

# SECOND NATURE



**CHANGING THE FUTURE  
FOR ENDANGERED SPECIES**

IUCN SSC CONSERVATION BREEDING SPECIALIST GROUP (CBSG)

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## **Second Nature: Changing the Future for Endangered Species**

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St. Paul, Minnesota

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Cover and page design: Trio Bookworks  
Cover photo: © Florence Perroux/La Palmyre Zoo

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ISBN: 978-0-9983065-0-6

Printed in the United States of America

21 20 19 18 17 1 2 3 4 5 6 7 8 9 10

*I attended my first IUCN SSC meeting in 1987 and was hooked. In 1991 I joined the Conservation Breeding Specialist Group and began to apply CBSG tools to conservation planning for yellow-shouldered parrots on Margarita Island, Venezuela. We can now proudly say, 25 years later, that the conservation efforts inspired by this work and led by the Venezuelan NGO, Provita, succeeded in increasing the parrot population from 700 birds in the early nineties to 1,700 at present.*

*This book is precisely about similar success stories. By convening all relevant stakeholders, thinking creatively, working cooperatively, and applying a portfolio of cutting-edge tools, CBSG has developed a unique approach that allows practitioners to compile the data available, examine scenarios, and build an adaptive plan to reduce a species' risk of extinction. I look forward to working together with Onnie Byers and her team over the next few years on a set of new, similar initiatives, and to begin developing the case studies for the next edition of the book!*

**— Dr. Jon Paul Rodríguez**

**IUCN Species Survival Commission Chair**

*Throughout my tenure with the IUCN, including as SSC Chair, I have watched the CBSG evolve from a group solely dedicated to assisting with management of small captive populations to one that plays a major role in conservation planning for species, both in the wild and in captivity. The CBSG has been instrumental in forging strong links between the SSC and the zoo community, and the power of this collaboration to improve the fate of globally threatened species is reflected in the stories in this book. The vision of the IUCN's Species Survival Commission is "A just world that values and conserves nature through positive action to reduce the loss of diversity of life on earth." The CBSG's collaborative, inclusive, and science-based approach to planning not only helps achieve the SSC's vision, but also ensures that it delivers the most effective conservation action to protect future generations of threatened species.*

**— Dr. Simon N. Stuart**

**IUCN Species Survival Commission Chair, 2008–2016**

CBSG is a global network of conservation professionals dedicated to saving threatened species by increasing the effectiveness of conservation efforts worldwide. CBSG is a specialist group of the Species Survival Commission (SSC) of the International Union for Conservation of Nature (IUCN). The IUCN is the world's oldest and largest global environmental organization. IUCN provides public, private, and non-governmental organizations with the knowledge and tools that enable human progress, economic development and nature conservation to take place together.

The Species Survival Commission advises IUCN and its members on the wide range of technical and scientific aspects of species conservation and is dedicated to securing a future for biodiversity.

CBSG headquarters is staffed by a Global Conservation Network–supported team:

Onnie Byers, Phil Miller, Kathy Traylor-Holzer, Caroline Lees,  
Elizabeth Townsend, and Emily Wick.

**The Conservation Breeding Specialist Group**

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## Preface

When I shared the concept for this book project with my colleagues, they asked repeatedly, “Who is your target audience?” My initial answer was that the audience for this book was me.

After 20 years dedicated to the work of the IUCN SSC Conservation Breeding Specialist Group, I wanted to compile a sampling of our successes to document and celebrate CBSG’s impact on species conservation . . . for myself. But then I thought a bit more about this and broadened my focus. So, who is the target audience? Everyone.

Everyone who has devoted their professional lives to the work of this amazing group, every member of CBSG’s global network of intellectual and financial contributors and potential future contributors, every partner we have worked with to produce these successes, and all those who may benefit from the effective tools and processes we employ—and all of their colleagues, families, and friends. It is these people I hope will see themselves in and be inspired by this book.

The 10 stories collected here illustrate ways in which CBSG workshops have been a turning point in species conservation efforts. And they show how CBSG’s influence can improve the status of threatened species in the wild: by helping the people already working to conserve a species come to agreement on what needs to be done to succeed.

But this book isn’t just about what CBSG does—it’s also about who CBSG is. These stories, told by some of the people who have worked with us over the past 30 years, testify to the fact that CBSG is not just a few program officers working from modest offices in

Minnesota. CBSG is the ever-growing global network of conservationists who identify with the ethos of CBSG and partner with us in conservation planning for threatened species. Their stories tell our story, and that is what this book is: the story of us, the story of you, the story of the Conservation Breeding Specialist Group.

—Dr. Onnie Byers, CBSG Chair





For over 35 years, CBSG has been assisting in the development of conservation plans for more than 260 species, including mountain gorillas.

# A Second Chance Is Second Nature

This book is one of hope.

Without question, there are serious conservation challenges facing our planet. Of all species that have been assessed according to the International Union for Conservation of Nature (IUCN) Red List, almost a third are currently on a path to extinction. With habitat destruction, climate change, pollution, and the spread of invasive species among the many threats responsible for today's biodiversity crisis, it is easy for conservationists to become discouraged.

But there is also good news. There are success stories. There really is hope for endangered species in the wild.

This book proves it. In these pages the Conservation Breeding Specialist Group (CBSG) of the IUCN's Species Survival Commission shares ten examples of what can occur when dedicated people with diverse perspectives work collaboratively toward a common purpose: to help a species survive. Each chapter tells the story of what

happened when a government agency, a zoo, or another conservation organization asked CBSG to help them overcome a problem they were having with their work to save a threatened species. Each faced different, very specific challenges, but they all knew that CBSG's scientifically sound, consensus-based methods could help them improve their results.

This collaborative approach is second nature to CBSG. It's in our DNA. It's what sets us apart. It was the vision of Dr. Ulysses S. Seal when he became CBSG's first chair in 1979, and it informs every aspect of our work to this day.

