

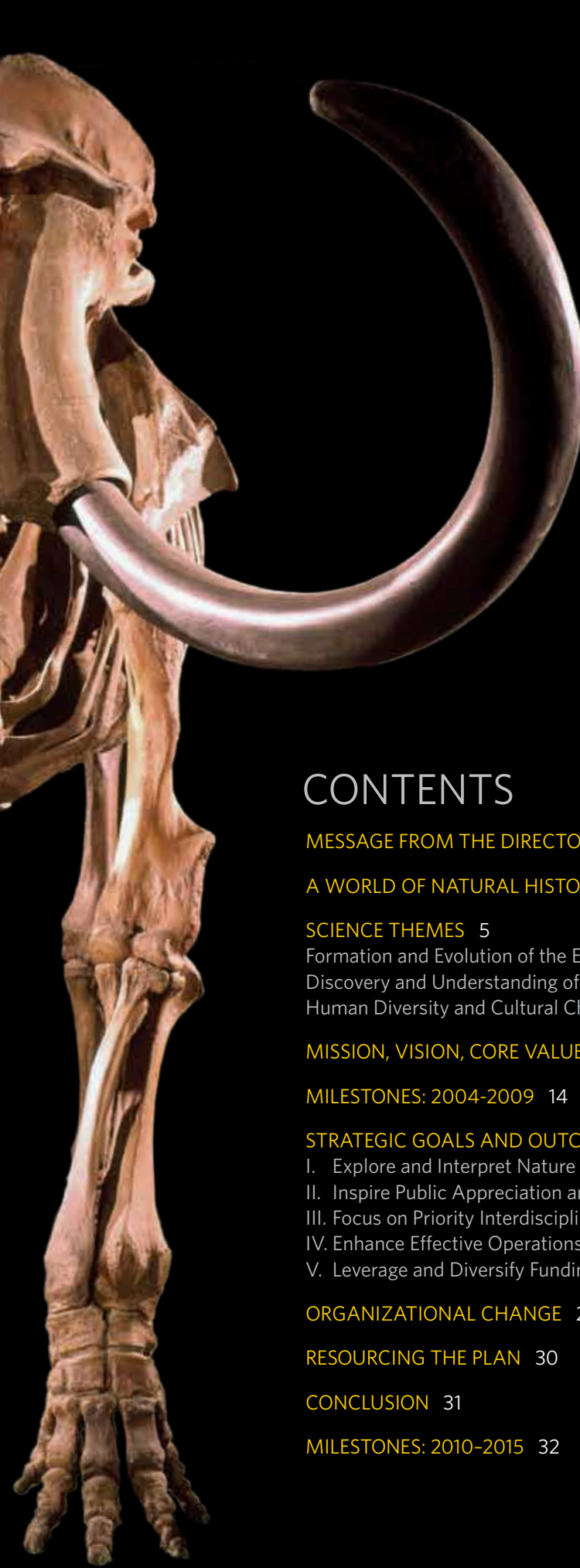
NATIONAL MUSEUM OF  
**NATURAL  
HISTORY**



Knowledge for a Sustainable Future | Strategic Plan 2010-2015



Smithsonian  
*National Museum of Natural History*



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# MESSAGE FROM THE DIRECTOR

## IMAGINE A DAY

when we can have instant access to all the Smithsonian collections anywhere in the world, in multiple languages. Imagine an online encyclopedia with a Web page for every known species, with links to specimens and literature, through which we can engage thousands of students and citizen scientists in research projects. Or a day when we can gather rock samples from every part of the solar system, analyze them in our labs, and determine what makes our planet uniquely capable of supporting life. Imagine using museum collections to recreate entire environments, or a time when we can fully understand what the diversity of the world's languages—particularly those that are endangered—can tell us about how our minds work and how we think about the world.

This future is on the horizon, and the roadmap is in our hands.

The National Museum of Natural History's strategic plan, *Knowledge for a Sustainable Future*, guides our work over the next five years. Since our main building first opened its doors to the public on March 17, 1910, the world has changed dramatically, and the future holds even greater promise for natural history science. New technologies let us ask new questions of our existing collections, share our science and education programs with millions of people, and inspire them to understand the natural world and our place in it.

But we also face significant challenges. Globalization and environmental change threaten the existence of countless species and speed the disappearance of indigenous languages, traditional knowledge, and practices. Finite resources limit

our ability to carry out an agenda that will both advance science and address some of society's greatest concerns.

Designed to contribute to the Smithsonian Institution's vision and goals, *Knowledge for a Sustainable Future* will help us sustain our leadership and, by 2015, become a Museum and research institution that:

- Expands the world's most comprehensive natural history collections, preserves them for future generations, and makes them available globally.
- Uses these collections to make fundamental contributions to our knowledge and understanding of nature and culture.
- Reaches a global audience and inspires people to learn about the natural world.
- Integrates its research and collections with its education and outreach activities.
- Builds strong collaborations across the Smithsonian Institution, government agencies, and national and international institutions.
- Fosters an adaptive, accountable, and entrepreneurial culture.

We invite you to join us as we reconfigure the Museum for the 21<sup>st</sup> century and contribute to a deeper appreciation for and better understanding of nature and culture. It promises to be an exciting journey.

Cristián Samper, Director

# A WORLD OF NATURAL HISTORY



The National Museum of Natural History has grown to become the most visited museum in the United States, attracting more than seven million visitors a year, with millions more visiting online. But the many people who come to see our dynamic exhibitions might not realize that we are, first and foremost, a scientific institution, whose work is based on a rich collection of natural history and cultural objects—the size and scope of which is unrivaled anywhere in the world.

## SCIENTIFIC RESEARCH

The Museum supports research in three thematic areas: the formation and evolution of the Earth and similar planets; the discovery and understanding of life's diversity; and the study of human diversity and cultural change. Today's complex scientific and cultural challenges require broad collaboration across various disciplines, and the Museum strives to link knowledge from geological, paleontological, biological, and anthropological research. Our scientists collaborate with universities and research centers in every state across the United States and conduct research in more than 80 countries around the world. Their efforts inspire future scientists and promote the scientific literacy that enables citizens to weigh evidence and make informed decisions about the future.

## THE NATIONAL COLLECTIONS

More than 126 million specimens and objects make up the National Collections, which are essential to our understanding of nature and culture. Our collections document the history and formation of Earth, the diversity and evolution of life on the planet, and our shared human heritage. The collections' relevance to science and society grows as new technologies are applied to their study and analysis. We use DNA from specimens collected in the past to address issues related to conservation, public health, and national security. Thousands of researchers visit us to study the collections, and at any given time, over two

million objects from our collections are on loan to national and international research organizations. Cited in more than 1,200 scientific publications annually, the Museum's collections also play a key role in research conducted by government agencies such as the United States Departments of Agriculture, Defense, Commerce, and the Interior, as well as other federal and state agencies.

## ENGAGING THE WORLD IN SCIENCE

The Museum is a "must-see" destination in Washington, D.C.—more than 90 percent of our visitors come from other parts of the nation and the world. We engage them with large-scale permanent and changing exhibitions that deepen their understanding of Earth's natural history and cultures. For example, we use the famous Hope Diamond to tell the story of the formation of minerals, and the North Atlantic right whale to explore the evolution of life and our impacts on the ocean. More than 600 trained volunteers guide visitors through our galleries and enrich their appreciation of the exhibitions. We also develop educational materials and programs that use our resources to involve students in natural history studies. Advances in information technologies enable us to reach broader audiences, and online information now accompanies all major exhibitions. As a result, online visits to the Museum have dramatically expanded to more than 30 million in 2009. We also collaborate with the Smithsonian Channel and other media outlets to introduce our collections and experts into homes across the country.



# SCIENCE THEMES



The following section describes the Museum's three science themes. Each of these themes is based on a commitment to generating new knowledge and interpreting for the public the results of our research.

# FORMATION AND EVOLUTION OF THE EARTH AND SIMILAR PLANETS

Our Earth and planetary scientists endeavor to understand the cosmic origins and continuing evolution of Earth and similar planets. Our world-renowned collections of minerals, gems, rocks, ores, and meteorites, and our unprecedented database of volcanic activity, reveal the history of our dynamic planet.

For example, today we are able to measure the chemistry of grains in ancient meteorites to reveal our planet's connection with distant super-massive stars, allowing us to chart events that occurred some 4.56 billion years ago when our solar system was born. The Antarctic Meteorite Program recovers, documents, and studies new meteorites, bringing previously unknown worlds into scientific view each year. Museum scientists also take part in NASA missions to Mars, comets, and asteroids, and compare results from those missions with studies of samples from those worlds, to understand the context of our solar system and the universe. Our scientists seek to understand what makes the Earth unique among known worlds.

