

TESTIMONY

OF

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COMMITTEE ON NATURAL RESOURCES

U.S. HOUSE OF REPRESENTATIVES

**OVERSIGHT HEARING ON MARINE MAMMALS IN CAPTIVITY: “WHAT CONSTITUTES
MEANINGFUL PUBLIC EDUCATION?”**

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Introduction

Chairwoman Bordallo, Ranking member Brown, and distinguished members of the Subcommittee, thank you for the opportunity to discuss the enormous contributions that the AZA-accredited zoos and aquariums across the country make in educating the public about marine mammals. My name is Dr. Paul Boyle, Senior Vice President for Conservation, Education, and Professional Development for the Association of Zoos and Aquariums - AZA.

AZA-accredited zoos and aquariums serve as conservation centers of excellence that are concerned about ecosystem health, take responsibility for species survival, contribute to research, conservation, and education, and provide society the opportunity to develop personal connections with wildlife and nature.

AZA and its member institutions are proud to work with Congress, the Federal agencies, conservation organizations, the private sector and the general public to conserve our wildlife heritage. With 175 million annual visitors to our 221 accredited zoos and aquariums, AZA's focus on connecting people and animals provides a critical link to helping animals in their native habitats. Far-reaching conservation programs at AZA institutions have provided over \$90 million per year over the past five years to support over 4,000 field conservation and research projects in more than 100 countries. AZA-accredited zoos and aquariums are among the leaders in the protection of endangered species and we enjoy beneficial partnerships with NOAA's National Marine Sanctuary Program and USFWS' National Wildlife Refuge System and Endangered Species Program.

As centers for conservation volunteerism, AZA-accredited zoos and aquariums offer the public a great way to discover connections to their environment and to learn how they can make a difference in conservation. Annually, more than 58,000 volunteers invest over 3 million hours of their time supporting virtually every aspect of zoo and aquarium operations.

AZA-accredited zoos and aquariums effectively communicate science-based educational messages about the importance of conserving marine mammals and their habitats to more than 175 million visitors each year. Fifty million annual visitors are children, making accredited zoos and aquariums essential to how we connect children to marine mammals and the natural world. These messages and programs meet state and national science curriculum standards. In the last 10 years, AZA-accredited zoos and aquariums formally trained more than 400,000 teachers in informal science education methods, supporting science curricula with effective teaching materials and hands-on opportunities and providing over \$85 million annually in educational support.

In addition, AZA-accredited zoos and aquariums enhance local and regional economies, collectively generating \$8.4 billion in annual economic activity and supporting more than 126,000 jobs. In many cases, our zoos and aquariums are the economic engines of the community and the region. When I was Director of the New York Aquarium, every summer my institution was the largest employer of youth in Brooklyn, and a similar story surrounds many of AZA's member institutions across the country. For many of these young people, a job at their local aquarium or zoo represents their first experience in the workplace and first experience in developing job skills for the future.

AZA-accredited zoos and aquariums are windows onto nature for millions of Americans. In fact, their constant delivery of professional programs in informal science education collectively represents one of the chief mechanisms for connecting Americans to nature.

Just a few months ago, testifying to the House Committee on Science and Technology, the Director of the National Science Foundation's Division of Research on Learning in Formal and Informal Settings reported:

“In an era where we are all lifelong learners, the boundaries between formal settings for learning – such as schools and universities – and informal learning settings – such as museums, cyberspace, and the media – are increasingly blurred and porous.” (J. Ferrini-Mundy. NSF. 2009)

Today, we see wildlife and natural habitats increasingly impacted by human activities. This situation affects every part of our planet. AZA-accredited zoos and aquariums are devoting a constantly increasing amount of time, effort, and resources to conservation and the protection of threatened and endangered species including marine mammals. They devote equal energy toward the protection of their living collections, which represent a national heritage for future generations to connect with, understand, and value.

As the subject of this hearing, my testimony today will focus on four key points:

1. The power and effectiveness of informal science education programs that exhibit marine mammals and the current professional standards for education in ensuring sound education outcomes through marine mammal exhibits at zoos and aquariums;
2. The strength and quality of marine mammal conservation programs and marine mammal rescue and rehabilitation programs managed by AZA-accredited zoos and aquariums;
3. The current and evolving methods for evaluating marine mammal education and conservation programs at AZA's member institutions; and
4. Recommendations to the Committee regarding standards.

Although twenty years ago many questioned how much learning occurred in museums, today the enormous value of informal education is proven. Within zoos, aquariums, and science centers, an entire field has emerged around informal science education following fifty years of research and investment in informal science education by the National Science Foundation.