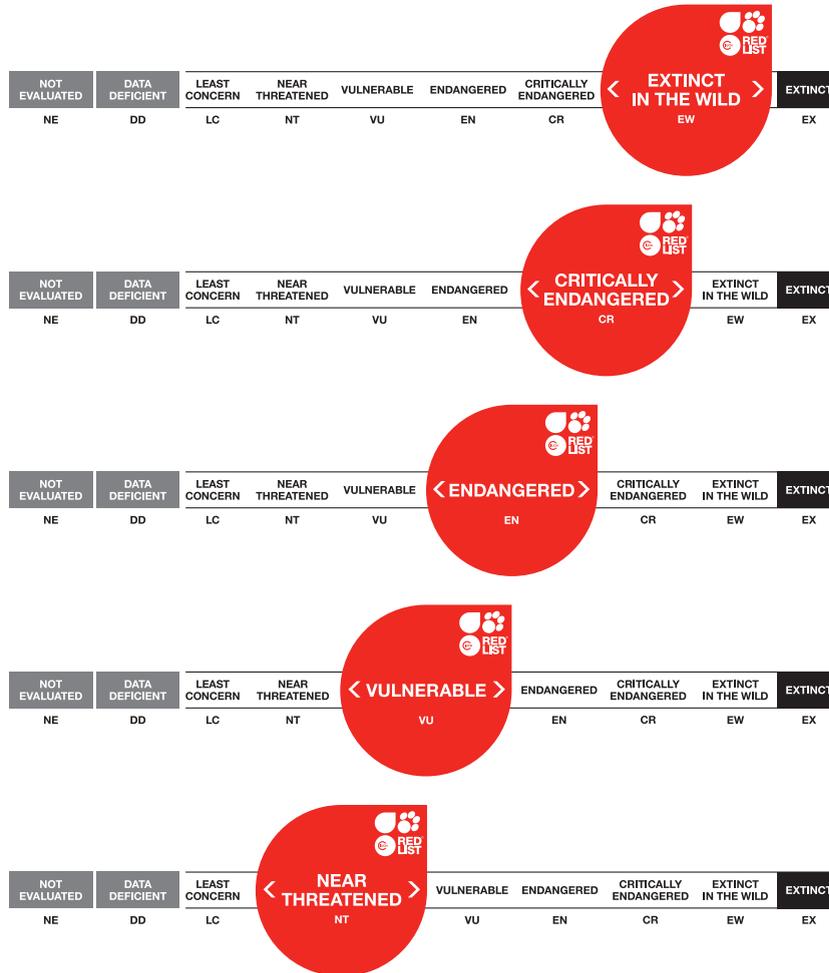
Our principles of sound science, neutral facilitation, and commitment to collaboration are detailed throughout this book. But our success stories also belong to the people around the world—local community members, scientists, field researchers, government representatives, zoo and aquarium professionals, and representatives of nongovernmental organizations—who came to CBSG with a significant challenge and an even greater commitment to overcoming it.

These are their stories. Among them, stories of how a tiny fern frond stood up to a hurricane, why understanding and engaging a local community helped save a tree kangaroo, and what happened when penny-sized toads flew first class across the ocean.

And these are just a sample of the results of purposeful planning. CBSG has helped hundreds of organizations find common ground, overcome conflicts, build consensus, and develop creative, effective solutions that change the future for an endangered species.

By bringing people together to address a shared goal, appreciating the value of collaboration, and pushing for innovation, we do more than address challenges. We bring about second chances for wildlife and a more hopeful future for the planet.

# The IUCN Red List



The IUCN Red List of Threatened Species™ is the world's most comprehensive inventory of the global conservation status of plant and animal species. For more information, visit [www.iucnredlist.org](http://www.iucnredlist.org).



# 1

## Moving Parts

### Putting the Pieces Together to Conserve Wattled Cranes

Wattled cranes' innate behavior makes conserving them quite a puzzle. They mate for life, have long gestation and fledging periods, and rear only one egg at a time. If a second egg is produced, the parents often abandon it: raising more than one chick per season just isn't in their DNA.

Wattled crane populations began to suffer in the 1980s, when agriculture, industrialization, and overgrazing of domestic animals significantly reduced the cranes' wetland habitat. Much of what remained was located on private land, making it difficult to protect.

In response, the Endangered Wildlife Trust began coordinating conservation efforts among NGOs, forestry departments, governments, zoos, and universities in South Africa. Despite their hard work, by the year 2000 the once-widespread South African population of the species fell to just over 200 birds.

But these groups had gathered a lot of data on the species, and

they recognized that the time had come to assess what they knew so they could determine why the population continued to decline.

“We needed to step back and grasp the bigger picture of wattled cranes’ historical and current situation,” said Kerry Morrison of the International Crane Foundation / Endangered Wildlife Trust partnership. “CBSG’s philosophy seemed ideal for helping us come to a common understanding and define a direction for the future.”

### **Visualizing the Future**

To jump-start putting the data to good use, the Endangered Wildlife Trust and its partners invited CBSG to lead a workshop in Wakkerstroom, South Africa, in 2001.

Wattled crane experts presented information about the species, gleaned from both published scientific papers and unpublished ongoing research. Using those data, CBSG and a subset of the workshop participants built computer models to predict how wattled cranes would be affected by potential future scenarios. What was the risk of extinction under current conditions? What factors would cause their numbers to grow or shrink?

The projections revealed high-priority issues needing further consideration. Over three days, CBSG led dynamic sessions structured to help the participants expand on their ideas for wattled crane conservation. They discussed overarching concerns in large and small groups, shared their findings, and considered next steps.

They agreed that the way to give wattled cranes their best chance at survival was to ensure no more of their breeding sites were lost, to raise public awareness of the cranes’ plight, and to study little-known aspects of crane biology, compiling what they learned in a place they

could all access. And they clarified the purpose of the captive population—to provide a strong, healthy source of birds for reintroduction—which guided their short-term and long-term activities.

Also, they formed several lasting partnerships at the workshop. Notably, four of the organizations (later joined by a fifth) established the Wattled Crane Recovery Programme, a conservation breeding program based on the action plan they had just developed. In addition to fostering the growth of the captive program, a subset of this partnership teamed up to monitor wild wattled cranes in KwaZulu-Natal Province, the stronghold of the species in South Africa.



Protecting wattled crane nesting sites has been critical for boosting their population in the wild.

## Complete Turnaround

After the CBSG workshop, project collaborators further researched wattled crane habitat and not only slowed the loss of breeding sites but gained protection for several more. Presently, local farmers and landowners assist with researching and monitoring the cranes who live on their properties. All new data go into a central database so everyone can stay up-to-date. Conservationists use the cranes' breeding biology to the species' advantage: they rescue doomed second eggs from wild nests and raise them as part of the captive population.

**“The work is far from over,  
but we’ve made good progress,  
and the plan we formed with  
CBSG’s guidance provided us  
with a solid foundation.”**

At the time of the workshop, the captive population was struggling along at just 9 birds; it has grown to 44 birds under the new plan. “The models CBSG created have been at the core of every decision we made for developing what has become a very strong captive population,” said Morrison.

The number of wild wattled cranes in South Africa has increased more than 60 percent since the workshop, to about 320. “Wattled

cranes have seen a complete turnaround,” said Morrison. “So much so that soon we will no longer need to consider supplementing the wild population with captive-raised birds. The work is far from over, but we’ve made good progress, and the plan we formed with CBSG’s guidance provided us with a solid foundation.”

## At a Glance

**Species:** Wattled crane (*Bugeranus carunculatus*)

**Region:** Sub-Saharan Africa

**Then (2000):** Vulnerable—in South Africa, just 200 left in the wild

**Challenge:** Conservation groups with different data and research findings were unable to determine why existing efforts were not succeeding.

