Roots of Wisdom

Native Knowledge. Shared Science.

The graphic icon in the *Roots of Wisdom* logo expresses interconnection, a theme that is emphasized throughout the project in the content of the exhibition and activity kit, as well as the way all the partners worked together. The four colors represent the four cultures featured in the project and are used throughout the exhibition and the website. As a jumping off point, we listed a few evocative words—interconnection, reciprocity, kinship, collaboration—and selected several of the visual elements used in the exhibition graphics—circles, the four colors, and dashed lines. The designer explored a number of options, and we did a quick test with visitors to determine what they thought. Like every part of the project, we sought input from partners and advisors during the development of the icon.

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ROOTS OF WISDOM: NATIVE KNOWLEDGE. SHARED SCIENCE. was developed by the Oregon Museum of Science and Industry (OMSI) in collaboration with the Indigenous Education Institute (IEI), the National Museum of the American Indian (NMAI), native community elders, educators, and youth. The exhibit was produced and is toured by the Oregon Museum of Science and Industry. The exhibit was made possible with funds provided by the National Science Foundation.

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Forward

The *Roots of Wisdom* exhibition is rooted in indigenous knowledge and ways of life lived for countless generations. Much of this Traditional Ecological Knowledge (TEK) has been passed down for generations. Today, as never before, this knowledge is of vital importance as it speaks strongly to the significance of balance to create a healthy environment. The exhibition also provides a contemporary scientific perspective, along with the traditional knowledge perspective, illuminating the complementary aspects of both ways of knowing and a greater sense of understanding that would not be possible with one perspective alone.

The exhibition was created through a working partnership between a large science center (Oregon Museum of Science and Industry, OMSI), a Native, non-profit indigenous organization (Indigenous Education Institute, IEI), and four Native communities: Native Hawaiian members of the Pacific American Foundation and Waikalua Loko Fishpond Preservation Society, Tulalip Tribes, Confederated Tribes of Umatilla, and Eastern Band of Cherokee Indians. The partnerships were unique in that they were created at the very beginning of the project to engage Native voices as co-creators of the exhibition. This type of collaboration provided a unique organization and process of creating the exhibition collaboratively with mutual consensus. This work was indeed a learning process for the participants and resulted in an exhibition that reflected the voices of the communities and respected the ways that the communities wanted their stories told. At the same time, the process acknowledged the rigor and discipline of the scientific establishment.

Roots of Wisdom supported four distinct Native communities in sharing their stories of revitalization and restoration using their traditional knowledge in a contemporary perspective. The result is a synthesis of TEK and Western scientific knowledge in a way that each one complements the other.

There are many commonalities between the two worldviews, but there are also many distinct differences even among and within tribes. In this project, the communities were able to speak for themselves, and the collaborative process allowed for unique and authentic voices to be heard rather than a collective generalized, simplistic approach.

To our eyes, the importance of understanding ecology from a Native perspective may be the most significant aspect of the exhibition. The interconnections of all things and the interdependencies of all relationships need to be understood within this comprehensive context of restoration built on traditional knowledge and practices.

Restoration in this case implies an understanding of environmental balance created by nature. Conservation in terms of the environment can enable a community to achieve wellness and freedom from toxicity. In Native communities, balance is of primary importance. Understanding the concept of balance is a facet of living in accordance with the natural cycle. This concept permeates every aspect of life, from the skies of the universe to every part of the land and oceans.

This collaborative project has provided a place for authentic Native voices in a major science center. Bringing together two lenses and two perspectives of Native and Western science results in a synthesis of restoration and conservation, thus engaging Native communities as well as the scientific community to the benefit of the general public.

The *Roots of Wisdom* exhibition is unique and, to the best of our knowledge, an exhibition like this one has seldom been created before. We are grateful to OMSI and the National Science Foundation, as well as to all the partners, for funding and bringing this project to fruition, in a spirit of collaboration, as well as respecting traditional cultural protocol and professionalism.

There are many Native communities in the United States, and we have only focused on four communities (Native Hawaiian, Confederated Tribes of Umatilla, Tulalip Tribes, and Eastern Band of Cherokee Indians) for this exhibition. Almost every tribe across the county is involved in one way or another in these kinds of restoration projects. Wherever *Roots of Wisdom* is exhibited, local tribes may well have restoration projects underway. These projects can also be showcased as an addition to the exhibition and for public outreach in order to provide relevance and be useful to local communities.

Each Native community has established sustainable ecological relationships with the local environment. Many places have been historically altered, but there is great potential to restore the land and waters to a healthy environment. In this age, human health and community wellbeing are connected to the land. A healthy environment can ensure a healthy population via the establishment of a balanced ecological network. A reciprocal relationship of land and water resources should be of vital interest to every person and every community. After all, we share this planet together.

David H. Begay, Ph.D.
Nancy C. Maryboy, Ph.D.
Indigenous Education Institute

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Thank you very much to the following partners, advisors, and contributors for participating in the *Roots of Wisdom* project and the development of this guide.
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Introduction to *Roots of Wisdom* for Museum Staff

This Staff Guide has been written for the staff working and volunteering in the *Roots of Wisdom* exhibition and the people training them. The guide includes cultural sensitivity information, exhibit descriptions, demonstration ideas, maintenance and safety tips, and the Active Learning Log—an open-ended worksheet for students to fill out while exploring the exhibition.

As museum staff hosting the *Roots of Wisdom* exhibition, it is important to understand some of the critical history, misconceptions, and current realities of U.S. Native communities and peoples. Few people in North America know much about Native communities and cultures, leading them to stereotype Native peoples in disrespectful and misguided ways. Similarly, many non-Native people believe that "Indians are all gone," "ancient relics," or "something from the past" and talk about Native people, communities, and cultures in the past tense. However, as museums and visitors will see in this exhibition (and hopefully elsewhere), Native people have overcome many challenges and are very much alive.

In fact, it is an exciting time in Indian Country. Native peoples today are working on thriving and cultural revitalization. Many communities are also focused on restoring their local environments because environmental health and cultural preservation depend on one another. The National Science Foundation and Ecological Association of America are also looking to Native people to help restore environments. *Roots of Wisdom* demonstrates how four Native communities in the United States are using Traditional Ecological Knowledge along with Western science to restore their local environments.

Roots of Wisdom is a cross-cultural collaboration among the Oregon Museum of Science and Industry (OMSI), the Indigenous Education Institute (IEI), the National Museum of the American Indian (NMAI), and the four Native partner communities highlighted in the exhibition including the Confederated Tribes of Umatilla, Eastern Band of Cherokee Indians, Pacific American Foundation and Waikalua Loko Fishpond Preservation Society, and the Tulalip Tribes.

Abundant thanks go to all of the project partners, advisors, community leaders, and youth advisory board members who worked together to create this project. Their willingness to share their insights, time, stories, and hopes for the future is the heart of this project and will touch visitors around the country.

If you have any questions about the content of the staff guide, exhibition, or related materials, please contact the OMSI Exhibition Tour Manager at 503.797.4659 so that we can help connect you with the right people to answer your questions.

Guidelines for Respecting Cultural Knowledge

The topics included here were identified and written in collaboration with Deana Dartt, Ph.D. (Chumash), project advisors, and project partners.