In fact, the National Academies Press published the book titled “Learning Science in Informal Environments,” (Bell et al 2009) which reported:

“Informal environments are of fundamental importance for supporting science learning...”

And

“... designed settings – including museums, science centers, zoos, aquariums and nature centers – can also support science learning. Rich with educationally framed real-world phenomena, these are places where people can pursue and develop science interests, engage in science enquiry, and reflect on their experiences through conversation.”

It goes on to report that

“They also can be effective in improving students' attitudes toward science and toward themselves as science learners.”

Similarly, Miller and Kuczaj (2009) reported that visitors to dolphin shows showed:

“an increase in conservation-related knowledge, attitudes and behavioral intentions immediately following their experience,” and “three months later they reported engaging in more conservation-related behavior compared to three months before the programs.”

Their study demonstrated that people retained the knowledge they gained during the marine mammal experience. In addition, this study showed that the dolphins involved in these shows exhibited higher rates of behavioral diversity and play-behavior immediately following the programs compared to non-program times, which typically has been used as an indicator of well-being. These findings “suggest that dolphin shows and interaction programs can be an important part of an enrichment program within a zoological setting.”

In addition, three weeks ago, an editorial in the journal *Nature* (2010) reported that “education policy-makers should take note” – that “much of what people know about science is learned informally.”

Accredited zoos and aquariums represent national centers of excellence in informal science and conservation education, offering a wealth of valuable science learning to the over 175 million visitors they serve each year and their impact is supported by all of these scientific reports.

Professionally recognized standards for education or conservation programs at public marine mammal display facilities:

As background, the U.S. Commission on Ocean Policy stated that:

“The general public increasingly has opportunities to come into contact with marine species through diving, aquarium shows, and similar activities. These interactions can increase public awareness and sensitivity about the needs and vulnerabilities of these animals and the ways in which human activities can affect them. Aquariums and other exhibitors can also showcase how larger environmental issues affect marine species and the ecosystems on which they rely.” (www.oceancommission.gov)

At present, education standards for informal science learning, outlined by the National Science Foundation (Friedman et al 2008), suggest that learning about the nature of science (how science is done), specific scientific principles, and attitudes toward science in general supports the intent of the Marine Mammal Protection Act.

Further, the Environmental Protection Agency defines environmental education as follows:

“Environmental education increases public awareness and knowledge of environmental issues and challenges. Through environmental education, people gain an understanding of how their individual actions affect the environment, acquire skills that they can use to weigh various sides of issues, and become better equipped to make informed decisions. Environmental education also gives people a deeper understanding of the environment, inspiring them to take personal responsibility for its preservation and restoration” (Falk et al 2009).

The questions posed in the invitation to testify seem to address education separately from conservation. AZA believes that education and conservation can not be separated and, as a result, conservation education is mandated by AZA Accreditation Standards

for any institution housing marine mammals (and any other living animal as well). Our position is based on the widely held recognition that conservation outcomes depend on significant numbers of *people* becoming involved. Stated another way, conservation outcomes require that large numbers of people know more, care more, and do more about the issues in order for the underlying factors that govern change to become activated.

As society urbanizes, more and more people have less and less contact with nature. We believe, because the evidence shows us, that the opportunity to see and get close to wild animals at zoos and aquariums is one of the few authentic experiences that can stem the tide of Americans' growing disconnect from nature.

AZA's Education Standards are in place specifically to use these opportunities to target conservation education directly where it is most needed - in the 175 million people who visit AZA -accredited institutions each year.

The Marine Mammal Protection Act states that a permit for public display can be issued only to those who offer "a program for education or conservation purposes that is based on professionally recognized standards of the public display community;"

Congress has entrusted zoos and aquariums with great responsibility in caring for marine mammals. AZA and its accredited member institutions strive daily to meet this responsibility with mandatory, science-based standards for education, conservation, and animal care and welfare. The National Marine Fisheries Service (NMFS) formally recognized both the standards of the Association of Zoos and Aquariums (AZA) and those of the Alliance of Marine Mammal Parks and Aquariums as the "professionally accepted standards" on which a public display facility must base its education and conservation programs. The standards were published in the *Federal Register* by the National Marine Fisheries Service (Federal Register 1994)

AZA Accreditation Standards:

The highly-trained staff at AZA-accredited zoos and aquariums provides excellent care for more than 800,000 animals nationwide. As part of AZA's mandatory accreditation process, AZA members meet rigorous professional standards for animal welfare, veterinary care, wildlife conservation, scientific research, education, safety, staffing, and more.

