

# Progress Report

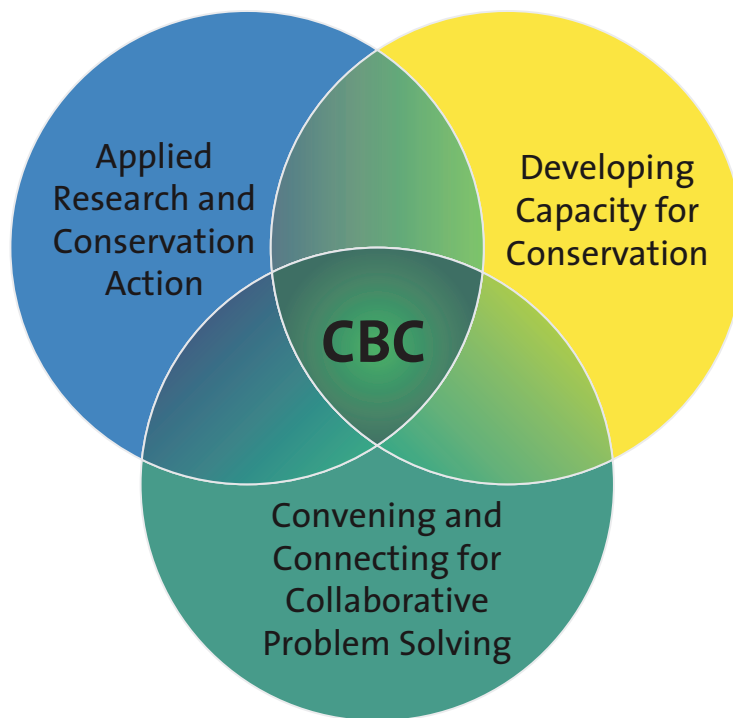
Fall 2017



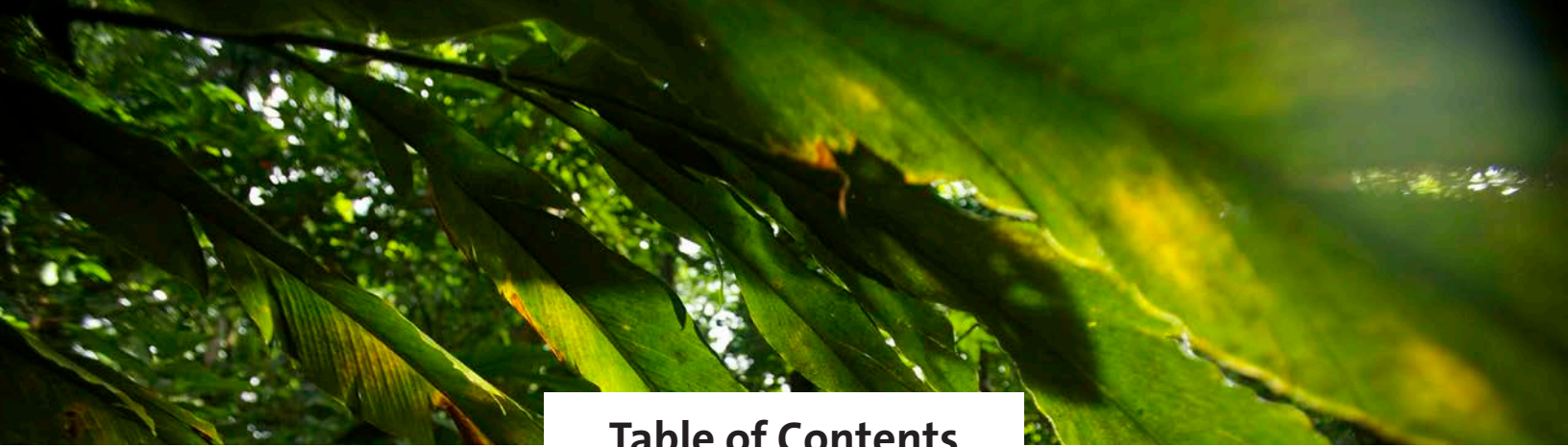
## What we do

We believe that understanding life on Earth and how to sustain it is the fundamental challenge of our time. The Museum is devoted to understanding our universe, our planet, and our place in the world. Through the CBC, the Museum embraces the responsibility to act on that understanding, and contribute to our collective endeavor of learning how to live with nature, in equitable ways.

