

An underwater photograph of a sea turtle swimming over a coral reef. The water is clear and blue, with sunlight filtering through the surface. The turtle is the central focus, moving from the bottom right towards the top left. Its shell is brown and patterned, and its flippers are visible. A small tag is attached to its flipper. The background shows various types of coral and marine life.

**Enabling solutions to sustain Earth's biodiversity**

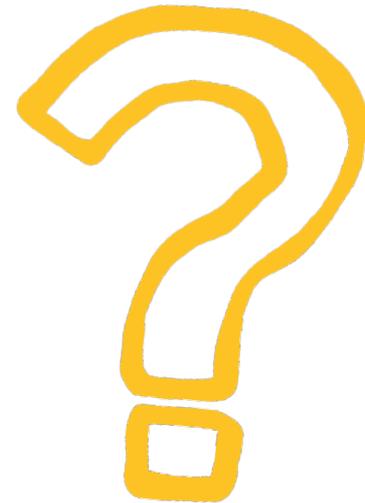
# Center for Biodiversity Outcomes 2.0

**PROBLEM : SOLUTION**

# The problem

- Global biodiversity loss occurring at a rate 1,000 times greater than the estimated background rate of species extinction.
- This loss threatens the sustainability of our planet and the foundations of our future prosperity — from food security to access to clean water to our ability to adapt to climate change.
- Biodiversity remains marginalized in policymaking, in private-sector tradeoffs and in public awareness.

**How do we mainstream biodiversity into global decision-making and sustainable development?**



# Our solution

## That is our purpose.

CBO is a leading global catalyst and resource for implementable solutions for the global biodiversity crisis.

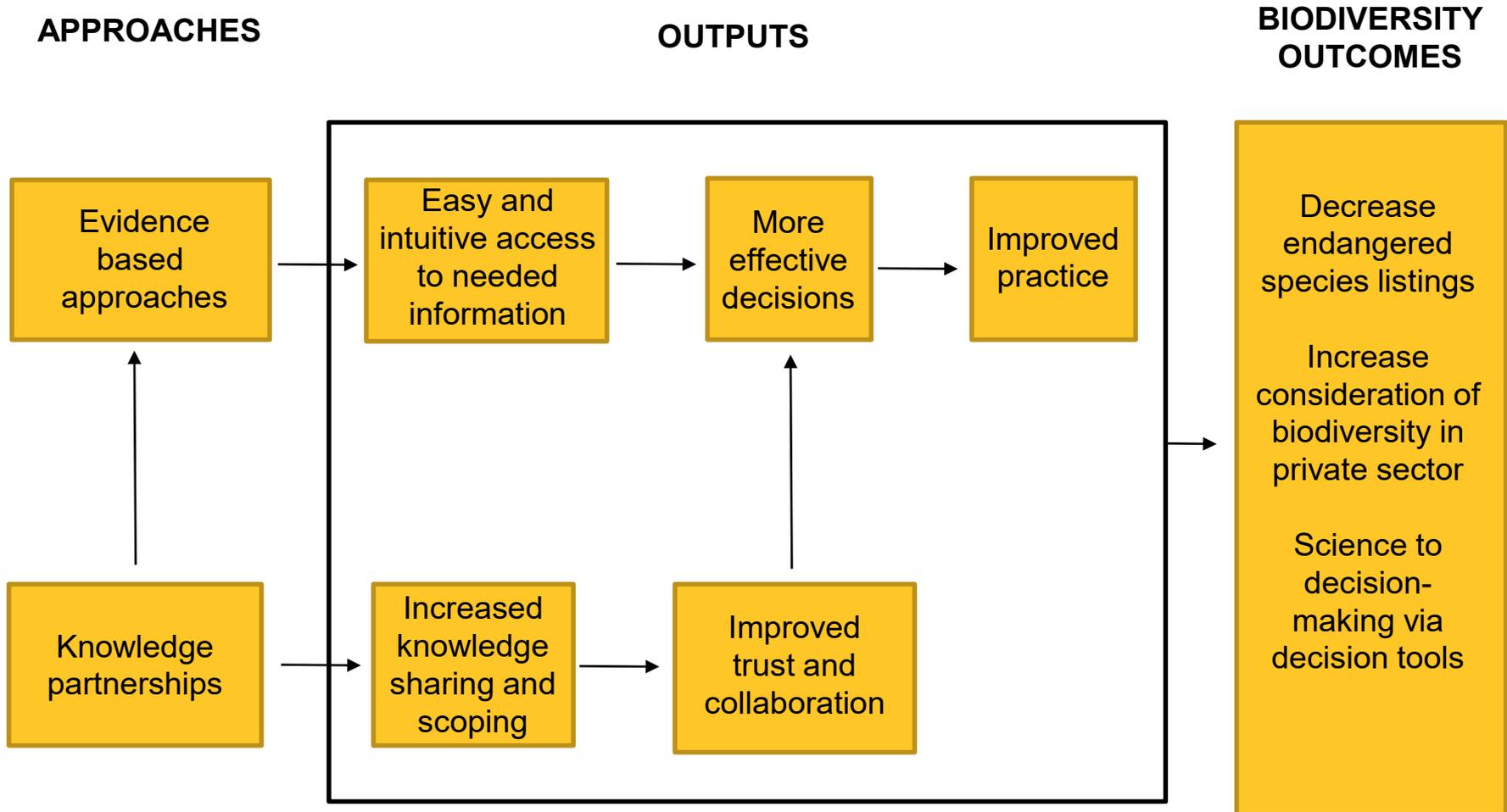
CBO generates solutions that are:

- **Based in research**, targeting both decision-maker needs and disciplinary gaps;
- **Implemented through partnerships** with corporations, policymakers and NGOs;
- **Communicated globally**; and
- **Used to educate a new generation of citizens** about the importance of biodiversity to Earth and society.



# DEFINING A BIODIVERSITY OUTCOME

# How we define a biodiversity outcome



# ACCOMPLISHMENTS

# Accomplishments

## Partnerships

These are some of the organizations with whom we have established partnerships over our first five years, resulting in research, education and decision-tool collaborations. Refer to the **Accomplishments Report** for details.



# Accomplishments

## Research

- Produced over **100 representative publications and reports**.
- Hosted a three-part **seminar series on our research focal areas**, providing concrete examples to 45 faculty and students.
- Assessed the **public value of conservation** to move from conservation evidence to tangible outcomes via knowledge partnerships via NSF grant.
- Advanced research linking **governance theories** with biodiversity conservation.
- Completed the **final extinction risk assessments** of the world's 900 species of eels, which the IUCN Red List of Threatened Species will publish in November 2018 in their website.
- Conducted **research on a variety of topics**, including: soil microorganism adaptations to climate change, sustainable fisheries, the role of natural capital in achieving the SDGs, nutrient pollution risks associated with intensified agriculture in the North Carolina, Key Biodiversity Areas and Ecosystem Services, etc.

# Accomplishments

## Education and diversity

- Launched the first IUCN Red List Training Center in October 2017 and trained more than 30 students, scientists and international partners on the IUCN assessment process. In addition, we certified 10 scientists and students as official IUCN trainers.
- Onboarded six CI scientists as professors of practice and launched the first Conservation in Practice class co-taught by them
- Launched the Graduate Certificate in Environmental Communication and Leadership
- Provide funding, administrative and marketing support to Nature at ASU (undergraduate student club)
- Partnered with the [Center for Gender Equity in Science and Technology](#) to facilitate two [annual gatherings](#) to promote diverse participation in STEAM+H careers at ASU and co-sponsored an [ASU Female Director Convening](#).
- Published “[Without inclusion, diversity initiatives may not be enough](#)” (Science Magazine) to inform and incentivize the academic community.
- Participate in [ANGLES](#), a network of higher education professionals dedicated to a sustainable future and engaged in graduate student leadership.

# Accomplishments

## Decision-making tools

- Tools for measuring, modelling, and valuing ecosystem services: Guidance for Key Biodiversity Areas, natural World Heritage sites, and protected areas
- Recovery Prioritization Explorer for the US Fish and Wildlife Service
- The Green Infrastructure Support Tool
- Intergovernmental Science Policy-Platform on Biodiversity and Ecosystem Services guide (in progress)
- Endangered Species Act compliance tools for the Electrical Power Research Institute and Monsanto (in progress)

# Accomplishments

## Funding

- Requested **\$189.2 million** in external funding (grants and philanthropic support). Secured **\$6,022,101**. Awaiting response for **\$4.4 million**.