AZA Standards require that education must be a key element in the mission of the institution and that education/conservation messages be an integral component of animal demonstrations (see attachments for AZA Education Standards). Every institution must have a written education plan that matches current industry standards, which is overseen by a trained/experienced education professional.

The AZA Standards further state that the institution should encourage active, ongoing collaborative partnerships with community groups, other informal education institutions, school districts, institutes of higher learning, other conservation organizations, local and national governmental agencies, and other organizations and individuals that can contribute to the expansion of the institution's educational dimension and accomplishment of its mission.

There are a number of AZA standards in place which guide the development and delivery of high quality education and conservation programs in AZA-accredited zoos and aquariums. The first four of these are attached to my testimony and they include:

- The AZA Policy on the Presentation of Animals
- The AZA Education Standards which are an integral part of AZA's Accreditation Process
- The AZA Program Animals Policy
- The AZA Program Animal Position Statement, and
- The AZA Recommendations for Developing an Institutional Program Animal Policy (see www.aza.org/accred-materials/),
- The AZA Conservation Standards (see www.aza.org/accred-materials/), and
- The AZA Code of Professional Ethics (see www.aza.org/Ethics/).

This testimony, along with the attached and above referenced materials provided to the committee, emphasize that AZA's standards for education and conservation are stronger today than ever before, and should continue to be recognized as the professionally recognized standards to be met by all permit holders.

The need for regulations to be developed pursuant to Section 104(c)(2)(A)(i) of the Marine Mammal Protection Act to ensure sound standards for marine mammal education or conservation programs:

The letter of invitation to testify at this hearing states that "Regulations delineating the standards for such [marine mammal] programs have never been promulgated." The Marine Mammal Protection Act did not specifically require that either the National Marine Fisheries Service or the Fish and Wildlife Service promulgate its own standards. In this case, the NMFS recognition of the standards for marine mammal education or conservation programs, developed by experts in conservation and education, fulfills the spirit of the requirement of the law.

I express great concern at the thought that the detailed and Federally-recognized, professional conservation education standards produced by AZA and referenced above may be undermined by those who deny the now significant body of evidence demonstrating why zoos and aquariums are achieving conservation education outcomes that could not have been anticipated just twenty years ago.

The social sciences have been actively using internationally peer-reviewed processes for assessing quality, developing new methods, and exploring how learning can be achieved. The vibrant community of professional educators within AZA-accredited zoos and aquariums will continue to push the envelope in informal science education, as they have succeeded in doing for the past two decades. This is not only our responsibility with respect to marine mammals under the law, it is our duty as stewards of these magnificent animals.

Methods for evaluating education and/or conservation programs at public display facilities

With regard to evaluation, I want to provide examples of recent research that have direct relevance to your deliberations. First, I would offer examples of papers published in Curator: The Museum Journal, the leading international journal of museum studies. These studies were made possible by funding from the National Science Foundation (NSF) based on an extensive and highly competitive peer-review process that scrutinizes the methods and approach. This

research by Dr. John Falk and his colleagues was the first descriptive study of motivations for visiting zoos and aquariums and the associated conservation learning outcomes from those visits. Dr. Falk and Dr. Heimlich and their colleagues created new research instruments for long-term assessment of our conservation education programs and helped to define how we can report on these results as a community. As a result of this NSF funded study, and subsequent training, I can confirm that today more than 25% of the members of our association have been trained in how to apply these evaluation tools and we continue to ensure that our members will have training opportunities.

But, we have not stopped there. Some people speaking to you during this hearing claim that zoos and aquariums are not educational facilities. I challenge these claims as an unsubstantiated academic hypothesis that is unsupported by empirical research, and represents a deluded view of what we know about how people learn. These nay-sayers are locked in the past, suggesting that the methods developed under rigorous scrutiny of an international community of scholars devoted to the study of informal learning experiences are somehow inadequate - nothing could be farther from the truth.

First, as you all are aware, science evolves and builds on prior knowledge. We accept that the methods we have today will continue to become more accurate and predictive. The last thirty years have seen a revolution in methods for evaluating education in non-formal learning environments, whether they are our facilities with live animals or any museum or environmental learning center.

The National Science Foundation has been a global leader in the use of evaluations and in developing a consistent approach to conducting evaluations. In fact, NSF's Framework for Evaluating Impacts of Informal Science Education Projects (Friedman et al. NSF) is the state of the art evaluations handbook.