Earth's rocks document the history of processes that have shaped our planet. Using state-of-the-art laboratories, our scientists are able to reconstruct and understand events as diverse as the formation of planetary cores and the ongoing cycle of formation and destruction of Earth's crust. Our planet is constantly being resurfaced by geological processes, and Earth's crust links the planet's interior with life on the surface—sometimes in dramatic ways. By maintaining an extensive database of global volcanic activity and working with diverse government agencies, the Museum's Global Volcanism Program seeks to understand the hazards that volcanoes pose to humans. Our collections also inspire human innovation and imagination, from the use of minerals in technology, to the storied history of the Hope Diamond. All of these research lines attempt to unravel the critical and complex pathways that have shaped our planet from stardust to the unique blue world we inhabit today.





# DISCOVERY AND UNDERSTANDING OF LIFE'S DIVERSITY

Our biologists and paleontologists are interested in the diversity and evolution of life on Earth. They play a major role in the discovery and classification of species, as well as in the study of the patterns and processes that explain the distribution of life in the past and present.

The fossil record provides unique insights into the history of life and allows us to study responses of species and ecosystems to countless—occasionally cataclysmic—changes in Earth's physical environment over the past 3.5 billion years. Independent data gathered from fossils complements studies on present-day organisms that are aimed at understanding and interpreting evolutionary innovations and diversifications as well as patterns of biodiversity. Museum paleontologists combine field- and collections-based data with novel analyses of biological and geological processes to understand the forces, such as climate change, that affect the evolution and ecology of life through time.

While more than 1.9 million living species have been scientifically described, estimates of present-day diversity range as high as 30 million species. We continue to discover and describe many new species and are using new tools to assemble a Tree of Life that reveals the history and shared ancestry for major groups of plants and animals. Our scientists, in collaboration with other leading institutions around the world, are compiling an online Encyclopedia of Life, with information about all described living species, available to everyone for free. Unfortunately, many of these species are disappearing as a result of accelerating environmental changes. The degradation of natural systems makes imperative the rapid acquisition of detailed knowledge about Earth's biological diversity. Genomes of known and unknown species hold vast, but still largely, untapped potential for elucidating the biology and interrelationships of organisms, and modern research increasingly draws on this critical resource. This work is fundamental to the informed management of the planet's natural systems for future generations.



# HUMAN DIVERSITY AND CULTURAL CHANGE

Our anthropologists seek to understand humanity in all of its complexity, within a framework of broad cultural, social, linguistic, and biological theories, from the emergence of the human species to the present. They communicate their findings widely, and their insights address the problems of the modern world and promote cross-cultural understanding and dialogue.

Our physical anthropologists study long-term trends in human biology, with emphases on health and disease, forensics, demography, evolutionary change, environmental influences on human biology and evolution, and the biological correlates of cultural diversity and change. Archaeologists focus on major cultural transformations through time, including human colonization of the world's continents and the origins of agriculture, urban societies, and civilizations. They also assess long-term relationships between humans and their physical and biotic environments, as well as examine evolutionary and ecological relationships over long periods of time. Cultural anthropologists and linguists explore how the world's societies and cultures develop, maintain, and transform their distinct identities and traditions, both historically and today.

The Museum's vast collections of material culture, ethnographic and linguistic documentation, and images in various media preserve knowledge of human behavior, cultural expressions, and social institutions that are changing or disappearing in a transforming world. This material also provides the platform for carrying out more collaborative scientific endeavors to address these changes. The Museum is a global leader in the study of Native American cultures, languages, and history. Programs in this area include working collaboratively with Native communities, as well as disseminating information about Native American heritage and cultural resources. Our Repatriation Program oversees the return of Native American human remains as well as sacred and funerary objects, as mandated by law.



# MISSION

We increase knowledge and inspire learning about nature and culture, through outstanding research, collections, exhibitions, and education, in support of a sustainable future.

# VISION

Understanding the natural world and our place in it.

# CORE VALUES

**SCIENCE:** we use the scientific method to propose and test hypotheses and generate new knowledge.

**INTELLECTUAL FREEDOM:** we recruit and train the best minds and give them independence to pursue important questions.

**EXCELLENCE:** we deliver the highest-quality products and services in all endeavors, from research publications to exhibitions and educational programs.

**DIVERSITY:** we capitalize on the richness inherent in differences.

**INTEGRITY:** we achieve our goals with the greatest responsibility and accountability.



# CORE STRENGTHS

**PEOPLE:** our staff and volunteers are exceptionally experienced and dedicated to our mission.

**COLLECTIONS:** we care for the largest natural history collections in the world.

**RECOGNITION:** we have a long tradition and are widely known throughout the United States and the world as part of the Smithsonian Institution.

**LOCATION:** our headquarters in Washington, D.C., provides access to national and international partners and audiences and is of symbolic importance to all our constituencies.

**PARTNERSHIPS:** we are dedicated to collaboration with other parts of the Smithsonian, government agencies, universities, and museums in the United States and abroad.



# MILESTONES: 2004–2009

In setting benchmarks for the future, we assessed outcomes from our 2004–2009 strategic plan, *Understanding Our World*, which established an ambitious agenda for change in the midst of a challenging environment. Many of these milestones were directly related to the recommendations from the 2003 Smithsonian Science Commission.

## HIRING THE NEXT GENERATION OF RESEARCH SCIENTISTS

Recruiting the next generation of research curators was a top priority because many of our experienced researchers were nearing retirement. To date, we have hired 21 new research scientists and secured the Museum's first two endowed chairs: the Sant Chair in Marine Science and the Peter Buck Chair in Human Origins. Endowed chairs support our ability to recruit and support the work of leading scientists around priority initiatives.

## IMPROVING COLLECTIONS STORAGE

The expansion of the Museum Support Center (MSC) added a new state-of-the-art facility for biological collections stored in alcohol. The MSC is a complex of buildings, referred to as "pods," that store specimens and artifacts and house laboratories and research facilities where Museum scientists and visitors conduct their work. We have moved some 25 million specimens to this new facility, including most of our fish collection—the largest in the world—and collections of alcohol-preserved amphibians, reptiles, and marine invertebrates. We also renovated spaces at MSC to house our marine mammal collection—also the world's largest.



## RENOVATING THE EXHIBITIONS

We opened two major permanent exhibitions—the spectacular *Sant Ocean Hall* and *Butterflies and Plants: Partners in Evolution*. In March 2010, we opened the new *David H. Koch Hall of Human Origins*. These renovations of exhibition space—the largest in the Museum's history—improve the visitor experience, address topics important to society, showcase our scientific work and collections, and employ new educational methods and tools to engage the public.

## EXPANDING WEB OUTREACH

We launched several large-scale Web initiatives to take advantage of the Internet to reach greater audiences with substantive content. The *Encyclopedia of Life*, an ambitious project involving several partners, offers multimedia Web pages for many of the 1.9 million known species. We are building new Web portals related to the Ocean and Human Origins initiatives. Our Global Volcanism Program's website, displayed as a layer in Google Earth, has made the Museum an internationally recognized resource for understanding volcanic events.

## STRENGTHENING THE EDUCATION TEAM

We have reorganized and strengthened the education and outreach team that oversees public programs, on-site learning venues, and electronic outreach to serve our diverse audiences and reflect best practices in education. Our expanded volunteer program now has more than 600 members, including 150 individuals who have been specifically trained to deliver programs on ocean science and forensic anthropology.

# STRATEGIC GOALS AND OUTCOMES

Despite these accomplishments, we still face significant challenges. Staffing levels, along with our ability to recruit new staff in several critical areas across the Museum, have declined for the past two decades. We have not been able to upgrade some of the exhibitions or take full advantage of the opportunities offered by new information technologies to disseminate information. At the same time, there are new regulations for access to genetic resources and exchange of cultural objects internationally. Nonetheless, there are very good opportunities to establish partnerships with a diverse array of institutions, and to use new technologies to address new questions and share information. We can also diversify our funding sources going forward and leverage our existing resources.

This new strategic plan sets out our shared vision for the next five years, outlines our desired outcomes, and establishes our priorities. We believe that its implementation will result in a stronger Museum for the future.