**Turning Point:** CBSG helped stakeholders combine and organize their data and establish a common understanding of the species’ situation so that they could jointly evaluate options, make decisions together, and maintain their momentum.

**Now (2016):** The number of wild wattled cranes in South Africa has increased more than 60 percent, to about 320.



## 2

# Into the Mist

## Kihansi Spray Toads Return Home in Style

In 1996, a group of scientists stepped into a small, nearly inaccessible gorge at the base of a waterfall on the Kihansi River in Tanzania. They found it teeming with tiny yellow toads whose robust *chit-chit-chit* calls could be heard above the tremendous roar of the cascading water. Deep in their isolated territory, these newly discovered toads appeared to be abundant: the scientists estimated the population to be in the tens of thousands.

Kihansi spray toads are unique among amphibians because of their bright yellow color, diminutive two-centimeter size, and reproductive process: instead of laying eggs like most other amphibians, the females give birth to babies smaller than a grain of rice. Their habitat, about the size of four football fields, is among the smallest known ranges for any animal. Inside the gorge, the toads received a constant misting of water from the falls, which created a cool, moist climate with temperatures significantly lower than the surrounding areas.

In the late 1990s, a hydroelectric dam was constructed near the Kihansi Gorge to provide much-needed electricity to the region. But this changed the water flow and humidity of the unique spray zone at the base of the falls. In an attempt to mitigate these effects and restore moisture to the toads' habitat, the World Bank funded construction of the world's largest gravity-fed artificial mist system.

Unfortunately, nine months passed before the artificial mist system was functional, and the spray zone dried out. In the following years, spurred by additional factors like disease, the toad population plummeted and the species was thought to be extinct in the wild. Before the toads disappeared from the gorge completely, the Tanzanian government invited herpetologists from the Wildlife Conservation Society to collect 500 toads in order to cultivate an insurance population in US zoos, which would guard against total extinction and serve as a source for reintroduction in the future.

### **Staying on Track**

Since the conservation effort spanned continents and required the participation of many stakeholder groups, the project's partners called on CBSG to help them develop a strategy for returning Kihansi spray toads to Tanzania.

In 2007, CBSG led a workshop at which collaborators met to exchange information and define what needed to be done, such as managing disease risks, securing support and partnerships with local communities, and improving understanding of the toads' unique habitat.

Taking these and other challenges into account, they drew a timeline for safely and successfully returning the toads home. The time-

line included logistical details, such as acquiring the correct permits to transport captive-bred toads to Tanzania, as well as broader goals, like initiating long-term studies of the Kihansi Gorge. They discussed the construction of a breeding facility for the toads in Dar es Salaam, where Tanzanian biologists would take over the toads' care before their reintroduction.



Kihansi spray toad females give birth to live young smaller than a grain of rice.

“CBSG created the right conditions for identifying the steps to build capacity in Tanzania prior to the toads’ reintroduction,” said Jenny Pramuk, Animal Curator at the Woodland Park Zoo in Seattle, Washington. “When the second workshop took place in 2010, the timelines we created at the first workshop made it clear that many of the tasks had been accomplished, and that the project was on track to move on to the ultimate goal of reintroduction.”

**“The timelines we created at the first workshop made it clear that many of the tasks had been accomplished, and that the project was on track.”**

### **Homecoming**

In August 2010, the first “knot” of 100 spray toads from the Bronx and Toledo zoos flew first class to Dar es Salaam. Their arrival was greeted with much media fanfare: the return of the toad to its homeland was a source of celebration and pride for many in Tanzania.

These toads, which were housed in the new breeding facility, became the first in-country colony. In 2012, biologists began releasing captive-bred toads into the Kihansi Gorge, and they continue to closely monitor the species’ progress today.

The wild population was recently estimated to be 589 individuals and the insurance population exceeds 6,500, a remarkable reversal for a species that had been extinct in the wild. Although the wild population is still being augmented with toads from captivity, project partners are another significant step closer to reestablishing Kihansi spray toads in their native habitat.

## At a Glance

**Species:** Kihansi spray toad (*Nectophrynoides asperginis*)

**Region:** Eastern Tanzania

**Then (2007):** Extinct in the Wild—with an insurance population in US zoos

**Challenge:** The lack of a defined strategy for reintroducing these amphibians to their wild habitat.

**Turning Point:** CBSG's workshop served as a platform for exchanging information and putting together a comprehensive timeline for the activities that moved the effort closer to reintroduction.

**Now (2016):** Spray toads have been reintroduced to the Kihansi Gorge, and their population is now believed to be approaching 600. Biologists are seeing toads of all age classes, indicating that the toads are reproducing.



# 3

## Planting a Seed

### How Conserving an Orchid Helped Protect Governor Laffan's Ferns

When Hurricane Fabian bore down on Bermuda in 2003, 120-mile-per-hour winds ripped across the islands, taking the lives of four people and causing \$300 million in damage.

The Bermuda Botanical Garden greenhouse stood in the storm's path. Up until just a few days before the hurricane, the building had housed the last five remaining specimens of the Governor Laffan's fern. These ferns are native to Bermuda, and due to habitat destruction and invasive species, they hadn't been seen in the wild since 1905. They grow nowhere else in the world, and no other garden had them in their collection.

The plants were difficult to reproduce in the greenhouse, and the botanical garden had been having little success. Through a network of plant experts and enthusiasts in the United States, Bermuda's environmental agencies were aware of the Department for Plant Conservation at Omaha's Henry Doorly Zoo and Aquarium, and they reached

out to Marge From, the lab's Director of Plant Research. Together they decided that two tiny fertile fronds should travel to Nebraska for propagation in the lab. The 1.5-inch samples shipped out of Bermuda just days before the hurricane struck.

Hurricane Fabian destroyed the greenhouse and damaged the remaining ferns in Bermuda, leaving the survival of the species entirely dependent on the spore-bearing fronds that had arrived safely at From's lab. Over time, using the lab's carefully developed protocols, she coaxed the spores to germinate.

The botanical garden knew to contact From because of the lab's worldwide reputation. The lab's success is a result of the hard work and dedication of From and her colleagues, but the vision for a plant lab dedicated entirely to conservation had been sparked years earlier at a CBSG workshop for a completely different endangered plant.

### **Unpredictable Impacts**

In 1997, CBSG led a workshop for the western prairie fringed orchid, an endangered flower native to the North American tallgrass prairie.

The product of the meeting was a plan for conserving orchids, but an equally important result was the impact of the ideas it generated. Although the group had focused on the orchid, Dr. Lee Simmons, then-Director of Omaha's Henry Doorly Zoo, left the meeting with a new perspective on plant and habitat conservation as the basis of all conservation efforts. Soon after, he made the zoo's involvement in endangered plant research a top priority and began to develop a laboratory devoted entirely to plant conservation. CBSG had created space for innovative thinking related to plant conservation in general.

