at the history of California in terms of how it came to be so diverse topographically.

One of the goals is to try and distinguish each of the places from each other. We are also concerned with the look and feel of these places. They have to be really distinctive. We are also considering the look and feel within each place. How close is the look and feel to the real place? How literal are we in the translation of the quality of that real place? Those are the beginning conversations we're having. We haven't thought through how to bring out the content using which modes yet, and we haven't gotten to where the cocreation pieces are going to be, but we know we want them.

In the floor plan you can see the entry on the lower right, with entry experiences. Cordell is the first space that you come to as you enter the gallery. Considerations regarding the layout include thinking about what spaces you can see from the overlooks above, what places we think will need the ceiling height, what places need to be bounded by three walls so that we can control the light in a certain way, and what's near the windows. • Mary Jo Sutton

- We are dealing with the logistics right now, given the bubbles of the idea of the places and the constraints of the building. • Kathleen McLean
- A lot of what is driving the interpretive framework is that we have this collection with these pieces, and we are trying to retain the lion's share of those. Most projects don't necessarily have that as a big given, so it is a constraint and an opportunity. We are trying to see how much space they take up. We are on the threshold of how we are going to express

Gallery floor plan



The importance of boundaries between places



About the Layout, Adjacencies, Sequencing, Look and Feel - *continued*

the human element, the ghost of Christmas past, present and future of each place, but it is very much going to include the story and history of the place. It is the intent to have that nexus articulated in each area. • Mary Jo Sutton

- One thing I keep hearing during our meetings as we talk about design and the look and feel is that there is a pretty strong feeling about recreating the look and feel of being in that space, in that environment, though that is difficult. I think there is a major intent in development to create areas that are really distinctly different from each other, and conceptually right now the design intent is to create really different areas within the building that give you a sense of some of those environments. It's a dream right now, but I'm

hearing a lot of commitment to it and I like that challenge.

Another thing that hasn't been mentioned involves the path that you see in the floor plan. The idea is to get enough separation between the different areas so that we have that opportunity create a real difference. When you visited the gallery you saw the dotted tape on the floor. That was a reaction to some visitors not getting the groupings that were happening in there. It was a really simplistic way of saying here is a bubble and here is a bubble, but from what I understand it made a huge difference. That is what we are trying to do with that trail. It also gives us a little distance from bubble to bubble so that we can have real differences in lighting and other elements. • Dirk Dieter

very literal. Maybe that's where the literal needs to stay. That is the kind of thing that we are grappling with. • Kathleen McLean

- Correct me if I'm wrong, but part of the goal is to also have visitors reflect on the experience and think about it so that there is the possibility that they may say, "I'd like to go to that place." • Cecilia Garibay
- The hypothesis for the project really is, is love of place transferable? In a certain way, books and poetry and the art of exhibition can do that. There are fabulous place-based exhibits that give a magical sense of the

place. Maybe we can spark that idea that the place is fabulous, or the idea that if that place is fabulous, maybe my place is too. But we haven't done much sense-of-place testing at all. • Mary Jo Sutton

- But we are waiting for Cecilia. This is the first step and we will be doing that. • Kathleen McLean

Beyond Objects: Immersive Images to Create Sense of Place

- What struck me was that I really loved Douglas's presentation with a lot of fabulous

photographs of these places. You walked into the gallery and you see objects, you're not seeing places so much. So one thought was, maybe use big photographs in there. There is a piece of public art in Denver that I really like. It is actually in an elevator in the Hyatt Hotel. A photographer framed a photograph and it's really a video, so when you get on the elevator you see that there's actually movement, the grass is blowing, and you're in that place while you ride the elevator. It's not a live feed camera from the place and it's not a still photograph, but you really feel like you're there.

That's what is really missing here. Animals aren't place, glass boxes aren't place. I think you're asking way too much of visitors to associate a place with a group of objects. You need to give them some big, anchoring, immersive experience, be it a true diorama with a curved wall or a floor-to-ceiling photograph that is as gorgeous as the ones you already have on your PowerPoint presentation, or something innovative like the example I just cited, which is not a video or a photograph, it's both, but it actually puts you somewhere. • Kirk Johnson

Sense of Imagination and Wonder

- I was thinking about what Mary Jo said about love and what gets somebody when they go to a museum. I was thinking about my personal experience at the Museum of Natural History in New York as a kid. I remember

seeing that huge whale hanging from the ceiling, and it was so outside of my reality. I was just thinking about what is missing and about listening to that little girl on the video talking about animals with jet packs. This is where I think the natural scientists in the room are going to hate me. Isn't there some space in the gallery to be imaginative, to evoke that sense of wonder instead of focusing so much on place? I think Mary Jo is right, if you don't actually go to a place, it's never going to be the same, but you can capture that sense of wonder.

I also agree with Scott. We should be focusing on everything with that kind of intensity and we can at least have the intention of that behind everything. So it's not just about a sense of wonder but understanding that what captures somebody is something outside of their experience, outside of the literal. And it's a museum, you can do that, and why not? • Carolyn Finney

People's Stories and Opportunities for Going Deeper via Involvement

- The seven places really worked for me in the gallery. I felt I was right back with Douglas's PowerPoint. But building on what others were saying here, *People Magazine* outsells *Audubon*. I am a scientist and a natural historian, but what I want to hear is the people and their stories about these places. I think if there was a jet pack video [*i.e.*, *Temescal-type video*] in each of these seven places

Wonder of Human Stories (e.g., Discovery of Cordell Bank)

- That video [*Temescal video in Oakland section*] is the thing that transfixed me in the whole gallery. Was it the content, was it the cuteness, was it just hearing human voices and their sense of reality? At lunch we were talking about a very different human story about an individual diver, who discovered the richness of the Cordell Bank in the seventies. Hearing that story about some random dude from Walnut Creek who decided to go scuba diving in a very challenging environment and discovered a very rich and unknown biological frontier gave me a sense of wonder. This story happened just thirty short years ago, right nearby off California, in my lifetime. I think that's the kind of wonder you could communicate—not in a cookie cutter fashion, but differently for each place. • Dan Rademacher

Dan Rademacher in the gallery



Richard Bugbee and Peter Kahn in the gallery



it would be really powerful. I didn't happen to catch the story that Dan related about the diver, but I would bet there's a story like that or multiple stories like that in all of these places.

Half an hour ago we were talking about how deep you go. One way to go deeper is to empower people to believe that they can get involved in that story somehow. That can be done through some version of citizen science or participatory action research in any one of these different habitats, even if you don't live there, but especially in the Oakland area if you do live there.

So it's trying to find stories that are involving. It could be scientists telling their story. It could be non-professionally-trained scientists who have had an impact on understanding the natural world telling their story, so people would feel that they can get involved in that as well. Or maybe it's a beach clean-up, maybe it's not exactly science investigation but something that they can do later on. It would allow you to go deeper without having to go deeper. • Rick Bonney

Degrees of Verisimilitude

- We know from lots of visitor testing that visitors love two things most: one is immersive experiences, the other is objects and specimens. Dioramas are successful because they give them both in one package. The very complicated question of to what degree

your dioramas should be loosely interpretive versus highly literal is a difficult one to sort through, and you may not want the same answer in every instance. We do know that the higher the degree of verisimilitude, the higher the marks are in terms of what visitors like. They like that literalness.

Now to address that issue about not actually being there in that place. A lot of people have done research about this borderline of seeing something with a high degree of verisimilitude but knowing that it is artificial. Japanese gardens are built off of that concept. You can also think of it occurring when you think of miniaturized dioramas. We both simultaneously love their verisimilitude and at the same time we know that it is HO scale (the scale of model trains and slot cars). I think you have to acknowledge that is where visitors' heads are going to go.

But while I was arguing that in my head I was thinking about Bertolt Brecht. He was a German playwright whose plays were all ham-fistedly rhetorical. He is the guy who said, "Art is not a mirror to reflect reality, it is a hammer to smash it," or something like that. He also said people attending a play ought to be able to smoke cigars in the balcony because no one smoking a cigar can get totally sucked into what is happening. He didn't like the sucked in, the verisimilitude. What he always wanted to do in every play was to create this thing called *Verfremdungseffekt*, the estrangement effect. He wanted

his plays to look like this is a thing happening on the stage, so don't get too caught up in the drama because I want you to learn something from it. The *Verfremdungseffekt* is not popular in practice these days. There is good theoretical argument for it, it's a difficult aesthetic decision, but think carefully about how far away from verisimilitude you do want to go. • Matt Matcuk

Edginess, Disequilibrium, Constructivism, and Unpacking Key Exhibit Problems

- In robotics there's a phenomenon called the "uncanny valley." As you make something more and more lifelike, if it doesn't also have the properties that you associate with lifelike, at some point it gets very, very edgy and people kind of get creeped out. That's the uncanny quality. It's a classic phenomenon in human-robot interaction (HRI).

There is another way to think about exhibits, and I'm sure you've done this, but it would be interesting to understand how you've worked this and the potential for it. That is, to get edgy. Where are you edgy? I'd be interested in hearing that.

Connecting that to a basic view and maybe a different view of child development, instead of seeing it as an exogenous account of social or cultural learning with the museum transmitting all of this stuff to passive individuals, there is this much more constructivist view.

The whole interactive component that shifted is really tied to a constructivist view of education. If that's the case, then you need to understand that the mechanism for development from a constructivist standpoint is disequilibrium. This goes back to Piaget and is throughout his work. With disequilibrium and with the edginess connected to disequilibrium, where are the problems that people are facing that forces them to reorganize and restructure their information and their current world view to construct a more adequate and comprehensive world view? It is basically problems and problems are good things.

When I've consulted with colleagues of mine in zoos, like Carol Saunders at the Brookfield Zoo in Chicago, we've had long discussions and arguments. George Rabb, who is director of that zoo, says that zoos need to be the conservation center of the world and are going to change everything. My reaction was, "Wow, you're aware that you have this huge problem because you have captive animals, and part of the problem is that we are dominating these animals at the very point where you are saying you are going to teach conservation. How does this work?"

Basically, the zoo tries to hide that. My proposal to them was, don't hide it, bring it out. It's a problem that zoos have. Everyone who works in a zoo knows that's a problem and they try to hide it. Bring it out into the public and that becomes a powerful place

Visitor Research/Testing with Verisimilitude v. Looser Interpretations

- Are you planning on researching the literature on this question of visitors' thoughts on verisimilitude versus looser interpretations? Or maybe Cecilia has already done that. • Matt Matcuk
- We did a literature review on the front end, but as it related to the NSF proposal. There were a few things along the lines of people loving the immersive quality. There was attention around the idea that these animals are real, but they're dead. There is this whole question of where the museum got the animals, the whole trajectory that you all know well. There is this tension where they kind of like it because it's this really cool scene, but there's something about it that makes them a little uncomfortable regarding how this came to be. • Cecilia Garibay
- And just the degree of suggestiveness though, like a more abstract framework versus a realistic backdrop? That would be a great thing to look at. • Matt Matcuk
- I think we are going to test that. I will say, though, that the strength of dioramas is their immersive quality. Clearly the more life-size they are and so on, the more immersive they are. They seem to have an emotional quality to them, and I think we are going to have to deal with how we don't lose that amidst everything else that is going on in that particular area. • Cecilia Garibay

Enabling Visitor Imagination, Engendering Appreciation for Places

- I think that we need to really try and experiment with this. We tend to have all the fun in museums. We get to use our imaginations, we create these wonderful things, we tell these stories, we pick the objects, and we hear from scientists about the real nitty gritty. Then what we distill for visitors is such a pale reflection. It's like the detritus of an experience of ours. What we have to get out of the habit of doing is thinking that we have to imagine it all for our visitors. So what can we do that gets their imagination going?

Rick noted that the research that Cecilia is doing now indicates that you can market places. For me, the idea that you can have an appreciation for these places even if you haven't been there is the real breakthrough stuff because that is what we are going to try to do. We are going to try to create things where visitors use their imagination and can be there in a way. There are a lot of people who love Paris who have never been to Paris. That's what we've got to do because we are not going to take people on busses and drive them to all of these places. • Kathleen McLean

that they can just own it and move forward with it.

Museums don't have that problem, thank goodness, but I do think Mary Jo was articulating a form of that, at least one form of that. That is, a place you have here is not the place out there, and reading about Paris isn't being in Paris. That whole thing is, in fact, a problem. One can try to hide it or one can say yes, it is a problem, it is a central thing that we are dealing with. Are there some components of the exhibit that unpack that idea for the public and get them to work with it? • Peter Kahn

- I think we've done that in a few ways in our Art and History Galleries. In the History Gallery the problem was how to create exhibits that are contemporary and recreating a time and place. You don't want people to confuse what you've built in the gallery with the real authentic objects. The answer that Kathy and her team came up with was to create these stage sets, to make them theatrical by comparison, really making it obvious that this is not a real train station, this is not a real mission, this is not a real boat, but to take it to extremes so that you could see the authentic objects in it. I think that idea of going to the opposite of the literal with the habitat cases and the dioramas, to really juxtapose, would make that much more edgy.

Another thing you were saying, Peter, was to bring forward and acknowledge the problems

or the challenges. In the Art Gallery we did things as simple as having the curator talk in the first person voice, which is almost unheard of in an art museum. You have these texts and labels with the curator talking from on high, so it is like it is coming down from god, what this painting means. Instead, we have the curator say, "This is why I like this," or "This is how I relate to this," or having the registrar insert her voice into the label and say, "This is why we actually look at the back of paintings." We found that using those techniques, some of them very simple, really does demystify what is going on. This is a real person talking about the art and this is who they are. Or this is not a real train or real boxcar, but you can have that sensibility with this almost theatrical experience. • Lori Fogarty

- I want to follow up on this disequilibrium and controversial move. What if you asked people leaving, "What is the edgiest or most controversial thing that you encountered in the museum?" If you asked people that and they can't think of anything, do you think you've succeeded or not? • Peter Kahn
- No, I think we would not have succeeded. • Kathleen McLean
- So how would they answer that now in the way that you're thinking about this exhibit? • Peter Kahn

- It used to be that when people would ask me that question I would make some kind of idea statement, like a factual statement. I think it's about the quality of the questions that people ask. For example, "I don't get it, how come such-and-such is happening? I've got to go and find that out." With the kind of cognitive dissonance that you're talking about, it's not that we've fixed it for people but that we get people curious enough or compelled strongly enough to go out and grapple with it beyond this place. • Kathleen McLean

Need for Testing with Everyday People; Connecting to Action; Hearing Other Visitors' Stories

- First, a disclaimer: I don't think you have to sacrifice hard science for the affect. I never said that and I would never say that. I do think you have to understand the social piece before you can get to the hard science. I'm sorry, that's what my data shows, so we have to pay attention to it. We have to start walking families through immediately—ordinary, everyday people, not the people in this room—so we know what people think and do with this stuff. We have to know that almost immediately, like yesterday. Really do an intense following of families that we get from a variety of sources, invite in, and give them a hundred dollars. That should be done right now.

The other thing is this connection between attitude and action. We are really making as-

sumptions. It's a sticky, fuzzy thing. The best I can do is follow up on what Rick said. Give them some citizen science. Have the schools sign up for something. Have the families sign up for something. It almost doesn't matter what, but the participation is really important if you're going to have any kind of change in the future.

The third thing is, I really want the people stories on the fly. Rick Stevens had this thing where you could have the voice of the people who come to the exhibits. I know you have to make sure it's not X-rated and all of that stuff. I told the people I was sitting with in the gallery that I wanted to sit down in that redwood forest and hear stories, and I wanted to tell my stories. To me, redwoods mean having to clear off my roof of all of the redwood stuff that falls on it every winter. That is very personal to me. I want to hear other people's stories too, and not a post-it note, that doesn't do it. You need some way of doing that as well. • Doris Ash

Ecosystem-based Management

- It strikes me that a central theme here that we keep weaving in and out of could be distilled down to "people nature." I don't say "people versus nature," I just say "people nature." Scientifically, if we are looking for a framework to show us one perspective, one form of guidance might be ecosystem-based management because that is something that explicitly deals with people

Sharing Nature Stories on the Web

- Building on Doris's comment about visitors' voices, I'm engaged in something I'm calling the Nature Language Project, where we have people on a Web site write in about their nature stories. I'm wondering if there is a way to incorporate that. Maybe we can unpack that at a later time. • Peter Kahn

Kirk Johnson and Doris Ash on a bench in front of the redwood forest diorama



Juxtaposing Art, History and Natural Science

- One of the things I thought was really cool about the Art and History Galleries was this juxtaposition disciplines. We haven't talked much about that, but my assumption is that is going to play a big role in how we interpret these things. And that is edgy, when you compare how most museums treat information, putting different contexts in play. • Kirk Johnson

Artistic Takes on Place: Emulating the Escalante Painting Competition

- I was just in Escalante, Utah where they have this yearly art festival and Plein Air Painting Competition. A bunch of artists show up, they stamp their canvases at the same time, and then they rush out, and over two days they all create paintings of that same place. Then there's an art show of all of these paintings of the same place. You'd have fifty different paintings of the same place that different artists had painted at the same time, all in different views. It would seem to me that would be another way you could capture these places. You could do that every year for all seven of these places and just continue to build knowledge of this place. • Kirk Johnson
- You could include photography • Anon.
- You could choose your medium. It's really a great way to experience place. • Kirk Johnson

as part of the natural environment and how we work with that, how ecology is changing, how governance is changing. It is this huge package. That might be a framework which is perhaps better than biodiversity. Biodiversity would be part of that picture, it would just be ramping it up one more level to ecosystem-based management. I talked about that last year and would like to bring that back to the table.

That brings in the edginess because this is one of the big edges. This is the thing that makes people uncomfortable but also gets them engaged. The seven bubbles each have a story. Sure, there has maybe been conflict in the past and there is change and things like that, but there are also decisions to be made about how we move forward with those seven places, or any places. So each one of those has a story with which people can engage. We can ask, "What do you think?" We could even project different scenarios. There is lots of science, and I've been involved in some of that, that looks at scenario predictions. People really get engaged with that in very deep ways. We could spend the rest of the day talking about just those, it's a huge topic. • Christopher Cogan

Telling the Uncomfortable Stories, Not Supplying All the Answers

- I want to follow up on what Chris just said. Earlier this summer I went to the African

American Museum in Detroit. I know this is a different story, but bear with me for a minute. The coolest thing about that museum for me was that they just decided that they were going to tell America about the African American experience (even though we could argue that experiences differed). So the whole way this museum of 22,000 square feet is set up is as a journey. You have to start at the beginning when Africans were brought over on slave ships. One room was the hull of the slave ship. You had to go upstairs to get on deck and then you got off and were suddenly somewhere in New England and there was the auction block. Then it went up to Motown and barber shops.

Some of those stories were difficult. The hardest part for me was being in the hull of the ship because they actually had bodies packed in like sardines. I was in there with four other people and nobody said anything, it was so uncomfortable.

In the room that was Motown you could listen to music. There were earphones and records on the wall and you could pick who you wanted to listen to. They had a large selection for you to spend time there.

I was thinking about each of the seven bubbles. There are difficult stories, tensions, and you could highlight some of those stories. Sometimes it's going to be difficult, but it wouldn't just be about what's pretty, what we should try to be thinking, how we are

supposed to be. Instead you would somehow present that problem and not answer it. Or if we are listening to stories, there's a set-up where people can choose to listen to different people's stories. • Carolyn Finney

History, Threats, and the Future as a Connected Story

- Let me follow up. I'd really like to break down these barriers. Instead of history and then threats, it's all part of the same story. We really don't know the answers to what will happen in the next fifty years to these seven places, but we do know there are some likely scenarios and we know, based on choices that we make today, which way they can go. We can predict those fairly well, and I think that engages people very strongly. And all of a sudden its from history to the future, it's all connected. You don't need those barriers at all any more. That might be the same kind of thing, where you take that tension, that stress, that fear, and turn it into more critical thinking, without pushing that on anybody. • Christopher Cogan

Balancing the Science Crisis Story with Personal Stories and Connections

- As we start to go into small group discussions, one of the things I wanted to put out there is this tension relating to what Scott said. Scott was at one of the original sessions that we held with scientists before we submitted the NSF grant. We also had sessions with

educators and with museum people, but the thing that really steered us in our current direction was the statement from scientists who said, if you don't deal with the crisis facing the world, you are not fulfilling your responsibility as a museum. We took that very much to heart and it is absolutely part of the meta-narrative of this project.

One the other hand, we have this tension with what this museum does very well, which is the personal stories of everyday people. That's what the whole History Gallery is: This is your story, you are part of this story, and your story as an everyday Californian is every bit as important as Leland Stanford's story. So how do we balance those? How do we balance those personal connections to the stories that people tell about going camping in Yosemite as a kid or walking on the beach with a grandfather with that science story? As we get into the small stories, maybe it is the scientists telling their stories of what keeps them up at night, worrying about the next hundred years. That is one of the things I wanted to put out there. • Lori Fogarty

Bussing Visitors Out to These Places

- One of the things that this museum does almost as well as any museum I know of is engage the community. It's really impressive what you folks do here, and you are engaging communities that don't traditionally go to museums. What would be useful to think about is ways to increase that. It's one of your strengths.

Kathy said you're not going to get busses and take people to all of these seven places. Why not? Why not raise money to go do that? At the very least there are these cool programs that take kids from inner city Oakland over to Muir Wood and things like that. Maybe this museum becomes the starting place where people learn about these places and then get the chance to go out and actually experience them. Maybe that's part of the fund-raising in this museum's future, to allow for those types of activities.