This section is meant to be a general introduction for museum staff on how to better respect and present cultural knowledge and issues pertaining to Native peoples in the United States. By no means does the following section encompass all of the ongoing and multifaceted matters related to the varied and diverse cultures of the indigenous peoples of North America and Hawaii. Instead, the content is intended to address some of the most important questions and issues that museum staff might come across or be asked about. We strongly encourage museum staff to learn more by accessing the resources listed at the end of the guide and by looking for educational resources created by Native communities in their areas.

Respecting Native cultures

Valuing and respecting diverse cultures is critical for museums of all types and particularly important when hosting the *Roots of Wisdom* exhibition. Staff should be considerate of cultural differences and similarities that exist without equating value (right or wrong, good or bad) to these differences. Respecting people and cultures means recognizing that all individuals are unique and that the way they interact with their community and the larger world is affected by their language, beliefs, values, and personal experiences. Respecting cultures in this way also allows us to communicate and collaborate more effectively with diverse communities, such as in the *Roots of Wisdom* exhibition.

When hosting the *Roots of Wisdom* exhibition or conducting any project with Native communities, it is critical to develop a basic understanding of the key issues impacting Native communities today and historically. This understanding is particularly important because of the long history of human rights abuses Native communities have been subjected to and the lack of information most people have about contemporary Native peoples. Below, we highlight historical notes and discussions of some of these key issues that project partners and advisors wanted staff at host museums to be aware of.

North America was not "wild" or "undiscovered" before Europeans arrived

> *"Native people often feel the term 'wild' is a pejorative term. From a Native perspective, it is thinking more about a natural order. There is no such thing as a wild river, it has an order, nature's order. The beauty has an order." – David Begay, Ph.D. (Navajo/Diné), Vice President, IEI*

In many Native American languages, there is no word for wild. Instead, nature is often understood as an interconnected, organic system of which the indigenous people are a part. However, because European explorers and settlers did not understand these interconnections or natural systems, they called the

environments that they encountered in the Americas "wilderness." Therefore, for many Native people, using the word "wild" diminishes the value of nature's order and the long-term relationships indigenous communities have had with their homelands.

Similarly, it is crucial to understand that the ancestors of contemporary Native American people were the original discoverers and inhabitants of North America and that they lived on this continent for thousands of years before Europeans arrived. Contact with Europeans first occurred with the arrival of Western explorers and settlers in the fifteenth century who brought with them devastating diseases that Native peoples had no immunity to, cultural conflict, and displacement on a mass scale. These disturbances changed the life-ways and futures of millions of people, and Native communities today are still recovering from the near obliteration of their populations and cultures.

*"European settlers who first arrived in the 'New World' wanted to believe it was just that: new not only to them but to all human kind. With their diseases preceding them, diminishing complex Native civilizations, Europeans readily assumed that the Americas were, and always have been, a barely populated wilderness. This view, which justified hundreds of years of European land theft and mistreatment of Indians, has been slow to die." – Stephanie Batencourt, NMAI (*quotation from the NMAI book *Do All Indians Live in Tipis?)*

Although Europeans perceived North America as empty space when they arrived, it was in fact populated by tens of millions of people (Batencourt 27) from an enormous diversity of Native American communities. The continent was a mosaic of sophisticated cultures with varying political systems, spiritual beliefs, languages, and forms of art. These cultures included rich knowledge of their local ecosystems and how to sustain their communities in that environment. Many tribes also had working systems of agriculture and aquaculture that dated back hundreds or thousands of years.

"When talking about a name for the exhibit 'wild' was a word that rubbed people the wrong way. Native people know about managing resources from living in the same place for so long. Before Europeans showed up, they assumed things were 'wild.' They didn't know how to take care of it." – Randall Melton (CTUIR), Collection Curator, Tamástslikt Cultural Institute]

Refer to Native communities with the appropriate names

It is best is to refer to the specific, official tribal or National name whenever possible. Many Native people feel honored and recognized when their tribe, Nation, or community is referenced accurately. Many tribes are commonly known by names that they do not use for themselves and are sometimes offensive. Therefore, it is best to either ask a tribal member or go to an official resource (e.g. the tribe's government website) to make sure that you are using the appropriate name.

If you do need to use a generic term, *American Indian* and *Native American* are both used in the United States. The terms *Native* and *indigenous* are also acceptable. In Canada, the appropriate terms are *First*

People, First Nations, and *aboriginal*. When talking about Hawaii, use *Native Hawaiians* and, for Alaska, use *Alaska Natives*.

Native America is incredibly diverse

Native Americans do not belong to a single homogenous group—instead Native people in the United States belong to hundreds of different nations, tribes, bands, villages, Rancherias, and pueblos. As of September 2014, there are 566 federally recognized American Indian tribes and Alaska Native villages in the United States (http://www.bia.gov/WhoWeAre/index.htm). Many other tribes and Native communities are not federally recognized, but are recognized by states or are seeking federal recognition. For more information on this topic, visit NMAI's website for the *Nation to Nation* exhibition (http://heritageforward.com/nation-to-nation).

Identifying "Who is Native?" is a very complex issue

Identity establishment is a complex issue in many Native American communities**.** Overall, there is no single Native American experience, and each community or tribe establishes its membership in different ways. It is especially important to know that *it is inappropriate to ask someone "how Indian" they are or make assumptions about their Native ancestry based on their appearance as it can be offensive or embarrassing for that person.*

Blood quantum is one system that is used in the United States to identify Native Americans, but it is not the only mechanism that individuals or communities use to define their cultural identities. The Oneida Trust and Enrollment Committee explains, "In the United States, 'blood quantum' is the degree to which an individual can prove a certain amount of Indian blood. This amount is used to determine the individual's tribal belonging and legal rights. Blood quantum is a measure of the amount of Indian blood, expressed as a fraction such as one-half or one-fourth."

For many people and some tribes, though, clan relationships and lineage are more important than blood quantum. For example, the Cowlitz Indian Tribe in Southwest Washington have eliminated the need for blood quantum to establish cultural identify and instead require that newborns be lineal descendants in order to be enrolled in the tribe.

> *"Each tribe establishes its membership in a different way. Tribes have the right--because they are governments--to decide who is and who is not a tribal member. As a result, a lot of Native people today may not 'look Indian' or fit a stereotypical image of an Indian."*
> *– Liz Hill, National Museum of the American Indian (*quotation from the NMAI book *Do All Indians Live in Tipis?*)

In general, the work of determining membership and establishing cultural identity is a complicated, ongoing issue. To learn more, please see the resources listed at the end of this guide.

Federally recognized tribes are "sovereign nations" with certain rights

Tribes that are federally recognized by the U.S. government are called "sovereign nations" and are supposed to be protected by federal law differently than other entities. This sovereign nation status is meant to require the U.S. government to engage with the tribe in a "nation-to-nation" relationship. Sovereignty also allows for the nation's independent authority and the right to govern itself.

The sovereignty of federally recognized nations extends to the traditional cultural practices of these communities, including the rights to use land and resources associated with cultural traditions. The following quote from the US Bureau of Indian Affairs addresses the special rights that American Indians are entitled to:

> *"Do American Indians and Alaska Natives have special rights different from other citizens? Any 'special' rights held by federally recognized tribes and their members are generally based on treaties or other agreements between the tribes and the United States. The heavy price American Indians and Alaska Natives paid to retain certain rights of self-government was to relinquish much of their land and resources to the United States. U.S. law protects the inherent rights they did not relinquish. Among those may be hunting and fishing rights and access to sacred sites."*
> ("Frequently Asked Questions")

Therefore, some Native communities have the right to hunt, fish, gather, or perform other activities in places where non-Native people are not allowed to because of these treaty agreements.