The challenge is both scientific and social, and hence we work to connect different strands of knowledge, connect people and knowledge, and connect people to each other, to contribute solutions. This report presents highlights of our most recent accomplishments.



The Center for Biodiversity and Conservation (CBC) transforms knowledge—from diverse sources and perspectives—into conservation action.



## Table of Contents

### **Research and Conservation**

Primate evolutionary biogeography and wildlife trade in Southeast Asia	4
Tools for conservation planning and monitoring	5
Resilient biocultural landscapes: strengthening local coastal management in the Solomon Islands	7
Flamingos in the Americas	9
Human-Wildlife Conflict in the Lake Tahoe Basin	10

### **Capacity Development**

Network of Conservation Educators and Practitioners	11
Advancing conservation education: thinking big about food	13
Enhancing diversity in conservation science	14

### **Convening and Connecting**

Student Conference in Conservation Science–New York	15
Guiding global policy	16
Exhibitions and Outreach	17



Research & Conservation  
**Primate evolutionary biogeography & wildlife trade in Southeast Asia**

Dr. Mary Blair, *Director of Biodiversity Informatics Research* at the CBC, continues to collaborate with partners in Southeast Asia on wildlife trade mitigation. Dr. Blair’s efforts in Vietnam have produced important results; Vietnam’s first National Primate Conservation Action Plan was signed into effect by the Prime Minister in May 2017, and officially launched in August. Dr. Blair’s work on the population status and diversity of lorises is included in the Action Plan. This crucial work has also informed the International Union for Conservation of Nature (IUCN) Red List assessment for lorises, which will be published in 2018. Dr. Blair recently published several high-profile publications on the importance of interdisciplinary research to the study of illicit wildlife trade. One of these influential articles presents an innovative model of trade dynamics that integrates economic and social factors to foster a better understanding of the drivers of the trade in the region, and should be instrumental as the Action Plan is implemented.

Dr. Blair continues to generate new knowledge about primates in this area, and mentor rising conservationists. She returned to Vietnam in June to revisit Ben En National Park, an area that was last surveyed for lorises almost 20 years ago. She found that although they remain, their numbers are reduced. Tuan Anh Nguyen, a Vietnamese graduate student at Hanoi University of Science recently received funding from National Geographic to continue monitoring the site based on Dr. Blair’s preliminary results.



**Research & Conservation**  
**Tools for conservation planning and monitoring**

The CBC’s biodiversity informatics experts continue to develop new methods, software, and training resources to support conservation. Maxent, the cutting-edge, open-source software for modeling species niches and distributions that we launched in Winter 2016 has proven influential and has been cited seven times, including in a conservation assessment for an endangered capricorn beetle in Poland (estimating current range and the effectiveness of the current protected area network), and to predict plant pathogen outbreaks and inform a forest management plan in Italy under future climate change.

Ned Horning, *Director of Applied Biodiversity Informatics*, continues to lead the research and development of new computational approaches for image analysis, developing innovative software that can automate the detection and counting of features captured in digital photos and video. A two-week field trip in the Great Basin of the western United States yielded thousands of drone photographs that are being used to compare our object detection algorithms with other land cover classification methods. These tests are ongoing, but will likely result in a hybrid approach that improves on existing land cover classification methods. A presentation highlighting our work and soliciting collaborations was given at the International Congress for Conservation Biology in Cartagena, Columbia in July. *Software Developer* Peter Ersts—the chief developer for this project—created software to implement and compare different image processing methods to advance our goal of automating object identification in imagery. This research will generate open-access tools that are adaptable for a broad array of conservation applications—a potentially transformative resource for the field of conservation monitoring.