## FIVE BROAD STRATEGIC GOALS WILL FRAME THE MUSEUM'S WORK OVER THE NEXT FIVE YEARS:

- I. Explore and Interpret Nature and Culture
- II. Inspire Public Appreciation and Engagement with Science and the Natural World
- III. Focus on Priority Interdisciplinary Initiatives
- IV. Enhance Effective Operations and Partnerships
- V. Leverage and Diversify Funding and Resources



## I. EXPLORE AND INTERPRET NATURE AND CULTURE

The Museum will gather and analyze collections and data relevant to addressing major scientific questions, particularly those relating to the history and evolution of Earth and to changes in Earth's biological and cultural diversity. These questions are critical to enhancing a global understanding of human impacts on the environment, specifically how cultural and biological diversity is affected by the use of natural resources. We will broaden access to our information for scientists, decision makers, and the public at large. To extend the scope of our research and collections in new directions, we will strengthen our infrastructure and set international standards for collections care and accessibility. To provide enduring leadership and knowledge, we will continue to educate and train the next generation of scientists and collections management staff and build capacity of our partners around the world. To accomplish this, we will:

**Address critical scientific questions to increase knowledge and understanding of patterns and processes in the natural world by making substantive contributions to our understanding in three core research themes.**

- Formation and evolution of the Earth and similar planets.
- Discovery and understanding of life's diversity.
- Study of human diversity and cultural change.

**Build and improve stewardship and accessibility of collections.**

- Improve collections conservation status, based on existing profiles and periodic assessments.
- Augment the digital collections records for primary type specimens to contain appropriate imagery and geo-referenced data.
- Digitize collections of national significance and make them available online.
- Create a virtual natural history collection on the Web, including objects on display in our exhibitions, in support of education programs.

**Strengthen the capacity of our collaborators by training the next generation of museum professionals.**

- Increase the number and diversity of fellows and interns.
- Establish an endowed fellowship program.
- Strengthen collaborations with museums, universities, and academic institutions.
- Develop a program to provide technical assistance to other museums.

## II. INSPIRE PUBLIC APPRECIATION AND ENGAGEMENT WITH SCIENCE AND THE NATURAL WORLD

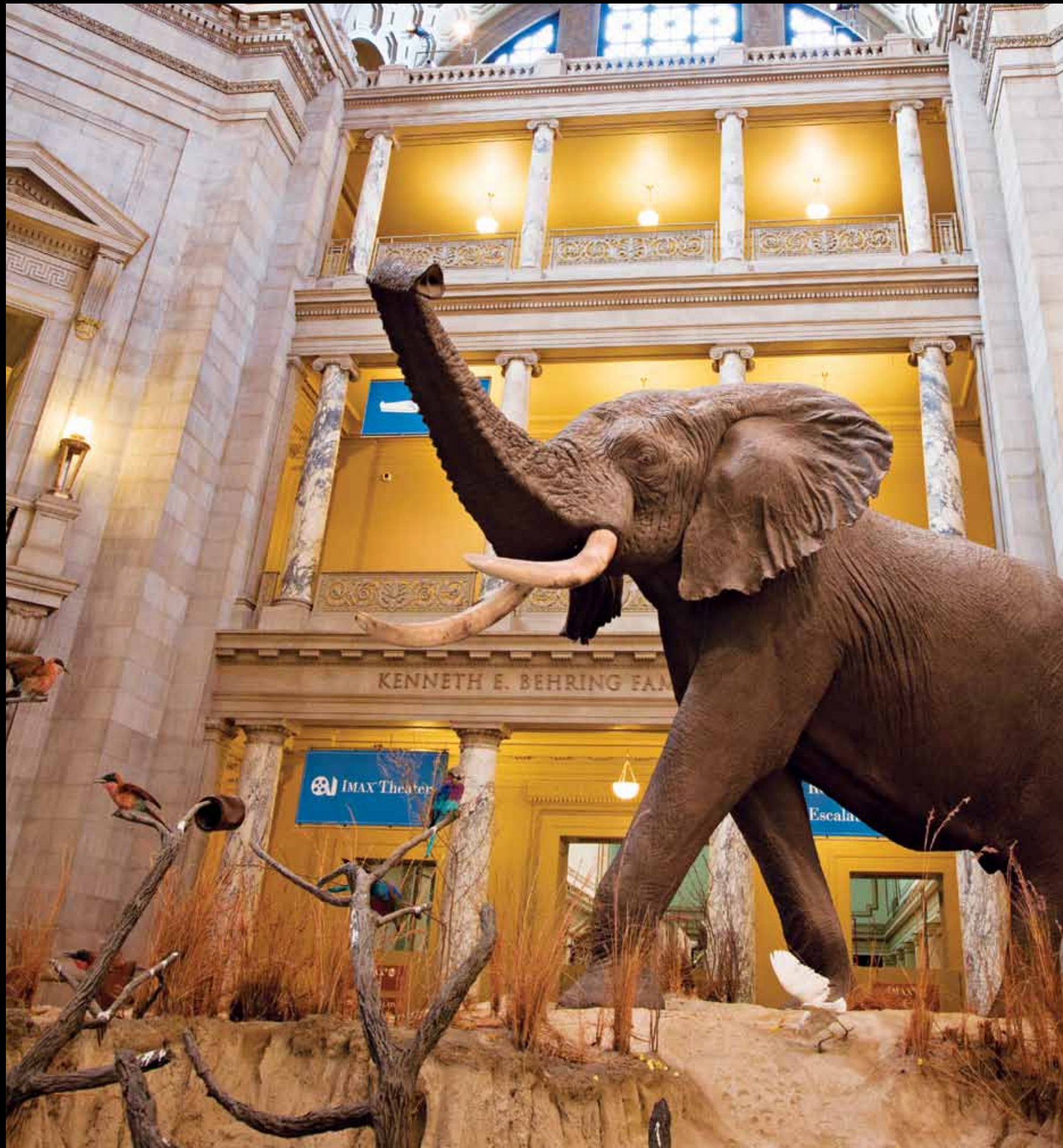
The Museum will strive to instill in all visitors a sense of excitement about the power of exploration and discovery, as well as a deeper understanding of science and the natural world. To have a lasting impact on diverse audiences, we must make information relevant, engaging, and thought provoking. All Museum communications should promote the understanding and retention of scientific knowledge across audience demographics and learning styles. We want the public to view us as a leading, trusted, and accessible source of information on nature and culture.

As part of a new initiative to make our unique assets—science and collections—more readily available to the public, the Museum will build an Education Center where on-site and online visitors will experience science in an entirely new way by having access to real objects, experts, state-of-the-art research equipment, and interactive experiences. In this space—the largest the Museum has ever dedicated to educational programming—visitors of all ages and backgrounds will have opportunities to explore their personal interests in the natural and cultural world and engage in the process of scientific inquiry. They will see the relevance of science as a tool for understanding and improving our world. The Education Center will also serve as a platform to test innovative educational strategies to engage individuals and school groups in scientific research; to train students, researchers, and museum professionals in effective science communication; and to connect national and international communities through science-based projects.

The Museum will do all it can to ensure that both on-site and online visitors leave with greater knowledge of natural history and the desire to learn more, and will design ways to engage them as active participants in our programs. Our aim will be to create experiences that invite visitors to connect with science at a very personal level, understand its relevance to society, and recognize their role in the preservation of the natural world and in building a sustainable future. To accomplish this, we will:

**Use multiple, integrated and sustainable methods to inspire curiosity in diverse audiences to deepen knowledge about science and the natural world.**

- Develop and implement science interpretation programs for all major exhibitions.
- Open the *David H. Koch Hall of Human Origins*.
- Design and build a new Education Center.



- Design the new Paleobiology online and on-site exhibitions.
- Develop an integrated Web outreach program encompassing the Encyclopedia of Life, the Ocean Portal, the Human Origins website, and the Global Volcanism Program's website.
- Plan and implement audience-focused programs that foster personal connections with the natural world and encourage its stewardship.
- Innovate educational models and outreach strategies to enhance access to and engage broad audiences with science and collections.
- Place Museum stories in major media outlets, including social media.

**Create, update, and maintain a positive, personally meaningful visitor experience.**

- Develop a comprehensive interpretive plan to improve the visitor experience.
- Expand, diversify, and professionalize the Volunteer Program.
- Evaluate and continually improve on-site and online exhibitions.
- Improve accessibility for all visitors, especially those with disabilities and non-English speakers.
- Strengthen the infrastructure for education, outreach, and exhibitions maintenance.

## III. FOCUS ON PRIORITY INTERDISCIPLINARY INITIATIVES

Six priority interdisciplinary initiatives emerged from our strategic planning process. The first three are existing initiatives identified as part of the Museum's 2004-2009 strategic plan: the Ocean Initiative, the Human Origins Initiative, and the Encyclopedia of Life. We have already made substantial progress on these and will continue to develop and expand them. The remaining three are new initiatives selected from a pool of more than 30 ideas submitted by our staff and developed with broad involvement of the Museum community. Each of the six represents an area that has special relevance and urgency to society, where the Museum has a comparative advantage, and where we are poised to make substantial progress over the next decade. Each priority integrates our core functions: research, collections stewardship, and outreach. Designed to be long-term and transformational for the Museum, these priorities build on our strengths and expand our partnerships within the Smithsonian and with external collaborators.