- Scott Sampson
- We have done some of that, we just haven't done it with every visitor yet. • Suzanne Pegas

Evoking Place

- There is also the question of how you create this sense of place. I don't think it's about making a redwood that looks as real as the ones we have. It's how you evoke that place. And it may not be that exact place but a place that is similar in your own experience, whether it's the sound or the feel. It's those more evocative things that may connect you to the place. • Lori Fogarty

Small Group Discussions

The Questions

1. World view: How do we facilitate a conversation about the tension between culture and natural science? What are strategies that we can use to help visitors feel these issues are relevant to their lives? How do we link presentation of habitats to environmental justice and improvement of quality of life in the city? How do we “depoliticize” the notion of conservation?
2. How do we get the abstract sense of place to marry the exhibit cases, which are very concrete?
3. How can we present Deep Time (both past and future) in a way that is comprehensible? What strategies can we use?
4. How do we use/embed/combine exhibits about systems and interactions with a natural history perspective?
5. What are the most important climate change scenarios for these seven places?
6. Whom should we be talking to (scientists, partnerships, etc.)?
7. We are concerned that we are not going to be able to deliver the science and/or meet the STEM standards. What do you think?
8. What are your thoughts on participatory experience in relation to the gallery?

INTRODUCTION

Kathleen McLean
Facilitator, Creative Director;
Principal, Independent Exhibitions

What we would like you to do is read through this list of questions, decide which ones you think are of interest to you, and break into small groups to discuss the question that is of most interest to you. The staff participating

Chris Cogan signing topic list



in these small groups will fill you in as needed with what is going on with the interpretive plan that might inform your discussion.

These are questions that we have been grappling with and that we thought we'd like to have you tackle in a concrete way while you are here. Regarding the first question about facilitating the conversation between culture and natural science, when we brought some advisory committee people through the Natural Sciences Gallery early on, one person said that seeing the hummingbird brought back all kinds of creation stories and notions about the hummingbird and values regarding hummingbirds that might not even fit in a natural science world view. If we are going to go out to the communities and tell them we want to hear their stories, what happens when the stories that come back are orthogonal to or in conflict with the natural sciences world view?

What are the strategies that we can use to help visitors feel that these issues, whatever they are, are relevant to their lives?

How do we deal with issues of environmental justice and improving the quality of life in the city and the notion of preservation of natural habitats? There is a whole range of questions around that: What is a native species or exotic species and what belongs here and what doesn't? We have the human world and the

natural world, which are not split. But we may say that we want to preserve native species and that exotic species are not good. The reaction of one of our curators to that was, “Wait a minute, so what am I, an exotic species? I come from the Philippines.” So there is that kind of tension around what is again world view in a way.

How do we “depoliticize” the notion of conservation? We’ve heard a lot of people say, “Oh yeah, cleaning up the beaches, worrying about conservation, that’s a white person’s thing, a middle class thing, an upper class thing.”

Another question is, how do we marry that abstract sense of place, which we have been talking about, with the habitat cases, which are really concrete?

How can we present Deep Time in a way that is comprehensible, both past and future notions of time? Are there strategies that we can use to talk about Deep Time or, as somebody said yesterday, are we just hard-wired not to be able to comprehend that? Or should we even try?

How do we use/embed/combine exhibits about systems and interactions? I think this is where we thought maybe we should tell you a little more about the interpretive plan. How do we combine those systems and interactions with a natural history perspective? In museums and

in classrooms at colleges and universities you get the physical sciences, you get the phenomenological sciences, the cause and effect and looking at phenomena, and then the classification of critters and grouping them into habitats. These are two really different kinds of ways of seeing the world. How do we pull those together in this gallery?

What are the most important climate change scenarios for these seven places? We thought we could just put Norman in a room and let him tell us. We are committed to having some kind of climate change scenario for each of these seven places.

Another question, one that may be addressed off to the side or tonight over dinner, is whom should we be talking to? What partnerships should we be considering for each of these seven places? Whom are the scientists we should be talking to about each of these seven places?

Also, we are concerned that we are not going to be able to deliver the science content or meet the science, technology, engineering and mathematics (STEM) standards that NSF is concerned about. There are some staff that are worried that whatever we do is not going to deliver that science content, and we want to know what you think about that.

Clarification/Comments/Questions

World View

Several separate questions were combined into question number one under the umbrella, “world view,” based on suggestions from Carolyn Finney.

Partnerships

Rick Bonney identified partnerships as a key issue and the need to form deep partnerships in each of the seven places. Suzanne Pegas noted that a presentation about partnerships is scheduled for later on the agenda.

Scope of Questions

Kathy McLean clarified that the questions are targeted to development of the Natural Science Gallery and that is the focus of the small group discussions, but anything that happens in that gallery will influence the rest of the museum.

Abstract Sense of Place

Doris Ash questioned the meaning of the phrase “abstract sense of place” (question 2). Kathy McLean explained that the issue is that visitors relate to the concrete exhibit cases and don’t make conceptual leaps of scale regarding endangered species, habitats, and so on. Another dilemma is that the cases show something being here while the narrative may talk about it no longer being here, so there is a time shift problem.

Participatory Experience

Matt Matcuk suggested the addition of the eighth question regarding participatory experience.

What are your thoughts on participatory experience in relation to the gallery?

Group Members:

Rick Bonney, Matt Matcuk, Dan Rademacher,
John Perry

Participatory group



PARTICIPATORY EXPERIENCES

Reporting: Dan Rademacher with additional group input

We talked a bit about the 1960s boxes that people made for the Forces of Change gallery upstairs and the incredible amount of commitment required on the part of the people who made them, which led to the idea that you have to be realistic about what participatory exhibit making is like and set up enough support for it so that people can actually do it. The value of it, as Rick said, is that once you start hearing people's different stories and start to connect with those stories, it's almost impossible to not like them in a certain way, even if you disagree with the content.

We also discussed what kind of citizen science you can get people to actually do on-site and how important it is to have something that people do right in the gallery rather than saying that they are going to do it later. At the Cornell Lab, follow-up they've done indicates that something like one percent of people will have actually participated in citizen science six months later. Even if the Lab made a big effort to make it easy for people to participate in citizen science, people just don't do it. So the idea is to try to find different ways for people to participate while they are there, and to

try and do it in different ways, whether that is creating art on-site or recording a little story on site. That can also involve your partners, though we don't yet know who those are. The opportunities will grow out of who your partners are.

That leads into one other thing. We were struggling with the question of whether you have to have participatory experiences in all seven of those places. It felt most realistic to us to focus on Oakland. It seems like that is where you would get the most bang for your buck in terms of participation after people leave the gallery. It doesn't make sense to push for participation elsewhere. You could probably make arguments for Yosemite, since that is such a well-visited place. Regarding Tehachapi, do people actually stop there? Is it popular? Is it realistic to think that you are going to coordinate with whatever efforts are going on down there? I don't know what percentage of museum visitors come from distant parts of the state. That would dictate how much effort we want to put into these more far-flung, less likely opportunities.

Why were we interested in this topic? I was interested in this topic because I come from a journalism background and was involved in citizen journalism and participatory journalism. I think it is coming up in almost every aspect of our lives, in different aspects of culture. In the Bay Area there is the Maker Faire, underground food culture, DIY culture, and all of these things are converging on a different model.

I can't remember whether this came up in

general discussion or in our group, but Matt said that we can't think of exhibits, or for that matter journalistic enterprises, as tubes through which we force-feed content. To be fair to all of us who have histories in our professions, it's hard not to think of them in that way, and yet there are massive and I think often positive cultural forces going in a different direction for group creation. But again, you have to be realistic. People aren't going to devote days and days of their lives, or at least only a very small percentage will be inspired to do that.

We talked about things that we are doing. At the Field Museum, Matt is working on a project to have people make pledges that are measurable and show the results of those pledges within a conservation-type exhibit: I'm going to make this change, I can see that fifteen people have decided to make the same change since I've been here, that is going to make this amount of difference. Suddenly, on the screen, we are saving 10,000 gallons a day of water, just with all of these strangers with whom I suddenly have a connection. Technologically it may be complicated, but the conception involves a pretty simple kind of participation.

At *Bay Nature* we are trying to do crowd-sourced trail reports, not focusing on what type of wildlife you saw but instead, was there mud, is there a ramp, were there flowers? These are the kinds of things that are actually useful, that anyone can experience and report on accurately because it's their own experi-

ence, and it has value if you frame it properly.

If you frame it as saving water through personal choices and not necessarily as saving the polar ice caps through shorter showers, but just saving water through personal choices, people will do that. In our case, you can help other people experience this park that you enjoyed because you can tell them that it's not so steep.

- Another issue that came up was telling multiple sides of the same story. Rick was talking about upstate New York and natural gas drilling and the devastating impact that is having on the ecology and the water table. But then when you look at the poor farmers, who are supporting the natural gas drilling, it's really hard to hate a poor farmer who is going under financially and you understand why they're supporting the natural gas drilling. So it's hearing the voices behind an issue.

Right at the tail end we were discussing the San Francisco foraging group, which I was ignorantly enthused about until Dan pointed out the impact of too many people foraging in an area. That in itself is an issue that could lend itself to the many voices approach. Foraging for native weeds to eat sounds like fun, but on the other hand you're destroying the environment. • Catherine McEver

Different Levels of Participatory Commitment: Exhibits v. *Farmville*

- You say people aren't going to devote days of their lives to this. What about *Farmville*? What's the difference between that and this?
• Kathleen McLean
- I don't know. Games? • Dan Rademacher

The Foraging Issue: A Potential Participatory Experience?

- The issue of foraging is a story we're trying to do at *Bay Nature*. Coming along with the whole maker culture is an interest in food and foraging. Talk about participatory—there are invasive weeds, and you could create a local, citizen science participatory project by pulling out the invasive weeds and eating them. But on the other hand you might go out foraging and take the last of some native bulbs that are barely hanging on. The difficulty is trying to get people to understand that when several million people do something, it can have a devastating impact. That food connection is something that is potentially very valuable but potentially difficult. • Dan Rademacher

How do we facilitate a conversation about the tension between culture and natural science? What are strategies that we can use to help visitors feel these issues are relevant to their lives? How do we link presentation of habitats to environmental justice and improvement of quality of life in the city? How do we “depoliticize” the notion of conservation?

Group Members:

Amy Billstrom, Mary Jo Sutton, Richard Bugbee, Doris Ash, Peter Kahn, Christopher Cogan, Evelyn Orantes, Carolyn Finney, Cecilia Garibay

World View group



WORLD VIEW: CULTURE AND NATURAL SCIENCE TENSION

Reporting:

Amy Billstrom and multiple group members

- We had four questions we were trying to answer and each one of them could be a complete conference. We started with the question about the tension between culture and natural science. We had an interesting discussion. One idea that came up was, is it possible to create a comfort zone for living in the duality of a system that is cultural as well as scientific. We could study that. Richard offered an example of that. • Amy Billstrom
- We have a belief that the Grand Canyon was formed by a big rattlesnake that came out of its house, but we also know that it was caused by erosion. We believe in both things, it's not a conflict. • Richard Bugbee
- We were talking about creationist stories and how those stories are generated by Christians and Native

Americans and others. Richard said he was a creationist and an evolutionist, so it isn't like the creationists are over on one side with the Christians over here, and the people who relate to nature spiritually over here, and so on. In some cases that's all in one place. And in some cases it doesn't mean you have to exclude a creation story because you're telling a science story. • Mary Jo Sutton

- Before we get into a discussion of that, and I know it's a really hot issue that I look forward to digging into deeper, there was another question raised. We had a lot of different people at the table with different perspectives. Evelyn Orantes, who is our Cultural Arts Developer, summed it up in the following way: Is there room in the exhibit for people to express different relationships with nature, and are we ready to allow them to express very different relationships? Are we ready to go there?

What also came out of our discussion was stories, stories, stories. Not only do we all like to tell stories, it looks like we want to incorporate stories from people representing these different perspectives, using varying methods, even that means sneaking in a six-line poem from Tupac Shakur about a rose growing in concrete.

Then we were able to delve a little into environmental justice and preserving natural habitats. I hope we have a decent discussion about that at some point also. There

are a lot of interesting issues that come up regard privilege. Who is sitting at the table and, as we develop this project, where are we beginning to recognize that some things are becoming more privileged than others? That includes the stories we choose to tell, whom we choose to tell them, and whom we choose to partner with. How are we going to deal with that? We also talked again about relationships: relationships to land, relationships to nature. • Amy Billstrom

- There was also the whole notion that people are part of nature. The way we view it from a European American perspective of people over nature isn't necessarily shared universally, and that is really important. • Doris Ash
- We mentioned in passing something that came up in threads during our conversation that relates to the last question, how to depoliticize the notion of conservation. One of the things I was going to raise regarding that was that we shouldn't depoliticize it, we should actually build in the concept of how policy and policy makers and all of that is connected to nature.

We had passing discussions on deep ecology and how that might be a useful concept, though without using those labels because it is controversial. Perhaps there are some interesting things that could be drawn out and used as concepts without using the labels.

• Christopher Cogan

- I offered a counterpoint to that. There are two ways of dealing with the labels. One is, steal the concepts but don't use the labels because you want to remain noncontroversial. So use the deep ecology ideas and stay away from who is saying whatever. But I proposed that if you do that, you need to really give it some thought because you might be missing an enormous opportunity. Natural scientists shape the discourse by naming theory, building theory with constructs, and naming those constructs something like "evolution." And you fight for that. You fight because a lot is at stake and the label does a lot of work.

Why leave it just to natural scientists to have those constructs out there? If one could get the right constructs, you commit to them and put them out there and that is part of the work the museum does.

So there are two very different ways of dealing with this. Maybe you do some of each in different constructs. I just think it's important to approach this thoughtfully and recognize the strengths of the different sides.

• Peter Kahn

- To build on what Peter is saying, something Carolyn said really resonated with me, which is that this project can look at new ways of defining a relationship with the environment. We have such a diverse audience in terms of culture, economics, and experience, and it would be really exciting to redefine relation-

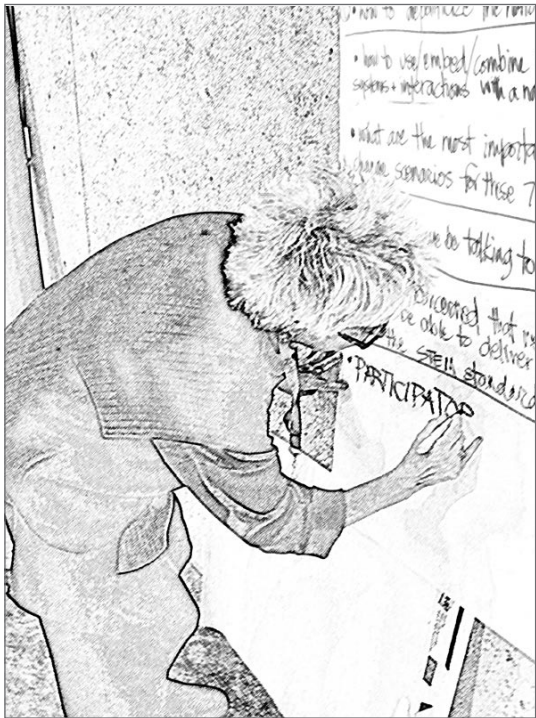
Sidebar: Demographics

- Do you have demographic data on exactly how your audience breaks down in terms of residency? How many out-of-state people do you get? • Matt Matcuk
- Yes, we have the demographic data. About 80% of visitors are from the immediate Bay Area, meaning a fourteen mile radius. More people come up from San Jose than across from San Francisco. We can get you the demographics of where the other 20% come from, and the percentage who come on school busses. • OMCA staff
- I think the exhibit's greatest strength will be the degree to which it is linked to curriculum. • Anon

World View group



Kathleen McLean editing topic list



ships with natural science. • Amy Billstrom

- You said you didn't talk much about the last question, depoliticizing the notion of conservation. I just wanted to tell a short story here. The recent NSF proposal that I submitted, which was funded, has to do with holding a conference to look at the ways we can better use citizen science for conservation. All of the reviewers and the program officer did not understand the difference between conservation and advocacy. They considered them to be one and the same. And our negotiation questions were about that, four times, and we got them to understand the difference. Don't de-emphasize the importance of that. There is such a difference between conservation and advocacy.

And regarding the connections for people in Oakland in terms of thinking about the other six places, there probably is a story to be told about the entire state of California being based on the health of all of those areas, which is not advocacy, it's just conservation.

• Rick Bonney

- I'd like to highlight one other idea that I'd like to put out there. I thought I had an answer to all four questions that was quite simple. Across all of them, the answer lies basically in trying to articulate what is universal in the human relationship that people have with nature, and I think there are universal ways of characterizing that, grounded in a deep sense of evolutionary theory. All of

us are products of a long history across the globe. That is part of the answer to those questions of how to move from abstract to specific and how to take all stakeholders into account and so forth. Equally compelling is what is particular in the human relationship with nature. That is your basic move right there, what is universal and what is particular. If you can work both strands together and not get caught up with one or the other, then that is your way in to being able to solve and answer those questions. • Peter Kahn

DEEP TIME

Reporting:

Kirk Johnson and multiple group members

- We noted at the start that there is a lot more time in the Natural Sciences Gallery than there is in the two other halls. The History Gallery has a very shallow timeline, a few thousand years amongst friends. Deep Time is an unusually challenging thing to talk about. We quickly settled on the fact that there are a couple of interesting temporal things. For example, the 164-year-old fish found at Cordell Bank was living when Abraham Lincoln was living. There is the fact that it took John Muir two months to walk to Yosemite from Oakland. The redwoods were logged in fifteen years and it will take a thousand years for them to go back to that level. There are those sorts of things for each of the places.

One idea we sort of liked was this idea of then and now, a sort of place-based thing. For each of these seven spots we would pick one point in time and refer to that spot in time. For instance, Sutter Butte is now this rocky island in the Central Valley. Three million years ago there was a sea there and it was actually an island. The image of that island as opposed to its current state is a pretty graphic then-and-now kind of thing. Another was Yosemite with the valley flooded with glacier, so you could actually see it then and now. Another was Shasta actu-

ally erupting rather than being a dormant volcano. Another was Oakland with redwoods and mammoths. Cordell Bank, with low sea levels during the Ice Age, was actually rocky islands instead of a submarine mountain. So those are examples of a lot of really distinct changes over time.

Then there was the idea of tying that to an animated paleogeography map that would stop through time and you could click it on these various scenes, these then-and-now scenes.

We talked a little bit about interesting connections, like the fact that grizzlies ate elephant seals down on the coast. It's just the idea that different interactions occurred at different points in time with different players involved. • Kirk Johnson

- I liked a couple of different quotes that I heard: that landscapes have a surprising history; that the place we're at now wasn't the place ten thousand years ago, a million years ago, a hundred million years ago. But more importantly, understanding major changes over time, we need to think about major changes that will come. It is trying to get the idea not of the instability of the earth but the changing nature of

How can we present Deep Time (both past and future) in a way that is comprehensible? What strategies can we use?

Group Members:

Kirk Johnson, Lauren Palumbi, Douglas Long, Scott Sampson, Tisha Carper Long

Scott Sampson and Kirk Johnson



Tisha Carper Long and Kirk Johnson



the earth. So part of it would be around that surprise, but it carries with it a bigger message that we are on a constantly changing earth. It might be woven into global climate change. People might think, well, the earth changes anyway, but we would be able to show that type of change happens at a slower rate, one to which natural ecosystems are able to respond, whereas the situation we are in now with global climate change is happening much faster than organisms or ecological communities can withstand.

We also talked about the Mannahatta Project, which many of you may be familiar with. We recently talked with a couple of people who are doing something very similar for the San Francisco Bay Area and are currently having a discussion about how that might be interpreted in the gallery in some way. For those of you who don't know, Mannahatta is a project where you can look at Manhattan today versus Manhattan in pre-contact times, and how the habitats and ecosystems have changed very dramatically. We could have something like that to show what Oakland was like just 200 years ago, which is a radical departure from what you see now.

Or there is just that picture of 8th and Madison, where Oakland is this beautiful canopy of live oaks covering a thoroughfare of horse-drawn carriages, which is so dramatically surprising to a lot of people. How do we bring into that the fact that there used to be Pronghorn Antelopes and tule elk here, and

before that there were grizzlies, and before that mammoths and mastodons and bears bigger than grizzlies that could run as fast as a horse—exciting things like that? • Douglas Long

- I'll mention one more thing that Kirk himself and his museum have done called "Ancient Denvers." They hired an artist to depict what Denver was like at different points in history. We were talking about doing then and now, but actually hiring artists to portray Oakland, or each of these seven spots, in the then and now. You could even do a future thing and hire an artist to do multiple versions of the future to get a sense of where that is going. This could give people a sense of time and interject them into that history. • Scott Sampson
- We were talking about participatory experiences in our group. There is an example on the Mannahatta Project that is not exactly user-generated content, but involves using a slider and stopping where you want to. Being able to control that information and stopping where I want to and seeing what it was like then is a really good example of a more deeply engaging activity. • Matt Matcuk
- A different way of looking at time is something that a group of us were playing around with. We were looking at digital maps of California and speeding up time, looking at seasonal changes, especially in vegetation.

There are some really neat things you can do with satellite imagery, which provides views of the whole state. You can run it through on fast forward, and what you see is the green-ing up of the Central Valley. It's amazing. It looks like a pulsing heart and the whole state comes alive. And you can loop it and play it at any speed you want, but you are speeding up time and you're showing how the seasons are affecting the state. It could be very effective and a very easy presentation. It's something you can create. We just did it as a thing to try out. There is a whole range of different satellite or air photo imagery. • Christopher Cogan

- I'm wondering how your group dealt with something that Scott said earlier today when he was on his powerful rant. Basically, if we don't do something big and change in a big way, in a hundred years we could largely destroy an enormous part of everything. What I'm concerned about is that sometimes as evolution gets played out and anyone gets a handle on that and projects it out into the future, they come up with the statement, "Oh, I get it. Evolution and adaptation is how we came to be. We adapt. The environment changes and we adapt to it and we're fine. I kind of get that things are going to change in the future and we'll adapt to it and we'll be fine."

If you're doing the Deep Time story, people may think, wow, everything has just kind of moved along great for a hundred million or a

million or a thousand years, and I don't have to worry as much because I'm understanding evolution. I think there's a critical junction there that has to shut that down because yes, we will adapt, but we won't be fine.