We are pleased to announce that we received positive news on a recent grant submission to NASA and the Group on Earth Observation's Biodiversity Observation Network (GEO BON). The project is focused on improving biodiversity informatics tools useful to conservation management. If funded, the project will be led by Dr. Blair as Principal Investigator, and focus on expanding the Wallace open-source species distribution modeling software to include measures of biodiversity change. Work will be conducted in collaboration with the City College of New York (City University of New York), Yale University, and the Alexander von Humboldt Institute in Colombia.



Research & Conservation

**Resilient biocultural landscapes: strengthening local costal management in the Solomon Islands**

The CBC continues to illuminate the fundamental connections between people, their culture, and their environment in the Solomon Islands, fostering more robust natural resource management in areas of high cultural and biological diversity. The research team led by *Jaffe Chief Conservation Scientist* Dr. Eleanor Sterling in collaboration with several partners—now in its fourth year—has generated valuable new data on the importance of biodiversity to food security and climate change adaptation, and defined new indicators that the participating communities can use to track progress in these areas.

In Spring 2017, we reported on data collection, ranging from the health of amphibian populations to changes in food garden pests; the development of books documenting valued plants and traditional recipes; and the development of large-format booklets, created with artist Hara Woltz, summarizing outcomes from the visioning and mapping workshops we conducted in each community. Since then, the team has worked with communities to refine these products and discuss other ways to share data and the results of our analysis, continued to collect data, and conducted scenario-planning workshops with communities using innovative visual and art-based techniques.

A core part of this work is supporting communities in addressing challenges to local resource management, including strengthening aspects of management that are likely to help communities adapt to climate change. Food security has emerged as a primary concern, and in response we have focused our work on nutrition, garden health, and the connections between land and sea. In September and October, we carried out fieldwork in the communities of Zaira and West Parara. We presented our analysis of data gathered over the past two years back to the communities in meetings and small workshops. Evidence of community enthusiasm for this work and the results is particularly apparent in West Parara, where raised beds and small plant nurseries have sprung up around many households. This work is already improving the communities' capacity to manage for sustainability. Notably, Zaira recently won timber rights for the full Dokoso area within their territory in Customary Land Court, and partners there have relayed that the aerial photos made available and analyzed through this project were an important part of their presentation. The photos allowed the community to clearly show that they knew their boundaries, and that they are working toward conservation goals. Finally, this trip also provided an opportunity to discuss our work with a wide range of stakeholders in Honiara between October 2 and 6 at the inaugural Solomon Islands Natural Resource Management Symposium.

The results of this project are being disseminated through presentations, university-level courses, and scientific publications, including a high-profile article just published in *Nature Ecology and Evolution* that describes the value of the biocultural approach for a global audience. This project is funded by two grants from the National Science Foundation (NSF), as well as the Tiffany & Co. Foundation, the Gordon and Betty Moore Foundation, Lynette and Richard Jaffe, the Jaffe Family Foundation, and SNAPP: Science for Nature and People Partnership.





# ROTUNDA

Member Magazine  
Summer 2017 Vol. 42 No. 3

## THE GREAT FLAMINGO COUNT

Summer  
Stargazing

Superpower  
Senses

### Research & Conservation Flamingos in the Americas

As previously reported, early in 2017 the CBC and its partners co-led an expedition to the Lagunas Altoandinas y Puneñas de Catamarca (LAPCat) Ramsar site in the Andes of northwestern Argentina. New research, led by *Associate Director* Dr. Felicity Arengo and international collaborators, has focused on the expansion of lithium mining activity in Andean wetlands over a broader area. The team led a survey of mining projects using information available from government and public sources (internet, press, media), from interviews with government officials and mining company employees, and from field observations. They identified 16 new mining projects involving the extraction of lithium, metals, silica sands, and diatoms that do not comply with current environmental regulations. A preliminary report of the findings has been distributed to authorities, academics, environmental and community organizations, and the general public to raise awareness and highlight the concept of wise wetlands use promoted by the Ramsar Convention. Dr. Arengo has also focused on outreach, preparing four presentations for scientific conferences, publishing a blog on amnh.org, and contributing to the cover article in *Rotunda*, the Museum's Member magazine, which reaches close to 60,000 readers.