The following section presents the scope and outcomes of each initiative.

## OCEAN INITIATIVE

### Understanding and Preserving the Diversity of Life in the Ocean

The ocean covers more than 70% of the Earth's surface; more than half of the world's population lives along its coastlines; and we depend upon it for food, transportation, and recreation. Yet the ocean remains largely unexplored, and human activities continue to threaten ecosystems such as coral reefs and fisheries, and jeopardize the livelihoods of millions of people.

To increase understanding of the ocean and recognize its importance as a global system essential to all life, the Museum launched the Ocean Initiative in partnership with the National Oceanic and Atmospheric Administration (NOAA). As part of the initiative, we opened the spectacular *Sant Ocean Hall*, visited by more than five million people during its first year, and we trained 125 new volunteers to staff this exhibition. We also established the Sant Chair in Marine Science, the Museum's first endowed chair, and we appointed several research curators in ocean-related areas.

#### Over the next five years, we will:

- Develop new content and expand educational programs in the *Sant Ocean Hall*.
- Launch the Ocean Portal, an online educational resource about the ocean.
- Provide digital access to all marine type specimens in our collections.
- Expand research on the diversity, distribution, and evolution of marine life.
- Establish a network for documenting the biodiversity of coral reefs and monitoring changes in these ecosystems over time, as part of the Smithsonian Institution Global Earth Observatories (SIGEO).
- Develop a marine component to the Encyclopedia of Life.



## HUMAN ORIGINS INITIATIVE

### What Does it Mean to be Human?

Our origin and evolution as humans is a compelling scientific question. Where did we come from and how have we changed over time? What are the main characteristics that make us human? The Human Origins Initiative expands our understanding of human evolution.

Our researchers are investigating the evolution of human ancestors in Africa and Asia, focusing particularly on how human adaptations relate to environmental change over millions of years. During the last five years we have strengthened the human origins research program in collaboration with institutions and scientists from developing countries. We established the Peter Buck Chair in Human Origins and designed and completed the renovations for the *David H. Koch Hall of Human Origins*.

#### Over the next five years we will:

- Open and promote the *David H. Koch Hall of Human Origins*.
- Launch a major website devoted to human evolution.
- Develop and implement an educational outreach effort on human evolution.
- Expand our research program in human evolution.
- Expand our partnerships with institutions interested in human evolution.



## ENCYCLOPEDIA OF LIFE

## A Web Page for Every Species

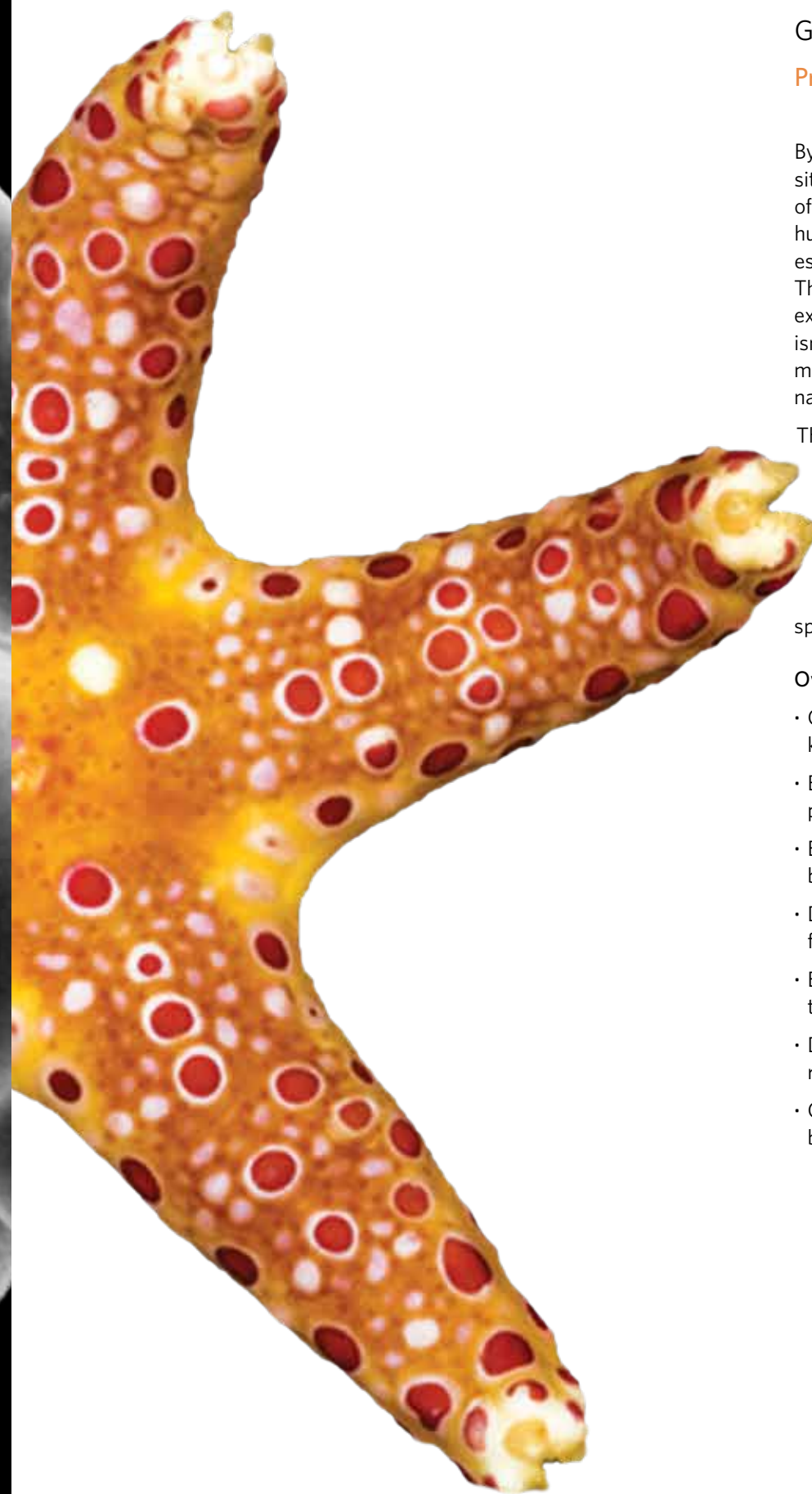
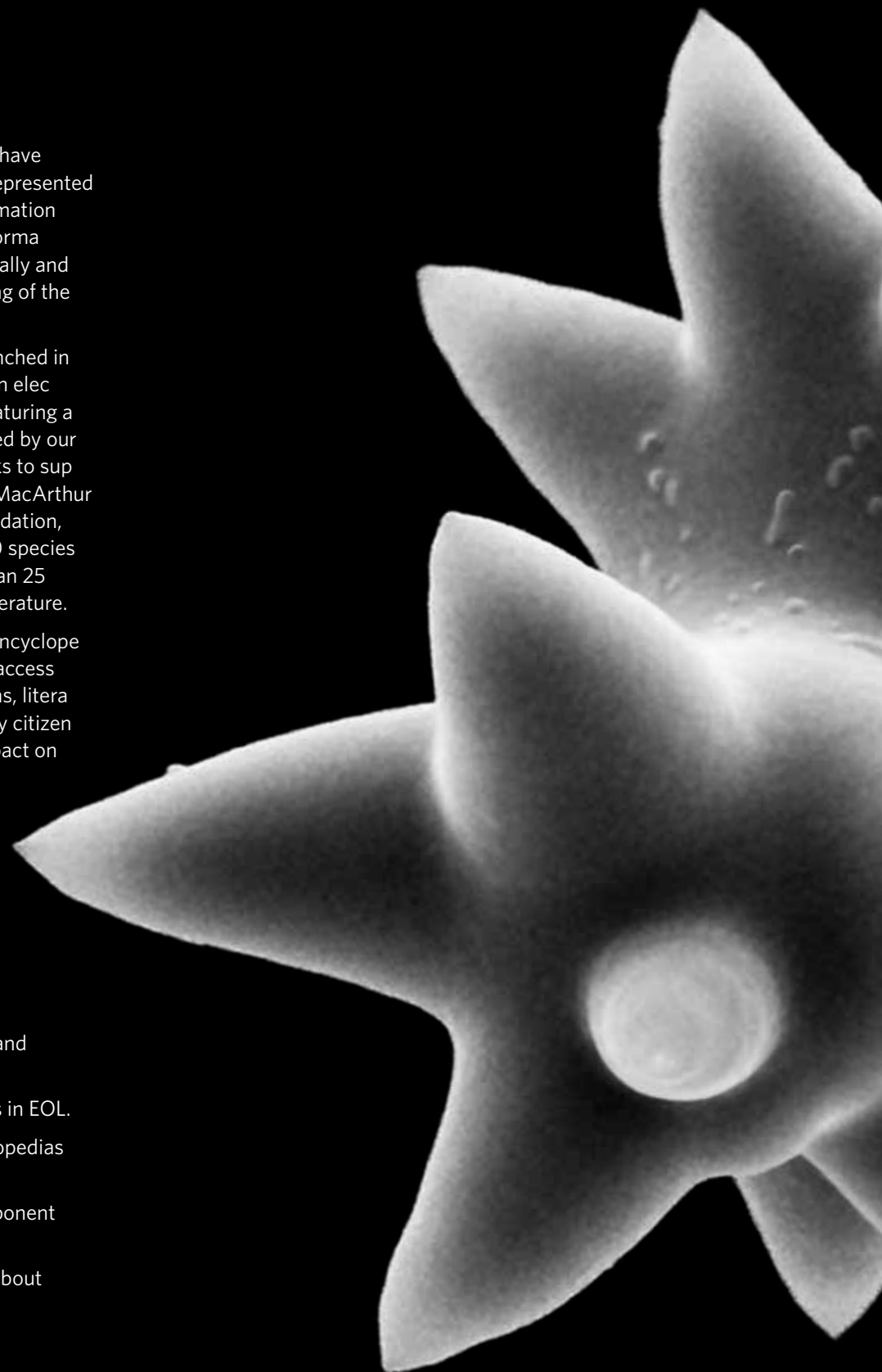
More than 1.9 million of Earth's species have been described to date, and many are represented in the Museum's collections. New information technologies enable us to share this information with a much broader audience globally and engage people in a deeper understanding of the diversity of life.