One of the ways we can do that is to show that other cultures have adapted and have died out. They've made choices. Look at Easter Island or Chaco Canyon or any of these cultures that have not lived sustainably. It was advantageous for a certain number of people for a certain number of years, and then they wiped themselves out. So we've got the history that shows that. And Scott's point is, on a global level we are potentially for the first time at that spot.

If we don't convey that, what I've found, at least in my discussions with a lot of people about evolution and adaptation and the psychology of it, is that people just say, "Huh, I get it, we're fine. Adaptation will just be different." We will be different but it's not going to be as good and we may get to Scott's point. If that doesn't get in there, it could be a shortcoming. But then you've got to counter that doom and gloom because it's a pretty depressing doom and gloom thing. There's the balancing. • Peter Kahn

Sidebar: Research on People's Relationship to Nature

- Cecilia, are there any evaluation studies out there on people's relationship to nature in terms of museum work? • Doris Ash
- Not evaluation studies, no. There is literature out there and Peter probably is a good resource for that. • Cecilia Garibay
- I asked Peter the same question. I mean evaluation studies regarding museum work. There aren't any? That's bizarre. How many science museums and nature museums do we have that convey that sense of a multicultural view of nature? • Doris Ash

How do we get the abstract sense of place to marry the exhibit cases, which are very concrete?

Group Members:

Lisa White, Christopher Richard, Jennifer Stock, Gail Binder, Lauren Palumbi

Place group

PLACE

Reporting: Christopher Richard and multiple group members

- We were seeking concepts of place, ranging from Google Maps through Mannahatta. There are a lot of whole new techno ways that people are gaining a sense of place. Even the accursed cell phone and its GPS capabilities is getting a lot of people more map literate. Hopefully we can take some advantage of that.

We talked about the difference between an actual geographic to scale map versus something that's more like a semi-geographic bubble diagram. Remember the New Yorker cover with a map where Manhattan was three-quarters of it and then there was a dime-size San Francisco. That was really more a sort of bubble diagram of relevance,

at least to the artist in that case.

I would love to see interpretations of that here. I would love to give people a pencil and tell them to draw something like that representing their life around here, around the bay. What are the landmarks in their minds? Whether they locate them accurately or not, it would be a really interesting way to get at people's sense of place.

We talked about some gallery sorts of stuff and the history of place in the gallery and what the unit of place was in the gallery. When it started out, at least from the curatorial point of view, the unit of place was the community, essentially the plant community. Yet from the design approach, with those evenly spaced walls marching down the gallery, there was this sort of geographic cut: What was this transect, this continuum across the state? We had to conjure up names for that stretch of the continuum that happened to be between wall eight and wall nine. So that was always some sort of an artifice but as the gallery evolved, it leaned more and more towards focusing on that and away from focusing on the community.

When we began this process in its earliest iterations, with people being part of it, we were really glad to get back to communities, but now we've made this jump to the hot-spots, so there has been this various sort of thinking along the way.

During one conversation, Jennifer noted



that she is uneasy about calling a hotspot Cordell. They have a pretty rigidly controlled vocabulary and Cordell Bank is that bump on the bottom. It's smaller than what they would refer to as the sanctuary, which is the political boundary of the sanctuary. Sort of the next step up in scale is the Gulf of the Farallones. The thought is that what we are really talking about, with the components that we are currently thinking of including, is the ecosystem of the California Current. An even bigger next step up from that would be the coastal ocean.

It is sort of a nomenclatural quibble, but nomenclature does have specified geographic footprints. In Yosemite it pretty much is the political boundary, but Shasta isn't. There still is not good consistency or clear conceptualization or rule-making about how we are coming up with these names.

In terms of making this manifest in the gallery, we have been talking about things like the lighting, the pathway. You might even get into some walls, some big props. In Cordell, for example, there's the idea of a boat or a sub or something like that.

Gail came in with a scheme that sort of worked for a while for all but one of the places. That was the idea what people recognize as the slices of the pie in this state are things like the desert, the mountains, the valley, and the coast. We were talking about some sort of overall first pass at cutting the pie. Of course, that would mean starting all

over with the floor plan and that sucks. And then, of course, Tehachapi doesn't work because it's a quadruple junction of those zones.

We also talked about Gray's Reef, which is another national marine sanctuary off the coast of Georgia. They have a lot of built infrastructure touting their existence at the big aquarium in Atlanta and the Fernbank Science Center and I don't know where all else. It's even a smaller, much more obscure chunk than Cordell Bank, but Jenny said she'd look into what they'd learned about trying to sell their spot in terms of gaining public awareness to see if we can pick up anything there.

We got back to talking about the feel, the immersiveness of place. We're asking the question, what is it about those places that is inspirational, confrontational, terrifying, comforting, whatever it is? It's like when you are dragging someone around out in the woods, it becomes a teachable moment because it has grabbed them somehow. Is there any conceivable way that we can hope to even approach that experience in the gallery? We didn't get anywhere on that one.

We did talk about some more theatrical, big-scale stuff. A number of people have seen a number of recent installations using low-key, animated, video-wall backgrounds, like the elephants that walk through every now and then in the back of the California Academy diorama or the big video wall at AMNH. It's

Ecosystem Names v. Place Names

- People by and large were not happy with the working names. I wrote a note that somebody said that the working names are a barrier.
 - Christopher Richard
- For example, some people might not know where the Sutter Buttes are, and that might be a barrier for them to enter, or Tehachapi, so there might immediately be a "What's that?" instead of understanding the concept of what that ecosystem is all about. We discussed that as far as entry points.
 - Jennifer Stock
- And using those ecosystemic names might actually underscore your message of the many different types of ecosystems rather than the many places.
 - Matt Matcuk
- The Cordell Bank is sure to confuse a lot of people.
 - Jennifer Stock

basically using big scenes of nature with some motion to make it more immediate, but without being like the upwelling animation, telling a story rather than being art. We were talking about something more environmental

and experiential. • Christopher Richard

- We have something like that with a Precambrian ocean. There's no plot, it's just like you're under water looking at a bunch of really bizarre animals swimming around, but it's super high-res and people just stand there, mesmerized. • Matt Matcuk

Establishing Units of Time: 48-mile-long Fingernails

- I'm very interested in this notion of unit of place because unit of analysis is everything in the work that I do. I was going to ask the Deep Time folks about units of time. I have graduate students working on issues of space. We think of the solar system, we think of the galaxy, we think of the universe, and we parse it up that way. We can parse geological time up, but that's pretty boring and people don't get it. Is there a way to parse time that is a little more graspable for people? When you say "three million years ago at Sutter Buttes," what is three million years?

Is there some way to get a grasp of time the same way you're trying to get a handle on a unit of space, on place? I think it's a really important concept. You're saying, do we want community, hotspot, Cordell Bank, the coast, or whatever, and the same is true of a unit of time if you're going to say this is what it looked like then. • Doris Ash

- To address that issue a little bit, what we discussed was using finite stories in order to start to establish a sense of time, and then keep moving it back. So you start off with your fish that's 140 years old, that's a unit of time.

You then move to your tree that's 2,000 years old, or sort of build it from there, build those stories in. And then at some point you're going to have to have a reasonable cut off.

We discussed having it more of a reference to what we already have in terms of images of California 200 million years ago, and having that sort of interactive slider bar access so that you can track through those time periods. Then when something of relevance comes up, it's not only then and now, it's also put in the broader context: This is then and now for this place, this is where it was in current California. And that's probably not going to be where you expected.

It's about creating those reference points and that sense of place because you're asking people to step outside of their normal concept of time, which is only a few decades, and interact and engage with this very out-there idea. I think starting from stories and building outwards might be the best way of achieving that. • Lauren Palumbi

- Doris, you want to know what three million years is? It's the time it would take your fingernails to grow forty-eight miles. • Kirk Johnson

- I think Christopher covered our discussion and just how difficult an issue it can be finding the right sense of place. Our discussion ranged from the abstract to the tangible physical and all of the scales. • Lisa D. White

- I liked the idea you mentioned about capturing visitors' sense of space by having them draw maps. There is a project related to that called Walking Papers, created by a company in San Francisco called Stamen Design. They do all kinds of amazing stuff, but this one isn't digital, it's a physical piece of paper that has a bar code on it. It's a map of whatever you want. Anyone can draw on the map and then you scan it. In a museum setting you would probably collect those papers. When they are scanned in they are georeferenced by bar code onto a Google Map.

There were a couple of grad students who did a project with students in Richmond and created their sense of what they need in their neighborhood to feel safe, focusing on replanning this two or three square block area and it was all over the map. Some of it was kind of nutty. Some of it was things like,

“I hate crossing the street.” It was really a whole range of stuff.

Walking Papers was specifically designed for working with communities that don’t have iPhones and aren’t interested in tablet computing, and so on. There’s no technological access, you just use a sheet of paper and then you send it in. The museum setting is actually an advantage because you could just have them drop it into a box. Someone then has to scan them, but you really could have their sense of place. And it’s participatory, and easy. • Dan Rademacher

- One of the things that I cover in teaching land use planning is urban renewal and urbanization. A key element there is how nature fits into urban centers and how that’s evolving, how that is changing in the future. One of the buzz words that I use is this transformation from social space to MySpace. It’s all about place and how you think about place. I just wanted to toss that out there because it’s a big part of smart growth and reurbanization that is pretty powerful. It’s part of the nature story right here in Oakland.

There is another element that you described at the beginning [*New Yorker* magazine cover map]. I forget the term you used for it, but the name that I and others have used is “cartograms.” It’s a very cool kind of thing, very digital and very interactive. Essentially, you make computer maps that distort themselves based on the content that you’re interested

in. So if you wanted a cartogram of the Bay Area based on population, the areas most heavily populated would blow up and get bigger, all out of scale. You could have hundreds of different things built in and have the visitors very interactively make their own cartograms. It would be very easy to do because you could pre-load those, and the visitor is driving it. • Christopher Cogan

OMCA staff listening to group debriefs



What are the most important climate change scenarios for these seven places?

Group Members:

Dorothea Crosbie-Taylor, Norman Miller, Steven Beissinger, Rebekah Berkov

Climate Change group



CLIMATE CHANGE

Reporting: Dorothea Crosbie-Taylor and multiple group members

- We realized that there are a lot of different ways to go about talking about climate change and that there is a lot of information that would probably overwhelm some of the visitors, so what we ended up talking about were some specific things. To start with, we identified the 1860s as being important in terms of that being the period when man started to have a major impact on nature with agriculture and irrigation, and we talked a little about how the Gold Rush figures into all of that.

Then we began to look at each individual place to see what would be the biggest thing in terms of climate change to hit in each of those areas. In Oakland we are looking at a change in sea level, and in this case a rise in

sea level. In Yosemite we look at the snowpack and the fact that the freezing line is going up. That in turn affects vegetation, which is being

squeezed out. There are a lot of things to potentially focus on in Sutter Buttes: air pollution, heat stress on animals, and rising nighttime temperatures affecting the ability of animals to cool down. • Dorothea Crosbie-Taylor

- In Shasta it's about water, the Central Valley Project, fish migration, habitat degradation and how animals will respond. • Rebekah Berkov
- The main message here has to be tied together from an entry point where there is a good understanding of what climate variability, climate change, natural variability, and man's land use and modification of land really means, and how we understand it in the context of California and uncertainty and the bigger picture of politics, if you will. That really needs to be an entry piece as you come to these seven little ecosystems. Throughout each of them there needs to be a tie-down point, which is the most sensitive response for that particular ecosystem and how it is related to the others, which we began to summarize.

I think in the Tehachapis it's going to be increased fire extent, run off related impacts with increased drying, and if things happen the way they seem to be playing out it will be very intense wet periods interspersed with long drought and dry periods, which may not be too different in some regards from the past except that it's going to be hotter. We

have high confidence that is really happening and that it is related to carbon dioxide.

The important aspect is not only the entry but the exit, and leaving a really solid set of take-away messages that a student, and a parent who drives the student's thinking to some extent, as well as the teacher, can walk away with some action items that can help them go to the next step if they choose to.

Those might include low hanging fruits such as making more efficient use of electricity and water, or cutting out something on the order of one meat meal a day [see Environmental Defense Fund Diet in sidebar]. It's a lifestyle change that is a clear, easy deliverable in terms of a way for us to reduce our carbon footprint.

Also, there may be a way to publicize Assembly Bill 32 here and what that translates into, and what a fifty-percent reduction on our 1999 level means. That could be connected to the idea that California is at the cutting edge of green technology and of a lot of historical things that we have done over the last 150 years. Here is a great opportunity to not just look at gloom and doom but to offer an exit plan for people to go out and make the world better, and not just say the sky is falling. • Norman Miller

- There were a couple of other important things that came up in the group that I wanted to mention. One of those was what

Norman just referred to, to present California as a leader. California has always been a leader. The idea is again to give this sense of empowerment from the beginning to combat this doom and gloom. We got to the point in our group where we said, "Well, you are two climate scientists sitting here with us. How do you get up in the morning and keep going having all of this data in your head and in your work lives all the time?" That is a piece we need to grapple with, and I really like this idea of starting from an empowerment point, and these little things, the low hanging fruit, will make a difference when you think about how many people we are talking about making these changes.

There was also the point about clarifying national climate change versus global climate change, looking at the 1860s as a real turning point, and then the human relationship with the environment: farming, the Gold Rush, industrialization, and the population influx that we are continuing to experience. One last thing was responsibility and the possibility of really presenting each visitor's role and responsibility in climate change in terms of how they live their life and the impact that has. • Rebekah Berkov

- It's not all speculative, or what is going to happen, there is a lot that has already happened. You could find an example or two for each of the seven places and say, "This has happened." Don't let anybody have the opportunity to question it. • Rick Bonney

The Environmental Defense Fund Diet

- If every American skipped one meal of chicken per week and substituted vegetables and grains, for example, the carbon dioxide savings would be the same as taking more than half a million cars off of U.S. roads.
- If every American had one meat-free meal per week, it would be the same as taking more than 5 million cars off our roads.
- Having one meat-free day per week would be the same as taking 8 million cars off American roads.

To see the statistics behind how these savings were calculated go to: <http://www.edf.org/article.cfm?contentid=6604>

Climate Change group



About Partnerships

Whom should we be talking to (scientists, partnerships, etc.)?

- Partnerships and collaborations haven't come up that much in the discussions today. I just want to assure you that there is a convergence and we have been working on the partnership aspects while design and our first stab at content is all coming together. You will be hearing a presentation on partnerships later on the agenda. • Amy Billstrom

Steven Beissinger and Norman Miller



- We talked a lot about that and thought that in this exhibit it would be to the benefit of the audience to talk more about what has been observed than to talk about projections because they are going to stir the pot. • Norman L. Miller
- And those examples are easy to find. • Rick Bonney
- There are lots of them, from the grapes to the snowpack to the fish migration. • Norman L. Miller
- And a lot of that information comes from citizen science projects over time, so there is another opportunity for participation. • Rick Bonney

MORE IMMERSIVE EXPERIENCES

Seven Big, Immersive Dioramas

- I really love this idea of the seven places, it really resonates, but I keep thinking that the objects in habitat cases don't get you to those places. That's a seminal issue. You guys have done a really great job with the other two galleries and I think you want to carry that on with this gallery, but there needs to be more immersion there. There are not a lot of real things there and there is not a lot of immersion, and those two things are so central to getting people transported from downtown Oakland to another place. • Kirk Johnson
- What do you mean by real things? • Kathleen McLean
- I'm still not blown away by the density of objects to be on display. There are the habitat boxes, which to me are sort of intermediate between real things and dioramas. I guess the thought that I have is, build seven big dioramas. Move the boxes up to the history complex and build seven dioramas and immerse people in those seven places. • Kirk Johnson

3-D Immersion

- I dreamed last night that when I walked into the entryway of the exhibit I had to put on my 3-D glasses, and that the entire thing was done on visual screens in 3-D and I was in those ecosystems in some way, and that was really a very different experience. I kept hearing yesterday that you want to immerse people in these ecosystems and it's hard to do that inside in that situation. Unfortunately, our society has just become so technology-oriented. What wows them?

That gets away from what has been the tradition and strength here, the dioramas in the cases. It's also probably a whole other level of technology and funding and you'd need to think about that. But maybe there is still some intermediate thing that still allows that connection to happen.

You asked about dreams. That could also be your worst nightmare, the technology involved in doing something like that. I walked into Costco the other day and there were the 3-D TVs that you could try out and little glasses you put on to see the screens. I thought, it's not as if people don't spend enough time looking at a TV screen, now what are they going to do? And how will that affect their impression of what we provide

A Call for Reflections

- We would like to hear your thoughts, questions, dreams or ideas at this point in the session before we begin day two. It sounds very Californian, but we find that sometimes dreams can present new ideas and change the direction of the design process. • Kathleen McLean

Douglas Long and Kathleen McLean review the agenda



Adding Video, Film, Light and Sound to Frozen Dioramas

• As I was walking around the History Gallery yesterday, one of the things that really caught me a little bit off-guard in a pleasant way was this one scene with an open door, and then every now and then this woman comes by. These dioramas are so “yestercentury” and so frozen and so archaic in a way, compared to where we are headed now in this YouTube generation.

How do you capture people’s quick-moving attention?

We could see ways in which you could team with Pixar and others to develop things, but to me what would be immersive as you walk through these little regions would be running film and video vignettes—running water, the grasses moving—so there is a sense of dynamics. A lot of that needs to come in so there’s some light and motion with these frozen, age-old dioramas, that to me seem nice but old and kind of dusty. • Norman L. Miller

them? Maybe I was picking up on Kirk’s reaction to the gallery. There’s nothing alive in there for them to see and interact with, so what would they experientially walk away with? How do you get that sense of awe, which I think is where you’re trying to go with this, so that they feel some attachment to those seven places or the concept of hot-spots? • Stephen R. Beissinger

Different Styles of Immersion from Low-tech to High-tech Iconic

• Just to build on that, would it be useful to think about different styles of immersion? I agree that part of the goal here is awe and wonder and getting people to really feel something for these places. You could use everything from a beautiful photograph, like the ones Douglas was showing us yesterday. It could be blown up, so you could walk into this wraparound with the objects within and it makes you feel like you’re there. Clearly it’s a photograph and you’re not trying to make it look like you’re in the real place, but you get a sense of the beauty of the place. That’s the low-tech, easy way.

Then there might be one or two examples of the kind of thing Steve was talking about, where you use technology to blow people away. Maybe you create some underwater scene for Cordell Bank, so it is immersive and you feel like you’re right there under water with these animals doing their thing.

Or something like that, so there are one or two iconic things.

In the exhibits that we’ve talked about, I don’t really see the iconic things that people are going to see and talk about here. I don’t get that so far for this exhibit. So you might think about using technology to provide one or two really amazing, iconic things that would be immersive. I have to agree with the others. I’m very into this immersion thing and I push it all the time, and I’m not quite sure how that would happen here. • Scott Sampson

Effective, Nuanced Examples in Native American Section of the History Gallery

• I agree with the scientists (I am one, but I often tend to go the other way in terms of voice). I was really touched going through the Native American section of the History Gallery. I thought it was the best part, quite frankly. You did some really lovely, little, sophisticated, nuanced things. There is a wall displaying basketry, which also has two or three little screens that show a person making a basket. That changed the whole thing for me.

But what really got me were the stories in each of the little subareas. And I assume you made a conscious decision not to try to recreate real background contexts. Instead, you had plywood that was partly painted brown. Very simple, but it worked. And then

there was a screen with mostly women telling the stories of foraging and so on. I didn't do them all, but I really stayed there watching this little screen that wasn't too big and wasn't too small, it was just right. And behind the screen was the granary and over there were some objects, so as I watched the screen, my side views were doing the rest of the surround. It pulled me in in a way that actually surprised me, so kudos.

It would be great if we could do something like that in the Natural Sciences Gallery. I like the idea of the grasses moving and the water flowing and I think you can get that with smaller screens, not big ones necessarily. Did anyone else go into that section?

• Doris Ash

- I did. • Richard Bugbee
- There was one experience in a dark room that just gave me goosebumps. It's where the Spanish and the Native American cultures meet and it's a dark room with an Indian headdress and a Spanish helmet. It really is immersive. And there's a voice-over which includes Richard's voice, which I didn't know at the time. I was thinking about the Tehachapis, where everything comes together. You did a good job of showing cultures coming together, and if the Tehachapis really are a meeting place... • Doris Ash
- Not just cultures, but it would be interesting to have a long, Deep Time, geological process showing the actual formation. That

would be a little bit of a mind blower.

• Norman Miller

MAKING THE SCIENCE MORE APPROACHABLE

Presenting This to Middle School Students as Something They Could Pursue

- As the exhibit hall gets better and better in our minds or in reality, there is also a risk that it can alienate. Especially an audience like middle school kids, who might come here and say, "Wow, that is so amazing I could never do that." It's something I've struggled with in working with students in my area, especially at the junior college level, where we are trying to focus on STEM issues, which I notice was on your list of questions as an NSF priority.

I can't help but wonder if there is some way there could be a connection to encourage or at least keep the door open to kids coming through, letting them know that they've got this incredible university system, actually two of them, in California: the University of California system, represented by some people here at the table; and the California State University system, which is actually the largest university system in the whole world in terms of numbers of students.

There might be some way to keep that door open— "If you want to do this as a career, as a lifelong passion"—especially for middle

The Value of the Dioramas: Awe, Resonance, Close Observation

- Scott said "awe and wonder." I feel museums are most successful when they capture resonance and wonder, and I see those things as different. One of the things I think is so successful about the dioramas is that they remind me of being in real nature. The detail is so real and so accurate. That really resonates for me.