“There are only a handful of plant research labs in the United States that are dedicated to conservation,” said From. “Thanks to the workshop, the Omaha Zoo jumped into plant and habitat conservation in a big way. As a result, our plant research lab has been asked to help with conservation of threatened plants in the United States, Canada, Madagascar, Central America, and Bermuda.”

Without the lab’s reputation, the Bermuda Botanical Garden would likely not have connected with From, and the few remaining Governor Laffan’s ferns would have been destroyed by the hurricane. Instead, not only does the species flourish in the Omaha Zoo’s lab,



Unlike many other plants, ferns reproduce through spores—not seeds.

but From's team has flown thousands of plants back to Bermuda, where efforts to reintroduce the fern into the wild are underway.

"We are excited that they are now actually back in their natural habitat," said From. "We continue to propagate and germinate spores in the lab for Bermuda. It is one of our most exciting projects."

**"Many of the protocols developed for the orchid as a result of recommendations from the workshop were eventually used in conservation of the Governor Laffan's fern. All of this has come about, in large part, because of the CBSG workshop."**

### **The Root of Success**

What about the fate of the western prairie fringed orchid, for which the catalytic workshop was convened in the first place? More than 100 orchids have been propagated and reintroduced into their natural habitat, laying the groundwork for future recovery efforts.

Conservation progress for the two species can be traced back to a common factor, according to From: “Many of the protocols developed for the orchid as a result of recommendations from the workshop were eventually used in conservation of the Governor Laffan’s fern. All of this has come about, in large part, because of the CBSG workshop.”

## At a Glance

**Species:** Governor Laffan’s fern (*Diplazium laffanianum*)

**Region:** Bermuda

**Then (2003):** Extinct in the Wild—five ferns remaining in the Bermuda Botanical Garden

**Challenge:** Efforts to produce offspring from the only remaining plants were unsuccessful.

**Turning Point:** The plant lab at Omaha’s Henry Doorly Zoo successfully reproduced plants from two fertile fronds using protocols that existed because an earlier CBSG workshop had inspired their development.

**Now (2016):** Thousands of ferns have been returned to Bermuda, where the country is restoring them to their natural habitat.

# SCIENCE

CBSG's work is rooted in thorough scientific analysis. Key to many of our workshops is the incorporation of population simulation modeling. This unique approach provides a strong foundation for determining the most effective strategy for conserving a species.

## **Assembling Information**

CBSG begins by developing a deep understanding of the species, its habitat, and the ways human activities threaten its survival. This information comes from the scientific literature and, just as importantly, from people outside the scientific community who have firsthand knowledge of the species.

## **Modeling Populations**

CBSG uses cutting-edge population simulation models as a critical planning tool in many conservation planning workshops. These computer models use information about the biology of the species of concern—data such as annual offspring production, adult survival, and habitat needs—to assess the risk of future population decline or extinction.

# CBSG

# science facilitation collaboration

## **Testing Scenarios**

Simulation modeling shows the degree of risk under current conditions. Its more significant value, however, is its ability to show how the risk would change under alternative scenarios that would result from choosing different population or habitat management options. With these tools, CBSG can even gauge the consequences of scientific ignorance about the species.

## **Developing Insight**

The models help confirm or dismantle assumptions about the species and its behavior. The results sometimes reveal that a species' situation is even more perilous than originally thought. These revelations are critical for guiding discussions among conservation biologists, species managers, and community members, and for prioritizing the most urgent conservation activities.



# 4

## Resisting Intruders

### The Battle to Save Okinawa Rails from an Introduced Threat

Yambaru was under siege.

The forested, mountainous northern region of the island of Okinawa, Japan, is home to several species found only on the island, including Okinawa rails. The rails' dramatic coloring makes them easily recognizable—they have sleek, striped faces, white-barred breasts, and bronze backs accentuated by bright red-orange feet and beaks. Rails evolved to be nearly flightless, supported by a unique island ecosystem that had no carnivorous mammals—until humans stepped in.

In 1910, people hoping to protect themselves from poisonous Habu snakes set 17 mongooses loose on the southern part of the island with the intention that the small carnivores would eat the snakes. Unfortunately, the plan had a serious flaw: mongooses are active during the day, but Habu snakes are active at night. Instead of preying on snakes, the mongooses developed a taste for other local wildlife, including Okinawa rails.

Over the next century, the mongooses multiplied and expanded their territory northward. By 1980, it was clear that rail populations had rapidly declined in areas where mongooses had become established. By 2006, the estimated total population had diminished from around 1,800 to less than 1,000.

Researchers, wildlife managers, and government agencies in Japan recognized that eradicating mongooses from Yambaru was the key to preserving Okinawa rails. They also considered the benefits of cultivating a small insurance population in a local breeding facility in case the mongooses drove the wild population to complete extinction.

They invited CBSG to help them organize their different but related conservation activities into a coordinated plan.

### **Two Efforts, One Plan**

On the first day of the 2006 workshop, the participants split into two groups according to their expertise in order to focus on two main objectives. One group worked out the best ways to eradicate mongooses in Yambaru and support wild populations, and the other group, with input from the local and national zoo community, laid out plans to develop a healthy insurance population of Okinawa rails to ensure long-term species survival.

On the second day, CBSG brought the two groups together and created a timeline to show how, over time, the different elements of the plan could coincide and eventually achieve the overall aim of safeguarding rails in the wild. Establishing a common understanding of how major events were intertwined was crucial, since each group would depend on the other's progress to succeed.

## Eradicating the Intruders

After the plan was forged, a new force entered the forest to help carry it out.

The Yambaru Mongoose Busters, a group of professional invasive species managers and their highly trained mongoose-sniffing dogs, took to Yambaru daily to track, trap, and remove mongooses. By 2010, they had achieved the first target of the action plan—to secure a mongoose-free area in the northern part of the island. Efforts to win the next battle—complete regional eradication of mongooses north of a mongoose-proof fence—continue tirelessly.

Concurrently, as recommended at the workshop, Japan's Ministry of Environment created a policy for conservation-focused breeding of Okinawa rails. Since then, local rail breeding centers have fostered a



Okinawa rails evolved to be nearly flightless, putting them at a disadvantage for avoiding predation by introduced mongooses.

strong captive population, incorporating rescued birds that have been injured by cars and rehabilitated at the centers, as well as eggs that were abandoned by their parents after human activities, like mowing grasslands, disrupted their nests. These birds are available to supplement the wild population during the next phase of the project.



The local community enthusiastically supported the workshop and created artwork to raise awareness of the threats facing Okinawa rails.

Local conservation authorities estimate that the wild population of Okinawa rails has increased to around 1,500, thanks to decreased mongoose predation. The rails have been spotted in areas where they were once believed to have disappeared completely. By working with CBSG to organize their collaborative conservation efforts, stakeholders have given these living national monuments a second chance to thrive.