The Encyclopedia of Life (EOL) was launched in 2007 as a collaborative effort to build an electronic encyclopedia of living species, featuring a Web page for each species authenticated by our scientists and their collaborators. Thanks to support from the John D. and Catherine T. MacArthur Foundation and the Alfred P. Sloan Foundation, as of December 2009 the first 200,000 species pages are now available, as are more than 25 million pages of digitized biodiversity literature.

We are in a unique position to use the Encyclopedia of Life to provide public, worldwide access to information from biological collections, literature, DNA barcodes and observations by citizen scientists. This will have a profound impact on the engagement of scientists, students, and the general public in the discovery, understanding, and conservation of life on Earth.

## Over the next five years we will:

- Make available one million authenticated species pages through EOL.
- Digitize 50 million pages of literature and make them available through EOL.
- Feature the Museum's type specimens in EOL.
- Develop at least three regional Encyclopedias of Life.
- Develop a strong citizen-science component for EOL.
- Use EOL to generate new knowledge about the diversity of life.



## GLOBAL GENOME INITIATIVE

## Preserving the Diversity of the Tree of Life

By working to preserve the planet's genetic diversity, the Museum will sustain the next generation of biodiversity collections, help solve many of humanity's biological challenges, and in the process, transform itself into a 21<sup>st</sup> century institution. The diversity of genomes holds great potential for explaining the evolutionary relationships of organisms and supporting advancements in agriculture, medicine, environmental stewardship, and even national security.

The Museum has also been a partner in the establishment of the Consortium for the Barcode of Life, an international collaboration involving more than 170 institutions in 50 countries and working to develop a unique genetic fingerprint for each species. This information has many applications for the identification of species and research studies.

## Over the next five years, we will:

- Carry out expeditions to strategically collect key specimens and preserve their genomes.
- Expand the use of DNA barcoding in research projects.
- Expand our cryo-preservation and molecular biology facilities.
- Develop data standards and informatics tools for cryo-repositories.
- Establish a global network of DNA and tissue banks.
- Develop an information portal to species represented in this network.
- Communicate the relevance of genomic biodiversity research to broad audiences.



## RECOVERING VOICES

### Preserving Endangered Languages and Traditional Knowledge

An estimated 90 percent of the world's more than 6,000 languages will disappear or be threatened with extinction by 2100. The loss of languages in small indigenous communities—and the associated loss of traditional knowledge embodied in those languages—is universally regarded as one of the 21<sup>st</sup> century's key global societal challenges.

The Museum hosts the National Anthropological Archives and the Human Studies Film Archives and holds vast ethnological and natural history collections from many parts of the world. These resources support the documentation of many of the world's extinct and endangered languages and assist global efforts to preserve indigenous languages and knowledge systems. In collaboration with other units of the Smithsonian and external partners, this new initiative will assist community-based efforts to document, preserve, and revitalize language and knowledge.

#### Over the next five years, we will:

- Build an international network of communities, institutions, and scholars to collaborate on documenting and revitalizing the world's endangered languages and knowledge systems.
- Increase access to our endangered languages collections through digitization and other technologies.
- Nurture a new generation of scholars devoted to understanding and preserving language and knowledge systems, emphasizing the importance of supporting scholars from within communities whose languages are endangered.
- Develop a Web portal for information, collections, research, and educational resources on endangered languages and traditional knowledge.



## DEEP TIME

### Understanding Impacts of Environmental Change on the Evolution of Life on Earth

Humans are now altering the life-support systems of the entire planet, marking a unique moment in Earth's 4.56-billion-year history. It is essential that we understand how global systems change over time and develop sustainable strategies for the management of natural systems.

The Museum has the largest fossil collection in the world with 40 million specimens and a team of expert scientists studying the evolution of the Earth and its biological communities over time. However, our Paleobiology exhibitions are outdated and in urgent need of a complete overhaul. Our online resources dedicated to this important topic are limited. At a time when the public is increasingly aware of the impact of climate change on our planet and our own livelihoods, we can help society learn from the past how humans are changing the future. We aim to establish the Smithsonian as the world leader in understanding global change over time.

#### Over the next five years, we will:

- Focus and expand our research on critical times in Earth's history when significant global changes occurred, and on their underlying biogeochemical, ecological, and evolutionary processes.
- Develop innovative on-site and online educational resources to build a global community of visitors interested in the evolution of life.
- Design and build a major new exhibition on the evolution of life.
- Expand online access to our paleobiology collections, especially type specimens.





#### IV. ENHANCE EFFECTIVE OPERATIONS AND PARTNERSHIPS

To enhance our effectiveness, the Museum must continue to build a diverse workforce and foster a sense of teamwork and common purpose. All employees should feel that they are an essential part of the Museum's success and that all human and financial resources are optimally deployed. The Museum should strengthen and develop valued partnerships with other Smithsonian museums, centers, and programs, as well as with external collaborators, to more effectively aid the increase and diffusion of knowledge.

##### **Foster understanding and respect among Museum staff by working toward shared outcomes.**

- Link annual performance plans and appraisals to this Strategic Plan and the Smithsonian's Strategic Plan.
- Improve communication within the Museum and with remote facilities using robust, collaborative tools and technical solutions.
- Increase and leverage diversity in all aspects of the Museum's work.