One other thing I wanted to mention relates to a conversation that Lindsay and I had last night. I think that the dioramas really invite the visitor to observe nature closely. As an educator, that's a skill that we are losing, that we are not fostering in people any more. I think that in order to be able to appreciate and connect with nature, we need to be able to observe it closely, and that takes patience and time. • Rebekah Berkov

Biomimicry: What We've Learned from Nature about Sustainability

- One entry point you might think about for combining the natural sciences with the social aspects is biomimicry. In every one of these seven spots, think about something that we've learned from nature. We can actually show a project with kids reclaiming a stream or recycling in a certain place—something that nature does that now we are starting to do. We can feature that, and it's a way to show that we are integrating back into nature. Instead of trying to dominate nature, we are using its wisdom, based on four billion years of R&D, to help push us into the future. It's a message about sustainability, but it's also a message about children being actively involved. My guess is that in all seven of these places you could find really great examples of that.
- Scott Sampson

school students. That might not work for the fourth graders so much. We haven't talked about that and if it's left out completely, there's almost a danger on the flip side that their reaction will be, "Wow, that's so amazing, but it means all of this science and I could never do that, so I don't want to try," especially given the kind of students that you've described coming through the museum.

So that might be a danger if it's ignored. I don't have the answers for how to do that. It's not just about "go to college," the idea of going into STEM disciplines is a bit more focused. There could be things that say something like, "Here are faculty at your local university. Go call them. Here's their phone number." • Christopher Cogan

Putting a Human Face on Natural Science: Ant Exhibit at the Field Museum

- We just did a small exhibition in one of our wildlife research galleries. It is a very small gallery, about 800 square feet. We worked with a scientist who studies ants. She is really cool, she is tattooed all over, and she didn't come up the easy way, she came up the hard way. We were looking at her tattoos and how she approached science. She is relatively young. I said, "You know, we really ought to do an exhibition that is not just about the ants but uses this young woman in some way. Let's take this dual-pronged approach where we do science here and human

entry point over here, her personal story."

So we did the exhibition as a kind of comic book on the walls, which we covered with white vinyl. It's huge and it traces her in four phases. There is when she was a little kid, standing on the sidewalk and looking at ants in the dirt with her brother. She was in New Orleans, living in an apartment building and there wasn't a lot of wildlife around, but there were always bugs. Then there is middle school where she was kind of ostracized because she was a girl, and she was studying ants at the time in middle school when there is pressure not to do that.

She went away to college at Berkeley and was going to be a teacher. She took a Biology 101 class and rediscovered this incredible love that she had for insects. The light went on and she decided that she was going to become a biologist. She ended up at Harvard, working with E.O. Wilson. She is a hotshot entomologist, completely down to earth.

So there it was on four walls in these four chapters, and it was accompanied by these huge, six-foot by four-foot, color photographs of macro shots of ants. So you've got these huge ant photos and your standard exhibit ID that talk about the biology of the ants and what is happening in that section, and then you've got her story. And people really use it, they love this thing.

We did it in twelve weeks, which was a struggle. It was my idea and I kind of got in

trouble for it, but I thought, let's change the whole paradigm. What people have commented on most in the comment book is that they read her story and felt like maybe they could do that to. The exhibit will be up for a year. • Matt Matcuk

THE NOTION OF PLACE

Continuum from Specific to General

- I've got an issue that I want to bring up, and it's one of the biggest things we have to tackle after you go home. The thing that came up over and over again yesterday was this notion of place, the scale of the notion of place, and the continuum of the idea of place from the very specific to the very general. It came up when we were looking at Cecilia's research. You have prairie and rainforest on the one hand, but the surveys you had talked about specific places. • Kathleen McLean

Visitor Reaction to Specific v. General Places

- What we can say from the front-end research here, and what we are finding from conversations happening at the dioramas, is that the more specific a place, the more likely it is that visitors are engaging mentally with where that is. For example, visitors can locate and situate themselves much more easily if you say, "This is somewhere along the Fox River," than if you said, "someplace

in Illinois." It's really a matter of scale.

One of the things we learned here really quickly from the front-end was that people thought of these places in the dioramas as very much what we would call "generic habitat." It was the prairie, the woods, the redwoods. That lends itself to very different kinds of conversations than they are able to have if they have a specific place in mind.

The example I might give from the current study at the Field Museum is that the Grand Canyon label has a very specific description, something like, "this particular view or part of the Grand Canyon." That then allows for different conversation about: "Was I at that place? I don't think it looks like I remember. I don't think I went to that side." As opposed to a much broader, "Isn't that a nice shot of somewhere in the Grand Canyon." Or worse yet, "Oh yeah, that's some really cool deer with some rocks in the back." That's important to think about, the way that visitors locate themselves. • Cecilia Garibay

- Can you say something more about what they say about that? What is the actual dialog? • Doris Ash
- A lot of the dialog is this memory piece, particularly if people have been to the Grand Canyon but at different times, so they didn't go together. It might be, "Oh, I remember seeing this," or, "I don't remember seeing this, did you see this part?" That lent

Missing Place/Hotspot:

Mediterranean Coastal Ecosystems

- Among the seven places, we are missing the main biodiversity conservation hotspot, which is the Mediterranean coastal ecosystems that run from the Bay Area down to Los Angeles. That is our internationally renowned biodiversity hotspot. You might want to think about some way to deal with that. I am not saying that it has to be number eight, but if you were to ask someone in the biodiversity community about California biodiversity, this would be the thing that would come to the forefront. • Stephen R. Beissinger

Bioregions and Watersheds, and Taking a Proactive Role in Sustaining these Places

- In most of the education literature, when they talk about place and defining it, they refer to bioregions, and bioregions are often equivalent to watersheds. One of the things we might think about is, what is the engagement of this museum with those seven places? Are we just talking about them here? Do we actually engage with the communities there? Could you actually work with those communities to make those places sustainable? For example, could you bring all of the different players to the table and talk about what sustainability would actually look like in this place, actually help them work towards the future rather than just featuring them in the museum? You might think about this in terms of bioregions or watersheds, though bioregions and watersheds don't map all the time, but think about it in terms of how nature would define it. What is this area in terms of the ecosystem and how would nature do it, and how does that map onto what you could do for that place?

• Scott Sampson

itself to several conversations about how maybe this place is much bigger than what you could possibly see at one time. So they began to think about what I think of as the spatial relationship and the dimension of that place. They wouldn't articulate it that way, but it's really clear that they began to locate themselves and think about place and space in that way. • Cecilia Garibay

- This is really important in terms of the learning piece. What you are saying is that people start with the very particular and then are able to generalize by themselves without any other spurring thing. • Doris Ash
- But they need to be able to locate themselves in that particular place. Otherwise, what we saw happening during the front end with the dioramas here is that it became a generic habitat. So then it was no place, it was just this generic thing called "the woods." • Cecilia Garibay

Impact of Place Decisions on Gallery Development and Design

The Next Small Group Assignment: Focusing on Specific Places, Drawing the Line

- I've been writing a lot about sense of place, but it's from a design perspective and the architecture, it has nothing to do with museums, but they talk about the continuum and the notion of the difference between space and place. Philosophers really get into this.

For most people it's probably boring, but I thought it was really interesting because space is a kind of chunk of the big void and with place, the more specificity you give the more people feel like they are grounded, and place becomes where they are personally.

Yesterday the question of how we are dealing with place came up over and over again. I think that's why I had a brainstorm in the middle of the night about our next small group breakout session. This time, rather than big, abstract questions about how to change the world and what's the meaning of life, we are going to break up into groups and we are going to talk about those seven places. You are not going to talk about all seven places, you are going to get one place to talk about and there will be a staff person there to facilitate it.

I think, even in those small group conversations, it might be helpful to think about something that Christopher raised yesterday in a more philosophical way: Where do you draw the line? That's something we've been really grappling with. And Jennifer brought up the question of Cordell Bank. Is it the pinnacle at Cordell Bank that we say is the place, or is it the coast of California, which is this huge marine system? • Kathleen McLean

A Design Issue

- But they don't have to be exclusive and it's highly likely you'll end up doing both. It's

really a design issue of how you'll balance those things. How large is the graphic that says "coastal upwelling ecosystem," and how large is the type that says "Cordell Bank." It's how you approach that, what you see, when you see it, how it's repeated • **Matt Matcuk**

An Issue that Permeates Every Aspect of the Project

- But it's not just a design problem, it's also what examples we use, which habitat cases are used, it's very complicated. The reason it kept bugging me is that it comes up in every level of what we are doing in terms of evaluation, in terms of prototyping, in terms of how you write things, the design. It's even the way we think when we're drawing the circle for our own attention in creating this thing. I don't have the answer, but it comes up in all of the different conversations we have been having. • **Kathleen McLean**

Enabling Visitors to Express their Own Values

- To attach something else onto that, when we talk about these places and we show them to visitors, we are also going to have to offer some explanation regarding why we think they're important. Once you have the values that we think are important and our representation of those values, the question I would have is how we keep that open for visitors' interpretive values and let those be a part of that as well. How do we tell them,

"We value this, what do you value about this place?" How do we incorporate that?

- **Lauren Palumbi**

Sacred Spaces and the Nature of What Makes a Place a Special Place

- During the last small group discussion I was in the World View group, which talked about accessibility and relevancy of the content of the places. In that conversation we talked about how these places, these experiences of nature, mean things to people. Last night, driving Peter Kahn to the airport, we were talking about the different places and I told him we are meeting with the Native Advisory Council in a few weeks to talk about the places. Two of them are these big sacred places within California: Shasta and Sutter Buttes. Peter said he had just come from a sacred space conference and that at this session we hadn't talked about sacred spaces at all yet. He remarked that he thought that was really interesting. We haven't talked about how biology and faith come together.

I'm hoping that comes up some time during the conversations today. For some people it's a bioregion, for other people it's their quarter-mile neighborhood. What is it about the place that holds together in a coherent way that is recognizable as a special place?

- **Mary Jo Sutton**

- That's the first thing that came to my mind when you mentioned Shasta: Oh, that's a

Sutter Buttes: The Nexus of Biodiversity and Private Land

- The thing that struck me about Sutter Buttes is that it's private land. Everything else is public access land for the most part, but Sutter Buttes is not. It's very hard to actually visit Sutter Buttes. It's open by prior arrangement for a very short time in the spring. But that brings up a whole bunch of other really interesting questions about the nexus of biodiversity and private lands. • **Stephen R. Beissinger**

Space for People's Stories.

- In our small group we talked a little bit about relationship to place. Richard's story about cocoon man reminded me, where is there space in the gallery for people to tell their stories of their place? It may be connected to that specific spot, but it may also be a reminder of a spot that is special or sacred to them. I haven't heard a lot of conversation about that notion of story in the discussion. • Cecilia Garibay

sacred space for all of these groups of people all of the way around the mountain. What has been bugging me is that I can't remember what the real name of the mountain is, the Native name. The cocoon man lives up there. He is the one who sent the Hawaiians home. The Hawaiians got lost in northeast

California. The cocoon man said, Gather flowers and put them in the fire to send them to Kashaya," and the flowers made a sacred bridge that sent them back to Hawaii. That's the short version of a long story. • Richard Bugbee

Community Partnerships

Amy Billstrom



INTRODUCTION

Kathleen McLean

We haven't talked about partnerships much yet at this session, we've been focusing on content and design, but as you know, the name of this project is "Bringing Dioramas to Life Through Community Voices." Well, who are those community voices? We are just now starting to get into that. Amy is going to give you a very quick overview of the complexity of the community partnerships piece.

OVERVIEW

Amy Billstrom, Interim Natural Sciences Interpretive Specialist, OMCA

First I would like to say that I have really appreciated the comments people have made

about links to education and schools at the K through middle school level and high school youth. I want you to know that there are allies here on this team for youth, and for pre-school and elementary school as well as community college. It is a part of the conversation we have talked about in the context of this NSF grant because of the funding parameters, but it is a priority here at the Oakland Museum.

The partnership component of the project is very complex. Kathy has worked with us to make a bubble map to try to explain how partnerships might fit into this project [*sidebar page 93*]. Our approach to the partnerships, both as an institution and for this project, is that we are committed to sharing the message. For instance, in the History Gallery there is a wall of baby photos from the Baby Boom era. We went out to the community and asked

people to contribute a picture from their childhood. Participation ranges from that relatively low level of involvement to cocreation. For the “Before the Other People Came” section of the History Gallery, we brought people in from our Native Advisory Council and shared the message with them from the start. We shared the power and the privilege.

How that is going to be manifested in this project is still largely unknown. I choose to look at this project as a living, breathing organism that can grow extra parts, while other parts might die off, so we are looking at expanding and contracting programs.

I’m going to quickly walk you through how partnerships fit into the project according to our current vision, and then other members of the team are going to address what we’ve done and where we are going. The development team is at the core of the extended team, what I refer to as our family, which includes staff, consultants like Kathy McLean, and our advisory councils, including the Native American Council, the African American Council, the Asian-Pacific Islander Council, the Latino Council, and the Teacher Advisory Council. That family includes our other departments—art, history and education—as well as our docents and an upcoming project on John Muir and other advisors that we have on our board.

Then we have our funders, we have our NSF advisors, and we have Cecilia Garibay, who should get her own bubble.

In terms of partners, we have a bubble representing local organizations, which includes five partners right now that we went into the grant with: the Golden Gate Audubon Society, the YMCA of the East Bay right here in Oakland, the East Bay Regional Park District, *Bay Nature* Magazine, and the Nature Conservancy. This is our starter group of partners and the constituency that we are going to work with for sure, though to which degree we are still exploring. There is an analogy that Lori uses: We are committed to a long term relationship and we are dating, but we are not necessarily married yet.

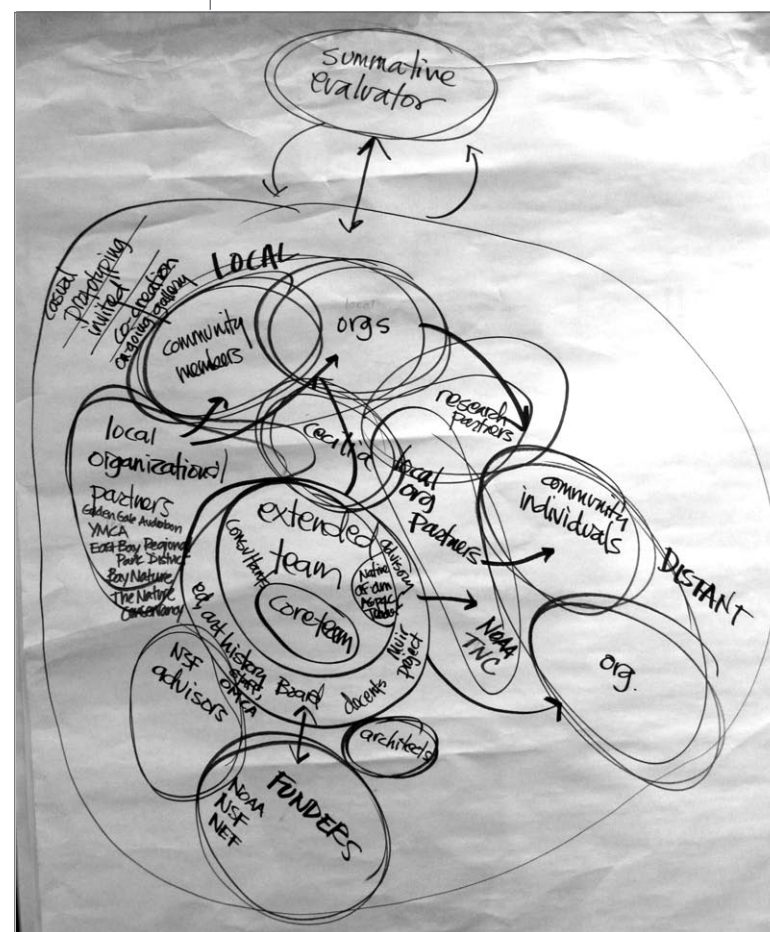
Now is the time that we are expanding and developing relationships in the local community. This includes local community members and organizations. As an institution we have extensive relationships with organizations all over Oakland, but there are gaps. There are people we don’t know, particularly in the natural sciences.

There is one problem we have been struggling with and we would appreciate any input you have regarding this. That is, how do we have a conversation and articulate our goals and yet not commit? People

About “Family” at the Core

- Who are your family? Aren’t family the ones you can’t pick? Your friends you pick, your family you’re stuck with. • Matt Matcuk

Community partnerships bubble diagram



Missing: Education and Business

- I see an apple when I look at that diagram, and I like that image. I'm curious about a couple of things that are not there. One is explicitly education and partnerships with teachers in the local area. It seems like that's a big one in terms of things like curriculum development partnerships and things along those lines. Second, I see a lot of organizations on your diagram and on the list you handed out, but I don't really see local business community leaders. I'm just wondering why. That's a huge one. That would be a different kind of partnership to be sure, but I suspect there are a number of businesses that could really get behind some of this and be very helpful.
• Christopher Cogan
- We find, as we get to know our local organizations, that many of them are businesses. But actually, businesses haven't been invited to the table yet. • Amy Billstrom

get very excited about the idea of participating in a project like this, but as we go through this experimental process we are not sure how everyone is going to fit in, and not everyone can fit in. Rebekah and Dorothea are going to share some of the criteria that we are using as we decide who we are working with.

So that is local. Then we have the other six places, which are distant. There again, we are going to look for organizational partners and specific individuals. At Cordell Bank, NOAA and the Nature Conservancy are solid partner right now and this is going to expand. We also have, meshed in between the local and distant partners, our research partners.

Our definition of "partners" right now is very broad. It could be someone who helps us, such as one of you or one of your colleagues helping us with specific content in the social sciences or natural sciences. It could be a whole organization. With the YMCA we are hopefully looking at working with a series of families to do some sort of project. But that may not work out, we may end up working with them just on prototyping. So there are a bunch of unknowns. Cecilia has a bubble amidst all of this because she is involved in much if not all of this. And finally, there is evaluation to find out how successful we were.

ROUND ONE Q & A

Partner Courtship and Marriage

- What does getting married look like to you?
• Kirk Johnson
- That's a really good question. We have enough experience here at the museum to know that for a partnership to be meaningful, you're going to be in it for a long time, so getting married means working with that person or that organization beyond the opening of the gallery. We are just going to have to be very careful about that because we really respect where the non-museum folks or the other museum folks are coming from. That's the getting married part. I have to start planning these opportunities two and three years out, knowing that we are not just going to get it up and started, we have to seed it. For example, I know what goes into having a youth program and what that requires in terms of commitment and time.
• Amy Billstrom
- Do you actually draft an agreement? • Kirk Johnson
- Yes, we are going to. A memo of agreement, even if informal, is important to make sure everyone is accountable. What is really important as we enter into these is that we have an initial discussion to create a shared mission. We can have talks about what is important to you and what is important to me,

but when we create it together and write it down, we'll be able to come back to that over time as we make the hard decisions.

• Amy Billstrom

- I was going to say exactly that. What do you want from them and what are you going to give them? If I were one of these organizations, I would want that right up front.
• Doris Ash
- We have also had experiences that are very difficult, and it takes a while to get over that. But with those we've approached so far, there are a lot of sophisticated folks out there who are grass roots and know what it's all about. • Amy Billstrom

The Need to Educate Non-museum People About the Exhibit Process

- Probably I could take lessons from you guys about community involvement because that's not my area of expertise and it's not an area of strength for my museum. But one of the things that we did learn doing an exhibition on Native Americans was something the exhibits people probably already know. No one understands what it means to develop, design, and then produce an exhibition, no one who isn't in the business. Because of that, they will make lots of assumptions they will end up causing headaches.

One of the things you might want to plan to do, if you haven't already, is lay out for them

a sketch of the process, including everything you'll be doing at each major stage, so they understand that this isn't the time to discuss the color of the carpet. • Matt Matcuk

- We've had several discussions about setting up the roles and understanding where various people come from. Fortunately, our *Days of the Dead* exhibition dates back fourteen or fifteen years, and that is a cocreation process we have been doing for a period of time now. I want to emphasize that the phase we are going through right now involves building relationships and not necessarily exhibit making at all. • Amy Billstrom

LOCAL PRIMARY CRITERIA

Dorothea Crosbie-Taylor, Community Liaison, OMCA

This is the list of criteria we are using to identify potential partnerships and collaborations on the local level in Oakland and the East Bay. Regarding the first criterion, what we are talking about is groups that are working to create a healthy environment.

For example, there has been some work going on in West Oakland, looking at all of the heavy particulate matter that is coming from the trucks lined up at the Port of Oakland to unload the containers. They did work that showed that kids in living in that area had asthma at a rate that was three or four times higher than any other neighborhood. So it's related to air pollution and things like that, and it's also related to the health of the commu-

Local Primary Criteria for Partnerships and Collaborations

Oakland and the East Bay

1. Organizations whose missions relate to developing healthy communities and supporting informal learning, and whose activities can be supported by inquiry into the natural world around us.
2. Organizations that represent a mix of communities that closely match the current and future demographic complexity of California and the Bay Area.
3. A mix of organizations that represent the geographic diversity of (a) the Bay Area, particularly the East Bay, and (b) California as a whole.
4. Organizations that have been recommended by our project partners and advisors.
5. Potential for a long-term relationship with the museum (and potentially with other departments).
6. Reach, visibility, credibility with the community. Organizations that are themselves at the forefront of innovation, are seen as "go-to" groups, or have a broad network of their own members, supporters and participants.

Gaps: Churches

- I'm wondering if this is intentional, based on the conversation, but I notice that you don't have churches anywhere. • Carolyn Finney
- One of the things we have talked about is how spirituality comes out in nature, whether that's related to a particular church or not. Spirituality and people's personal relationships is an area that we are discussing, trying to figure out how that might fit. • Dorothea Crosbie-Taylor
- That was one of the gaps that we identified. When we look at our big five (YMCA, East Bay Park District, et al.) and their constituents, some of the gaps they don't fill include the urban environment, the underserved, what is sometimes called environmental justice, and spirituality. • Amy Billstrom

nity. Another organization is out there working on getting healthy food to neighborhoods that lack supermarkets, they just have convenience stores that don't sell fruit and vegetables and instead sell chips and Fritos.

When we look at organizations that represent a mix of demographics we are looking at both current and future demographics and at Oakland in particular. There is one organization that is reintroducing African Americans to the natural world through hiking, camping, trips to Yosemite. Another organization works with youth and has them going out and reporting on the world around them.