## At a Glance

**Species:** Okinawa rail (*Hypotaenidia okinawae*)

**Region:** Okinawa, Japan

**Then (2006):** Endangered—only about 800–1,000 left in the wild. CBSG models showed risk of extinction within 15 to 20 years.

**Challenge:** Two groups of experts pursuing different but connected conservation objectives were planning conservation activities independently of one another.

**Turning Point:** CBSG's timeline helped participants visualize how the two complementary objectives could be united into one plan under a common goal.

**Now (2016):** The wild population has grown to about 1,500 rails, and ongoing efforts are expanding the mongoose-free areas of Yambaru.



# 5

## **Burying the Hatchet**

### **Moving from Discord to Harmony in American Burying Beetle Conservation**

Conservation efforts for the American burying beetle were off to a rocky start. Measuring just 1.5 inches long, these endangered carrion beetles had unearthed a lot of strife among the conservationists trying to save them.

Carrion beetles are nature's undertakers. They bury carcasses, eat the flesh of dead animals, and use corpses as the staging ground for nearly all of their significant biological needs: mating, giving birth, and caring for their young.

Though once found in 35 states across the United States, only two American burying beetle populations were believed to remain by 1989. They were added to state and federal endangered species lists, which launched conservation efforts across the country. The species had been declining for nearly a century, and although the exact reason is still a mystery, disruption in the food web and habitat loss are likely to blame.

As conservation efforts got underway, some recovery groups disagreed on details about the trapping methods used while surveying beetles in the wild. Ongoing disputes caused collaboration among these would-be conservation partners—zoos, land managers, universities, and state and national government agencies—to stall. Several years of contentious, unproductive meetings ensued, making attempts to reconcile increasingly complicated.

Knowing its reputation for achieving agreement and resolving conflict, the recovery groups invited CBSG to lead a new approach to reaching consensus.

### **Partners Already**

CBSG kicked off the 2005 workshop by presenting a set of ground rules to establish an atmosphere conducive to respectful conversations about contentious issues. When the participants agreed to abide by the ground rules and became confident that the rules would be enforced, the anxiety in the room dissipated.

CBSG used an activity called “mind mapping” to create a visual representation of issues and needs related to the long-term survival of American burying beetles. Each person expressed what they believed were important topics, and they added those ideas to a colorful diagram on the wall, connecting each issue to the overall theme.

Next, the participants divided into groups to delve more deeply into the issues displayed on the mind map and to identify possible solutions. One by one, the small groups presented their ideas, each time igniting a lengthy, animated discussion. With CBSG facilitating the conversation and enforcing the ground rules, the participants realized that their opinions were not so incompatible after all.

“We discovered that the source of disagreement was often just a misunderstanding between us—sometimes about differing definitions for a single word,” said Bob Merz, Director of the Center for American Burying Beetle Conservation at the Saint Louis Zoo. “CBSG led us through those difficult phases to get the issues out in the open, which allowed the group to see past the words to the intent.”



American burying beetles use carrion for feeding, mating, and reproducing.

At the close of the workshop, people who were very recently in direct conflict smiled and shook hands, wishing each other well. “The workshop helped us realize that we were partners already,” said Merz.

**“We discovered that the source of disagreement was often just a misunderstanding between us—sometimes about differing definitions for a single word. . . . The workshop helped us realize that we were partners already.”**

### **Ten Years Later**

The resulting plan has played a critical role in the recovery effort, guiding the development of protocols for monitoring, breeding, and eventually reintroducing American burying beetles to the wild.

Work to reestablish beetles in several states continues, and reintroduced beetles in Missouri have survived three winters and produced

offspring. Perhaps just as importantly, the spirit of collaboration sparked by the workshop environment has also survived.

About a week after the meeting, Bob Merz was walking across the zoo grounds when he met Jeffrey Bonner, the Saint Louis Zoo CEO. “He asked me how the meeting went, and I told him that five or ten years down the road, everyone involved would look back on this meeting and see it as a turning point in the conservation of this endangered beetle. Ten years later that prediction is holding true.”

## At a Glance

**Species:** American burying beetle (*Nicrophorus americanus*)

**Region:** Eastern and Central United States

**Then (2005):** Endangered—found in only 7 out of the 35 states it once populated

**Challenge:** Conflict among members of stakeholder groups had brought collaboration to a standstill.

**Turning Point:** CBSG opened up lines of communication and helped participants move past previous points of contention to agree on action steps.

**Now (2016):** Reintroduced populations of beetles are making progress in several states, some surviving over several winters. A spirit of collaboration persists among the stakeholders.

# FACILITATION

CBSG designs a unique conservation planning process for each project. Facilitation and communication tools based in social science are used to help diverse groups productively define and prioritize problems, identify goals, and determine which activities are most likely to meet those goals.

## **Leveling the Field**

CBSG establishes a safe environment within which stakeholders can express themselves, openly discuss differences in opinion and perspective, and work through issues with other participants. This helps level the playing field so that diverse groups talk to one another about challenges they face and clarify assumptions behind competing perspectives and values.

## **Maintaining Neutrality**

At its workshops, CBSG helps participants apply quality science and encourages honest dialogue, and does so without acting in the interest of any particular stakeholder group. This emphasis on neutrality assures participants that the workshop results are truly their own product, driven completely by science and their deliberation with peers.

# CBSG

# science facilitation collaboration

## **Surfacing Conflict**

Competing perspectives often lead to conflict, which CBSG actively works to surface within the workshop setting. Conflict between stakeholder groups can cause delays in action, duplication of effort, and lack of clarity about conservation goals. But it can also serve as the engine of creativity and learning. Aided by CBSG's communication tools and facilitation, participants can break down complex issues into their parts rather than letting conflict remain polarizing and discussions superficial.

## **Building Consensus**

Species conservation is always intertwined with the histories, needs, and beliefs of people with different relationships to the species, such as members of communities that live alongside it and biologists studying the species. CBSG's commitment to transparency, equality, and consensus-based decision making helps diverse stakeholder groups balance endangered species survival with the cultural, economic, and social needs of local communities. With CBSG's guidance, they reach consensus on creative, achievable solutions to difficult problems.



# 6

## Devil's Advocates

### Helping Tasmanian Devils Stay Ahead of a Devastating Disease

Tasmanian devils have a bad reputation.

These scrappy carnivorous marsupials are short-tempered and tend to lash out at fellow devils who encroach on their mate or meal. They are insatiable, feeding in packs and consuming entire carcasses—bones, fur, and organs. In the past, they lived throughout Australia, but in modern history they have been confined to the island of Tasmania. When early European settlers in Tasmania witnessed the species' combative group feeds and ghoulish, guttural screams, they called them “devils.” The name stuck.

Despite their disposition, Tasmanian devils are an iconic Australian species and an important part of the ecosystem. But in recent years, they have been nearly eliminated by an insidious illness.