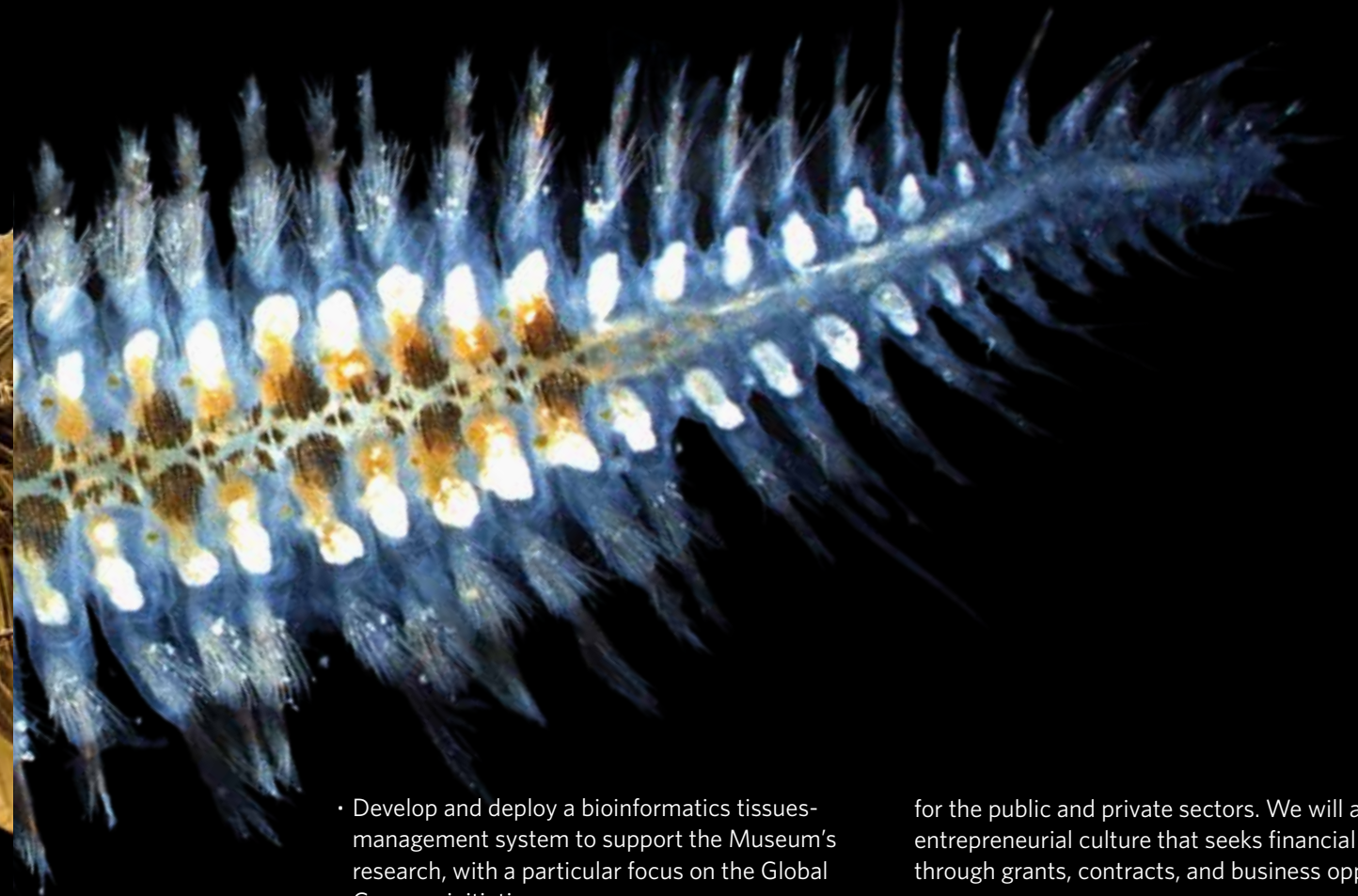
##### **Create a more diverse and motivated staff.**

- Implement succession planning, emphasizing collections staff.

- Facilitate and promote workforce diversity and retention at all levels.
- Develop and implement a training program to continually strengthen staff skills to support Museum programs and priority initiatives.
- Develop new ways to share information and improve communication across the Museum.

##### **Improve technology and facilities operations to meet sustainable criteria, provide a safe environment for our staff, volunteers and visitors, and to support the Museum's mission.**

- Carry out priority facility renovations and ensure they are LEED-certified.
- Complete the construction of Pod 3 at the Museum Support Center (MSC), and move physical anthropology collections, as well as collections requiring specialized storage, to this facility.
- Complete the construction of the new Education Center, a state-of-the-art education facility.
- Design and begin renovating the Paleobiology exhibitions for the Deep Time initiative.
- Develop a plan for Pod 6 at the Museum Support Center, to provide additional storage space for oversize specimens.
- Design and build four new laboratories at the Museum Support Center to enhance research capabilities and the processing of collections.



- Develop and deploy a bioinformatics tissues-management system to support the Museum's research, with a particular focus on the Global Genome initiative.
- Assess projected data storage needs and invest annually in increasing storage capacity.

##### **Build and expand durable partnerships to advance the Museum's mission.**

- Strengthen collaboration with other Smithsonian museums, centers, and programs.
- Develop and implement a strategy to provide technical assistance for partner institutions.
- Expand partnerships with private and public organizations, with a focus on priority initiatives.
- Lead within the Smithsonian by serving as a test bed, pilot, or source for new initiatives in key administrative and programmatic areas.

#### V. LEVERAGE AND DIVERSIFY FUNDING AND RESOURCES

Improving collaborative relationships with Congress and throughout the Smithsonian will allow the Museum to explain needs and potentially increase resources. The Museum will also identify and develop funding sources by exploring new opportunities, cultivating existing contacts, and positioning the Museum as an attractive partner

for the public and private sectors. We will adopt an entrepreneurial culture that seeks financial resources through grants, contracts, and business opportunities.

##### **Diversify sources and designated uses of financial support.**

- Increase non-federal sources of support.
- Increase generated income by 25 percent.
- Double the size of the Museum's endowments to \$100 million.

##### **Enhance resources by building durable partnerships.**

- Raise at least \$230 million in private gifts, grants, and contracts for priority initiatives.
- Expand and develop joint initiatives with federal and state agencies, universities, and other relevant institutions.

##### **Reinforce the role of the Museum within the Smithsonian Institution.**

- Develop new partnerships with other Smithsonian museums, centers, and programs.
- Sustain federal support for core Museum functions.
- Secure \$100 million for the Museum and Museum Support Center facilities upgrades and renovations, collections, and information technology.
- Increase the Museum's success rates for funding from Smithsonian central pools.

# ORGANIZATIONAL CHANGE

To achieve the five ambitious goals and outcomes defined in this Strategic Plan, advance our priority initiatives and create a more integrated and effective institution for the future, the Museum will focus on ten areas of organizational change.

## MEASURABLE OUTCOMES

Focusing on measurable outcomes will help us define clear priorities, develop processes to achieve our objectives, and assess the impacts of our work on science, education, and society at large.

## INCREASED COLLABORATIONS

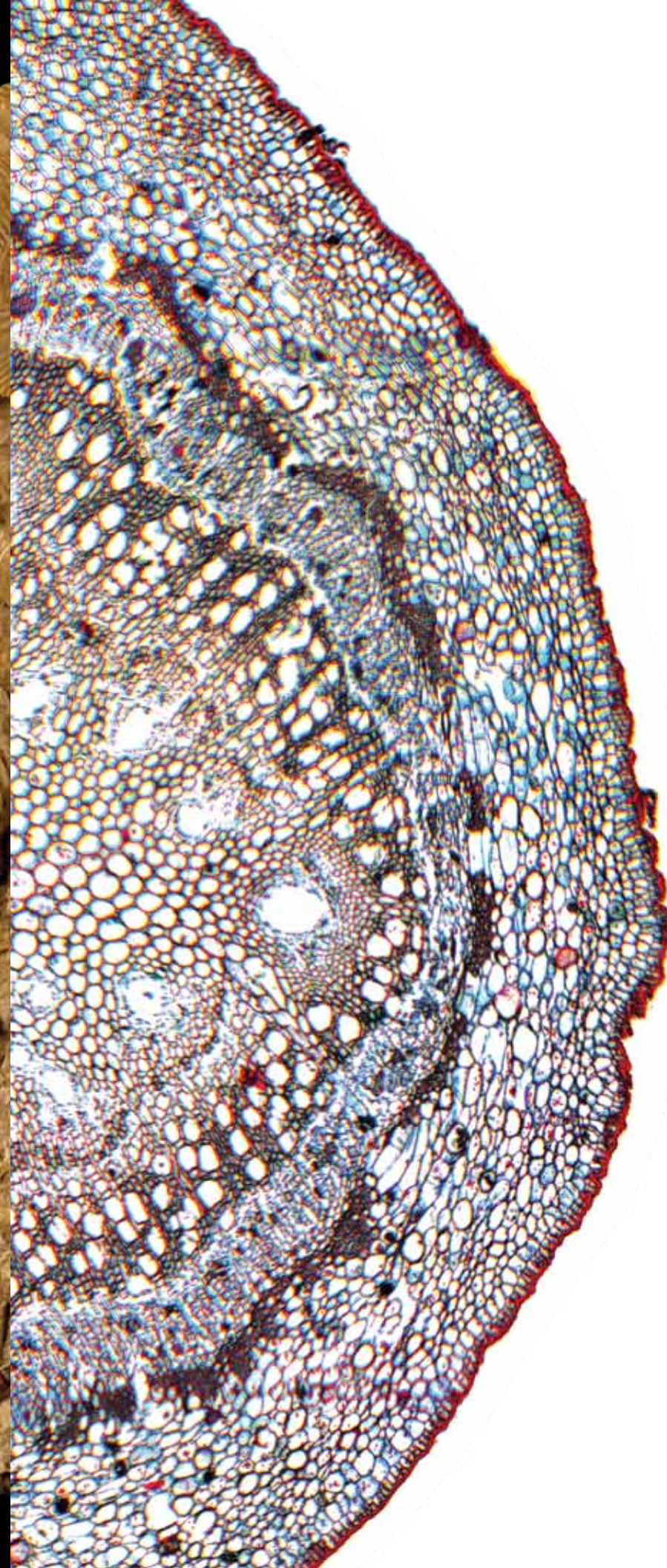
Today's most interesting questions often occur at the interface between disciplines. Addressing them will require intellectual, human, and material resources across many branches of knowledge and diverse institutions. The Museum will promote greater collaboration among our divisions and other units of the Smithsonian, as well as with external institutions and collaborators.