It is also important to note that sovereignty and treaty rights are a very complicated and contentious issue. Many treaties have not been upheld by the U.S. government, and access to land and resources outlined in treaties is often denied by government or private entities. To learn more about these issues, please refer to the references at the end of this guide.

Native languages are critical for maintaining Native cultures and knowledge

Language maintains the strength of a person's cultural identity. Indigenous languages also contain a rich place-based knowledge. Traditionally in Native American societies, language and knowledge have been passed down orally. In recent history, many Native Americans were persecuted for using their language. Many indigenous languages are in danger of disappearing.

When an indigenous language is lost, much of the cultural knowledge contained within it is also lost. Therefore, the loss of a language is also a loss of history and a culture. Now, many communities are actively

> *"Indigenous languages are very important—if you kill the language, you kill the culture. Raising kids to be multilingual is really important to the survival of all nations! 500 years of Hawaiian chants end up being detailed geological record. Native science describes inquiry through poetic story."*
> – VerlieAnn Malina-Wright [Hawaiian], Kula Kaiapuni `O Anuenue Hawaiian Language Immersion School

working to preserve and restore their languages and therefore to preserve the traditional knowledge that is contained within them. Throughout the *Roots of Wisdom* exhibition, Native languages and words are prominently featured because of language's importance in sharing and passing along culture and knowledge.

> *"A great deal of the knowledge of a people—cultural, spiritual, medicinal, and cosmological—is carried in the language. With the loss of language comes the loss of an immense cultural knowledge, history and beliefs." – Liz Hill and Arwen Nuttall, National Museum of the American Indian (quotation from the NMAI book* Do All Indians Live in Tipis?)

Traditional Ecological Knowledge

The term Traditional Ecological Knowledge (TEK) is not explicitly used in the exhibition, but the concept is used by several academics and government agencies, and the project team based the exhibition's main messages around TEK.

What is TEK? "Traditional Ecological Knowledge is the term used to describe the knowledge and beliefs that Indigenous peoples hold of their environments that is handed down through the generations…Drawing upon on the previous several decades of TEK-related research, the following attributes can be said to typically describe the central definition of TEK: cumulative and long-term, dynamic, historical, local, holistic, embedded, and moral and spiritual." (Menzies and Butler, 2006). Other people may refer to this type of knowledge as indigenous knowledge or Native science. The project team chose to use the term "traditional knowledge" in the exhibition to avoid academic jargon and to keep concepts accessible to a wide range of audiences.

Why is TEK so important to all people? TEK offers society the opportunity to strengthen its capacity to manage environmental disturbances and local environments sustainably. Because TEK is a long-term body of accumulated locally based knowledge, it can provide both a more intimate and holistic view of the natural world. A growing number of people, including many non-Native scientists, are beginning to see how traditional knowledge and Western science can be consider two 'ways of knowing' that can be complementary rather than contradictory, especially when considering understanding ecological systems. *Roots of Wisdom* focuses on this idea of "Shared Science" using TEK and Western science to enhance our knowledge and stewardship of the natural world.

> *"The Three Sisters [gardens of corn, beans, and squash] offer us a new metaphor for an emerging relationship between indigenous knowledge and Western science, both of which are rooted in the earth. I think of the corn as Traditional Ecological Knowledge, the physical and spiritual framework that can guide the curious been of science, which twines like a double helix. The squash creates the ethical habitat for coexistence and mutual flourishing. In envision a time when the intellectual monoculture of science will be replaced with a polyculture of complementary knowledges. And so all may be fed."* – Robin Wall Kimmerer (2013) in Braiding Sweetgrass: Indigenous Wisdom, Scientific Knowledge and the Teachings of Plants

"The survival of TEK—a living library residing in the hearts and minds of Native peoples—is tied directly to the survival of indigenous cultures. TEK is entirely dependent on the continuance or restoration of traditional land based cultural practices." – Dennis Martinez (O'odham/Chicano), Co-Director, Takelma Intertribal Project (TIP) and Chair, Indigenous Peoples' Restoration Network (IPRN), from http://www.ser.org/iprn/iprn-home/welcome

"For over 10,000 years, American Indians from diverse tribes have lived in the United States. Natural resource management is not a modern invention; Indians have practiced the roots of this applied discipline for millennia. Our North American landscapes, a reflection of historical processes, both natural and cultural, bear the indelible imprint of a harvested and tended the wilds for millennia." – Traditional Ecological Knowledge: An Important Facet of Natural Resource Conservation. U.S. Department of Agriculture Natural Resource Conservation Service. n.d. (http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb1045244.pdf).

Speaking With and About Native People in the Museum

An important part of our roles as museum educators is to respectfully share the content of our exhibitions with diverse audiences. The following section contains suggestions for how to be culturally sensitive in these interactions recognizing that many non-Native museum staff, especially in science centers, will not have had a lot of experience working with Native curators, partners, and visitors. This information is provided because it is also important for staff to be accurately and respectfully presenting the material to all audiences to reinforce the messages of the exhibition and dispel misinformation.

> *"People are going to ask you questions, and you think that they are questions, but they are really lightning bolts of fear… People have an investment in **not** knowing in a settler nation state. This is a different kind of ignorance. This requires different levels of patience and understanding."*
> *– Darren Ranco (Penobscot), University of Maine, Coordinator of Native American Research & Associate Professor of Anthropology*

Assume that there are Native people in your audience

With this idea in mind, always be polite and respectful when talking about someone else's culture and recognize that you might make mistakes.

> *" It doesn't make sense to say…'I read all about you guys before I got here,' before coming to a tribal museum. You can't really know in that way. Instead, I answer, 'this is what I've been told or taught,' to explain how I know the things that I am sharing."*
> *– Randall Melton (CTUIR), Collection Curator, Tamástslikt Cultural Institute*

If you do not know the answer to a question, do not answer it

It is okay to say, "I don't know, but I will try to find out." There are several resources listed at the end of this guide to help answer common questions. The book written by the Smithsonian Institution's NMAI titled *Do All Indians Live in Tipis?* is especially helpful for many common questions. You are also welcome to contact OMSI or IEI (http://indigenousedu.org/), and we can reach out to project advisors and partners to answer questions.

Learn about what names to use

As explained previously, it is best is to refer to the specific, official tribal or national name whenever possible. Many Native people feel honored and recognized when their tribe, nation, or community is referenced accurately. Many tribes are commonly known by names that they do not use for themselves and are sometimes offensive. Try to learn how the Native communities describe themselves before identifying them. It is best to either ask a tribal member or go to an official resource (e.g. the tribe's government website) to make sure that you are using the appropriate name.

If you do need to use a generic term, *American Indian* and *Native American* are both used in the United States. The terms *Native* and *indigenous* are also acceptable. In Canada, the appropriate terms are *First People, First Nations*, and *aboriginal*. When talking about Hawaii, use *Native Hawaiians* and, for Alaska, use *Alaska Natives*.

Recognize that "Native America" actually represents an enormous diversity of nations, people, cultures, and communities

Native American cultures are commonly lumped together, and many people assume that all American Indians are the same. This idea is not true. Native Americans come from thousands of different communities with a multitude of diverse cultures, separate histories, and unique languages. No general characteristics apply to all Native American people, tribes, or communities. Although some tribes may share similarities in their stories, language, or cultural practices, all North American tribes are unique in and of themselves.