The third criterion, regarding geographic diversity, is fairly straightforward. It is not just Oakland, though Oakland is spotlighted in the gallery. We are also looking at surrounding areas, whether that is Richmond or Berkeley or San Leandro or San Rafael. We are trying to make sure that we are not concentrated all in one area.

We are also targeting organizations recommended by our project partners and advisors, and encourage you to make those recommendations. Amy talked about seeking out the potential for long-term relationships. We don't just want the involvement limited to the renovation, we want to take that further, whether that means programming outside the museum, or organizations coming into the museum. We are not seeking their participation in only providing content or only contributing to one particular exhibit.

And finally, we are seeking organizations with reach, visibility and credibility. What we are talking about there is organizations that perhaps are already well-known in the community, that reach into other organizations, that possibly serve as something like a clearing house. In other words, they are one organization, but they know fourteen other organizations they can put us in contact with.

ROUND TWO Q & A

Long-Term Relationships

- According to what Amy was saying, some of these partnerships are going to be based on long-term relationships. The question I have is, once the exhibit is open, what is it that you are going to be doing long-term for which you would need or want to have partners? What are the activities you see that relate to this gallery that go on beyond the opening? • Scott Sampson
- The cocreation pieces and the community input pieces in our gallery are going to be changing from here on out, so the gallery will be open, but it will be constantly changing. Over what kind of timeline I have no idea, but the idea is that we will invite new organizations in to create new exhibits or be present in some way. In the long term, I can't say what our role as a museum will be, but we can serve the community in many different ways. We serve as a venue for many organizations for small and large events, including

the Day of the Dead event and exhibit, so in terms of true programming the sky is the limit. It is the changing exhibition that poses a challenge. Those are the kinds of relationships we can have in the long-term. • Amy Billstrom

- You have this long list of organizations. What can they do for you other than the cocreation piece? • Scott Sampson
- We are going to have more than one cocreation piece in the gallery. They are going to help us revision how we communicate with visitors about environmental science. • Amy Billstrom
- So over the long term, are you envisioning new ways of working with the community and actually having them see the Oakland Museum as partly their home, so that they will have stuff that goes on here rather than some other place? Are you looking at this as a locus of attention for community events? • Doris Ash
- That is one aspect, yes. We also see their involvement in ways that you were able to see in the History Gallery with “Forces of Change” [1960s boxes] and “Before the Other People Came” [Native American section]. The idea is that when people come, they will also see themselves. They will see their stories, they will get the natural science and the environment and the issues that we are

facing, but they will also see the kid in West Oakland who decided there was a need to provide healthy food to the neighborhood that has branched out and now involves a lot of other people. There are many different ways you can take that story. It could be a social issue, it could be an economic issue, it could be an environmental issue, but other kids who come here will see that and think, oh, that’s something I can do. So it is not only continuing programming with these organizations, it is also the stories they can tell and having personal stories in the gallery, and working with us to cocreate exhibitry. • Dorothea Crosbie-Taylor

SIX PLACES PRIMARY CRITERIA

Rebekah Berkov, Natural Sciences School Program Coordinator, OMCA

If you look at the criteria for the six places, you’ll see that they’re similar to the local criteria. We are going to look for individuals and organizations in each place who are gatekeepers, so to speak, with a strong connection to that place.

One criterion I want to touch on briefly is that we want them to have a diversity of perspectives about that place. That’s going to include the work relationships, a subject that was brought up earlier, as well as spiritual relationships, recreational relationships, conservation, and research perspectives. We really want to include a diversity of voices and stories.

Six Places Primary Criteria for Partnerships and Collaborations

Cordell Bank, Sutter Buttes, Shasta, Yosemite, Tehachapi, Palm Desert

1. Individuals/organizations that have a strong connection to the place and/or are “of” the place.
2. Organizations that provide a diversity of perspectives, including but not limited to: conservation/protection, academic/science research, aesthetic, economic, spiritual, recreational, nature-as-not-separate.
3. Organizations or a mix of organizations that match the current and future demographic complexity of that place and California.
4. Organizations that have been recommended by our project partners and advisors.
5. Organizations with reach, visibility, credibility with the community. Specifically looking for leaders/representatives/men-tors/cultural translators of that community and place.

Beginning Relationships

- In Sutter Butte we've talked to the Middle Mountain Foundation people and several of the private land holders who are around the circle, as well as the local museums.

We've gone down to Palm Desert and talked to people at the Cahuilla Cultural Center; the Coachella Valley Preserve, a privately owned and operated preserve that incorporates land owned by fourteen different groups; the Living Desert Museum, which does a lot of public outreach and desert observation; and people in the UC Deep Canyon Preserve doing desert research. • Douglas Long, Mary Jo Sutton

We are also looking for organizations that match current and future demographics of the place and of California. The Institute for the Future of Museums put out an article on a fascinating study about who is going to visit museums in the 21st century. It's a seven-year-old, multiethnic student. That was huge in terms of helping me understand what we need our impact to be in the future, who we need to cater to, and who is going to be our largest audience. That is not the only study out there, but it was particularly fascinating.

Then, of course, recommendations from you guys and from other advisors are always welcome. And lastly, we are looking for organizations with reach, visibility and credibility within the community because you can't just go into the community and say, "Hi, we're the Oakland Museum, come and work with us." We need to identify the gatekeepers within the community, the cultural translators who can help us find a common language, the mentors who can help us foster relationships with students and teachers.

We are just beginning these relationships and I personally haven't been involved in going to these six places yet, but there are a few people we have met and begun relationships with already.

The last thing I want to mention is that we are really looking to our advisory councils here at the museum. We have long-term relationships with them. We are talking to the Native American Advisory Council to identify whom we

should be talking to in each of these places to get the Native perspective.

PARTNERSHIPS: THE EDGY ASPECT AND THE BEGINNING PROCESS

Suzanne Pegas,
Natural Sciences Program Coordinator, OMCA

Earlier someone was asking about what was going to be edgy. I think a partial answer about what is edgy is this whole partnership aspect of the gallery and sharing the message. We got money from NSF because we said we know the problems that we are facing as a world right now are larger than can be dealt with just by experts. We need to introduce community voices and grapple with this stuff together. So I think this is the answer to edgy.

You received a list of local environmental groups and organizations as a hand-out, and we are going to be hosting an open house next week for potential Oakland partners. We have a lot of goals, but this is the way we've decided to start this process. We want organizations in Oakland to know what we are doing, that we want to share the message, that we don't have the whole answer, and that Oakland is a big part of the gallery. We want to share our ideas so far, and we really want to learn about the priorities and passions of these organizations in Oakland. The ones that we have primarily chosen to invite are those that can, as Amy has said, fill in the gaps in areas where we don't have expertise or advisors already.

One example of things we have done in the past that have been effective is Youth Radio. The museum has launched a partnership with Youth Radio, and Youth Radio was involved in cocreation of an exhibition called *Cool Re-mixed*, which went along with the travelling exhibit, *Birth of the Cool*. It was youth interpreting what is cool in the present day. We have an ongoing partnership with them and I have a fantasy that we will dispatch reporters to these seven places, including Oakland, and that will be part of the story, an interpretation from Oakland youth about these places. It could happen.

We are going to bring these Oakland organizations to this community event and we are going to share a very little bit of what we have shared with you. It is going to be more about getting to know people and engaging in activities that are going to help us get to know their priorities and passions and their identification of the critical issues in the physical and natural environment in Oakland. What has to be in this Oakland section? That is the minimal contribution, what we can learn from them. We are also going to be putting our feelers out to see who is a good match for us, who we can work with in a deeper relationship, who has the time to work with us, who we get on with nicely, and things like that.

Hopefully it is a quick way to start a buzz and provoke the reaction, “Oh, the Oakland Museum is doing this thing, I’d better tell them about this thing that is happening.” We hope to

start this pipeline of information coming in. We are also hoping for new approaches, new ways to frame things and to hold attention in view of these many different realities we have been talking about. After this event we are hoping that organizations will know more about our goals and that we will know way more about what they are up to, and that some organizations will emerge as a good fit for reciprocal relationships.

Ongoing conversations will be part of a Web presence that we hope to set up. We got some advice from Nina Simon about how to continue to engage people. Hopefully they will pass on the word about checking out this interesting Web site that the Oakland Museum has that is asking us about the most critical issues in Oakland. And we will start having conversations that may develop into these deeper partnerships.

ROUND THREE Q & A

What Will the Museum Offer These Communities?

- What is it that you are going to be doing for these seven communities? What are you going to be giving them? To me, that in part determines with whom you are going to partner. What is your long-term commitment to these communities? • Scott Sampson
- That’s what we are going to find out in these conversations. We know what we can give

Pie in the Sky with a Practical Side

- Before we have questions, I just want to add that we are aware of what a crazy idea this is, looking at the magnitude of these seven places. We also have experience in keeping it practical and knowing just how many relationships we can develop and sustain. We are currently at a pie-in-the-sky stage because we are not going to edit any opportunities yet, but we know what we can handle. • Amy Billstrom

Missing: National Park Service

- One of the organizations that seems to be glaringly absent is the National Park Service. Not only is Yosemite one of your places, but they have such a wealth of information about natural science and about communities. They have such a presence here in the Bay Area, and I work with a lot of people throughout the Park Service, which is why I’m thinking they would be really useful. • Carolyn Finney
- We just haven’t gotten around to expanding that list yet, but this is the kind of thing we need to hear from you. • Amy Billstrom

Pie in the Sky: Partnering with CSU to Take Urban Youth Outdoors to These Hotspots

- This is another pie-in-the-sky idea, but at this point everything is on the table. I started to think about some of the old work that I do that tries to look at the interface of field trips for urban youth, science education, and involving the California State University system. That system has twenty-two campuses and I would bet that there is one within ten to thirty miles of each of these places, such as Humboldt State for Shasta. In thinking long-term and planning ahead, you want to think about ways to engage your community partners and youth in the Bay Area through the museum to these places. There would be really great opportunities to partner with universities. There are so many things themes that are at the top of funders lists, and not just the National Science Foundation but even within the state, to get youth outdoors. If you can center it around the hotspots, with the intent of bringing youth to these places, there is an enormous amount of things you could build on there. I definitely know folks within the geoscience and environmental science departments at CSU you could talk to. • Lisa White

them right now, but they may have some ideas of their own. • Amy Billstrom

- That's part of the conversation: How do our missions overlap? That's part of our criteria, we're not just looking at our goals and what they can do for us and that's it, it's definitely a reciprocal relationship. We are trying to be as open as possible, which is a hard thing to do. • Suzanne Pegas
- For instance, the *Days of the Dead* exhibit and festival came about from the advisory committee, but part of the need was that the folks on the original advisory committee wanted to educate their own community about this tradition. That was one of the major goals. The folks from the community came and said, "We want to reach our own people and we need a place to do it and support on how we do it," and a decision was made to do an exhibition and a festival. The reason we are holding this year's festival on October 23 instead of November 1 or 2 is in order to help folks learn about the traditions and have time to assemble their own materials at home. The advisory council was committed to recognizing that Days of the Dead can be a very private celebration within a family at your own place, whether that's in a cemetery or at home. That is why we have always held our festival a week or two before the actual date. So that's one example. • Amy Billstrom

- But take a place like Tehachapi. • Scott Sampson

- Building on what they've said, we are not going to say what we are going to give them, we are going to ask them what they want, what they need. • Kathleen McLean
- It's a question we all have, we just don't know the answers yet. • Amy Billstrom
- So those conversations haven't happened yet? • Scott Sampson
- We've started some conversations. • Amy Billstrom
- It's like meeting someone and saying, "Hi, here's what we do. Want to go out on a date? Where would you like to go?" • Kathleen McLean
- "Here's what I bring to the relationship, are you interested?" • Amy Billstrom

Cordell Bank: The Opportunity to Engage New Communities

- Cordell Bank National Marine Sanctuary is one of these partnerships, and we came to the museum because we have funds that we want to contribute, but we see the benefits in terms of reaching an audience we totally do not reach in terms of making a connection to the ocean. So when I'm hearing a lot of

what you are saying about partnerships I am thinking, that's exactly what we are doing. We are bringing funds to it, but it's because the opportunity to reach the communities that you reach is really valuable to us. I'm imagining that some of the other places might view this that way as well, as an opportunity to expose another huge audience to their place that they have stewardship over.

I view that as a long-term relationship as well in terms of going way beyond the exhibit. When the exhibit is done and built, great, but from my perspective, I anticipate our partnership going far beyond that to ongoing connections through programming and school programs and whatnot. • Jennifer Stock

Awarding Satellite Center Status to Partners in These Seven Places

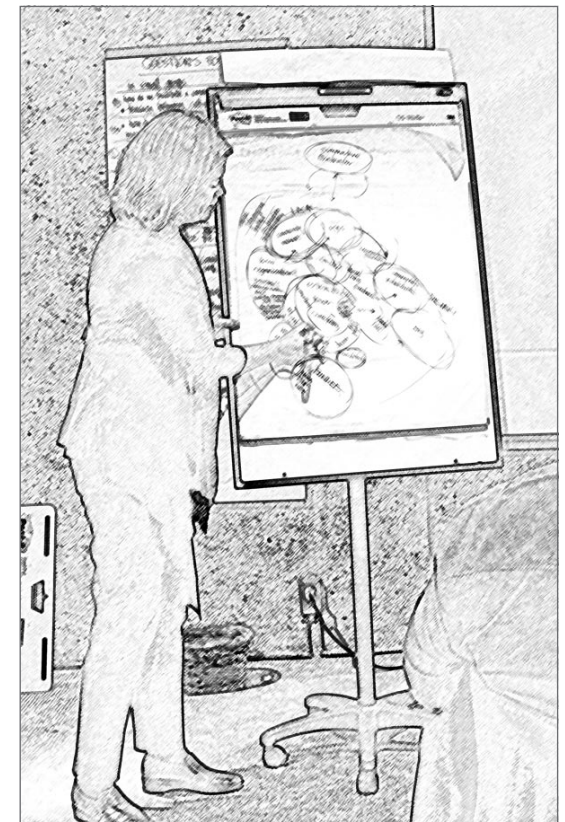
- Following up on Scott's question about what you are giving to these communities, I can envision satellite centers in all of these

seven places, including Oakland. What would that kind of satellite relationship look like? Are you in constant contact with Tehachapi? Who are the movers and shakers, and what will you need to do to have that constant connection with them and to nurture that?

That is a really big reach. People would really be impressed by that—"We are the satellite partner of the Oakland Museum"—or whatever you want to call it. They would all feel like they belong here. It's that sense of belongingness, writ large, and there's no reason you can't do that. Then you are providing something, you are giving something. You are giving them the notoriety and the PR that they would never get otherwise. • Doris Ash

- Bringing us back down to earth, I'm wondering whether that notoriety and PR is at all of interest to the private land owners around Sutter Buttes. You may have a little bit of a different situation there than you have with these other places. • Stephen R. Beissinger

Amy Billstrom with partnership bubble diagram



The Seven Places

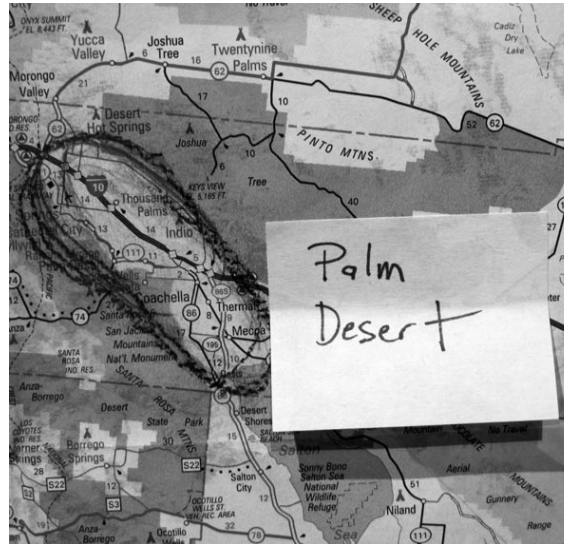
Advisors separated into seven groups, each group focusing on one of the seven places currently highlighted in the project design. OMCA staff members served as facilitators and participants in these groups.

Palm Desert Group Members:
Kirk Johnson, Richard Bugbee, Amy Billstrom,

Palm Desert group



PALM DESERT



- Palm Desert has ringtails, rattlesnakes, wind turbines, Mexicans, Cahuilla Indians, casinos, snowbirds. The palms are in oases and along faults. At Mount San Jacinto there's an elevational gradient story. Richard told us that "Takwish" is the name for ball lightning that can be seen over the mountain sometimes. And if you get bit by a rattlesnake someone should sing you a song that gets slower and slower and slower so that your heartbeat gets slower and slower. • Kirk Johnson
- Takwish Peak is almost equivalent to Shasta in terms of its sacredness, at least to the Cahuilla people. "Takwish" is the Native

American name for Mount San Jacinto.

• Richard Bugbee

- There's also the extension of the whole Gulf of California up into that area. This was an area we had a hard time drawing a circle around. It was definitely one of those areas where you have questions about what you choose as your region. And there's the Salton Sea, and Lake Cahuilla, which used to occupy the basin in the Pleistocene era. • Anon.
- You can see the old shoreline of the lake still at the base of the mountains, the calcium deposits or whatever that is, and all of the old Indian villages are outside that marking. There are no Indian villages inside where the lake used to be. • Richard Bugbee
- Lake Cahuilla was seen by De Anza when he came through. It was a freshwater lake and at that time it was still contracting. In the 4,000 years before that there is evidence, from these fish traps made from rocks that extend further and further out, that in relatively recent historical times it was a pretty big freshwater lake. • Douglas Long

TEHACHAPI

- Because it's an area that's not known to many people, there needed to be a way to profile this as a way for people to get grounded in familiarity. We were talking about using geology and it's unique characteristics as a transverse range running east-west, which differs from the majority of ranges in California that run north-south. That could be a unique identifier. Geology would be a major foundation for understanding the biological communities, and those biological communities are part of much larger ecoregions.

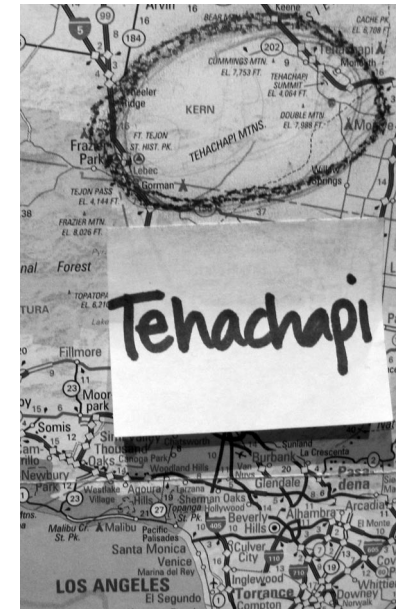
So by looking at geology, tectonics, ecoregions, vegetation, communities, you can go, as Christopher said, all the way from geology to policy, looking at this whole gradient all the way from the bedrock to current political issues.

Another conversation was about the fact that this is a collision of these major ecoregions. It's not necessarily about the boundaries between these ecoregions, but the fact that at these boundaries there is a lot of mixing, so there are chunks of adjacent habitats that are now melded within one another. It is now an opportunity for new ecological relationships between different species and between plants on new sediments, more or less setting up evolutionary scenarios that are relatively new that could perhaps lead to the evolution of new organisms in the future.

It is changing the evolutionary dynamics of what had been these ecoregions. You have this ecotone, which is now a mega-ecotone, and rather than two habitats coming together in a relatively small area, habitats are coming together along boundaries that are hundreds of miles. So it is a relatively new and diverse and active playing field for the evolution of organisms in California.

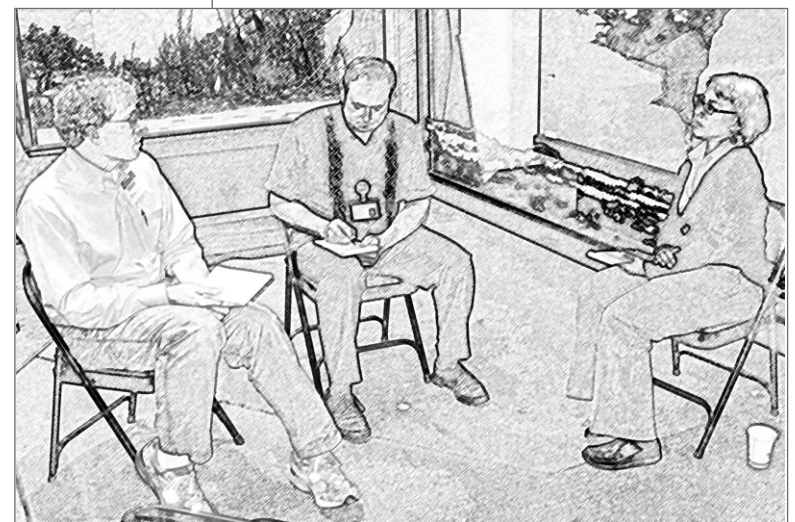
If you look at what are called the “physiographic provinces” of these major regions that are coming together and compare that with what is going on in other states, you would see that what is happening in Tehachapi is special. Within that area are five major biogeographic realms that re in collision or in some cases even overlap and are in fusion with one another. As Christopher pointed out, that is a very important thing that you don't see happening on that scale in many other places in the U.S. When people think about their sense of place or that their place is special, we are able to show how California is special on a superlative order of magnitude.

Lisa was also talking about how the geology and the topography of the area now creates very interesting and unique weather and climatic conditions, and



Tehachapi Group Members:
Douglas Long, Lisa White, Christopher Cogan

Tehachapi group



Why Choose Tehachapi?