In addition, two professional organizations, the American Association of Museum's Committee on Audience Research and Evaluation and the Visitor Studies Association have together produced copious studies and reports on the appropriate use of evaluations in the social sciences. Rather than outline all of the methods developed for these studies, let me just say that we look to these external, independent, academically rigorous communities for our evaluation standards. We respect that this community is leading this challenge. Further, attempting to entrench current evaluation methods in legislation will restrict rather than support the refinement and advancement of ever more predictive tools as we seek to understand how to more successfully assess the conservation learning outcomes that our members are committed to achieving.

As a self-regulating organization, with the most comprehensive and stringent Accreditation process in the world, we have created a new Research and Technology Committee directly charged with the assessment of scientific methods and increased dissemination of assessment tools for promoting conservation.

Today, what we know about the lives of many animals was built on non-invasive research done in zoos and aquariums. Many animals, especially aquatic species, cannot be studied in their natural habitat. What we learn from marine mammals in public facilities has, in fact, built our knowledge about their perceptual world, their social needs, their cognitive skills, and virtually all of their basic biology. I offer you another example of a project that I led as Principal Investigator with funding from the Institute for Museum and Library Services. This study, *Thinking about Dolphins Thinking*, tested how complex scientific information could be delivered meaningfully to visitors surrounding the topic of dolphin cognitive skills discovered, in fact, through studies on dolphins at the New York Aquarium. The project succeeded in achieving a

high level of learning outcomes from an aquarium exhibition about dolphin cognition. This evidence is just one example among many demonstrating that conservation education is measurable, achievable, and built on prior research.

Additional studies conducted by social scientists demonstrate that public discourse about dolphins (outside of zoos and aquariums), in fact, creates misconceptions, and that aquariums are places where these misconceptions can be corrected. These papers speak directly to how technical misconceptions are promoted in society and the very surreal ideas people develop about dolphins based on cartoons, music, and new media rather than through real encounters with these animals at accredited facilities.

I shudder to think where we will be if the average American adult has to rely exclusively on what they learn from popular culture and media about the lives of marine mammals. Aquariums are accessible for all levels of our society, including underserved and under represented audiences. All but the elite cannot afford access to eco-tourism experiences to see these animals in the wild. You may hear from some presenters that television, magazines, and stuffed animals should be enough. However, we know from studies conducted by social scientists in our institutions and even a study by a current program officer from that National Science Foundation (Allen, 2004) that live animals promote more synthesizing conversations that help visitors make sense of the natural world around them, and increase their value for it, than any other type of formal or non-formal learning experience.

What we know from another recent study funded by the Institute for Museum and Library Services through the Wildlife Conservation Society is that Americans expect and want our zoos and aquariums to be educational institutions, that they trust these institutions to honestly report on the environment and nature, and that the public sees these institutions as much more trustworthy than animal rights activists who they perceive to play loosely with the truth (Fraser & Sickler, 2009).

Additionally, if you feel there are other issues that are important for the Subcommittee to consider, please feel free to address them

I would like to directly address something that you have heard in earlier testimony. Recently, the animal rights journal *Society and Animals* published an unsubstantiated critique of the research conducted by the leading scholar in free-choice learning, John Falk, his colleague Joe E. Heimlich from COSI and the Ohio State University, and their colleagues and advisors from across the country. It is clear that this paper by Dr. Lori Marino and her colleagues was a veiled attempt to discredit a team of respected researchers and to disparage their reputations in order to claim that zoos and aquariums can't be educational environments. This criticism did not meet even the minimum criteria for scholarly ethics nor the basic rules of evidence for scientific research. They elected to criticize the methodologies in a public summary document, not the original research publications when, by definition, summary documents do not provide detailed methods or data. Similarly, they ignored the freely available data which was a part of the public record. They challenged the methods on the basis of Karl Popper's outdated standards for science research published in 1959 that were debunked in the final years of the last millennium (Sokal & Bricmont, 1998) – standards that would not permit us even to consider physics to be a science. They also ignored that the research followed the best practices for museum research as outlined in Diamond, Luke & Uttal's (2009) recent guidelines, rigorous standards for validity assessment in the social science literature, and disregarded the facts regarding how learning and knowledge were assessed and validated in this study.

I cannot imagine why these scholars chose to play so fast and loose with the facts. Dr. Marino and her colleagues clearly have no knowledge of the education standards for evaluation that are

used to assess the effectiveness and efficiency of the professional education programs in accredited zoos and aquariums following methods developed by the social sciences professional community and forwarded by the National Science Foundation.

I would like to shift my focus now specifically on the conservation work of AZA's member zoos and aquariums.

AZA-accredited zoos and aquariums are concerned about species survival and ecosystem health and therefore are dedicated to making substantial positive impacts for wildlife conservation. AZA's accreditation standards and Board-approved policies have been established to ensure this objective is achieved and are continuously updated to meet increasingly rigorous criteria.