> *"It has been reported that at the end of the 15th century, over 300 American Indian and Alaska Native languages were spoken."* – U.S. Bureau of Indian Affairs, http://www.bia.gov/FAQs/

Avoid using the past tense to talk about Native peoples, cultures, knowledge, and life-ways

Non-Native people often assume that if current Native people do not live traditionally, then they do not exist. This idea is not true. There are many Native communities that are actively working to protect and restore their cultural traditions in a modern context.

> *"When you say, 'This is how they used to do it,' you are teaching students that we are dead."*
> *– Wenix Red Elk (CTUIR), Public Outreach and Education Specialist, Department of Natural Resources, CTUIR*

To acknowledge the continuing existence of Native peoples and cultures, it is more respectful and accurate to use the terms "art" or "object" instead of "artifact" when referencing an object from a Native culture. Similarly, use "pre-contact" instead of "prehistory" when talking about Native cultures before Europeans arrived. Change has always been happening in North America, before and after contact with European and other cultures, and Native communities have a variety of ways of tracking and recording these changes over time.

Be respectful of Native worldviews and knowledge

Origin stories and traditional knowledge are not "myths" or "legends." Instead, they are a critical part of many people's worldviews. Traditional stories and knowledge are also rooted in a deep understanding of the local environment and history of the places where indigenous people have lived for generations.

"Well-meaning people assume traditional knowledge is like a legend or myth. Actually, it is a form of real empirical knowledge that can be used. It is real knowledge based on doing something over and over again." – Charles Menzies (Tlingit/Gitxaała), Professor, Department of Anthropology, University of British Columbia

Avoid "exoticizing" or "romanticizing" Native people and cultures

Exoticizing means to portray Native people and cultures as exotic or unusual. Romanticizing means to glamorize or idealize Native cultures or people. It is particularly common for non-Native people to exoticize or romanticize Native cultures or people in regards to their spiritual or environmental practices. Therefore, it is important to recognize that there are many Native people with strong connections with the environment or spirituality, but not everyone and not all in the same way.

Avoid reinforcing negative stereotypes

Here are some common examples:

- *Not all Native people live on reservations.* Just like most U.S. populations, the largest Native communities are found in urban areas. According to the 2010 U.S. Census, 78% of people who identified as Native American lived outside of American Indian or Alaska Native areas. Many Native people live in urban centers because of relocation policies.
- *Not all Native people are "traditional" or "spiritual," but that does not mean that they are not still Native people.* Like any diverse category of people, each person and community has their own spiritual and religious understanding and identity.
- *Do not assume that Native people look a certain way* (e.g. high cheekbones, dark straight hair, and other physical characteristics). Individuals have their own unique and diverse ancestry, set of physical attributes, and personal preferences that influence how they look, but this physical appearance does not confirm or negate their identity as a Native person.
- *Not all Native people live in teepees, nor did their ancestors.* There are thousands of different Native communities throughout what is now the United States with a wide variety of housing used to best fit their cultures, environments, and climates. Such housing can include teepees, pueblos, longhouses, or high-rise apartments.
- *Not all Native communities have casinos that pay for schooling and other community needs.* Many Native communities do not have casinos or other tribal enterprises that provide payments to individuals or fund community needs. Other Native individuals are not enrolled members of a federally recognized tribe or nation, therefore making it impossible for them benefit from tribal enterprises. People in this situation are also denied services reserved for tribal members under federal law. Therefore, it is not appropriate to assume that all Native American and Alaska Native people have special financial or support services available to them.

Important Considerations for Science Museums

Respecting intellectual property

Museums and similar institutions must respect the intellectual property rights of Native knowledge holders, which means respectfully working with the knowledge holders to identify what information should be shared, how it should be shared, and how it should be credited. Just like any expert in their field, the knowledge holders should also be compensated appropriately for their time and expertise. Unlike with many other types of scientific or historical knowledge, it is rarely appropriate to simply reprint or share Native knowledge without the explicit permission of the knowledge holder. For example, it would be inappropriate to retell a cultural story or share photos of a cultural ceremony without first consulting with the knowledge holders who maintain and understand those traditions. It is also important to know that one individual does not speak or represent his or her tribal nation or community. If you are looking for this type of credit or authority on an area, then you must approach the tribal council, and they will lead you to the appropriate individuals.

To learn more about how to respectfully work with Native knowledge holders and include cultural information in educational environments, please refer the reference at the end of this guide including the documents created by the Alaska Native Knowledge Network and Preston Hardison of the Tulalip Tribes.

Human remains in the building

Being near human remains and/or having remains on display can be uncomfortable or offensive to some Native people for a variety of reasons. For some people, human remains are seen as potentially harmful. For others, it reminds them of how remains of Native people have been removed from their traditional and appropriate burial grounds to be put in museums and other non-Native institutions, which is extremely offensive and painful. Other individuals and communities may prefer not to view or be close to human remains such as skeletons and fetuses. Therefore, if your museum has human remains in its collections or exhibitions, it is important to warn visitors about this situation and allow them to make an informed decision about visiting the museum or certain exhibit areas.

> "The reason for telling people that there are human remains in the building is to protect the visitor. Many Native people feel that there is a negative attachment to the bones, and visitors could be harmed by the negative energy." – Nancy Maryboy (Cherokee/Navajo), President and founder of IEI

[Note: it is now illegal in the United States for museums to keep remains of Native people or funerary objects. The Native American Graves Protection and Repatriation Act (NAGPRA) requires that these items be returned to the Native communities that they were removed from.]

"When I talked to our Native advisors about why it would be offensive to see human remains in a museum, especially those of their ancestors, I started thinking about how I would feel if someone removed my grandfather from where we buried him in our nearby veteran's cemetery. I would be horribly sad and offended. It would be even worse if they put his remains on display without permission." – Kyrie Thompson Kellett, OMSI

Advisors for the *Roots of Wisdom* exhibition brought this issue to OMSI's attention before the exhibition opened allowing the team to reach out to local advisors and partners working in Native-serving organizations and tribes for guidance about where to locate the exhibition and how to alert visitors to the presence of human remains in the building.

The following recommendation to include signs/copy in critical areas came from advisors and partners as well as OMSI's experience while hosting the exhibition.

Include signage/copy in the following places:

- At all point of sale stations, membership window, and membership check in
- Near any exhibitions with human remains
- On any materials/advertising promoting the *Roots of Wisdom* exhibition
- On web pages promoting the *Roots of Wisdom* exhibition

Suggested copy for signage: Out of respect for cultural and personal beliefs, OMSI would like to make you aware that there are **human specimens in the museum.** If you have any questions, please contact a staff member.