In the mid-1990s, grotesque facial tumors began breaking out on the devils' snouts. Devil facial tumor disease (DFTD) is the first known contagious cancer. The fatal disease capitalizes on the species'

principal form of interaction with other devils: it is transmitted through biting. Devils bite during communal feeds, brawls, and mating. The tumors swell, making it difficult or impossible for the animal to eat. Devils that contract facial tumors usually die from them within a few months.

The disease front swept across the island like a storm and devastated devil populations in its path. It spread so quickly that conservationists feared the species would disappear from the wild within a few decades.

The Tasmanian government and zoos in the region began plans for an insurance program. They hoped to build a captive population that would be genetically robust enough to take the species through a period of wild extinction and reestablish it in its native habitat once conditions would allow. The program was one of a number of proposed conservation activities, which included veterinary diagnostic work, vaccine research, field monitoring, disease suppression trials, and studies of potential offshore island refuges.

Because of the celebrity status of the Tasmanian devil, conservation activities drew the attention of local, national, and international media, the Tasmanian tourist sector, and the public. Activities surrounding the program became a topic of wide debate, political interest, and controversy.

### **Obstacles to Success**

Some stakeholder groups were concerned that investing in the insurance program would drain limited resources from field research, and that the captive program would replace efforts to maintain devils in the wild. Others worried that if people could see devils in captive

facilities all over Australia, fewer tourists would visit Tasmania to spot devils in the landscape.

Additional questions arose: Who would “own” the animals entering the program? How dependable were the protocols to keep DFTD far away from the insurance population?

This discomfort with the developing insurance population had practical implications. It delayed much-needed animal transfers and drove politically motivated compromises intended to avoid further provoking critics. Confidence in the program started to erode, and key supporters began to question the wisdom of investing in the long-term plan.



Tasmanian devils feed in groups, where close contact and biting perpetuate the spread of devil facial tumor disease.

As the conflict escalated, project partners proposed a CBSG workshop to openly explore concerns associated with the implementation of the proposed Tasmanian devil insurance program.

In 2008, wildlife managers, researchers, policy makers, cultural leaders, and zoo community representatives came together to resolve the issues that had delayed progress. Led by CBSG, they put their heads together to sort through the issues surrounding the controversial program.

### **From Insurance to Recovery**

“The CBSG planning workshop cleared up many of the concerns and disagreements that were limiting the development of the insurance program. It gave the program its current shape and catalyzed its implementation,” said Rebecca Spindler, Research and Conservation Manager at Taronga Conservation Society Australia. “The workshop was a pivot point to direct investment in devil conservation.”

CBSG’s computer modeling underscored that the problem of saving Tasmanian devils had to be addressed from multiple angles. On this basis, the group devised a series of interlinking programs that could be implemented simultaneously, both protecting devils in their wild habitats and working to preserve the genetic health of the species through the insurance program.

Now, after several years of carrying out the plan, the insurance population has grown to more than 600 devils who live in zoos, free-ranging enclosures, an island, and a few fenced-off, disease-free peninsulas. Although the areas that can be isolated this way make up only a small portion of the devil’s range, they are significant enough to shift the project from insurance toward ecological recovery, securing

a future for Tasmania's beloved devils that would not otherwise have been possible.

“Devil recovery is complex,” said David Pemberton, who manages the Save the Tasmanian Devil program. “When in doubt, when in need of data, or when in need of guidance for decisions, I turn to the CBSG workshop report.”

## At a Glance

**Species:** Tasmanian devils (*Sarcophilus harrisii*)

**Region:** Tasmania, Australia

**Then (2008):** Endangered—declining rapidly in the wild because of a contagious cancer

**Challenge:** Attempts to gain support for a breeding program from skeptical stakeholders and from the public were stalled.

**Turning Point:** CBSG helped stakeholders define the parameters of the breeding program and then effectively communicate its role, helping win broad support.

**Now (2016):** More than 100 healthy devils have been released into disease-free areas, and the insurance population has grown to 600 animals strong, allowing experts to focus on helping the wild population recover.



# 7

## Aristocrats on the Steppe

### Restoring a Homeland for Hungarian Meadow Vipers

For Hungarian meadow vipers—nicknamed “aristocrats” by the zoologist who first described them—human encroachment into their habitat has been both a blessing and a curse.

Conflict between warring empires from the sixteenth to nineteenth centuries altered the landscape in Eastern Europe. Armies trampled over wild and rural places to expand their territories. Forests were razed for resources during war, increasing the area of the dry grassland, or steppe, ecosystem. This expansion of the Hungarian meadow vipers’ steppe habitat was advantageous: for a time, it allowed the population to grow and flourish.

The species historically inhabited parts of Hungary, Austria, northern Bulgaria, and present-day Romania. These small, intricately patterned, venomous snakes, which prefer small prey such as insects and rodents, shared the land peacefully with grazing cattle. But starting in the 1900s, growing human populations gradually planted new

forests and tilled the soil to grow crops, decimating the vipers' habitat in the process.

By the year 2000, the species was limited to only two sites in Hungary, and just 500 vipers were believed to survive in the wild. Political issues and agricultural policies in Hungary stymied efforts to protect crucial remaining habitat. Though protected by law, Hungarian meadow vipers continued to suffer from the effects of human activities, and year by year the species slipped closer to extinction.

The Budapest Zoo approached CBSG in 2001 to lead a workshop where stakeholder groups with differing views of the meadow vipers' situation could clarify the available information and address the issues surrounding the species' decline.

### **Sticking Points**

At the beginning of the workshop, CBSG invited participants to identify what they thought were the biggest challenges to viper conservation. Many indicated that habitat management conflicts and poor communication among stakeholder communities were holding up progress. Lack of understanding about the threats to the species and scarcity of scientific data were exacerbating the problem.

On the first day, researchers presented the best current knowledge of the vipers' status. Next, CBSG organized the participants into working groups to further examine the data and clarify what they knew. Old conflicts quickly surfaced: some participants questioned whether the species was actually in decline, and thus whether all the fuss was necessary. CBSG redirected the conversation back toward the data and suggested tools to help participants push through the points of contention. Population models, compiled using the data pre-

sented earlier at the workshop, confirmed that the vipers' situation was indeed urgent.

Though their discussions were difficult, the stakeholders were able to make progress on a shared understanding of the species' status. A number of participants told CBSG facilitators that the small group activity increased trust among those present at the workshop.

“The gathering of well-known international experts convinced Hungarian stakeholders and authorities that the time had come for coordinated action,” wrote Dr. Endre Sós, Veterinarian at the Budapest Zoo, in the European Association of Zoos and Aquaria's *Zooquaria*



Steppe, or grassland, habitat like this in Kiskunság National Park is favored by Hungarian meadow vipers.

magazine. He told CBSG, “Although the legislation in place to protect the species appeared to be adequate on the surface, the field data presented at the workshop revealed that was not the case. Immediate actions could not be postponed anymore.”