- Why was this place chosen with its intersection of habitats, as opposed to something like the Mediterranean coastal system? This seems so complex to interpret. I'm just wondering what the logic was. • Scott Sampson
- This does have some part of the Mediterranean ecosystem to it. Part of it was trying to search for a place that represents Southern California to some degree. It also encompasses some of the dioramas that we have. But it was really these light bulbs that went off when I was on I-5 and stopped in a place where, literally, for a hundred yards in each direction I could see California sage scrub and manzanita chaparral; there was valley oak and grass savannah; there were little fragments of Great Basin sagebrush and Joshua trees from the western Mojave. All of those very different, very diverse plant communities were literally within the distance I could chuck a rock. It was just amazing. And then Mary Jo came back from a trip and said, "I just went through the Tehachapis and you wouldn't believe what I saw," and started naming off these different plant communities that were interwoven with one another. • Douglas Long
- Are those things recognizable enough to a guy like me that I would look around and go, whoa, these look like plants that come from different places? • Scott Sampson
- Yes, absolutely. • Christopher Cogan
- Maybe—most people don't get plants. • Mary Jo Sutton

this is one of the places where you can show extremes in the range of climate, both daily and seasonally, and also the differences in climate from the western side to the eastern side. This is also a good place to show seasonality in California. In the Central Valley you can see extremes in the green right after the winter rains and the blooming of the wildflowers, and then the dying and drying out of the grasses, whereas if you look on the Mojave side, you see very little differentiation in seasons.

There was also talk about the condor story in this area. This is a historical breeding and foraging area for the condors, and this is the place that condors that have been released are going back to for a variety of reasons. One is because it is a large, contiguous, relatively uninterrupted area for foraging. More importantly, however, the topography and the climate, particularly the winds, afford what are basically freeways or rivers of wind that the condors are able to use to cross very large regions.

That brought up a couple of interesting things. One is, can we show this area on a level of scale, say from the view of a condor that is flying hundreds of miles a day, to something like a kangaroo rat with a home range that might be just a matter of tens of yards? In looking at a habitat, different organisms will have different relationships with that habitat on a variety of scales.

There was also talk about maybe depict-

ing the variations in these regions by having some sort of drive-through video. You could take a transect from one of the roads going from west to east and have a video camera mounted on top of the car. You could then speed that up, so you could have maybe an hour-long drive shortened into a five-minute video, going through extremes of habitats and illustrating just how diverse these habitats are as you're moving from one area to the other.

The condor discussion also led into a conversation about conservation issues. One of the reasons that the condor is there, of course, is because of the prevailing winds that allow them to migrate through and forage. But this is also an area where people are going to be setting up green energy turbines, and they will be putting these turbines up in the path of the California condor.

This led to other discussions about conscientious land use. The current owners of the Tejon Ranch, which is a holding of 270,000 acres covering a majority of this area, want to develop on some of the most ecologically critical and sensitive habitats in that entire region. How can science influence policy and policy influence conservation and conservation influence the future of this area?

Lastly, we talked about these very important wilderness corridors connecting these various bioregions. There was also talk about ways of depicting these regions. A good way might be to have a topographical map showing the

terrain, which you can't really depict in a two-dimensional photograph. With a three-dimensional model you'd be able to show just how varied this place is. • Douglas Long

- If there were any way to enhance the exhibit through visual displays, we thought a relief map would be important, even a new school one that's video or experiential. • Lisa White
- I wonder if you could benefit from a useful analogy like immigration, where different zones and people come in and these overlap zones are very, very rich, like where we are right now at the edge of Chinatown and Lake Merritt, so people could have a grasp of these mixing zones and what's rich about this. • Doris Ash

YOSEMITE

- We talked about Yosemite as a place and how, as a place, it feels very iconic, and about some of the weight that it carries as an icon. For Norman it feels very close to nature and might represent that as a place. The fact that it is iconic means that in some ways it carries the weight for mountain ranges in general.

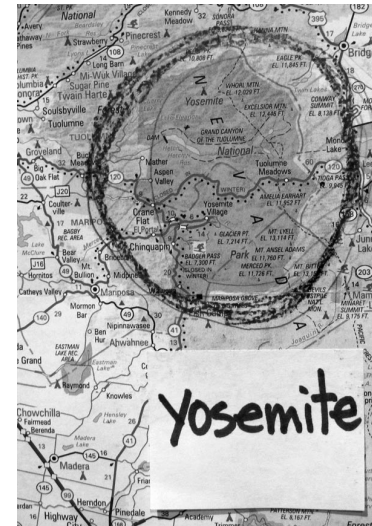
Carolyn was very interested in bringing out some of the people stories in Yosemite, in particular the Buffalo Soldiers story.

We also talked about climate change and Yosemite, the place, as a venue for climate

change stories. The Grinnell Survey and the resurvey came up of course, and the opportunities that they present for showing research that has been done on change over time.

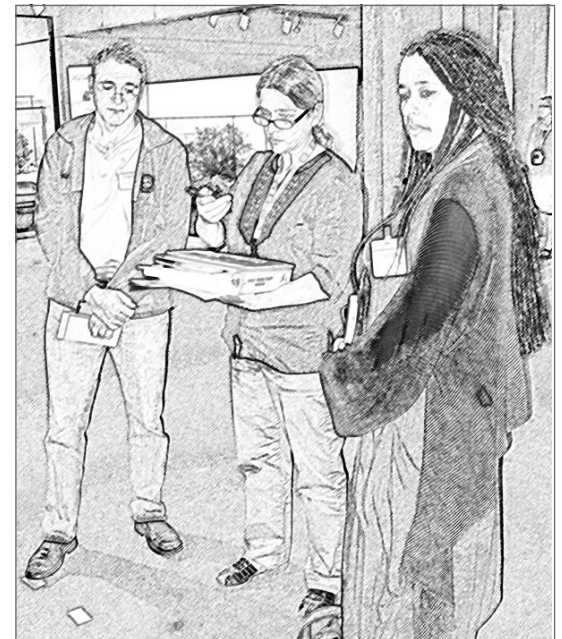
Norman had some specific stories that we might be able to draw out in cases. To me they feel like they will always be the same essentially, and they will be related to climate change timing, snow melt change, river flow, elevation within the space, and where these plants and animals go as these situations change. • Lindsay Dixon

- In terms of the stories (and Norm felt this as well), when the national parks were created it was about creating a sense of American identity, so the story of this place is a way to connect to a larger story of this country. • Carolyn Finney
- When I think of Yosemite I think of John Muir and of Roosevelt, standing on top looking out. I think of the 1950s tourists in their plaid, baggy shorts, looking up and trying to figure out what's up there. And I think of those looking out from the top, seeing all of the mountains and the connectedness, and people looking up from the bottom, who can observe only a piece of it from a different perspective altogether. What we want to try to do is provide the two of those connections of perception of the grandness of this icon, which is internationally known as a unique slice. • Norman Miller



Yosemite Group Members:
Lindsay Dixon, Norman Miller, Carolyn Finney

Yosemite group



- When I think of Yosemite I think of Julia Parker. She has been weaving baskets in Yosemite for probably fifty years, and she knows everything about Yosemite. She's a wonderful lady. She has woven baskets for the Queen of England. She's a very talented lady and basket weaver and story teller. You might want to contact her. She works for the National Parks Service as the tribal liaison. She is actually Pomo, but she married into the Miwok and she weaves Miwok baskets.
• Richard Bugbee

Missing: Indian Land Relationship

- I see Yosemite as underused. We are not allowed to gather there anymore and that was part of the ecosystem. That was what I thought was missing about everything here. It's called "Indian land management," but I always call it "Indian land relationships." This is something that has happened for thousands and thousands of years, and for the last couple of hundred years the relationship with the plants has been severed, and it's like the plants don't know what to do and they go crazy. There are a lot more trees in Yosemite than there ever were. That's the first thing the old people say: "There didn't used to be this many trees."

What has happened is, everything is crowding up because nothing is being gathered. I can see the tourists overrunning it, but the people that used to gather for thousands of years are not allowed to do that anymore. There is no such thing as "wilderness" to an Indian. • Richard Bugbee

- This is one of the things we tapped into. For me it is the fact that there were people before in all of the natural sites you've identified here. At what point are you deciding you're not going to talk about any of the people who were here before? At some point you have to decide what you're going to do about that. • Carolyn Finney
- Another thing, when talking about land management, is that California Indian basket weavers work a lot with Northern California basket weavers, burning areas to get materials to make their baskets, working with the Forest Service. • Richard Bugbee
- Louise Pubols, the Chief Curator of History, talks about seeing a National Park Service plaque with a quote from a Native woman who said that Yosemite had become really messy because it hadn't been tended properly.
• Kathleen McLean

- When I think of Yosemite, I think of the traffic jams on the valley floor. I think of the overuse by tourists as being just a small part of Yosemite. Everyone will know the pictures from that small little part of Yosemite, but the rest of Yosemite is untouched. • Stephen R. Beissinger
- The 1950s parking lot picture was the most striking example of how we approach our national beauty. • Norman Miller

OAKLAND

- In a lot of ways this was an extension of the community voice discussion. One of the things I thought was really interesting was the idea of strong identification with neighborhoods and bringing that out. When people say they're from Oakland the next question is, "What neighborhood are you from?"
• Tisha Carper Long
- We were trying to orient folks who weren't from Oakland and figure out how we were going to tell the story. We talked about whether other people feel it's safe to come, about who is coming to the museum, and what the museum is bringing out to Oakland and California. So do people feel it's safe to come here? Who comes here and why? There was some sense about who could be coming here, and weaving that with what is happening and changing here and/or what is surprising in the habitat. It was both about how

we are interpreting Oakland, and how we are trying to communicate to others what is most important about Oakland to folks from Oakland.

We were also trying to get feedback from the people in this group about the event we are going to have next week, and ended up veering a bit more towards that. Our angle was more the human angle than the natural environment in Oakland because there was the sense that what is there right now in the exhibit isn't the people's Oakland, and there isn't a lot that is going to resonate. So a lot of the focus was on what we are going to ask the people coming to this event next week.

• Suzanne Pegas

- We had a lot of discussion about how much of what we already have here is “push” content, versus leaving space for the visitor to sort of be in that Oakland section. So a lot of our conversation was about that idea. We touched on issues of people having an identity and potentially, because of visitor demographics at the museum, maybe there is a strong sense of Oakland identity that you might want to be thinking about. We had a list of question that I think are possibilities for next time, or they are at least jumping off points for other kinds of questions.

• Cecilia Garibay

- I was talking earlier about a program in D.C. that is called Second Nature. This relates to one way in which to highlight the rela-

tionship between the people piece (which seems kind of overwhelming in Oakland compared to the natural environment) and the natural environment. The National Park Service formed a relationship this summer with a Latino organization that works with African-American and Latino teenagers on art and music. They took them to one of the national parks in D.C.—there are eleven or twelve of them—and then they did murals and they did slam poetry on climate change and on their experience in thinking about the environment, which was really powerful. They were fourteen and fifteen years old and talented and had their own ways of thinking about things.

Imagine something like that, where you could have some of that poetry up next to some of the changing natural environment in a way that I think would invite a lot of Oakland residents to think that they might have a relationship with the natural environment. A lot of these teenagers hadn't thought about the natural environment at all before, and now they are



Oakland Group Members:

Tisha Carper Long, Suzanne Pegas, Doris Ash, Cecilia Garibay, Dorothea Crosbie-Taylor (with input from Carolyn Finney)

Oakland group



A Hybrid Approach: Science and Community Stories

- One of the things that has informed my thinking recently is a book called *Museums and Communities*. It has a chapter about the Chinatown History Museum in New York and about having a dialogue with the community and telling the story from the community's points of view, so alongside the academic account you have the story of the Chinese diaspora to New York told from the point of view of a laundry worker, for example. Apparently it was quite successful. I look at it as a hybrid version. You have what the museum wants and the intentions of the historians, who want their story told, and then you have what the community wants.

We don't know what the community wants, do we? We know that neighborhoods are probably important, and maybe the firestorm is important. So we have some ideas and can make something in the middle, a little bit of both, so that one can learn from the other. That's a hard task, but I think that the Chinatown History Museum did that. • Doris Ash

- I think the big difference is that that museum is about people's histories. That's where we get a little tripped up. We've got some other thing going on here that is not exactly parallel. But the issue that you raised is a good one. • Kathleen McLean

writing music about it and painting about it and having very different kinds of relationships. It was a very powerful program.

• Carolyn Finney

- One of the things we discussed was how you convey the natural sciences in these fragmented environments in Oakland in such a densely populated area. I live in the Temescal and for years I had no idea why my street was wider than other streets in the area. The train tracks used to run down that street and before that, Native Americans lived in that area. That was in my neighborhood and I had no idea about that. • Dorothea Crosbie-Taylor
- And why is it called "Temescal," which means "sweat lodge"? There used to be a sweat lodge there. • Christopher Richard
- Yes, "temescal" means "sweat lodge," I think in Aztec. It's from some language in Mexico. • Richard Bugbee
- One of the things that strikes me about California is that it has got so many invasive species. But if you didn't know which were the invasive species you wouldn't realize that. You might want to bring that out. And who is to say what is native and what is not? • Kirk Johnson
- Has anyone thought about incorporating the effect of the Oakland firestorm and the eucalyptus as part of that? • Norman Miller

- There are two things that I think would be interesting to juxtapose with Oakland. Of course, Oakland sits on the biggest estuary on the West Coast, so hopefully the whole bay issue can come in here. Then there are the oak trees, but there is also the reforestation attempt underway in Oakland with the Urban Releaf efforts and other groups that I think fit part of that interesting oak story. • Stephen R. Beissinger
- But there is apparently not a single native species on the approved list of street trees. • Christopher Richard
- Because they can't live in these environments very well. • Stephen R. Beissinger

CORDELL BANK

- We got so excited about Cordell, but we really struggled with the parameters. How do we define them? There are so many opportunities to describe the diverse habitats that are in the ocean, that are off the California coastline, and yet Cordell Bank is such a unique gem. And Cordell hasn't been highlighted or interpreted, other than a very small piece at the Bear Valley Visitor Center. We got excited about the opportunity to highlight something that is unknown, a place that most people won't ever visit. There is the intrigue and the mystique and the challenge of trying to interpret something that is abstract and out in the middle of the ocean.

Scott brought up the idea of starting at Point Reyes and having the beach serve as the interface for the visitor, since it is a place that many people have visited, and then making this transect that goes all the way out to Cordell Bank. We were all on board with that.

Jenny talked about this fabulous new high-definition footage that was just obtained, and talked about her preference for using real footage rather than animation to depict Cordell Bank, and we were all on board with that as well. We thought about the Pixar screen experience, that final twenty minutes or so, and whether there would be a way to show this fabulous, hi-def footage of Cordell, and feature Cordell as this amazing place of high productivity that brings animals and organisms from whale lice to the whale itself, and show the magnitude of scale of organisms that this place can support.

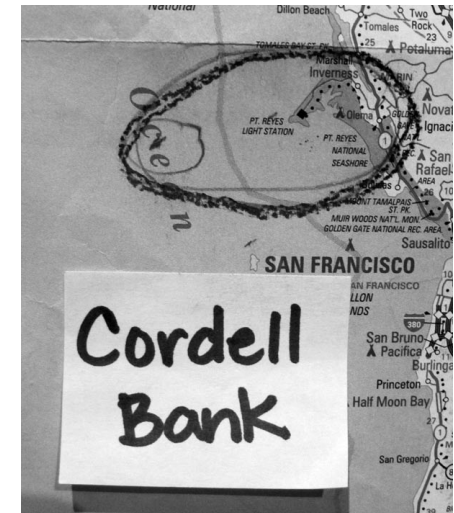
There are lots of opportunities for exploring conservation messages, from the story about the Cordell area being a Naval waste dump to the “Albatrocity” stories. There is also a lot of room for exploring affect that this place can create. • Rebekah Berkov

- A quick correction: that Naval waste dump was at the Farallones, it’s not a Cordell story. • Jennifer Stock
- There is the evolution story potential as well as geology and geography and how those

might come in here in a different way than in some of these other locations. Because it is such a productive place you can get into those stories from a different angle. For example, there is the fact that in Cordell there are the same rocks as at Yosemite. There are a lot of connections you can make that can give that sense of place a little bit more context, context that a visitor who might not have so much of a relation to the ocean might not originally bring to it. • Lauren Palumbi

- Scott brought up the opportunity to talk about evolution and adaptation and stratification of the different fish and how they adapt to particular niches. That could be a good story for this area.

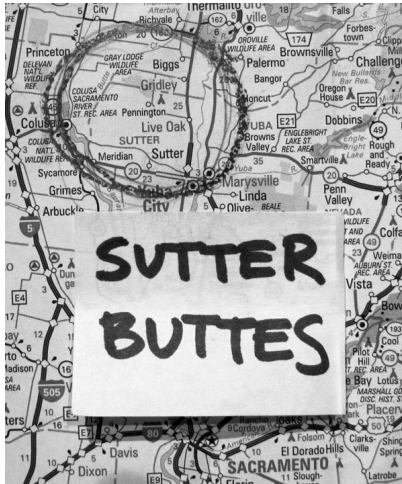
Lastly, I wanted to plug the connection between Oakland and the estuary and the streams and the bay and the ocean, and then the conservation messages. For example, we produce around eighty percent of the plastics that go out to the ocean. It is plastic that we have



Cordell Bank Group Members:
Rebekah Berkov, Lauren Palumbi, Carson Bell,
Scott Sampson, Jennifer Stock

Cordell Bank group





Sutter Buttes Group Members:
Mary Jo Sutton, Stephen Beissinger

Sutter Buttes duo



discarded as part of our disposable culture. We can bring these conservation messages home to visitors in an interactive, concrete way. • Rebekah Berkov

SUTTER BUTTES

- Maybe what made our group so small is that this is a very unknown place and no one had ever heard of it. It is a place that Stephen has wanted to go to but has never been. It has an aura of mystery, especially for those who are biologists or know about the natural world. The line you will hear people say is, “I’ve driven by it a million times and I’ve never been there,” and in fact, that is one of the things that Steve said.

I have been there a couple of times and have talked to people there. People talk about it as this line on the horizon, but it’s really a circle. It’s this kind of ring around all of these mountains. It’s a very atypical, anonymous place for the Central Valley.

We talked about how far our identification of place should extend. Is it just the peak of it, or does it go down to the watershed where it hits the Feather River and the Sacramento River? We both felt that should be included. It does have a north side that is more wet, it has wild fowl preserves, and it is surrounded by farmland. There is a ring of privately held land with a tiny little donut hole in the center that the state now owns.

Steve talked about the farmers and about

the people that he works with who are in the flatlands, who are now really managers of that land. What would they think if their place suddenly became this famous place? Would they like that or not? We should talk to them and ask them that. Some would think it was great and others would be really pissed off about it. The land holders are really the stewards and guardians of that place.

We talked a little bit about the physicality of the place really being like a ring. I said I keep thinking of it like this castle and the landowners are like this moat. There is access, but it is like a gate that can come down and that gate can go back up. We just have to be really sensitive about what people think about our project. I have talked to a couple of people there who are involved with the Middle Mountain Foundation, and they are kind of ecstatic that this place would get publicity because it has been very difficult to generate enough support to preserve that place. It’s hard to own the property and take care of it, and they’re at risk for it becoming all housing.

Back to the personal stories, what are the people’s relationships to this place, what are the personal stories? And what has disappeared that has gone extinct? What used to live there, what animals, what plants?

We talked about using *Calflora* (<http://www.calflora.org>), which is an online database, to put together a visual picture of what lives

there in terms of plants, and the important plant communities that are there: the Blue oak community, the wetlands. The story of loss of the wetlands in the Central Valley is huge.

Something Steve said that I thought was really interesting was, as soon as you put a road in there you're going to get trash, you're going to get invasive species, you're going to get degradation of that place. So is there a different kind of model? We talked about Denali in Alaska, where there are no trails. You get escorted in and the only trails there are made by animals. It's a low-density, low-impact model and it's a pretty different kind of idea for a state park.

We also went and looked at the habitat case. There's a rare Tricolored Blackbird in there right now that is very unusual. They nest in these large colonies, but in only a few places, so the places do matter. Once those places become housing, the Tricolored Blackbird is gone. • Mary Jo Sutton

- The only thing we forgot to talk about was the salmon connection in the Central Valley. That can connect to Oakland and that can connect to Cordell Bank. • Stephen R. Beissinger

SHASTA

- At Kathy's suggestion, I was paired with Matt with the idea that I would relate the stories

about Shasta that members of the team have heard a zillion times, and Matt would then parse them down to what he thought we should highlight, so I'll pass the baton to him. • Christopher Richard

- Poor Christopher was dealing with a guy who is a non-Oaklander, non-Californian, non-scientist—just the hardest sell imaginable. All I knew about Shasta was this soda pop brand. And you may laugh, but if you ask anyone where I come from, that's the connection they'd make.

Christopher walked me through some of the interesting hydrological and biological stories there. We really didn't touch on the anthropological or the people-oriented so much, except to say that of course it's a very spiritual place for Native Americans. That has kind of been taken over by various folks practicing various New Age religions, so there's a little tension there in terms of wanting to take it back from the New Age folks.

There are several cool biological stories. The one that I felt was really important is this, and Christopher can stop me if I go really badly awry. The McCloud River comes down, and the power company comes in and they create a dam. And holy cow, this area right here is the southernmost place that these fish, the bull trout, live and they sliced it in half. Well aren't there still two good groups? No, there's not enough genetic diversity



Shasta Group Members:
Matt Matcuk, Christopher Richard

Shasta duo



there and these guys start to suffer and they're going to die.

And then the power company says, "Oh, we're concerned, we'll help. We're going to restock that for the fishermen. We're going to put brook trout in there so you can fish."

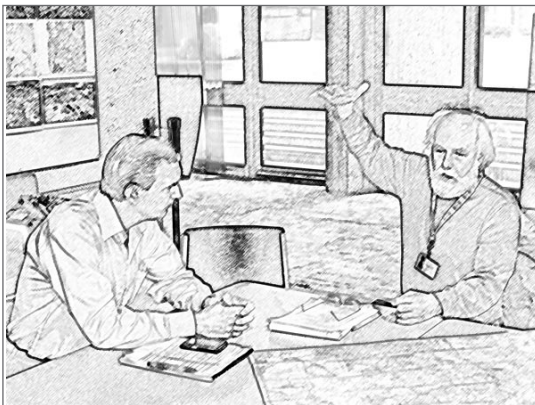
What they didn't count on was that when the brook trout and the bull trout mate, they produce mules that can't reproduce, so you're kind of killing them off in a different way. That's a real cool story about how you can monkey with things and then try to remonkey with them and make them even worse.