FY17 includes \$100 million MacArthur Foundation submission, for which CBO was a semi-finalist -- among 25% of submissions with highest scores and recognized by the organization as one of the Top 200 Problem Solvers.

FY17 (\$121.5 m)

FY18 (\$62.6 m)

FY15 (\$3.1 m)

FY16 (\$2 m)

# Accomplishments

## Operations

- Hosted **more than 50 events** creating unique spaces for the exchange of ideas. Events range from meet-and-greets to workshops, seminar, film screenings, museum expositions, conferences and symposiums.
- Onboarded **four directors, four staff members, six professors of practice, five postdoctoral research associates**, completed **34 student hires** and affiliated **125 faculty members**. **Over ten volunteers** have supported CBO and **three consultants** were hired to support development.
- Secured **centralized working space** in late 2016 in LSA to house our growing team, affiliates and visitors.

# CASE STATEMENTS

# NGOs



## Your problem

NGOs focus on action. Universities focus on learning. Together we co-create solutions to pressing biodiversity issues. Often times, NGOs lack the time and resources needed to stay abreast of cutting edge scientific research.

## Our solutions

- Executive education
- Decision-making tools
- Tailored research
- Network of 10,000+ scientists representing hundreds of organizations in more than 160 countries

# NGOs



## IUCN Red List

The IUCN Red List of Threatened Species is the most widely accepted and standardized system for classifying species extinction risk.

**Problem:** IUCN relies on the reach of more than 1,300 members and 10,000 experts to identify and categorize species. CBO is one of only three universities in the world, out of 11 selective members, to formally join the IUCN Red List Partnership.

**Solution:** CBO developed a New World Red List Training Center on Tempe campus, which offers specialized education, technology and analyses for scientists and students to better assess the state of the world's biodiversity. CBO has also committed to assessing more than 4,000 species over the next 5 years for inclusion on the IUCN Red List



## Conservation International

One of the most prominent and leading global conservation NGOs

**Problem:** Lack of collaboration between researchers and practitioners means valuable research at world-renowned academic institutions often does not inform practice.

**Solution:** We provide CI with a wealth of research capacity and they bring scientists to teach our students. We onboarded seven professors of practice to teach a course titled Biodiversity Conservation in Practice, which is part of our graduate certificate in Environmental Communication and Leadership. We foster collaboration between CI scientists and ASU faculty to inform important research.

# Corporations



## Your problem

Many companies lack the data, expertise and incentive to rigorously consider biodiversity in operations. Biodiversity materiality represents an enormous risk for companies, but is difficult to quantify. Companies need access to data and support to ensure they have the expertise to implement effective biodiversity management plans across their operations and value chains.

## Our solutions

- Executive education
- Decision-making tools
- Tailored research
- Network of 10,000+ scientists representing hundreds of organizations in more than 160 countries

# Corporations



## Electric Power Research Institute

EPRI is an organization dedicated to finding solutions to produce, deliver and use electricity in clean ways.

**Problem:** The electric power industry plays a major role in taking preventive measures to estimate the costs of compliance to protect species listed or under consideration by the Endangered Species Act.

**Solution:** We are developing a tool that will allow the electrical industry to estimate the range of potential operational, reputational, legal and regulatory risks associated with ESA compliance. The tool will also include an evidence-based comprehensive framework for assessing pre-compliance and compliance costs.



## GOMEX

GOMEX is a spatial decision-support tool for marine biodiversity and petrochemical vulnerability in the Gulf of Mexico Large Marine Ecosystem.

**Problem:** Most marine species across the Gulf of Mexico have not been systematically reviewed for population status and relative risk to major threats. Understanding how multiple stressors impact marine life in the region is critical to the development of effective management, recovery, restoration and mitigation initiatives for living marine resources.

**Solution:** This tool provides resource managers improved marine biodiversity data, packaged into a user-defined-support tool. Outputs include species-specific regional population risk assessments, updated distribution maps and peer-reviewed petrochemical vulnerability rankings for more than 2,000 marine species.

# Governments



## Your problem

Sound environmental policy requires not only cutting-edge scientific data and expert analysis, but also the ability to translate science into meaningful real-world decisions.

## Our solutions

- **Decision-making tools**
- **Specialized monitoring tools, multidisciplinary data analyses and access to state-of-the-art remote sensing and data management technologies.**
- **Hundreds of affiliated faculty.**
- **Online courses, certification programs and user-defined decision-making tools.**

# Governments



## Republic of Myanmar

Myanmar is home to a remarkable diversity of unique species and ecosystems. In 2015, Myanmar updated its [National Biodiversity Strategy and Action Plan](#) and confirmed commitment to the [United Nation's Sustainable Development Goals](#).