## EXPANDED ACCESS

New technologies create new opportunities to capture and share knowledge. We will continue to digitize our collections to reach broader audiences virtually, and we will also improve and expand physical access to our exhibitions and programs for all on-site visitors.

## STRATEGIC COLLECTING

Individual collection plans will direct acquisition and growth in accordance with our strategic goals and priorities. We will ensure that our collections are representative of the natural world and cultural diversity, and that they support our science and education.



## ENHANCED VISITOR RELEVANCE

Trips to the Museum are educational opportunities. To guarantee the strongest possible learning experience, we will measure the Museum's relevance to and impact on visitors.

## DEEPENED UNDERSTANDING OF AUDIENCES

One way to maximize relevance and impact is to better assess the interests and needs of our audiences, including the scientific community, the general public, and policymakers. We will explore new ways to increase our understanding of those we serve.

## INTERACTIVE COMMUNICATIONS

To ensure that our messages are reaching all audiences, and to solicit critical feedback in a timely fashion, we will investigate new, interactive ways to communicate with visitors, donors, and collaborators.

## STREAMLINED PROCEDURES

We will work to improve the efficiency and effectiveness of our work by proposing and adopting new procedures and technologies to simplify our activities and extend their impact.

## REPRESENTATIVE WORKFORCE

At the core of the Museum is an experienced and committed team of staff members. Our employees should reflect the varied backgrounds, perspectives, and skills in society at large, and we will take steps to actively foster diversity in our workforce.

## DIVERSIFIED REVENUE

We are fortunate to receive support from the federal government for ongoing operations; but to develop new ideas, we require additional resources. We will take steps to diversify the sources of financial support for our work, and to increase partnerships to support our efforts.



# RESOURCING THE PLAN

To implement this plan and build a stronger Museum for future generations, we must leverage our resources. Our emphasis will include strengthening the team of collections management staff, establishing an endowed fellowship program, and incorporating sustainability standards throughout our facilities and operations. We will also encourage and strengthen collaborations within the Museum, with other parts of the Smithsonian, and with key external partners to achieve our goals.

We estimate that our current baseline funding will provide approximately \$250 million over five years toward the implementation of this strategic plan, but achieving our ambitious goals will require additional resources. We will work to increase federal funding, primarily for facilities renovations, collections care, and improving information technology. We will also work to secure \$230 million in gifts and grants from private sources, to advance our priority initiatives.



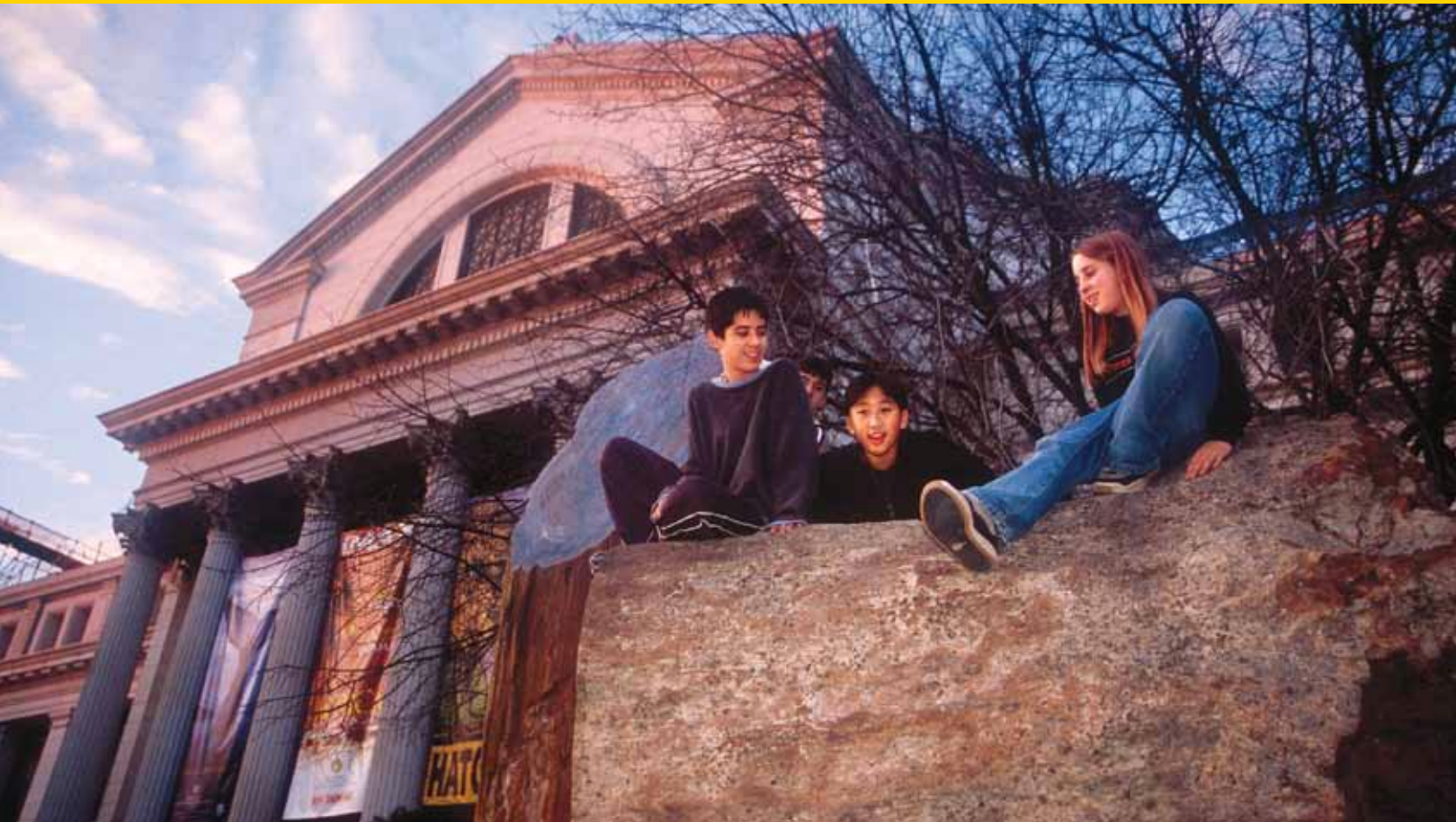
# CONCLUSION

As we embark on our second century, we are strongly positioned to enhance our leadership role in natural history science. *Knowledge for a Sustainable Future* will help us become more collaborative, sustainable, diverse, and entrepreneurial. It will help us broaden access to our treasures, expand our collections, and extend our educational reach globally. It also establishes a limited, strategic number of priority initiatives in areas that are relevant to society and in which we are poised to make a substantial contribution over the next five years.

How will we know we have succeeded? Just as we recognized milestones of past achievement, we have set key milestones for the future. The key results we expect to achieve in the next five years, as we implement the strategies put forth in this plan, are presented on the next page.



# MILESTONES: 2010–2015



- Host 35 million in-person visitors to the Museum and 200 million online visitors.
- Publish 2,000 peer-reviewed scientific publications that make substantive contributions in our three science themes.
- Establish a network of DNA and tissue banks preserving the major branches of the Tree of Life.
- Expand the Encyclopedia of Life to more than 1 million species and incorporate a strong citizen-science component.
- Mount a major initiative to document and preserve the world's endangered languages and traditional knowledge.
- Redesign the Paleobiology exhibitions, which will highlight the impacts of environmental change on the evolution of life on Earth.
- Develop innovative online exhibitions to improve education and public understanding of the ocean, human origins, and the diversity and evolution of life on Earth.

- Open a new Education Center to bring natural history science to visitors and schools across America.
- Augment the digital collections records for primary type specimens to contain appropriate imagery and georeferenced data.
- Establish an endowed fellowship program to train the next generation of scientists and museum professionals.
- Create state-of-the-art facilities that meet sustainability standards and that support our collections, research, exhibitions, and education activities.
- Build a more diverse and motivated staff, including a strengthened group of collections management staff.
- Build strategic partnerships across the Smithsonian, federal agencies, and national and international institutions.