As a secondary story, there's a big volcano that doesn't even look like a volcano be-

cause it's a shield volcano, and it's huge. The river where we get our water from here in Oakland starts way up north in Oregon. It turns into the Klamath River and it comes over, and then it hits this shield volcano and it goes underground. It becomes an underground river and it's so big that if there weren't water in it you could drive a semi truck through there. And it's desert up above! There's all this water underground, but it's desert up above.

Then it gets south of that big shield volcano and it pops out in these springs, turns back into a river and comes down to us. Is that cool or what? • Matt Matcuk

Shasta duo discussing really cool stuff



Advisors were treated to a screening depicting a trip through Deep Time in California.

Douglas Long, Natural Sciences Chief Curator, OMCA

This is a thirty-second video animation that was put together based on a series of paleogeographic maps of the western U.S. by Ron Blakey and the University of Arizona. There were forty maps that Carson Bell put together to animate to show the evolution of California. It is actually part of a series of 100 maps and we just got the remainder, so what you see here is a proof of concept, taking those single, static maps and developing something for possible use in the gallery.

When we incorporate 100 maps the animation will be much smoother and because we have the original files, visitors might be able to zoom in to California or manipulate the images in other ways.

This goes back 550 million years and takes us up to the present, and you can see some exciting things. Several times during the animation you'll see island arcs moving over from Asia and slamming against California.

Whoosh!

Wow!

Blam!

We want sound effects!

Whoa!

Reactions to Animation

Cheers, whoops, and exclamations of surprise and delight.

A screenshot from the *Paleogeography of California* proof of concept animation. Map images copyright Ron Blakey and Colorado Plateau Geosystems Inc.



Eliciting Advisor Thoughts on the Habitat Cases

- We thought we might now bring the dialogue around full circle to the gallery and the habitat cases. Given what we've talked about in terms of the project, what is your sense of how we are trying to incorporate those? Keep in mind that you have seen only a few of the habitat cases in the course of this advisor session. You saw a few in there, such as the one with the seal, where we are experimenting with some labels. So what about these habitat cases? • Kathleen McLean

Kathleen McLean



WALK-AROUND CASES

- There is something about a case that you can walk around that makes a different impression to me than one that rests against the wall. I noticed I was responding differently in the day-and-a-half I've been here to the simple way that the cases are in the space or filling the space. I think there's a value when you can see them from all sides because it pulls the observer in more closely to look at what's in the case. • Lisa White

DRAWBACKS TO HABITAT CASES

Unimmersive Albatrosses from Yesteryear

- I have said this before during other visits here. My impression is still strongly that these habitat cases could be an albatross to the project. First of all, most of them are not dioramas; they're not immersive. It would be interesting to know, and maybe you've done this, how fifty people taken off the street randomly would respond to them. My gut reaction is that people are not going to engage with those in ways we might like in terms of sense of place. On the contrary, they'll feel like the museum is outdated, that those are from a yesteryear. Basically, they're from another time period.

I think they could augment new exhibits and do a great job of doing that if you choose specific ones, but to focus around those habitat cases still seems to me like a big risk. I'm concerned about the project as a whole being successful with those as the core. That's my honest take, sorry. • Scott Sampson

Lack of Context

- I have feelings similar to Scott's. Yesterday when we looked at them it felt like the furniture got moved around, but it wasn't a living room yet. I knew all of those pieces. Some of them helped create a larger context and some of them just didn't. Some didn't work for me at all, like the Oakland one, the redwoods. There was no there there. It didn't hang together in a way that made any sense to me. But other ones were a little more contextualized. The first thing I thought yesterday was, get those things out of there. I've softened on that view a little bit. I think there's a mix and match you can do.

This doesn't mean I don't like the redwoods. That's my favorite place in the gallery. It's the only immersion experience out of all of the exhibits and the only place where I feel

like I'm part of something. I just wanted to qualify that. • Doris Ash

USING THE CASES SUCCESSFULLY

As Added Elements with Added Interventions

- I don't want to give the impression that I think that they're all bad. We saw what you guys did with the interventions we saw during the last advisor session. Some of those were really clever and really well done, and I think as added elements they could be phenomenal. But to base the entire gallery around them worries me. I don't see how you can do that and pull it off successfully. That's my concern.

Why? I don't find them engaging for the most part. I think they represent a time period in museums that is gone to some extent. They are not immersive or able to convey that sense of place that you've said is important to this whole project. I think as isolated elements, as teaching elements, they might be effective, but if you base the whole exhibit around them I don't think you'll achieve the goals that you have laid out for yourself.

• Scott Sampson

Quaint Habitat Cases Juxtaposed with New Technology

- I'm not sure that any dioramas really do immersion anymore in this culture, so I'm not sure that I can see them achieving that

goal. These ones certainly are from a different era, a bygone era, but that can be used to your advantage if you can find some ways to work them in quaintly. Maybe even think about some ways to combine new technology with them. As Lisa said, these give you a different kind of interaction than the diorama on the wall that you stare at through the glass, although with some of them you really do have to look around a bit to find the things in there, and there are all kinds of little hidden treasures. So they do push your powers of observation, which aren't pushed very hard in society anymore with everything pushing at us. But they have some baggage that goes with them as well. • Stephen R. Beissinger

Sliding Habitat Cases and Screen-based Media

- I'm just trying to think of examples of how they could be used but still have something screen-based, whether it's 3-D or not. There's a lot of ceiling space. I could imagine some of the smaller ones sliding up out of the way. You walk in and see that case and that's the introduction. You want to know more and the case slides up and away and there's something behind it you can watch and the closing scene is an image of the case and the habitat case slides back down and covers up the screen again. • Christopher Cogan

The Advantage of Choice

- I agree with what Scott has said about the habitat cases. One thing that is important to recognize is that you have a choice. In our museum, our dioramas are fixed and built into the building in a way that to move them would be to actually destroy them. These you could actually move. I'm imagining you could put them elsewhere and them even not being part of the exhibit if you chose.

It's not a question of use it or destroy it. With our dioramas, and with most dioramas, if you chose not to use them you'd have to rip them out and destroy them. • Kirk Johnson

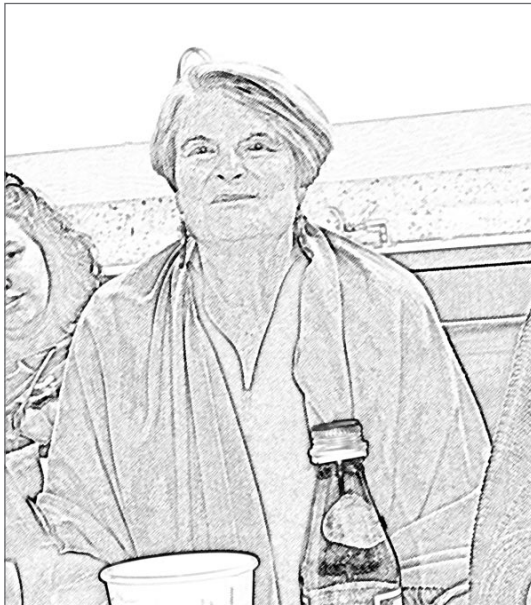
Seven New Immersive Dioramas

- I was not being tongue-in-cheek when I said why not build seven new immersive dioramas. I love the seven places, I love the concept. You've captured the state of California really well. There are lots of ways to do immersion and those cases don't do it. • Kirk Johnson

To What Purpose?

- I don't think the issue is keeping the habitat cases or not keeping them. I think the issue is, to what purpose will they be put? What is the immersive experience you are going for, and will this get in the way or not? My reaction to the little harbor seal in the Oakland exhibit was, "What?" That's not what I think of, even when I want to think about dangers, etc. The activity and the purpose weren't a match there. I think you have to consider that with each exhibit, each one of the seven. How do these cases enhance the exhibit? Maybe some of them will have none, maybe some will have two or three, depending on how it's meant to function. • Doris Ash

Doris Ash



EXAMPLES OF IMMERSIVE DIORAMAS

- Stephen said that dioramas aren't immersive. Have you seen some of the really immersive ones? We have two at our museum that you walk through. There's no glass, there's running water, there's sound, the light changes, you truly are in the space surrounded by the thing. It really is an immersive experience. • Kirk Johnson
- I can imagine that in that case it would be more so. But it's hard to know; society interacts with screens now in such a different way. • Stephen R. Beissinger

ABOUT USING NEW TECHNOLOGY

It's All Stuff Inside a Frame

- What is interesting to me regarding comments about new technology is that long ago when the proposal was being written and I was at NSF talking to program officers there, there was a technology program officer who was young and hip and very smart. She said, "Well you know, dioramas are kind of like the Web or going online because they are these things inside boxes. They don't move like the stuff on a screen, but when you go online you're looking at something with a frame around it as well, and these have a frame around them. Maybe there's something there."

That always stuck with me. I don't know

where I would have taken it, but there is something interesting about that notion of going inside that world that has a frame around it. • Kathleen McLean

UNTANGLING THE DIORAMA ISSUE

The Crux of the Problem?

- Rather than exhibit techniques, there's another issue I'm struggling with. Here you all are, you're deeply into this, you think this is a cool idea, you think it's a really important topic, you have science to contribute to it, you have some processes to contribute to help us make this a really great experience for people. You believe in what we are trying to do, right? I haven't heard anything around the table from advisors last year or this year thinking that we are on the wrong track in terms of what we are trying to do.

So what is the problem with these habitat cases beside saying they're old and from a bygone era? What are you saying we need to get at instead? Are you saying that everybody looks at a screen now and what we need is a lot of screens? • Kathleen McLean

Use of Dioramas at the Heart of the Grant

- What I'm sensing is that you're not wanting to hear what they're saying, that the habitat cases are dusty, boring, old fashioned, not as immersive as they could be, and not doing the trick in terms of your goal statements. But unless I'm mistaken, part of the NSF

grant and part of your goal is that you are going to demonstrate how to use old, dusty, bygone dioramas in a new and exciting way, so the fact that they're old fashioned and from a bygone era is sort of the point. How do you use these things? Museums across the country are dealing with this problem.

• Catherine McEver

Bait and Switch: These Aren't Dioramas

- These are not dioramas. I signed up for this grant with the promise of working on dioramas and this is like a bait and switch. These are a different experience altogether. Dioramas are structured, in a strict, traditional sense, to make you suspend disbelief and be in that place. What you have here aren't dioramas, they don't put you in a place. A diorama is an illusion of a place, not a diagram of a process.

I was truly struck when I first walked into your gallery and thought, this is a different game that is happening now. Regarding Cecilia's work, which I tried to burn through this morning, it's a really interesting situation to think about what dioramas are going to be used for in the future. That's a really important question, but comparing these to those is really an apples and oranges situation. That's really the challenge.

These things could be used in this exhibit, they could have a purpose, but it's not the purpose that was represented. • Kirk Johnson

- And wouldn't solve the problem of other museums across the country who have dioramas.
- Catherine McEver

- Right. And if they don't give you the immersion that you want, that's going to be a factor. • Kirk Johnson

WHAT'S THE EMPHASIS: HUMAN INTERACTION? NATURAL SCIENCE?

- I think you guys have done a fabulous job on the art and history floors, integrating all sorts of things that no other museum has really tackled effectively. You're in a real leadership role in the museum world right now, you've set the bar high. The first two floors, art and history, are really about human endeavors. So another question I have is a question that museums in general are facing now as we enter the 21st century: Is it about something or someone? No question that art and history are for someone and about something.

In the natural sciences, there are some really great questions here that aren't even addressed: the whole John McPhee, *Assembling California* story and how California came to be geologically, the whole geologic time story; the evolution of the biota and the landscapes. The conversations we had this morning were all about taking a very human view. You might end up making another history hall if you're not careful. It could

Kirk Johnson



The Need for Human Presence

- Before we had the NSF grant, people who were invited to come here and give their input said, "There are no humans, this is like a static fantasy land out there." That was one of the first things we got. I'm going to put that as the second elephant in the room. If there isn't human presence, we're not working it, and if there is human presence are we repeating the other galleries? I think we're someplace in between those because without the presence of humans, we aren't going to meet our goals.

• Suzanne Pegas

Telling Side-by-Side Human-Science Stories

- We have conversations and they revolve around stuff. That's what we do, we curate stuff. I want to get away from stuff for a moment. The seven stories that you want to tell should be some kind of hybrid, some kind of mashup between the natural history story and the human story, and it doesn't have to be the same with each one. How that story gets told will guide whether you put that seal in there or not because it will be relevant or not.
- So I think you have to have this individual vision for each one of the seven places. God knows you have enough ideas for each exhibit. Think of it as how, side-by-side, you can tell the human story and the science story, never giving short shrift to either one. The Venn diagram where the circles overlap is where you want your selection process to focus. It's a different way of looking at it, but I think it could be very useful. • Doris Ash

be so much about the human interaction with these places that it's just history part two and not natural science at all. • Kirk Johnson

- Which is why I think Douglas brought up the question earlier, how do we make sure there's enough? • Kathleen McLean
- You're so good at the human interaction stuff and you've sharpened your tool twice in the two halls. I don't know the answer. We are wrestling with this question at natural history museums, what do we do next? How do we portray the natural world? • Kirk Johnson
- I think our challenge is going to be not to turn it into a history hall but have the stories be a dialogue with the natural environment. • Kathleen McLean
- I'm absolutely not saying ignore the audience, but I am saying remember what the topic of the hall is. • Kirk Johnson
- I think the conversations have flowed pretty strongly around human-environment interactions and I don't think we've ignored that, although the mock-ups now do. But I think the conversations we've had have all been strongly about human-environment interactions and not making it a history hall. There is a danger, but I think our discussions have addressed those issues pretty well. • Christopher Cogan

RETHINKING THE HABITAT CASES

The Question About the Cases

- One of the questions that we addressed earlier was: How do we facilitate a conversation about the tension between culture and science? In some ways that is kind of this same thing we've just been talking about. Another question that Mary Jo added was: How do we get the abstract sense of place, which is a human notion in and of itself, to marry with the habitat cases, which are very concrete?

My intention in revisiting the habitat cases was more to get at that question. How should we be looking at these habitat cases and what should we be doing with them? Over the past two days, comments people have made to me echoed what Scott said, though perhaps not as strongly, that these are an albatross around the museum's neck. That's pretty scary. • Kathleen McLean

Accessories, Not Centerpieces

- My argument would be not to jettison all of the habitat cases, but rather use them as accessories, not the centerpiece. • Scott Sampson
- That's actually really interesting and I think you nailed it in terms of your concern. I wanted to hear what this meant for us, and it's thinking of these as accessories rather than the main attraction. We have been thinking of them as the main attraction and

that everything else would accessorize them.

• Kathleen McLean

- I want to second what Scott said. That's exactly the way I feel. I like the potential of using them as pieces to complement the other things you want to feature. They're different from dioramas in the sense that you don't get immersion in the place, but they're like an exploded piece of that diorama that you can walk around. You can look inside the habitat and maybe see some details that you might not be able to get otherwise, but maybe they don't have to be the centerpiece, they're accessories. • Stephen R. Beissinger

Contained Slices of Nature

- There are a few ways to connect a lot of these comments together. As Doris said, there are a lot of ways to tell a story. Maybe in some areas those habitat cases won't be the centerpiece, and maybe there's some way to repurpose them so that they can be. One of my difficulties with the cases is their clean-cut lines, in the sense that you get a piece of something, a slice of something, and it's very contained. It's a habitat handed to you on a silver platter in a way, and that's not how nature works in a lot of our experiences.

One of the things that strikes me in the History Gallery is almost a sense of clutter. It's overwhelming and it's cool, and explor-

ing that is interesting because you feel like there's a sense of exploration, whereas natural history, cookie-cutter environments are prim and proper, with almost a cabinet-of-curiosities-type of environment. I think that is contributing to that anachronistic sense, and it's hard to imagine it outside of that context, but I think that might be the place to go.

Think of something that is way out there and then see what you can do with those. I think they have so much potential artistically and in the prototyping people have really connected with them on an interesting level. I don't think we want to lose some of those pros, but there are pros and cons and we need to sort those out. • Lauren Palumbi

Capitalizing on Visitor Fascination with the Specimens; Avoiding a Biopsy of California Approach

- We have talked a lot about the spectrum from the most real to the most virtual versions of these natural places. We have also talked about the habitat cases and dioramas (there are four actual dioramas, which you didn't see on this trip) as being towards the real side of the spectrum compared to a projection, or a flat version, or an interpretation of the place that's just two-dimensional.

I think one thing that is really compelling to people is that we have talked about the animals being dead, but the animals look like they're alive. That cognitive dissonance is

Seven Different Ways of Telling Seven Different Stories

- I think it would be an interesting challenge to try to come up with seven different ways of telling the stories. Take a multimedia approach to this and try to find seven different techniques to really invest people. Some of them could be very simple and inexpensive: big, floor-to-ceiling photographs with things around them. For Cordell Bank we talked about using really high-end, high-def video, where you go off in a boat and jump off the boat with the diver and you're all of a sudden underwater experiencing this beautiful place. I don't know what all of the different techniques are, but think about what you can do in this day and age. And some things might be switched out. It's the dream that all museums have, to be flexible in your content, but think about things that might be flexible. • Scott Sampson

Christopher Cogan and Scott Sampson



Opening the Conversation About Stuff to Visitors

- I'd like to riff off of what Doris said about our tendency to talk about stuff. I find it interesting that over the last couple of days you have been having such intense conversations about stuff. I would actually like for the public to weigh in on the kind of conversations we've been having amongst ourselves about the stuff in our gallery because there are all kinds of different cultures in this room that could represent part of what's out there.

Also, all of us here are all answerers. We're all ready to provide answers and lectures for students and to write books. There's a lot of power to posing questions and hearing questions from other folks. • Amy Billstrom

Scope of Collection on Display

- One thing I don't have a good sense of is, what other collection items are going to be part of the project? Do you have collections of rocks, or other collections that are going to be displayed in some ancillary way? • Kirk Johnson
- These are the collection. There are some shells and other items, but this is basically the collection. • Kathleen McLean

a way into: "What's going on here?" A lot of people want to know what's going on. They want to know what is going on in the drama we've posed, but they also want to know what is going on with the animals: "I've seen dead animals and they never look like this." So there is a piece about the presentation that provokes a lot of curiosity that I think we can capitalize on.

I think it was Kirk who said that dioramas create an illusion of place. For me, growing up in California and having been to a lot of places in California and loving the real places in California, it never looks like these cookie cutter, petit four slices of place. It always looks like this landscape that rolls out of your peripheral vision and is under you, and that's the trick of immersion.

I want those pieces to not always be the center of attention but maybe sometimes. What I would like is to have them nested in a landscape that makes me feel like I haven't done a biopsy of California, with the pieces in little jars for you to look at. I want it to feel a little bit more like you're in the place. That would be a way to try to soften the surgical slicing of the places that the cases have.

I do think they're amazing objects, and from the way people look at them and react to them, they are kind of crazy. We are used to them, we understand the museum profession. Most people who come to the museum are not in the museum profession and we're

shooting for an audience that hasn't been at the museum before. That is another goal of this project, to bring people to the museum who don't have this fluency with this kind of construction. And the people we bring in who have no fluency look at it and it's like the moon: "Whoa, what is this thing?" I think there's something there for us. • Mary Jo Sutton

Value of Showing Natural Objects, Potential Visitor Fascination with Cases

- I think I may be the only one of the advisors who was defending those cases. It's fine if we don't make them the centerpiece and we have to work around them, but let's keep focused on what we intend to highlight, which is mostly the natural history of these spots. There is a lot of value in having natural objects from those spots and showing them in three dimensions to people who don't go to museums as much as we do. I'm hearing a lot of projection of what we see as more old fashioned and not 21st century, but perhaps to a kid it's different and they like those dioramas or habitat cases.

I'm also curious to know what the project's data says about the cases, besides the observation that they don't stop unless there are animals in the cases or the seal looks sad or whatever. • Lisa White

CROSS-FERTILIZATION OF GALLERIES

- We are clearly intending to use pieces from the collections of the other disciplines in the museum. • Mary Jo Sutton
- Something fascinating happened when one of the topo models from the Natural Sciences Gallery was put up in the Art Gallery. There are a couple of them up there, and there are a couple of pieces in the History Gallery. We have topo models that have been here since 1987, and I've never seen anybody stop and look at a topo model in the Natural Sciences Gallery, they just pass right by them

Up in the Art Gallery there is a topo model of the desert near a couple of paintings of the desert. I've seen people stop and look and point; they're talking to each other, they're hugely engaged with this topo model. And yet they'd never look at it here in the Natural Sciences Gallery. I think it's because of too much of the same stuff in here. In a different context with different things around it, it engaged people. • Gail Binder

- I want to follow up on what Gail said, which I love. Because we are the third gallery out of the gate in the renovation of this three-floor building with over 100,000 square feet of "stuff," maybe these temporary things happening upstairs are a sort of permanent changing opportunity for us as we think in terms of the long view and think of churning

and cycling our gallery pieces through these floors because they get a whole different audience.

When we did testing down here when the two floors were closed, we had an exhibit at the back of the hall that was art and history together. People who were into art came down against their will to the Natural Sciences Gallery and walked all the way through it to find the art, and in spite of themselves, some of them looked at stuff along the way. These are people who segment themselves, who say that they are only here to see the art and are not interested in natural science. They were forced to go through the Natural Science Gallery to see the art.

That's kind of what's happening upstairs now: "I'm an art person. Oh, what's this, this cool thing of grass? Trippy!" It has a different status and it has an aesthetic context. It's a piece of ground that just went up there, a little case with a rock, and it's like, "Wow, this looks so great up here!" It definitely changes it, whereas down here, we have boxes and more boxes and they don't communicate, "I am part of this whole other world."