Exhibition Overview

"Aloha 'Āina—to love the land, to plant the seed. I am hoping youth will see that and ask the question: 'how do you love the land?' When people come away with knowing that all knowledge is valuable, then that seed will spring forth to help solve the world's problems. I hope the exhibit inspires questions like, 'Uncle, how *do you aloha 'āina? How do you love the land?' It goes with the Hawaiian saying 'all knowledge is not learned in one school.'" – Herb Lee, Jr. (Hawaiian), Executive Director for Pacific American Foundation and Vice President of Waikalua Loko Preservation Society*

"What I want people to walk away with is that that they see these are three different tribal nations and Hawaiians, which are all different. We are not all the same people; we don't live in teepees, etc. These four stories represent even larger historical and cultural contexts and ecosystems, and we aren't all the same as Native Americans. Everyone has specific needs and projects despite overarching themes." – Wenix Red Elk (CTUIR), Public Outreach & Education Specialist, Department of Natural Resources of the CTUIR

"There are some protocols in indigenous communities about what types of knowledge you can share, so one of the key concepts that emerged for this project was reciprocal collaboration. Mutual exchange, shared science—it's collaborative. I hope people take away that we are all connected and interrelated and responsible for things on this earth." – VerlieAnn Malina-Wright, Ed.D. (Hawaiian), Chairman, Pacific American Foundation

"There are more things that are shared than are different. Don't be confused by the tag traditional. It's not staid, past, static. It's dynamic, shifting, and moving. Just like Western science changes, so does Native knowledge. We can get lost in the cultural differences, but there's a universal mode of inquiry framed through cultural traditions." – Charles Menzies, Ph.D. (Tlingit/Gitxaała)*, Professor, Department of Anthropology, University of British Columbia*

In *Roots of Wisdom*, students and families will learn the ways in which traditional knowledge of indigenous peoples and cutting-edge science are being applied to improve our world. The exhibition tells the stories of four communities, giving visitors real-life examples of how traditional knowledge and Western science provide complementary solutions to ecological and health challenges. Through the voices of elders and youth, hands-on interactives, and clever video games, visitors will gather resources, examine data, and take part in the growing movement toward sustainability and reclamation of age-old practices. The exhibition is specially designed for students ages 11–14 and has English audio, video, text and language samplings from several different indigenous communities.

Goals of the Roots of Wisdom *Exhibition*

Roots of Wisdom's primary educational goal is the concept that TEK and Western science are valuable and relevant to society, and that they offer complementary ways of understanding the natural world. Because general audiences are likely to be more familiar with Western science and relatively unfamiliar with indigenous ways of knowing, much of the exhibition content was developed to introduce TEK as a worldview/way of knowing. The main messages ingrained within these goals are as follows:

1. TEK and Western science have many commonalities, but they are also unique in many ways because they both depend on a cultural context.
2. TEK is long-term and place-based.
3. Indigenous peoples have been here for thousands of years and are still here today, engaging in both traditional and modern practices.
4. Native knowledge holders use TEK in a dynamic way, adapting their practices based on continuing observations of the environment.
5. TEK is cyclical and considers the connections between all things.

In addition, collaborative efforts are at the core of *Roots of Wisdom*'s goals and messages. This exhibition is the result of collaborations among OMSI, IEI, Smithsonian Institution Traveling Exhibition Service (SITES), and the Smithsonian Institution NMAI with four Native community partners that have graciously shared their restoration stories and their voices. As such, *Roots of Wisdom* aims to:

1. Leave visitors with knowledge that the exhibition is a collaboration among its partners.
2. Communicate the concept that reciprocal collaboration between TEK and Western science is valuable.
3. Foster further collaborations as the exhibition travels.
4. Encourage both Native and non-Native visitors to examine their personal connections to place, culture, and the stories being presented.

Exhibit Descriptions and Visitor Facilitation Tips

The exhibit components are grouped into five thematic areas:

1. Introducing and Understanding Traditional Knowledge and Western Science
2. Re-establishing a Native Plant (Eastern Band of Cherokee Indians)
3. Restoring Fish Ponds (Native Hawaiians)
4. Rediscovering Traditional Foods (Tulalip Tribes)
5. Saving Streams and Wildlife (Confederated Tribes of Umatilla)

The descriptions below include brief introductions to the themes explored in each thematic area as well as the title, description, and image of each exhibit component. If there are specific notes for facilitating or maintaining a specific exhibit component, they will be noted as *facilitation tips.*

THEMATIC AREA: Introducing and Understanding Traditional Knowledge and Western Science
Native discoveries and innovations have been used and adapted over time and now touch our lives every day: many foods we eat and products we use came to us through knowledge passed down by Native Americans and Hawaiians. However, sometimes this adaptation comes at a price for Native communities. In cases of biopiracy, traditional knowledge and natural resources are taken from Native people without permission or compensation.

Native Origins
Who knew that many of the foods and common household items we use today actually came to us from indigenous peoples? Visitors explore this display and realize that from our first aid kits to our crispers, Native knowledge impacts our lives every day.

Biopiracy
Visitors learn about the darker side of *Native Origins*. In many cases, knowledge has been taken from indigenous people without their permission and without compensation, an act called biopiracy. Visitors are asked to compare biopiracy with bioprospecting, the term for research of useful organic compounds that is not necessarily considered unfair to people or environments.

Story Area and Comment Board
Stories are an important means of passing down TEK. Listen closely to the stories of Native Americans and Hawaiians, and you will find a wealth of information about the natural world and traditions associated with it. At the story area, visitors are invited to read stories from Native communities and consider the wisdom they communicate.

What is your personal connection to the environment, culture, and tradition? At the Comment Board, visitors are asked to share their own stories. Facilitators can choose between a variety of prompts (or write their own—sample questions and additional discussion of this component are included in the *Maintaining the Comment Board* section of this guide), and visitors are provided with paper and pen with which to write their responses.

THEMATIC AREA: Re-establishing a Native Plant (Eastern Band of Cherokee Indians)
River cane, a North American bamboo, is important for river ecosystems in the southeastern United States and is used for many traditional practices by the Eastern Band of Cherokee Indians. Although it was once plentiful across southeastern landscapes, less than 2% of its historical range remains. Today,

the tribe is working with scientists and regional groups to restore river cane. They are also revitalizing cultural traditions that use the cane, such as basket making.

River Cane Ecology
River cane is important to water conservation because canebrakes (thickets of cane) filter sediment and excess runoff from farms and towns. In this exhibit, visitors turn cranks to work a model that simulates runoff flowing across two hills: one with a canebrake and one with grass. Which will allow more sediment to flow into the river?

Facilitation tips:

- *Periodically check to make sure that the balls roll into the conveyor troughs properly. If balls are straying inside the mechanism, call the Traveling Exhibits Technical Manager at 503.797.4660 for assistance.*

Passing a Tradition
River cane is used for many traditional practices including basket making. In this exhibit, visitors will learn about basket making and the ways that the Eastern Band of Cherokee Indians is keeping the tradition alive. Visitors are invited to watch a short video on the project and even try their hand at weaving.

Facilitation tips:

- *Periodically make sure that the two weaving boards and the four accompanying challenge cards are on the table.*
- *Feel free to leave the patterns made by visitors on the weaving boards. They are often interesting and inviting to other visitors.*

THEMATIC AREA: Restoring Fish Ponds (Native Hawaiians)
Everything that happens to the mountains above affects the land and water below. Because of this connection, Native Hawaiians traditionally lived in small land divisions called *ahupua'a* —land sections extending from mountain to ocean and including varied resources like taro fields and fish ponds. Native Hawaiians are today using traditional knowledge and science to restore parts of the *ahupua'a*. Although fish pond restoration is challenging, the work is significant for Hawaiian culture and is potentially important for future sustainable food sources.

Aloha ʻĀina: Love of the Land

Through the flow of water, anything that happens at the top of a mountain affects what is below. In this exhibit, visitors place blocks to build a Hawaiian *ahupuaʻa* based on traditional knowledge. Hints on each block help visitors place plants and animals where they grow best and help the system thrive.