### Embracing Complexity

In addition to helping participants work through many of their original sticking points, the workshop catalyzed further collaboration among stakeholder groups that had previously been at odds—which continued long after the workshop. To implement the workshop recommendations, BirdLife Hungary, government agencies, national parks, and zoos partnered to start a complex conservation project.

“The current collaboration between the different agencies, NGOs, and institutions was very unlikely before the CBSG workshop,” said Miklós Persányi, Director of the Budapest Zoo. “CBSG provided the right atmosphere and guidance for moving past our disagreements and building trust among everyone involved.”

The partners developed the Hungarian Meadow Viper Conservation Centre, based in a farmhouse in Kiskunság National Park. They began acquiring farmland to reconstruct suitable viper habitat and preserve the land into the future, and they monitored wild populations of the species. The center began a breeding program for vipers, and the Budapest Zoo provided veterinary support, produced crickets as food for young vipers at the center, and helped inform the public of the viper’s plight.

Today, over 2,000 Hungarian meadow vipers have hatched at the breeding center, and hundreds have been released into reconstructed grasslands nearby. Some reintroduced vipers have produced offspring.

In areas where reconstructed habitat was connected to existing habitat, sightings of wild Hungarian meadow vipers during surveys increased exponentially, providing hope that with continued work these “aristocrats” will persist long into the future in a protected grassland empire.

## At a Glance

**Species:** Hungarian meadow vipers (*Vipera ursinii rakosiensis*)

**Region:** Hungary

**Then (2000):** Endangered—500 to 1,000 estimated to live in the wild in a shrinking habitat

**Challenge:** Wide disagreement among stakeholders on the severity of the problem.

**Turning Point:** CBSG helped stakeholders identify their assumptions and interpret the data, enabling them to reach clarity and agreement.

**Now (2016):** Over 2,000 Hungarian meadow vipers have hatched at the breeding center, and hundreds have been released into reconstructed grasslands nearby. Some reintroduced vipers are reproducing. Efforts to preserve and reconstruct habitat are ongoing.

# COLLABORATION

CBSG's core philosophy is based on collaboration. All available tools and perspectives are needed if we are to solve complex conservation problems.

Finding a common language—for effective communication and problem solving among a diverse group—is a significant challenge, but the result is a more effective effort and a plan that is more likely to be implemented.

## **Global Networking**

As a specialist group of the Species Survival Commission (SSC), CBSG's power derives from its network of more than 300 volunteer experts from around the world who represent disciplines from biology to zoology. Our synthesis of skills, along with openness to new ideas and approaches to conservation, serves to contribute new ideas to the overall conservation landscape.

## **All-Encompassing**

A key component of CBSG's philosophy and success is our dedication to inclusivity. When a wildlife authority asks CBSG for help, we bring together an array of stakeholders, including people who are concerned about and affected by the species' fate; have expertise in the species' biology, habitat, or the associated human environment; or have influence that could ensure or impede the implementation of a conservation plan.

# CBSG

# science facilitation collaboration

## **Integrating Efforts**

CBSG promotes a “One Plan” approach to species conservation: the development of management strategies and conservation actions by all responsible parties for all populations of a species, both inside and outside of their natural habitat. This integrated conservation approach mobilizes and unites the spectrum of skills and resources available to help endangered species.

## **Building Bridges**

Zoos and aquariums contribute to conservation in powerful ways, such as maintaining insurance populations, managing field projects, and conducting research, training, and education programs that directly benefit conservation efforts. CBSG creates an environment in which these critical players can connect and collaborate with the broader community of species conservation specialists, thereby enhancing global efforts supporting species conservation.



## Three Claps for Conservation

### Landowners Play a Critical Role in the Fight for Tree Kangaroos

Tree kangaroos descended from ground-dwelling marsupials, but they evolved to inhabit the treetops of the cloud forest in Papua New Guinea by growing long, saber-like claws to cling to branches. For indigenous people living in the rugged terrain of the Torricelli Mountains, tree kangaroos are an integral part of daily life, serving as a source of dietary protein and featuring prominently in local legends and customs. They have intimate knowledge of tree kangaroos: where they move among the treetops, what they eat, and how they behave.

When conservation agencies in Papua New Guinea and Australia wanted to better understand tree kangaroos—about which little was known in the scientific community—they recognized the importance of involving local people, especially landowners. Not only would the landowners' knowledge provide a clearer picture of the status of tree kangaroos, but they and their villages would be most affected by the resulting conservation effort.

“Much of the land in Papua New Guinea is privately owned, and wildlife is considered the property of landowners,” said Peter Clark, Director of Life Sciences for Zoos South Australia. “Any planning or decisions made regarding the future conservation of tree kangaroos needed the landowners’ input and agreement to have any meaning.”

CBSG’s reputation for balancing endangered species survival with the needs of local communities led the conservation agencies to ask CBSG facilitators to guide their conversations about the status and conservation of tree kangaroos.

### **“I Am Going to Look After Them”**

On the first day of the 1998 workshop in Papua New Guinea, participants presented current information about the status of tree kangaroos in the country. Well into the day, a landowner named Mambawe took the floor. He had traveled by helicopter from his village to contribute to the workshop, carrying with him a large black plastic bag full of fronds, leaves, and branches. He described the role of each plant in the diet of tree kangaroos in his region. The twelve other landowners then spoke up to offer their experiences, discuss similarities and differences in their knowledge of tree kangaroos, and answer questions from the other attendees. Translation between English and Tok Pisin, a common local language, ensured that everyone could share their perspectives with the whole group.

Respect for the landowners’ role in and contributions to the meeting was apparent to everyone, most importantly to the landowners themselves. After the exchange that Mambawe initiated, they became intensely engaged in the meeting. In that plastic bag, he had carried the catalyst for establishing trust among all the participants.

The workshop proceeded in typical CBSG fashion: assembling current knowledge about the species and plugging the resulting data into population models to visualize how different conservation activities might affect the population. The landowners created a list of issues that were most pressing for their communities, and during the following days the whole group worked together to address the concerns.



Goodfellow's tree kangaroos were one of the six tree kangaroo species discussed at the workshop.

By the last day of the meeting, the participants had defined their goals, assigned tasks, and begun drafting the report that would record their decisions and strategies and guide implementation. But the success or failure of the workshop and resulting plan would depend on one thing: the landowners' satisfaction with the outcome. After holding a long discussion, the landowners clapped three times together, signifying their approval.

"I thought this tree kangaroo was just another animal to be hunted," said Kausa Ilaio from the Wau region. "But when I learned more about tree kangaroos from this workshop, I got excited. I will return to my village a happy man because in my wildlife area there are a lot of tree kangaroos. I am going to look after them."

### **Saving Tenkile Tree Kangaroos**

The landowners' input revealed that one type of tree kangaroo, the tenkile, was very rare: they believed that there were fewer than 100 left. Using this information, CBSG's risk assessment models confirmed that continued hunting of female tenkile would edge the species closer to extinction—possibly within just a few years.