Because we are the third out of the gate we have this opportunity to ask and demand that we be part of this timeshare of pieces within the building. We are, of course, going to get those paintings of Yosemite at some point. And maybe, as the carousel turns, they are going to get pieces from the Oakland section here up in art when it's about the Oakland

Pixar Metaphor: Evocative Abstract Sketches that Evoke Sense of Place

- The video in the Pixar exhibit blew me away, it's just an amazing thing, and I think it's an interesting metaphor for the exhibit that we are talking about. If you think about this set of images on a board, you can zoom inside of those things and explore them, it's very immersive. Because some of them are trying to show the process by which you create them, they're very abstract, just simple sketches. It's amazing what the artist can do with just a few lines that evoke the sense of something important and yet very immersive. It gives you a sense of the place that they're trying to depict and it shows you different ways to try and do that.

If you think of each one of the seven places as places that you want to briefly zoom into, how do you make them immersive? I'm not saying you use that same kind of technology, I'm just thinking of it as a metaphor, but they do it powerfully without trying to make it look like realism in all cases. I'm just hoping that might be a different window for looking at this problem. • Scott Sampson

Static v. Dynamic

- Do you have statistical information, data that show, nationwide, how adults and children observe these things, how long they like to stay? I guess the main question I have is how they're affected by a static versus dynamic set of displays, and to split those two apart and look at how they could be recombined.

• Norman Miller

- I would like for us not to get into the static versus dynamic issue at this point because we have to do that later, we have to get more data, there are a lot of things at play, there is a lot of research that has been done. I would like to focus more on other people's senses about the habitat cases, or elaborating on the strengths of these habitat cases.

• Kathleen McLean

Lisa White



art scene. Or maybe that's all down here. We have the promise to be more interdisciplinary than either of the other two galleries, and I think that's a hint I'm hearing: Get artists to portray these places; make those cases expressions of a really close view of part of those places.

• Mary Jo Sutton

REACHING THE YOUTH AUDIENCE

Capturing Kids' Attention: Enhancing Displays via Dynamic Visuals, Motions

- I agree strongly with that idea of using pieces across different galleries. I've watched students, which are your target audience. The outcome that NSF wants is that target audience, kids with short attention spans.

• Norman Miller

- And adults and families as much as children. It's not just for kids.

• Kathleen McLean

- All right, but adults want to see kids grow. They come here for their kids, primarily, I believe.

• Norman Miller

- There are also many adults without kids, who come here for themselves. But what have you observed about kids?

• Kathleen McLean

- They have a short attention span and they like dynamics, they like motion. If it's too static it might not capture them enough. So my view is, keeping these things here is fine and dandy and it's important, but you need

something, for example in the background, that keeps them visually engaged, something that has fluidity to it and a motion about it. That has come up a number of times in the discussion: having a water scene in the background or the image of grasses blowing in the wind. I think that would add a lot, just psychologically, to the sense of a static set of glass enclosures that you can walk around or look at. So add dynamics. I would even say do the reverse of your topography story. Bring some art down here to enhance this and have some local art for each of these regions. That would really bring richness to it.

• Norman Miller

- So you are saying that those habitat cases are too static for kids.

• Kathleen McLean

- I wouldn't say they're too static, I would say that standing alone they're not sufficient.

• Norman Miller

Testing Assumptions about the Youth Audience

- This discussion is raising the priority for me regarding the need to test and check-in with the youth audience because we are making a lot of assumptions. Based on all of the programming I've done, there is validity in Lisa's point of view that an object can be a powerful experience. I just want to give everyone a heads-up not to underestimate youth, including the younger kids.

What I would love to find out is, where are the common threads? What is it that they find engaging? It could be game playing, which could foster observation and other skills we want them to acquire, and not necessarily the technology.

When we did the front-end surveys, I did an exit survey with a young woman who was about nineteen years old. As she sat next to me she was using her cell phone, texting her friends (who were there in the room). I asked her to tell me about the exhibit she just saw and she said, “You’re not going to change them are you? You should keep them just like they are.” I asked her whether she would be interested in any technology and she said, “No, no, no, we don’t need any technology,” and then she kept going on her cell phone. • Amy Billstrom

- That’s the dilemma of museums. Matt was talking about that yesterday. • Kathleen McLean

STRENGTHS OF HABITAT CASES

Evocative Imagining of Self in Place

- Looking at the Yosemite one of Half Dome, my eye kept capturing the rock formation more than anything else. Anybody who looks at that thinks, how would I go up it, how would I feel in that region? Maybe that’s the same reason people stop at that topographic case in the Art Gallery, to see where they were with respect to that. I thought that was

a nice piece in that it did portray, “Where would I be?” • Norman Miller

Immersive Interventions with the Habitat Cases

- As I said earlier, some of the interventions that you guys came up with for the habitat cases the last time we were here were super-effective. One of the techniques you were using was to make a case immersive by covering up the entire case except for a small peephole that offered a glimpse of something inside that you wouldn’t see otherwise. To me, the strength of the habitat cases is that they are realistic three-dimensional models that are tough to come by. They are beautiful in themselves. But then if you could use some of these techniques to accessorize what you are doing with the habitat, maybe even create mini-immersive experiences, I think that’s a real strength you guys showed last time. You did things I never would have thought about. • Scott Sampson

Looking Closely, Observing (Finding Waldo)

- One thing that prototyping has taught us over the past couple of weeks is that people really like the “Where’s Waldo?” game. You set them up and give them flashlights and they are so happy. They look and they look, and when they find it they get this little shot of endorphins, they feel good about themselves. They really are good for that purpose. I don’t know about any of these larger

What Positive Purposes Do The Habitat Cases Serve?

- If we were going to think of the habitat cases more as accessories to the experience, and I’m not saying we are going to, what would you say these are good at? One example was they are good for looking at things more closely. • Kathleen McLean

Stephen Beissinger and Norman Miller



Cases as Entry-Exit Portals

- Regarding this idea of entrance and then immersion and then an exit, I could see playing off Lisa's idea, that being able to walk around these pieces has more power than if they were just shoved up against a wall. I could see some of the cases as entry portals, and then you go past them and into the space. You get your immersion there, and then as you walk back out you get the same case, but this time through slightly different eyes because you've learned some things and you've had that immersive experience. The case has these actual animals, it has detail, and it's immersion in a different way. The cases could be these portals that you pass by on your way in and don't think much about, but on the way out see in a different light, from whole new angles.
• Christopher Cogan

Carolyn Finney



questions, but I do know that visitors really enjoy that and I believe that it does sharpen their observational skills. It makes them want to look harder. • Tisha Carper Long

- In some instances, however, it's Walter instead of Waldo in those cases. In other words, maybe some of the species in those cases are not the ones you would have picked and associate with this particular one of the seven places. For example, a case in Palm Desert was filled with urban birds, birds I would see here in Oakland, with the exception of one species. They weren't filled with the things that I would think of as being typical of the desert. • Stephen R. Beissinger

SAME ACCESSORIES, DIFFERENT STORY

- What I'm thinking about is that, in fact, that these cases were originally designed as accessories. The question now is, what role do they play in the new storyline? They were developed with a very specific storyline in mind, and they are in fact accessories to telling that storyline. So here we are faced with using accessories from a previous storyline and we are trying to adapt our big-thread thinking as to how to tie those things in.

I do accept them as accessories and in fact they have always been accessories to a bigger master. In that case it was a representa-

tion of communities, so it was an ecological story. How do you tell the story of ecology? How do you represent the interactions that make up the science of ecology? You take that real place and you recreate it, and you offer a three dimensional illustration of the processes that take place and those interactions. And it has the whole geology and the whole transect. It was a very defined scheme for which these boxes were designed as accessories. • Lindsay Dixon

- The master narrative was just so invisible. It was invisible to me when I worked here for seven years in the Natural Sciences Department, so it was hard to see what they were accessorizing. • Kathleen McLean

- I accept that, but I know that it is there and it is the way it was constructed, and even though it wasn't successful, they were built as accessories to that story. • Lindsay Dixon

THE CALIFORNIA CONNECTION

Seeing the Whole First

- I've been thinking all day about something that I'm not hearing, and I'm assuming that it's something you're going to do. The thing that holds these seven places together is the fact that they're in the state of California. I'd love to see the state of California, like a topographic map, before you see any of the other stuff, the individual pieces that you've pulled out. How might it all look if you had

a big map? Somebody earlier said something about looking at a topographic display and getting excited about the question, “Where am I on here?” Where is the connection that all of these places are part of this state?

• Carolyn Finney

- They have a digital exhibit like that upstairs.
 - Norman Miller

Using the Deep Time Animation

- I’d like to see that little animation as the first thing, how California was formed, and then see the outcome of that formation.
 - Richard Bugbee

California as a Refuge

- The other thing that stuck with me was what Douglas said during his PowerPoint presentation about this notion of California as a refuge, that ice has come and gone. You could provide that as the context for all seven of these places. You tell a story at the beginning that includes that refuge story so everyone knows, wow, that’s the context, and then you tell these little subplots within that in each of the seven places.
 - Scott Sampson
- For example, with Oakland, there’s that line you have in the exhibit: “A dense urban environment with remnants of diverse native habitats.” Tell that story of where these remnants are growing.
 - Doris Ash

California as a Hotspot

- A step between *Assembling California* and going into these seven places is introducing them to California as a global hotspot. That has to be a step in there because almost all of these places fall into that. It doesn’t take much and you can decide exactly how to play it out. And it’s only there on that walkway on the way in, and most people are rushing past it anyway, but that’s the way to get it in. Then you’ve got the seven places, and then on the way out you let them know what they can do about it.
 - Stephen R. Beissinger
- I agree. Douglas’s presentation showed that really clearly, when he started out globally with all of the hotspots in the world, showed the California hotspots, and then zoomed down inside of the California region, which is a hotspot in itself, to the various selected seven places. So that is it, a way of bringing it down, focusing it in, showing the relevance, and then coming out again.
 - Norman Miller
- That is where we started, and we found it didn’t work for the visitors.
 - Rebekah Berkov
- Don’t worry about that. We are still talking about concept. Our job is to figure out how, and if it doesn’t work we’ll throw it away.
 - Kathleen McLean

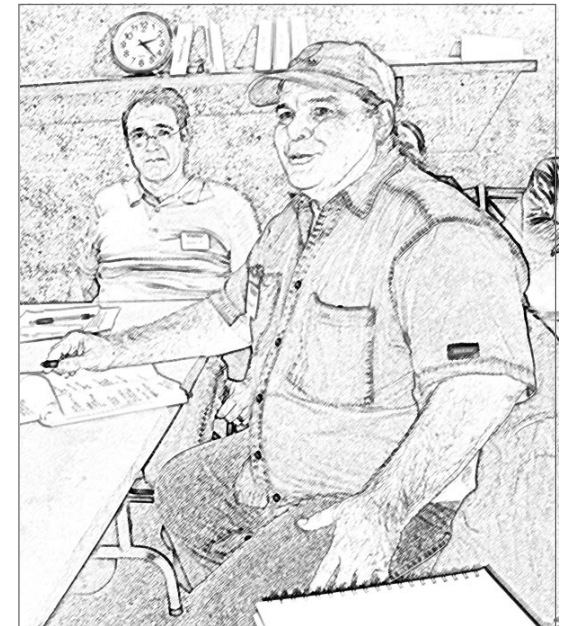
Literal Hot Spots

- You could have them touch a place and it’s hot on the map.
 - Stephen R. Beissinger

Touchscreen Display

- Upstairs in the Art Gallery there’s this side gallery that has found, funky art in it. There’s a table with a screen on top displaying something like nine places where this funky art exists. You touch the spot and you can pull up the story and see exactly what they’re talking about. It’s really cool.
 - Doris Ash

Richard Bugbee (foreground) and Norman Miller



Closing Thoughts

A CALL FOR CLOSING THOUGHTS

- I want to thank you all for your participation and your thoughts and comments. We thought we would give you a few minutes

to express any closing comments, thoughts, things for us to think about after you leave.

• Kathleen McLean

FOCUS ON RELATIONSHIPS

- I was drawing a little sketch here. I know I started off by saying you need to focus on human relationships. I know this is a natural science gallery and exhibition. I've also heard you all say that you want to connect with people, and you want people to be involved in the relationship. I really want to emphasize that focusing on the relationship doesn't undermine the natural science as something important and vital.

So I was trying to draw this sketch. I recently saw a billboard in Berkeley depicting a house with a person inside looking out and an owl sitting in a tree next to the house and the owl is looking back. They had this focus and were in some kind of conversation or had awareness of each other. So—focus on relationships. • Carolyn Finney

COOLNESS POTENTIAL: AN INTERDISCIPLINARY APPROACH

- I wasn't at the first advisor session so I didn't get to give you my passion statement. I'm a

Late Addition: Advising on Sense of Place Research

- In the presentation I did yesterday I mentioned Nicole Ardoin's work and the complexity of it. She is in a sort of advisory role for this project, particularly the research piece. • Cecilia Garibay

- Coming to this meeting is exciting for a number of reasons, not the least of which is that my background is in exhibit design and development; I was an art history major as an undergrad. But as Cecilia mentioned, for my dissertation work, which is still continuing, I looked at sense of place and environmental behavior on an ecoregional scale. I was really interested in ways that people connect with their places and what creates that connection as well as the "So what?" piece. What does that mean for the kind of behavior that people take or don't take?

I think, at least in the environmental education field, which is where I work quite often, we tend to believe that if people connect with their places and care about their places, they'll do something to take care of it. Yet in reality we find that's rarely the case. That was the

seed of the question that I had. I had three different research sites: the Galapagos, the Klamath Siskiyou in Northern California and Southern Oregon, and the Chesapeake Bay.

I am really excited to be able to think about how you would incorporate these principles of sense of place into an exhibit experience, with the challenges I think that you face of people being in some ways disembodied and the fact that it's also a mediated experience. But I also think you've got some tremendous opportunities here. • Nicole Ardoin

- We're glad you're here, and I know Cecilia was using your work as a foundational, organizational system for how we might ask some of these questions. Hopefully you can come to our next meeting. You've had exhibit development experience as well, haven't you? • Kathleen McLean
- Before I went back to graduate school I worked at World Wildlife Fund and managed the *Biodiversity 911* exhibit for three years, an NSF-funded travelling exhibit. • Nicole Ardoin

scientist who works with artists. As a paleontologist, I'm always imagining Deep Time and I have artists who can actually reconstitute Deep Time. I've always maintained that all scientists need artists. You actually need your own personal artist, and then every artist could have their own personal scientist.

I just love this museum. By having these three separate disciplines stacked on each other you have this huge opportunity, which you've really taken advantage of in the first two halls. Keep doing that. Use the art, use all of these different ways of accessing the natural world, which is the way we do think about the natural world. It has the potential to be a lot cooler than most natural history museums because you have these other toolkits to dip into. So go finish it, it's going to be cool. • Kirk Johnson

MESSY, EDGY, AND A GENUINE DIALOGUE WITH THE COMMUNITY

- I've said everything I would want to say on other levels, so I'm just going to emphasize what I think is very powerful. I liked what Lauren said about the fact that nature is messy and the idea of maybe messing it up a bit. It is a rather tidy hall and it is pretty circumscribed, what you are supposed to be doing. That has been true in the past anyway. So I like the idea of making it messy, whatever that means in terms of edgy. I don't know what edgy means to a natural

scientist, but edgy doesn't mean watering down the natural science. I don't think you give that up and I don't think you have to. You have a powerful story to tell and the tools and the people to tell it, and the cases, however you want to use them.

Here I'm going to get up on my soapbox. You need to have the voice of the people, the culture, whatever you want to call it, and really create a genuine dialogue with the community. Not what we think they want, but really opening the doors to see what that looks like. That's the genius of it. I think that's where you can carry the rest of the museums in the country with you because I don't think natural history museums have a clue how to do that, to be honest with you.

• Doris Ash

IN HUMANS AND NATURE

- Just as a counterpoint or balance, and to connect with a theme that I mentioned yesterday, I think that the problem right now is in part because we have this dysfunctional relationship with the non-human world. So it seems to me incumbent upon institutions like natural history museums to represent a new vision, a new perspective. I would suggest that when you're thinking about the voice, the vision with which you present the information in the hall, you think about doing it from the perspective of humans inside nature.

Plants, Plants, Plants

- I was reviewing and thinking about hotspots. Despite being a bird guy and really enjoying these cases because they have a lot of birds and neat animals in them, a lot of the hotspots issue is plants, plants, plants and plants. There are over 2,000 endemic plants, there are four threatened endemic birds, there are five threatened endemic mammals, there are eight threatened endemic amphibians. There are 2,124 endemic plants and they're not all threatened, but it's a hotspot for that reason. We just need to make sure that we build that in there somehow, into these places, and it won't be hard. • Stephen R. Beissinger

Ecosystem-based Management as Focal Point

- My lens on this is focused on ecosystem-based management, which I've already mentioned.

I see that as one way to focus in on how humans are a part of nature, how we have been destructive, and how we can clean up our act; sort of the scary and positive views wrapped into one. And again, not separating people and nature, but using ecosystem-based management as a mechanism to see how to incorporate all of those issues. • Christopher Cogan

Clarification re the Cases

- I'm concerned about some of the reactions that I've heard that have grown out of viewing our prototype set-up. I think it needs to be made clear that the cases that are out there now are window dressing; that what has been tested out there are text and graphics; that those are the only things out there that are at all representative of the new thrusts we've been pursuing.

People mentioned the interventions with the cases you saw the last time you were here. The cases as you see them now are actually a step backwards from where you saw them before, and no one here meant to represent them as anything other than that. • Christopher Richard

- I think people understand that. • Kathleen McLean

Don't make the mistake of talking about humans *and* nature. Rather, put us inside. That is where we belong, that's where we are. I think that's the fundamental shift that hasn't happened that needs to happen in this culture. One way of doing that is with artwork, and I think that many of these ideas are best embodied, best internalized, and they best become effective or emotional when they are done through various forms of art.

Science, because it is so rational, because it objectifies, is the evil antithesis of relationship. Science is all reductionism. It is through these other forms of knowing, through indigenous ways of knowing, through various forms of art, that we create this relationship. So what I would ask is that you would think about how best to embody that vision in how this information is presented.

- Scott Sampson

NARRATIVE THREADS AND CONCLUSION

- I am walking away with the sense that, one, there is a lot of potential, and two, there is a story you are trying to tell. You want to tell it as an entry, an opening, and an impact in that opening, and it links and threads each vignette. You have seven of them, and you want to have a nice clean thread, one of them being diversity. Then there is loss of habitat, climate change, all of these differ-

ent pieces that thread throughout as sub-plots in your story. Then you need to come out with a nice set of concluding statements and closure so that there is something people take with them when they walk away.

As an example, I remember going to the Holocaust Museum. It's a story that you walk through as a progression through time, about how it evolved and how any society can come to that consequence. Then at the very end you see these shoes, and that left me with a lasting impact, just seeing this pile of real shoes and hair from that time period. What you really want is that kind of walk-away hit.

This is a very precious set of hotspots, sub-hotspots if you will, that are in a very beautiful place. It's fragile, and what we are doing right now is trying to create stewardship. We need to know how to do it, and there are ways to create that. Maybe we can try to bring people forward with those kinds of messages as a story. • Norman Miller

ENGAGEMENT VIA THE HUMAN ELEMENT

- Some parting thoughts from me are that I was admittedly not thinking about the human element at all in the exhibits, even after two full advisory board meetings. Part of that may have been that I like to think of museums as ways we can all escape from how

much we're doing to the environment that's negative, so wouldn't it be nice to treat people to a visit that strips away our interactions and lets people take in and enjoy these environments?

But in listening to all of you and thinking about what that hook could really be to complete that engagement, maybe it is profiling those spots in ways that speak to stewardship or conservation or even activism, which could strike a tone with some of the youth groups that I think the museum intends to work with. That could be a way of drawing people in: Here are some things you could do, or here was this individual's experience when they went to this place, or this artist was especially impressed with this.

There were suggestions over the last couple of days about profiling individuals or historical people or Native Americans who have a special place in a particular spot. I think keeping that in mind would be a great way to link the human element in a couple of different ways to keep people engaged. • Lisa White

THE NATIVE AMERICAN TAKE ON INTERACTION WITH NATURE

- I just don't like the separation of people and natural science. I'm made up of the same stuff that animals are made up of. I just can't see the separation, we have to be part of it. You were talking about interaction, and

every time you hear "interaction" you see it as all negative and every time I hear "interaction" I see it as something we used to do and it was positive. There has to be something in between. I guess today's interaction has to be about being advocates for conservation and that type of stuff.

It's kind of a dilemma for an Indian to go out into the open and see the lack of interaction and how the plants have done, how they are growing and interacting with everything, and not be able to do anything about it now because it's gone past the point. We've not done the practices that we've done for all those years and we can't catch up, and it's going in a strange direction. I guess my main concern is to make people aware of that, seeing how everything was formed, how everything was, how everything is, and what they can do.

When I went into the exhibit, the first thing I went to was the ground squirrel. That's my clan. Then I realized that I'm a ground squirrel because I was descended from a ground squirrel that was one of the first people. So my relationship to the exhibit would be different from your normal visitor, but I think part of that story should be told. • Richard Bugbee

Next Steps

- Going forward, our job is to listen with beginners' minds to what you have all had to say, to be open. We will sort it all out and because the staff has a much deeper understanding of the process and all of the intricacies and details of this, we will be able to sort it out over time. The advisors' honesty hasn't set us off on a different track. I think we know what we need to do and I think it's important for us to hear, just off the top, how people are responding and to take the nuggets you have given us in terms of positive reinforcement.

My sense of this whole two days is that you have been an incredibly responsive, supportive group and have given us a lot of food for thought and a lot of material to build on. We hope that the next time you come back, you will see evidence of your thoughtful suggestions and inspirations among the things that will be in the gallery at that time. Given what you've all said, I think there is a lot of positive grist for the mill, so thank you very much.

- Kathleen McLean