Photo:  
Peter  
Houlihan

## Research & Conservation

# Human-Wildlife Conflict in the Lake Tahoe Basin

*Postdoctoral Fellow* Dr. Rae Wynn-Grant has continued her long-term research on black bear behavior and ecology in the Lake Tahoe Basin in Western Nevada. Her summer field season included new investigations into social drivers of human-bear conflict, as public attitudes towards wildlife management in the region shift with increasing human development. Dr. Wynn-Grant brought her summer intern, Wyatt Toure, from the Research Experience for Undergraduates (REU) program to her field site as a part of his first fieldwork experience. Together, they baited and set traps for black bears whose GPS collars needed to be removed, responded to reports of human-bear conflict, and explored habitat suitable for potential black bear population expansion. Dr. Wynn-Grant also captured and released three “conflict” bears, and helped facilitate a human-bear conflict workshop with colleagues at California Fish and Game who are working to mitigate similar issues on the western side of Lake Tahoe. Dr. Wynn-Grant also begun exploring opportunities for a study on interactions between black bears and mountain lions in the Tahoe Basin, as both populations are expanding and competing for resources.



**Capacity Development**  
**Network of Conservation Educators and Practitioners**

Our signature program dedicated to developing capacity for conservation, the Network of conservation Educators and Practitioners (NCEP) continues to support teaching and lead training to improve conservation.

Most recently, NCEP has partnered with the Museum’s Education Department to develop a new ecology course for the Museum’s popular online series for teachers, Seminars on Science. Funded by a grant from the Howard Hughes Medical Institute (HHMI), the course, “Ecology: Ecosystem Dynamics and Conservation,” covers topics in ecology and conservation using Museum, NCEP, and HHMI resources. CBC Director Dr. Ana Luz Porzecanski and Dr. Sterling are also featured in video lectures on the future of conservation and biocultural approaches to conservation. The six-week course will strengthen educators’ understanding of ecological principals, while providing resources and approaches for teaching a new generation of students about the interdependence of ecosystems and humans. This course will begin on October 30, 2017. It will also be adapted for Coursera as a massive open online course (MOOC) in the next year.

NCEP's Conservation Teaching and Learning Studios convene conservation educators for an action-oriented, participatory approach to conservation education. The most recent Studio, held on June 21-23, 2017, convened 16 university-level conservation science educators from the United States, Canada, and Vietnam for two and a half days of practice in applying tools and techniques in evidence-based teaching with NCEP experts; learning about NCEP resources; and networking with their peers. Each day combined training in new teaching and learning approaches with ample time for groups to apply and practice these techniques, with special emphasis on the assessment of learning and skill development using evidence-based methods. The ongoing high demand for these Studios, as well as other NCEP materials, demonstrates the important role of training and idea exchange in the field of conservation education. It was another resounding success, receiving glowing reviews and evaluations from participants.

*Feedback from NCEP Studio Participants:*

*"I have a ton ideas for next year and I think I've made really important and beneficial connections with new colleagues!"*

*"This was by far the most valuable workshop I've ever participated in."*

This year, we concurrently held an evening public event, "Teaching thinking skills in science education," which featured a diverse panel of educators discussing how they approach the teaching of critical thinking and inquiry skills.



NCEP also held two short training courses and one workshop at the recent International Congress on Conservation Biology in Cartagena, Colombia in July 2017. The first course focused on how we teach conservation and what students are actually learning, encouraging educators to approach teaching as they would approach research activities—in a rigorous, reflective, and evaluative manner. The second course focused on approaches for interdisciplinary teaching, and the training workshop focused on the teaching of adaptive management. A conference poster described NCEP's work in the Southern Tropical Andes, where we developed six field courses and reached over 500 university educators and professionals in past years.