Facilitation tips:

- *Check periodically to make sure all blocks are accounted for, and place them back in the storage bin if they have been left in the slots on the "mountain" part of the exhibit.*
- *Check the lights in this component periodically. If the thunder sound effect or any lights stop working, call the Traveling Exhibitions Technical Manager at 503.797.4660 for assistance.*

Hawaiian Fish Ponds

For hundreds of years, Native Hawaiians built fish ponds to produce food for their communities. Today, many groups are restoring ponds that have been out of use for at least 100 years. In this exhibit, visitors restore a traditional Hawaiian *loko iʻa* (fish pond) on a touch screen by removing invasive species, rebuilding walls, and stopping pollution. It is hard work!

THEMATIC AREA: Rediscovering Traditional Foods (Tulalip Tribes)

The Tulalip Tribes have historically gathered and tended a rich variety of natural resources, but over time, tribal members' health suffered as they lost access to traditional foods. Tribal members today are gardening organic foods and, in the process, reconnecting to native food and traditional medicine plants. In doing so, they combine traditional knowledge and Western science for a more culturally appropriate approach to health care.

Connected to the Land

Limited land access and environmental problems like pollution can make it difficult for the Tulalip Tribes to access native foods. However, the tribes continue to protect and carry traditional knowledge about the care and use of native plants. In this exhibit, visitors use a touch screen to explore the Tulalip lands to gather and learn about traditional foods available in different seasons.

Food: Medicine of the Land

Plants have a lot to teach us. In this exhibit, visitors learn about wild harvesting and gardening of important plants

through an audio interactive. Visitors touch a watering can to garden plants or a bee to wild native plants to hear what the plants have to share with us. Visitors learn how eating local, traditionally harvested food and community-grown produce is beneficial to human health.

Facilitation tips:

- *Check periodically to make sure that the watering wand is not dangling toward the ground, which strains the hose.*

THEMATIC AREA: Saving Streams and Wildlife (Confederated Tribes of Umatilla)

Throughout their long history in the Pacific Northwest, the Cayuse, Umatilla, and Walla Walla tribes have learned about and relied upon streams for water, transportation, cultural practices, and sacred foods. In recent years, the streams and wildlife have faced problems, but the tribes are using their resources to restore waterways.

Protecting an Ancient Fish

This fish looks positively prehistoric! And it is. The lamprey is over 450 million years old.

It is also a sacred food for the Confederated Tribes of Umatilla and an important part of local river ecosystems. Unfortunately, lampreys are facing extinction in the Columbia River basin. In this exhibit, visitors "catch" and scan lampreys to learn how tribal members are using traditional knowledge and Western science to help ensure a future for lampreys.

Facilitation tips:

- *Count lampreys periodically as they are sometimes stolen or missing. Eight or so seems to be the ideal number to keep in the bin, although it is best to stay below this number rather than over. Too many lampreys in the exhibit at one time seems to encourage theft, perhaps because visitors figure that one will not be missed.*
- *Check each day to make sure all lampreys are working. Sometimes the chips move away from the head, which makes them not register on the scanner. If this problem occurs, call the Traveling Exhibitions Technical Manager at 503.797.4660 for assistance.*

Healthy Streams, Returning Salmon

Construction, farming, and dams have blocked streams and removed water, which makes it difficult for salmon to swim upstream to spawning grounds on tribal lands. In this exhibit, visitors learn how the tribes are engaging in river restoration to make them healthier habitats for returning fish. Visitors use blocks to build a stream and score points for including features that the tribes are using to restore their waterways.

Facilitation tips:

- *It is okay to leave pieces on the board -- the partially completed activity draws the attention of other visitors.*

Correlation with Educational Standards

Next Generation Science Standards

Practices

- Asking questions and defining problems
- Developing and using models
- Constructing explanations and designing solutions
- Engaging in argument from evidence
- Obtaining, evaluating, and communicating information

Crosscutting Concepts

- Patterns
- Cause and effect
- Systems and system models
- Energy and matter
- Structure and function
- Stability and change

	Disciplinary Core Idea	MS
Life Science		
LS1	From molecules to organisms: Structures and processes	
LS2	Ecosystems: Interactions, Energy, and Dynamics	✓
LS3	Heredity: Inheritance and Variation of Traits	
LS4	Biological Evolution: Unity and Diversity	
Earth & Space Science		
ESS1	Earth's Place in the Universe	
ESS2	Earth's Systems	✓
ESS3	Earth and Human Activity	✓
Engineering, Technology, and Applications of Science		
ETS1	Engineering Design	✓

Topics

MSLS2.A	*Organisms, and populations of organisms, are dependent on their environmental interactions both with other living things and with nonliving factors. (MS-LS2-1)*
MSLS2.A	*Growth of organisms and population increases are limited by access to resources. (MS-LS2-1)*
MSLS2.A	*Similarly, predatory interactions may reduce the number of organisms or eliminate whole populations of organisms. Mutually beneficial interactions, in contrast, may become so interdependent that each organism requires the other for survival. Although the species involved in these competitive, predatory, and mutually beneficial interactions vary across ecosystems, the patterns of interactions of organisms with their environments, both living and nonliving, are shared. (MS-LS2-2)*
MSLS2.C	*Ecosystems are dynamic in nature; their characteristics can vary over time. Disruptions to any physical or biological component of an ecosystem can lead to shifts in all its populations. (MS-LS2-4)*
MSLS2.D	*Changes in biodiversity can influence humans' resources, such as food, energy, and medicines, as well as ecosystem services that humans rely on—for example, water purification and recycling.(secondary to MS-LS2-5)*
MSETS1.B	*There are systematic processes for evaluating solutions with respect to how well they meet the criteria and constraints of a problem. (secondary to MS-LS2-5)*
MSESS2.A	*All Earth processes are the result of energy flowing and matter cycling within and among the planet's systems. This energy is derived from the sun and Earth's hot interior. The energy that flows and matter that cycles produce chemical and physical changes in Earth's materials and living organisms. (MS-ESS2-1)*
MSESS2.C	*Water continually cycles among land, ocean, and atmosphere via transpiration, evaporation, condensation and crystallization, and precipitation, as well as downhill flows on land. (MS-ESS2-4)*
MSESS3.A	*Humans depend on Earth's land, ocean, atmosphere, and biosphere for many different resources. Minerals, fresh water, and biosphere resources are limited, and many are not renewable or replaceable over human lifetimes. These resources are distributed unevenly around the planet as a result of past geologic processes. (MS-ESS3-1)*
MSESS3.C	*Human activities have significantly altered the biosphere, sometimes damaging or destroying natural habitats and causing the extinction of other species. But changes to Earth's environments can have different impacts (negative and positive) for different living things. (MS-ESS3-3)*
MSETS1.B	*Sometimes parts of different solutions can be combined to create a solution that is better than any of its predecessors. (MS-ETS1-3)*

Performance Expectation

MS-LS2-1 *Analyze and interpret data to provide evidence for the effects of resource availability on organisms and populations of organisms in an ecosystem.*

MS-LS2-2. *Construct an explanation that predicts patterns of interactions among organisms across multiple ecosystems.*

MS-LS2-4. *Construct an argument supported by empirical evidence that changes to physical or*

MS-LS2-5. *biological components of an ecosystem affect populations.*

MS-ESS2-1 *Evaluate competing design solutions for maintaining biodiversity and ecosystem services.*

MS-ESS2-4 *Develop a model to describe the cycling of Earth's materials and the flow of energy that drives this process.*

MS-ESS3-1 *Develop a model to describe the cycling of water through Earth's systems driven by energy from the sun and the force of gravity.*

MS-ESS3-3 *Construct a scientific explanation based on evidence for how the uneven distributions of*

MS-ETS1-3 *Earth's mineral, energy, and groundwater resources are the result of past and current geoscience processes.*

Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment.