**Problem:** The nation faces challenges in understanding how best to implement conservation plans, especially in the wake of increasing economic development.

**Solution:** We led a working group in collaboration with the [Science for Nature and People Partnership](#) to help the Myanmar government develop a framework for documenting, measuring and valuing ecosystem services delivered by [KBAs](#).



## U.S. Fish and Wildlife Service

The [USFWS](#) is the US government agency in charge of managing national wildlife refuges, protecting endangered species, managing migratory birds, restoring nationally significant fisheries and enforcing federal wildlife laws. It works to protect 1,275 threatened and endangered species.

**Problem:** Funding restrictions limit how many recovery plans U.S. policy makers can implement to help conserve species.

**Solution:** In collaboration with the [Endangered Species Act](#) decision-making team and [National Socio-Environmental Decision Center](#), or SESYNC, we created a tool designed to improve species prioritization for the U.S. government. This tool helps engage decision-makers by highlighting how different kinds of funding allocations, choices and value-systems inform or affect species protection.

**CBO 2.0**

## CBO 2.0

CBO 2.0 builds upon CBO's five years of work connecting ASU's capacity for innovative, implementable research to the biodiversity challenges faced by leading institutions and organizations around the world.

Our partnerships have convinced us to focus CBO 2.0 on three of the biggest challenges biodiversity faces today:

- The **need to create broad support** for a richly biodiverse planet;
- The **lack of awareness of and capacity** to implement win-win solutions that benefit biodiversity as well as other priorities in sustainable development; and
- The **difficulty in identifying interventions** that can achieve effective biodiversity conservation despite funding constraints.

# Objectives

To meet these three challenges, CBO is focused on three objectives for its next phase:

- **Objective 1: Use the science of learning to grow a new biodiversity generation**
- **Objective 2: Bring biodiversity to the center of the world's decision making**
- **Objective 3: Transform biodiversity conservation investments and decision-making**

# OBJECTIVE ONE

# Use the science of learning to grow a new biodiversity generation

## Problem

While awareness of the global biodiversity crisis varies from country to country, awareness of the importance of biodiversity to sustainability and prosperity is low — fueling biodiversity's continuing marginalization.

## CBO-ASU Solutions

Drawing on ASU's partnerships and breadth of scholarship, CBO will mount **two initiatives to build a new biodiversity-conscious generation** in Arizona as well as nationally and globally.



1

# Use the science of learning to grow a new biodiversity generation

## Solution 1: The New Biodiversity Generation initiative

An ASU-based best-in-class interdisciplinary education and training program, **New Biodiversity Generation** will harness the complex challenges in conducting conservation to create a new generation of critical thinkers among ASU undergraduates — many of whom will go on to transform key sectors of society on the critical importance of biodiversity to sustainable development.



1

# Use the science of learning to grow a new biodiversity generation

## Solution 2: The Science of Biodiversity Learning Project and The Project for Biodiversity Engagement

CBO will draw on ASU's leadership in the science of learning to research, test and measure how to build awareness of and action on the global biodiversity crisis.

The **Science of Biodiversity Learning Project** will accelerate adaptive learning through all of our initiatives — from measuring how our New Biodiversity Generation initiative impacts participants and partner organizations' attitudes toward sustainability and biodiversity, to measuring partnership and sector adoption of win-win solutions for biodiversity and sustainable development, to the transformation of biodiversity conservation interventions through cost-effective information and approaches.



1

# Use the science of learning to grow a new biodiversity generation

## Solution 2: The Science of Biodiversity Learning Project and The Project for Biodiversity Engagement

The **Project for Biodiversity Engagement** will use the science of science communication to establish and disseminate globally recognized indices and benchmarks for public and sector awareness of biodiversity and engagement with biodiversity solutions. The Project for Biodiversity Engagement will also disseminate the findings of the Science of Biodiversity Learning Project to the world.