Finally, NCEP is pleased to announce that Dr. Suzanne Macey, a former NCEP Editorial Fellow, became the NCEP Program Manager in July 2017. We are excited to see how the program grows under her capable leadership!



## Capacity Development

### Advancing conservation education: thinking big about food

The CBC continues its partnership with Columbia University to convene educators and researchers analyzing the intersections between food, our bodies, and our environment and to develop teaching and learning materials that use food systems as the setting for practicing critical thinking and inquiry. The project encompasses development of three undergraduate courses: Food and the Body; Food, Ecology, and Globalization; and Food, Public Health, Policy, and Economics. Food, Ecology, and Globalization is currently being taught by Dr. Sterling, Dr. Sharon Akabas, and CBC *Biodiversity Scientist* Dr. Erin Betley. In this is a broad survey course, students apply the tools of systems thinking to understand the relationships between our food choices, ecology, and globalization. Students examine how and why food choices carry consequences across local and global scales, from historical times to the present. By examining the systems that make possible contemporary food production and consumption, students gain an understanding of how food choices are intertwined with the complex web of environmental, ecological, and social contexts. In June, the CBC and co-organizers at Columbia University also completed a second annual Studio which convened over 70 food systems researchers and educators from 22 different institutions to share materials that use systems thinking to teach about food systems.

Finally, and consistent with our goal of promoting systems thinking approaches in conservation, we are pleased to report that—together with collaborators at Michigan State University and Rutgers University—we have been awarded a new two-year grant from the NSF to use innovative software and classroom instruction to investigate how students can best learn systems thinking and systems modeling, particularly in the context of food systems learning. New exercises and class materials generated through this project will be contributed to the NCEP collection.



**Capacity Development**  
**Enhancing diversity in conservation science**

To encourage excellence, diversity, and inclusion in conservation, the CBC is devoted to promoting the recruitment, achievement, and success of students and early-career professionals from groups historically underrepresented in the field. We lead a number of activities to advance these goals, under our Enhancing Diversity in Conservation Science Initiative. We led a combination of mentoring and other activities over the summer and into this fall, including:

- mentoring of nine undergraduate students and two high school students
- developing a guide to inclusive undergraduate and graduate programs in conservation biology and a how-to guide for students applying to these programs, and
- creating and piloting media to raise the profile of conservation biology in underrepresented communities.

In addition, CBC staff led several high-profile events on this topic at the International Congress for Conservation Biology this summer in Cartagena, Colombia.

CBC mentoring of early-career scientists has long-lasting influence. Former CBC-AMNH undergraduate intern (2013) Elora Lopez’s graduate research on how coral and fish have thrived on Bikini Atoll 70 years after nuclear tests was recently featured in USA Today, The Guardian, and on Episode 2 of PBS’s Big Pacific.



## Convening & Connecting Student Conference in Conservation Science–New York

We held the 8th annual Student Conference in Conservation Science- New York, and it was once again a great success. We convened 285 participants but the stars of the show were the 94 student or early career researchers who presented. They were selected, in a competitive process, from a pool of 250 applicants from 59 countries and 41 States in the US.

Plenary speakers this year were Dr. Jeremy Jackson, a prominent marine ecologist, paleontologist, and oceanographer who is Professor Emeritus of Oceanography at the Scripps Institution of Oceanography in California, and Nai’a Lewis, a social entrepreneur and artist who has catalyzed a wave of large marine reserve designations under the umbrella of Big Ocean. The conference closed with a public event and panel discussion on ocean conservation.