With its 221 accredited zoos and aquariums, AZA is working to build North America's largest wildlife conservation movement. AZA-accredited zoos and aquariums spend nearly \$90 million per year on conservation and in the last five years, have funded close to 4,000 conservation projects in more than 100 countries. In addition, since 1991, the AZA Conservation Endowment Fund, which supports the cooperative conservation-related scientific and educational initiatives of AZA, its members, and its collaborators, has provided almost \$5 million to 280 conservation projects worldwide.

AZA provides conservation resources, subsidizes financial support, advocates on behalf of marine mammals, and maintains partnerships with like-minded government and non-government agencies such as the Alliance of Marine Mammal Parks and Aquariums and the International Marine Animal Trainers Association to raise awareness of marine mammal issues and promote marine mammal conservation. Some action taken includes:

- In March, 2004, the AZA Board approved a policy which calls for the termination of drive fisheries, stating that: *"Zoos and aquariums accredited by the Association of Zoos and Aquariums are experts in animal care, wildlife conservation and educating the public about wildlife issues. The AZA strongly believes that the practice of killing or taking dolphins and whales in drive fisheries is inhumane and should be terminated immediately."*
- AZA sponsors a campaign called "Act for Dolphins" to halt the annual dolphin drive in Japan. The campaign was launched by a coalition of zoo and aquarium professionals and scientists seeking to raise awareness and bring an end to the Taiji slaughter. Over 124,000 signatures have been obtained on a petition to end the dolphin slaughter in Japan.
- AZA supports H.R. 556 – The Southern Sea Otter Recovery and Research Act: To establish a program of research, recovery and other activities under the US Fish and Wildlife Service to provide for the recovery of the southern sea otter.
- AZA supports S. 859 to amend the John Prescott Marine Mammal Rescue Assistance Grant Program to authorize entanglement response agreements and updates existing practices and procedures for rescuing and rehabilitating stranded marine mammals.
- The AZA Bear Taxon Advisory Group, Polar Bear Species Survival Plan Program, accredited institutions, and Green Scientific Advisory Group work cooperatively to address issues related to polar bear survival and climate disruption.
- AZA collaborates with Polar Bear International to address polar bear and arctic habitat conservation through support for scientific research and educational outreach programs. Numerous AZA-accredited institutions serve as Arctic Ambassador Centers.

Zoos and aquariums also provide a host of conservation tools and resources, and develop conservation partnerships to increase public awareness of marine mammal and ocean conservation issues. For example, public exhibit messages, a public service announcement (<http://dontfeedwilddolphins.org/>), and *in situ* outreach campaigns have been developed by zoos and aquariums to inform the public of the dangers of feeding or interacting with wild dolphins.

Numerous AZA-accredited institutions have been directly involved in the rescue, rehabilitation, and release of marine animals. Collectively, these institutions have dedicated enormously to conservation through this work. At the surface, these programs seem focused only on humanitarian work, rescuing and rehabilitating animals in need of care. However, many rescue and rehabilitation activities lead to questions about animal behavior, physiology, diseases, and a host of other areas that generate many research projects that, ultimately, benefit our understanding of marine mammals and assist in developing practices that protect them in the wild. AZA-accredited institutions have:

- Collectively devoted more than 200 years of staff time caring for stranded dolphins, whales, sea lions, seals, sea otters, sea turtles, and manatees.
- Rescued each year, on average, more than 350 of these animals.
- Spent over 125,000 hours by more than 100 staff members caring for them.
- To date, allocated more than \$3,000,000 to programs for rescuing and rehabilitating more than 1,800 marine animals, of which over 1,750 have been successfully released back into their natural habitat.

RECOMMENDATIONS

Finally, I will offer the following recommendations regarding Standards for education and conservation programs.

AZA Standards are producing the intended results – effective marine mammal conservation and education programs that fulfill the requirements of the Marine Mammal Protection Act. Therefore, no changes in law or additional regulations are necessary.

However, the Congress and NMFS should feel free to engage with AZA and its members in a dialogue about how to make these programs even more successful. It's a conversation we as a professional community are having every day.

We also invite you to visit and experience these educational programs for yourself, and most importantly, to see what happens to people when they get close to marine mammals. The inspiration, the involvement, and the enduring commitment to conservation that is generated by these interactions is unquestionable, and undeniably important to the future of our planet.

On behalf of the Association of Zoos and Aquariums, thank you for the opportunity to offer testimony to the Subcommittee.

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