1

# Use the science of learning to grow a new biodiversity generation

## Outcomes (3-5 years)

- All **ASU students** have access to internships to obtain hands-on experience in critical thinking biodiversity conservation.
- At least 50% of all **ASU undergraduates** understand what biodiversity is, why it's critical to sustainable development and the foundation of future prosperity.
- ASU-CBO creates **international Master's program** for leaders of biodiversity conservation organization to inculcate interdisciplinary approaches throughout the biodiversity conservation sector.
- The **Biodiversity Engagement Index** becomes the global standard for public and sector awareness of biodiversity and engagement with biodiversity solutions.



1

# Use the science of learning to grow a new biodiversity generation

## Capacity needs

- **Program coordinator** to create and manage New Biodiversity Generation program and catalyze faculty engagement with program.
- **Coordinator/communications support** for Science of Biodiversity Learning Project and Project for Biodiversity Engagement.
- **Administrative support** for all programs and projects.



# OBJECTIVE TWO

# Bring biodiversity to the center of the world's decision making

## Problem

Decision makers today desire win-win solutions for biodiversity and sustainability — but they have low awareness for which solutions work best and often have low capacity to implement those solutions, resulting in negative consequences for biodiversity.

## CBO-ASU solution

Through **data analysis**, **partnerships** and **strategic communication**, CBO and ASU will surface and promote implementation of such win-win solutions — a critical part of making biodiversity central to sustainable development.



2

# Bring biodiversity to the center of the world's decision making

## Outcomes (in 3-5 years)

- Develop a **novel universally adopted standard** for biodiversity reporting.
- Become the **go-to academic center in North America** for conservation decision support for at least 50 NGO, corporate and government organizations.
- Convene **annual conference** for global leaders to establish a community of practice in integrating biodiversity into global decision-making.



2

# Bring biodiversity to the center of the world's decision making

## Capacity needs

- **Research associate** and postdoctoral staff
- **Program coordinator**
- **Administrative support**
- **Event management**
- **Communications** for thought leadership campaign about win-win research and solutions
- **Development** and development communications support



2

# OBJECTIVE THREE

# Transform biodiversity conservation investments and decision-making

## Problem

Biodiversity conservation organizations lack rigorous frameworks with which to make cost-effective investments and decisions — a gap that heavily contributes to the marginalization of biodiversity in decision making.

## CBO-ASU Solution

CBO and ASU will become global leaders in giving these organizations the **tools, insights, data and methodologies to become cost-effective** — and thus much more relevant to the world's businesses, decision-makers and impact investors.



3

# Transform biodiversity conservation investments and decision-making

## Outcomes (in 3-5 years)

- Establish a **living laboratory** for developing, testing and facilitating uptake of frameworks for cost-effective biodiversity conservation investments with at least 50 participating partners.
- Establish a **central repository and reporting system** of biodiversity conservation intervention costs and benefits to facilitate dynamic, real-time decision-making.
- Deliver **comprehensive guidance on implementation** based on behavioral psychology and organizational learning.
- Develop and implement **marketing campaign** to encourage global adoption by biodiversity conservation organizations of ASU/CBO frameworks, repository and reporting system and implementation guidance.



# Transform biodiversity conservation investments and decision-making

## Capacity needs

- Additional **research and research leadership** for living laboratory, cost and benefits database and guidance implementation
- **Program and outreach coordinator** for living laboratory
- **Administrative support**
- **Communications support** for thought leadership campaign about importance of cost-effective investments and decisions in biodiversity conservation
- **Development** and development communications support



3

# THE COMPETITIVE ADVANTAGE

# The competitive advantage CBO 2.0 brings to ASU

CBO 2.0 builds on the clear leadership of CBO among university-based boundary institution that deliver actionable science for adoption into solutions by real-world actors.

While CBO's peers focus on:

- a) specific methodologies and decision-support tools,
- b) specific sectors or
- c) specific geographies,

CBO continues to develop **cross-sectoral expertise** through partnership with a wide variety of institutions and organizations.

CBO's Actionable Science Model matches these partners together with ASU's formidable interdisciplinary **network of scholars, scientists and practitioners** to catalyze and co-create practical, cutting-edge solutions for the biodiversity challenges these partners face.

# The competitive advantage CBO 2.0 brings to ASU

CBO 2.0 will widen this competitive advantage by integrating our three Actionable Science Model components — **research, partnerships and education** — even more tightly to focus on the three most pressing challenges biodiversity faces today.

By 2025, this focus will make CBO-ASU **the premier global boundary institution for solutions to Earth's biodiversity crisis.**





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