*“I felt true exchange where I got to give and receive on so many levels; this isn’t something that happens at most conferences.”*

- Nai’a Lewis

*“Wonderful experience. Can’t wait for next year!”*

- Undergraduate student



## Convening & Connecting Guiding global policy

As we work to advance conservation action and bridge local and global scales in conservation, we continue to connect with the international arena and share lessons from our work with global initiatives. Dr. Sterling has been leading these efforts, which recently included:

- **Producing a new, step-by-step guidance document on best practices to engage stakeholders in biodiversity conservation projects, for use by the United States Agency for International Development (USAID).** This summer, CBC delivered a step-by-step guidance document to USAID that draws from our recent comprehensive literature review on the topic (published in May 2017). This report will be shared with USAID staff around the world, particularly with those funding biodiversity conservation work, to provide evidence-based, practical guidance regarding key steps, tools, and practices for effectively engaging stakeholders in biodiversity conservation projects. It has the potential to reach the 125 countries where USAID does biodiversity work through its missions and offices and hence to guide policy on a global scale.
- Presenting at Yale University when she received the 5th Annual Women in Science at Yale (WISAY) award (April 27) for “exceptional research in behavioral ecology and for serving as an excellent role model for many young scientists.”
- Participating in the Resilience 2017 meeting in Stockholm this summer, where together with CBC specialists Erin Betley and Amanda Sigouin they were able to present results from the biocultural indicator research and exchange ideas and information with others addressing similar issues. They also learned about cutting-edge projects on food security, sovereignty, and resilience that will inform other CBC projects and programs.

A priority for Dr. Sterling as Jaffe Chief Conservation Scientist has been to publish more about the CBC and its work to raise its profile. This endeavor has proven very successful; she has published nine papers over the past year, with another 14 papers in press—a prolific output that will increase public awareness and understanding of the CBC’s far-reaching work.





## Convening & Connecting Exhibitions and Outreach

Dr. Porzecanski was a special advisor to *Los Sueños Del Caribe (Dreams of the Caribbean): People, Land and Place*, an innovative Museum project that integrated science and art, funded by the National Endowment for the Arts. The project featured a months-long collaboration between Grammy-award winner musician Paquito D’Rivera in close collaboration with The Celia Cruz Bronx High School of Music and Museum scientists and educators. The project’s focus on the connections between music and Caribbean biodiversity was of special significance to the Celia Cruz Bronx High School of Music’s greater community as many of the participating students and families have their roots in the Caribbean. The project culminated in a music premiere under the Milstein Hall of Ocean Life’s iconic blue whale in late spring.

*¡Cuba!*, the groundbreaking special exhibition co-curated by Dr. Porzecanski, closed its doors in August after being enjoyed by more than 200,000 visitors, and future travel plans for the exhibition will be announced this winter. This July, while the exhibition was open at the Museum, Dr. Porzecanski attended the XI International Convention on Environment and Development in Havana, to present the results of our collaborations with the National Museum of Natural History of Cuba to a Cuban audience and meet with environmental leaders in the country to chart next steps. A joint talk from the Museum and MNHN was presented in Spanish, titled *Educating the public about Cuban biodiversity and culture through international collaboration between museums*.



As it travels across the United States, *Our Global Kitchen: Food, Nature, Culture*, co-curated by Dr. Sterling and Dr. Mark Norell in 2012, continues to reach new audiences. In August, the exhibition opened at the Indiana State Fair as part of its 2017 theme “The Wonderful World of Food.” A local newspaper noted: “You’ll even leave with a sense of hope about the future of farming. The exhibition takes a look at this optimistic future by sharing the past and the present of our world’s agricultural systems and gives us a view of the evolution that will need to take place to continue feeding the exponentially growing population.” Dr. Sterling also recently served as an advisor for a new exhibit at currently on view at The Museum at FIT, titled *Force of Nature*. The exhibit examines the complex relationship between fashion and the natural world, and closes on November 18, 2017.

Looking ahead, several CBC scientists are participating as advisors in the development of the new Gilder Center for Science, Education, and Innovation. We hope to showcase conservation work through some of the planned exhibits and teaching labs given its potential to illustrate the application of science, and scientific research methods, to the protection of biodiversity.