Analyze data from tests to determine similarities and differences among several design solutions to identify the best characteristics of each that can be combined into a new solution to better meet the criteria for success.

National Standards for Arts Education

NA-VA.5-8.4 ***Understanding the Visual Arts in Relation to History and Cultures***

- *Students know and compare the characteristics of artworks in various eras and cultures*
- *Students describe and place a variety of art objects in historical and cultural contexts*
- *Students analyze, describe, and demonstrate how factors of time and place (such as climate, resources, ideas, and technology) influence visual characteristics that give meaning and value to a work of art*

NA-VA.5-8.6 ***Making Connections Between Visual Arts and Other Disciplines***

- *Students describe ways in which the principles and subject matter of other disciplines taught in the school are interrelated with the visual arts*

Active Learning Log

Name_____

Native Origins

Many things we use or eat on a daily basis have come to us from indigenous people of the Americas. Explore the display of products with native origins.

Did any of the foods with native origins surprise you? Which ones? Why?

Re-establishing a Native Plant

- **River Cane Ecology**

  River cane is an important plant culturally and ecologically to the people of the Eastern Band of Cherokee Indians. Turn the cranks on the river cane ecosystem model to simulate how runoff flows down two separate hills.

  Which hill allowed more sediment (the white balls) to flow into the river: the hill with the river cane or the hill without the river cane? Why? Which environment is healthier?

- **Passing a Tradition**

  Watch the video. Sarah Thompson describes how Cherokee weavers prepare the river cane for basket making. What plants do they use to dye their baskets?

Restoring Fish Ponds

- **Aloha ʻĀina: Love of the Land**
  Place the blocks to build a Hawaiian *ahupuaʻa* based on traditional knowledge.

  Draw the flow of water from the top of the mountain to the fish pond. What plants and animals did the water encounter along the way?

- **Hawaiian Fish Ponds**

  Play the video game.

  How did you improve the environment in the fish pond?

  What plants and animals are the Native Hawaiians removing in order to restore the fish ponds?

Rediscovering Traditional Foods

- **Connected to the Land**

  Play the video game. What plants and animals did you harvest for your community?

  What happens if you harvest too much?

- **Food: Medicine of the Land**

  Use the bee and garden wand to touch the wild and garden plants. Listen to the recordings.

  How do the Tulalip people traditionally use Nodding Onion?

  Which plant do they grow that helps lower their rate of heart disease?

Saving Streams and Wildlife

- **Protecting an Ancient Fish**

  Grab a lamprey and scan it. Where was your lamprey last found?

  How do the people of the Confederated Tribes of Umatilla traditionally use lampreys?

- **Healthy Streams:**

  Build a stream. Draw your stream below and include the features you added to make the stream healthier.

Active Learning Log Answer Key

Name_____

Native Origins

Many things we use or eat on a daily basis have come to us from indigenous people of the Americas. Explore the display of products with native origins.

Did any of the foods with native origins surprise you? Which ones? Why? Bubblegum, chocolate, vanilla, pumpkin, sunflower, corn, bean, squash, popcorn.

Re-establishing a Native Plant

- **River Cane Ecology**

  River cane is an important plant culturally and ecologically to the people of the Eastern Band of Cherokee Indians. Turn the cranks on the river cane ecosystem model to simulate how runoff flows down two separate hills.

  Which hill allowed more sediment (the white balls) to flow into the river: the hill with the river cane or the hill without the river cane? Why? Which environment is healthier?

  The hill with the river cane grove is healthier because it had less runoff. There was less runoff because the river cane helped slow down the water so it could soak into the ground before getting to the river.

- **Passing a Tradition**

  Watch the video. Sarah Thompson describes how Cherokee weavers prepare the river cane for basket making. What plants do they use to dye the baskets? Walnut, butternut, and bloodroot.

Restoring Fish Ponds

- **Aloha ʻĀina: Love of the Land**
  Place the blocks to build a Hawaiian *ahupuaʻa* based on traditional knowledge.

  Draw the flow of water from the top of the mountain to the fish pond. What plants and animals did the water encounter along the way?

- **Hawaiian Fish Ponds**

  Play the video game.

  How did you improve the environment in the fish pond? By removing invasive and non-native plants.

  What plants and animals are the Native Hawaiians removing in order to restore the fish ponds? Barracuda, mangrove, and non-native seaweed.

Rediscovering Traditional Foods

- **Connected to the Land**

  Play the video game. What plants and animals did you harvest for your community? Salmon, blackberries, and clams.

  What happens if you harvest too much? You have to give it away to your neighbors who need it.

- **Food: Medicine of the Land**

  Use the bee and garden wand to touch the wild and garden plants. Listen to the recordings.

How do the Tulalip people traditionally use Nodding Onion? They eat it with Sockeye Salmon and season food with it.

Which plant do they grow that helps lower their rate of heart disease? Blueberries.

Saving Streams and Wildlife

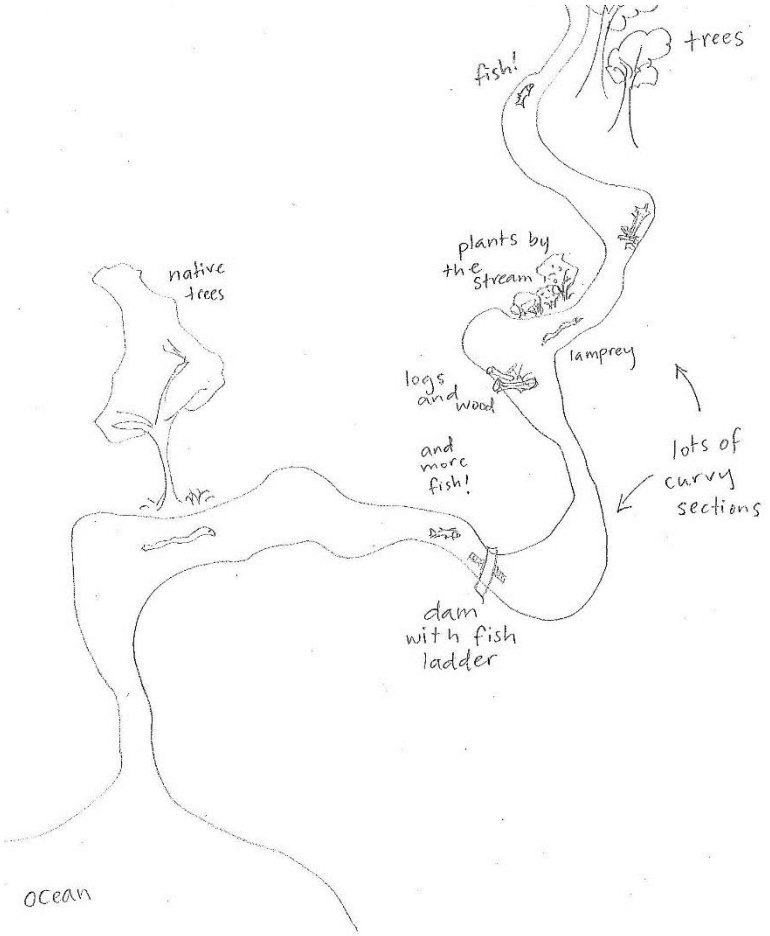
- **Protecting an Ancient Fish**

  Grab a lamprey and scan it. Where was your lamprey last found? On the _____ River near _____.