## PHOTO CAPTIONS AND CREDITS

- C Butterfly, *Evenus coronata* (upperside of male). Baños, Ecuador. Photo by James Di Loreto. \*
- Seahorse, *Hippocampus* species. Ghardaqa, Red Sea, Egypt. Radiograph by Sandra Raredon. \*
- IC, IBC Woolly mammoth, *Mammuthus primigenius*. Extinct. Pleistocene Epoch (2.5 million to 10,000 years ago). Alaska. Photo by Chip Clark. \*
- IC Museum director Cristián Samper. Photo by Donald E. Hurlbert. \*
- (1) The Natural History Building, National Mall, Washington, D.C. Photo by Carl Hansen. \*
- 2, 3 Anthropology collections and staff. Museum Support Center (Pod 4). Suitland, MD. Photo by Chip Clark. \*
- 4 Quartz, variety agate. Chihuahua, Mexico. Gift of E. M. Barron, 1977. Photo by Chip Clark. \*
- Brittle star (Ophiuroidea) attached to lace coral *Styaster erubescens*. Western Atlantic. Photo by John Steiner. \*
- Dinoflagellate microalga, *Gambierdiscus toxicus* (70  $\mu\text{m}$  long). Douglas Cay, Belize. Scanning electron micrograph by Maria Faust. \*
- 5 Invertebrate Zoology collections and staff. Natural History Building, Washington D.C. Photo by Chip Clark. \*
- 6 Hooker Emerald. Brooch designed by Tiffany & Co. Gift of Mrs. Janet Annenberg Hooker, 1977. Photo by Chip Clark. \*
- 7 Barred olivine chondrule from the carbonaceous chondrite meteorite (CV3) LAP 02228. La Paz, Antarctica. Polarized photomicrograph by Linda Welzenbach. \*
- Inserts (top to bottom):  
Quartz, variety amethyst. Guanajuato, Mexico. Gift of Mr. & Mrs. Brooks Davis, 1972. Photo by Chip Clark. \*
- Strombolian eruptions at Pacaya volcano. Guatemala, 1988. Photo by Lee Siebert. \*
- Marquise diamond in platinum ring. Designed by Cartier, Inc. Gift of Mrs. Augustus Riggs IV, 1964. Photo by Chip Clark. \*
- 8 *Triceratops horridus*. Extinct. Late Cretaceous (70–65 million years ago). Niobrara County, Wyoming. Photo by Chip Clark. \*
- Inserts (top to bottom):  
Thimble jelly, *Linuche* species. Moorea, French Polynesia (BIOCODE Project). Photo by Steve Haddock. \*
- Schiedea trinervis*. Oahu, Hawaiian Islands. Ink and digital drawing by Alice Tangerini. \*
- Red swimming crab, *Thalamita* species. Moorea, French Polynesia (BIOCODE Project). Photo by Biocode Team. \*  $\diamond$
- 9 Subangulate warrior beetle, *Pasimachus (Emydopterus) subangulatus*. Guerrero, Mexico. Photo-illustration by Karolyn Darrow. \*
- 10 Zuni polychrome bowl, ca. 1880. Photo by Donald E. Hurlbert. \*
- 11 Hawaiian feathered cape (*Po omaikelani-Nui*). Bequest of Princess Abigail W. Kawananakoa. Photo by Donald E. Hurlbert. \*
- Inserts (top to bottom):  
Clovis spear point (12,000 years old). Drake Cache, Northeastern Colorado. Photo by Chip Clark. \*
- Tunghat*, the moon-dwelling spirit-keeper of animals in Yup'ik Eskimo cosmology. 19th century ceremonial mask, Lower Yukon river, Alaska. Photo by Donald E. Hurlbert. \*
- Replica of human handprint (32,000 years old). Chauvet Cave, France. Photo by James Di Loreto and Donald E. Hurlbert. \*
- 12 Squat lobster, *Galathea pilosa*. Moorea, French Polynesia (BIOCODE Project). Photo by Arthur Anker.  $\diamond$
- 13 Butterfly, *Evenus coronata* (underside of female), Baños, Ecuador. Photo by James Di Loreto. \*
- 14 *Gazania* species. Namaqualand, South Africa. Photo by Vicki Funk. \*
- 15 Fossil leaf, undescribed species. Paleocene-Eocene Thermal Maximum (ca. 56 million years ago). Wyoming. Photo by Scott Wing. \*
- 16, 17 The Sant Ocean Hall. Photo by James Di Loreto. \*
- 18, 19 African elephant, *Loxodonta africana*. Angola. Photo by Chip Clark. \*
- 20 Orangefin anemonefish, *Amphiprion chrysopterus*. Moorea, French Polynesia (BIOCODE Project). Photo by Jeffrey T. Williams. \*
- Inserts (left-to-right)  
Purple lace coral, *Distichopora violacea*. Moorea, French Polynesia (BIOCODE Project). Photo by Gustav Paulay.  $\diamond$
- Red spotted Guard Crab, *Trapezia tigrina*. Moorea, French Polynesia (BIOCODE Project). Photo by Gustav Paulay.  $\diamond$
- Textile cone snail, *Conus textile*. Moorea, French Polynesia (BIOCODE Project). Photo by Yolanda Villacampa. \*
- 21 Skull cast of adult *Homo heidelbergensis*: Petralona 1 (350,000 to 150,000 years old). Petralona Cave, Thessalonika, Greece. Photo by Chip Clark. \*
- Insert:  
Reconstructed faces of *Homo neanderthalensis*, *Homo heidelbergensis*, and *Homo erectus* by artist John Gurche for the David H. Koch Hall of Human Origins. \*
- 22 Spicule (ca. 25  $\mu\text{m}$  long) of sponge *Clionaopsis platei*. Calbuco, Chile. Scanning electron micrograph by Klaus Ruetzler and Michelle Nestlerode. \*
- Inserts (left to right):  
*Gustavia augusta*. Guyana, Karanambo. Photo by Tim McDowell. \*
- Larva of mustard hill coral, *Porites astreoides*. Confocal image by Koty Sharp. \*
- Globehead parrotfish, *Scarus globiceps*. Moorea, French Polynesia (BIOCODE Project). Photo by Jeffrey T. Williams. \*
- 23 Sea star, *Neoferdina cumingi*. Moorea, French Polynesia (BIOCODE Project). Photo by Gustav Paulay.  $\diamond$
- Lubber grasshopper, *Romalea guttata*. Photo by Meghan F. Murphy. \*
- 24 Loma script used in Liberia and Guinea. Ms. 2005-10. National Anthropological Archives.
- 25 Ammonite, *Erymnoeceras* species. Extinct. Jurassic Period (ca. 170 million years ago). Photo by James Di Loreto. \*
- Insert:  
Lower tooth of a six-gilled Hexanchid shark. Extinct. Early Pliocene Epoch (ca. 5 million years old). Lee Creek, North Carolina. Photo by John Steiner. \*
- 26 Fossil skeleton of *Xiphactinus* species. Late Cretaceous (80–65 million years ago). Texas. Photo by Chip Clark. \*
- 27 Polychaete worm, family Polynoidea. Moorea, French Polynesia (BIOCODE Project). Photo by Biocode Team. \*  $\diamond$
- 28 Ammonite *Perisphinctes* and belemnite *Belemnites*. Jurassic Period (161–146 million years ago). Germany. Photo by Chip Clark. \*
- 29 Woody stem of *Mastixia trichotoma*. Indonesia. Micrograph by Stanley Yankowski. \*
- 30 Flags marking the location of meteorites at MacAlpine Hills, Antarctica. Photo by Linda Welzenbach. \*
- 31 Kaieteur Falls. Guyana. Photo by Carol Kelloff. \*
- 32 Kids sitting on a petrified tree trunk at the entrance to the National Museum of Natural History. Petrified wood *Araucarioxylon arizonicum*. Late Triassic Period (ca. 207 million years old). Petrified Forest National Park, AZ. Photo by John Steiner. \*
- BC Pomo feather-covered coiled basket. Mendocino County, California. Photo by Department of Anthropology staff. \*
- Hope Diamond, unmounted. Photo by Chip Clark. \*



## ACKNOWLEDGEMENTS

*Knowledge for a Sustainable Future: Strategic Plan 2010–2015* provides the vision for the National Museum of Natural History at a pivotal moment in its history when the Museum is celebrating its Centennial and entering a new century of opportunities. The strategic planning process included an analysis of the organization's strengths, challenges, opportunities and threats, as well as an assessment of results from the Museum's previous five-year strategic plan. Key priorities were identified by members of the Museum community in collaboration with various focus groups including members of the Smithsonian's leadership team. The Museum's Advisory Board provided helpful advice throughout the process. We thank everyone who participated in developing the plan for contributing great ideas, sound guidance, and input on the plan's various elements. In particular, we would like to thank Angela Roberts, Ruth Selig, Jennifer Tafe, and Steege Thompson Communications, for their assistance with the writing of the plan, and Splice Design Group for designing the document.

Sincerely,

The Editors

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