  How do the people of the Confederated Tribes of Umatilla traditionally use lampreys? As a food source and medicine.

- **Healthy Streams**

  Build a stream. Draw your stream below and include the features you added to make the stream healthier.



Procedures and Daily Maintenance

Opening

- Make sure all touch screens and computer-based activities (Connected to the Land, Protecting an Ancient Fish, Restoring Fish Ponds) are turned on and working properly.
- Make sure all video activities (four intro videos, Passing a Tradition) are working properly.
- Make sure the Comment Board is freshly stocked with paper and the pen is functional. Sort through the visitor-submitted sheets and post the interesting, relevant responses on the Comment Board. Update the question if need be. (Sample questions and more information about maintaining this component are included in the *Maintaining the Comment Board* section below).
- Make sure all exhibit surfaces and the exhibition area are clean.
- Make sure there are 6–8 lampreys in the Protecting an Ancient Fish exhibit.
- Make sure that two weaving boards and four accompanying challenge cards are on the table.
- Make sure all blocks in the Aloha ʻĀina: Love of the Land component are accounted for and placed in the storage bin.
- Check the lights in the Aloha ʻĀina: Love of the Land component are working. If the thunder sound effect or any lights stop working, call the Traveling Exhibitions Technical Manager at 503.797.4660 for assistance.
- Make sure that all of the lampreys are working. Sometimes the chips move away from the head, which makes them not register on the scanner. If they are not working, consult the Technical Manual or contact the Traveling Exhibitions Technical Manager at 503.797.4660.
- Make sure the balls in River Cane Ecology roll into the conveyor troughs properly. If balls are straying inside the mechanism, call the Traveling Exhibits Technical Manager at 503.797.4660 for assistance.

Throughout the Day

- Throughout the day, make sure to clean tabletops, especially near the Comment Board, of stray pen marks. Use a soft, lint-free, non-abrasive cloth dampened with Simple Green© to clean the plastic laminate. Dry the surface immediately with a soft, lint-free, non-abrasive cloth.
- Make sure the Comment Board is always stocked with paper and the pen is functioning. Keep the tabletop neat to encourage appropriate activity.

Closing

- Make sure all computer-based activities and videos are turned off.
- Make sure that the watering wand in Food: Medicine of the Land is stored properly so that it is not dangling by its hose.
- Check to make sure that the stuffed lampreys have not disappeared. If so, look for where they might have been placed in other exhibit components or areas of the exhibition hall.

General Cleaning

Please see the *Cleaning* section of the Technical Manual for general cleaning instructions.

Maintaining the Comment Board

The Comment Board is a component where visitors are asked to contribute their thoughts to the exhibition. Questions are chosen by the host organization and serve to encourage visitors to consider the big idea of the exhibition within the context of their own lives (see suggested questions and creating questions below). Visitors answer the question and then drop their answers into a slot, where museum staff will later gather, curate, and post the provided answers.

In providing a framework for visitor dialogue, the Comment Board helps to foster a sense of community and discussion. By having the opportunity to contribute their thoughts and experiences, visitors are able to personalize the exhibit and have a more meaningful experience. The answers posted on the Comment Board also help to expose visitors to each other's thoughts and ideas, enhancing the exhibit by including a diversity of community voices.

[*Get creative! Research has shown that visitors are more likely to respond to comment boards if the paper is colorful or has interesting shapes.]*

Creating Questions

The aim of each question is to get the visitor to consider the main themes of the exhibition, pause to think about his or her own experiences, and share. Ecological knowledge, tradition, environmental sustainability, cultural heritage, place, shared knowledge and personal connection to the land and environment are some topics that might be addressed in questions should the hosting organization decide to create its own.

The best questions are simple yet specific and personally relevant. The questions should give visitors set parameters, yet be short enough for them to be able to answer in a reasonable amount of time. It's important to be respectful of a participant's time and abilities while still offering him or her a meaningful means of contributing to the project. Keeping the questions open ended allows visitors to interpret them through their own personal lens and provide responses.

Questions Used at OMSI

These questions were created by the OMSI *Roots of Wisdom* team and tested while the exhibition was on the museum floor.

- What have you learned about your natural environment from living in one place for a long time?
- What is a food that is a part of a tradition in your family? What is the tradition?

The second question about food solicited more responses overall (169 vs. 29), suggesting that questions about shared experiences such as food or family may be easier to relate to for more people and therefore evoke more participation.

In both cases, though, about two-thirds of the responses were relevant and appropriate for posting. This fraction is relatively high, suggesting that both questions were good at soliciting

thoughtful responses. Having a portion of the responses be inappropriate or irrelevant is very common, so do not worry if this situation is the case at your institution as well.

Other Suggested Questions

The following questions are ones that the OMSI *Roots of Wisdom* team saw as having potential. A great deal of thought was put into creating them, although there was not an opportunity to test them while the exhibition was on the floor.

- Do you have a story about a plant or animal native to the place you live? Why is it important to protect that plant or animal?
- Do you live where your ancestors lived? Is there anything you wish you could learn about that place?
- What is special about your local environment? How many generations of your family have lived there?
- Is there something that comes from nature that is part of your family heritage?
- Do you have a special place? What about that place makes you feel connected to it?
- How long have you lived in your hometown? What do you find unique about the environment in your area?
- Is there a special place important in your family history? What is special about that place?
- Do you have a story of when you grew, harvested, fished, or hunted for your own food?
- What if you lived off the land? What would you eat? What would you need to know about?

Curating the Comment Board

Curating the answers for posting on the Comment Board is an important task for the overall benefit of complementing the *Roots of Wisdom* exhibition. When sorting and choosing answers for the board, pick answers that can model to other visitors how best to contribute. A diverse range of specific, thoughtful, and meaningful answers not only enriches the experience of those reading them, but models how to consider the question to other participants. Modeling great answers is also encourages participation and sets the tone of future responses.

Also, be sure to include answers given from people of varying ages and backgrounds. Doing so makes the content more accessible and serves to communicate to visitors of all ages and backgrounds that their contributions are relevant and appreciated. Host organizations can set the tone for future answers by answering the question themselves first and posting the answers for visitors to see.

Local Content

On the back of the Comment Board is an area that offers the host organization and its staff a chance to personalize the exhibit, interpret it through their own lens, and make the exhibit locally relevant. We encourage hosting organizations to fill this space with local articles and stories that reflect the big ideas of the exhibition. This opportunity can be used to spotlight local restoration or research projects, recognize exceptional individuals, or simply highlight interesting and relevant topics. However, the space can also be used for displaying more Comment Board responses should the host organization choose to do so.

References and Resources

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[This resource is highly recommended for museums hosting the Roots of Wisdom *exhibition. It is available for purchase from NMAI by emailing NMAI-info@si.edu or by phone 1-800-242-6624.]*
The book includes the following cited articles:

- Batencourt, Stephanie. “How Many Indians Lived in the Western Hemisphere When Columbus Arrived?”
- Hill, Liz, and Arwen Nuttall. “Is it True That Indian Languages Are Now Extinct?”

Norris, Tina, Paula L. Vines, and Elizabeth M. Hoeffel, 2012. *The American Indian and Alaska Native Population: 2010 (2010 Census Briefs)*. Accessed on May 15, 2015, http://www.census.gov/prod/cen2010/briefs/c2010br-10.pdf.

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