The group agreed that a small contingent of people from the workshop, including a local community member and a few zoo-based species experts, would travel to several villages, learn from the communities there about the tenkile's situation, and invite them to participate in the conservation effort for tree kangaroos.

Less than a year after the workshop, "Team Tenkile" visited several villages, where they gathered more information on tenkile and other tree kangaroos. Leaders from some of the villages helped organize a regional meeting to discuss the priority needs of the villages

and introduce the concept of a hunting moratorium on tenkile tree kangaroos in the area.

At the meeting, the village leaders offered their opinions on the need for alternate protein sources and discussed their support for a proposed conservation field station in the area. Representatives of all thirteen villages in attendance signed a hunting moratorium and enthusiastically joined the conservation initiative for tenkile in the region.

**“I thought this tree kangaroo was just another animal to be hunted,” said Kausa Ilaio from the Wau region. “But when I learned more about tree kangaroos from this workshop, I got excited. I will return to my village a happy man because in my wildlife area there are a lot of tree kangaroos. I am going to look after them.”**

A year later, Peter Clark helped draft a community-based conservation plan out of which the nonprofit Tenkile Conservation Alliance was formed. Thanks to the tireless work of its directors, Jim and Jean

Thomas, the Tenkile Conservation Alliance has become a remarkable conservation operation whose efforts have helped increase the wild population of tenkile from an estimated 100 in 1998 to over 300 today. In addition to species conservation, the Tenkile Conservation



One of the few photos of the elusive tenkile, whose population at the time of the workshop was believed to be less than 100.

Alliance carries out a number of community initiatives, including establishing alternate sources of protein and installing infrastructure for clean water and sanitation in participating villages. People within the local communities are integral to all operations.

“The TCA would not have started without the workshop,” said Clark. “CBSG makes a difference.”

## At a Glance

**Species:** Scott’s tree kangaroo/tenkile (*Dendrolagus scottae*)

**Region:** Sandaun and East Sepik Provinces, Papua New Guinea

**Then (1998):** Critically Endangered—only 100 believed to survive in the wild

**Challenge:** Local communities, essential to the success of any conservation program, hadn’t been fully involved in international planning efforts for tree kangaroos.

**Turning Point:** CBSG created the environment that allowed local landowners and conservation scientists to contribute their knowledge equally to the discussion and take joint ownership of the resulting conservation effort.

**Now (2016):** The tenkile population has rebounded to an estimated 300, and the local communities play a principal role in conserving the species.



# Beating the Odds

## Bright Ideas for the Survival of Golden Lion Tamarins

In the 1960s, the future didn't look bright for golden lion tamarins.

The first field surveys of the species revealed that they were in serious trouble: only an estimated 200 of these small, fiery-orange primates remained in the wild. The species is native to the Atlantic rainforest in Brazil, which had been steadily diminished by logging, agriculture, and urban expansion. The remaining tamarins lived in small groups scattered throughout fragmented patches of rainforest. With continued destruction of suitable habitat, the odds seemed to favor golden lion tamarins going extinct before long.

But a worldwide community of primate conservationists refused to let the species disappear. They started a broad, international effort to save golden lion tamarins. The Brazilian government oversaw conservation activities, which were supported by conservation nonprofit groups and zoos with established populations of the species in their collections.

Since these efforts were occurring separately—from the Atlantic rainforest to zoos around the world—the stakeholder groups needed to coordinate their work in order for them to be efficient and effective. The Brazilian government invited CBSG to guide the groups in determining exactly what it would take to not only save golden lion tamarins from extinction but allow them to thrive again in their rainforest home.

### **Creating a Framework**

At the workshop in 1990, CBSG created population simulation models to generate an overall picture of what conditions the species needed to survive in the wild. This helped the group articulate a specific vision that all their individual efforts would strive to achieve. Together they determined that to survive, the wild population needed to grow to at least 2,000 and have access to 25,000 hectares of connected and protected forest by 2025.

Using this goal as a starting point, they identified the activities needed to achieve it, such as restoring and protecting habitat and moving tamarins from one area of forest to another for the genetic health of the whole population. The models clarified the objectives of the overall breeding program as well, so participants were able to identify what steps zoos and breeding centers should take next.

The workshop also established clear relationships among the various organizing entities and a type of governing structure that would help them function together as they implemented the plan.

At two subsequent CBSG-led workshops, in 1997 and 2005, the participating conservation groups and institutions updated their strategy in response to progress, new research, and lessons learned.

“The three workshops created the goal-oriented framework that was necessary to make progress for the golden lion tamarin,” said Bengt Holst, Director of Conservation at the Copenhagen Zoo. “The work on the ground has been carried out by local conservationists and international experts, but the workshops created the framework and showed what way to go. That part was just as important as the work on the ground.”



Addressing deforestation and habitat fragmentation is a critical part of the plan to save golden lion tamarins.



The wild population of golden lion tamarins has grown from just 200 to more than 3,000.

### **A Force for Conservation**

Thanks to reintroductions, efforts to preserve habitat, and moving tamarins out of doomed rainforest fragments, the wild population gradually increased. In 2003, their status was officially changed from Critically Endangered to Endangered, demonstrating that the species' risk of extinction was lowered as a direct result of conservation activities.

Now, just over 25 years after the first workshop, the project's most important goal has been partially realized: more than 3,000 golden lion tamarins swing through the treetops in Brazil's Atlantic rainforest. Efforts to protect the species' habitat are just as intense as ever.

"This conservation success demonstrates how a goal-oriented approach can have a huge effect and really make a difference," said

Holst. “It shows the great value of the CBSG workshop process as a force for conservation.”

The golden lion tamarin conservation effort is held up around the world as a clear example of a conservation success story. Setting aside a few days—even in the midst of urgent conservation activities—to define a goal and develop a responsive plan really can make the difference in helping an endangered species beat the odds.

## At a Glance

**Species:** Golden lion tamarin (*Leontopithecus rosalia*)

**Region:** Atlantic rainforest, Brazil

**Then (1990):** Critically Endangered—about 450 left in the wild, scattered among forest fragments

**Challenge:** Several multinational conservation efforts were operating without defining a clear, unifying goal.

**Turning Point:** CBSG’s population models channeled workshop participants’ discussions toward a unified vision for golden lion tamarin conservation, which provided them with a specific goal and concrete routes for reaching it.

**Now (2016):** About 3,000 golden lion tamarins now live in the wild, and the effort to preserve and connect more of their habitat is ongoing.



# Balancing Act

## Managing Native Plants and Grazing Horses on Assateague Island

It is a bit of a mystery how free-roaming horses came to live on Assateague Island, since they don't naturally belong there.

Local legend says that the horses survived a harrowing shipwreck in the Atlantic Ocean centuries ago and swam to safety on Assateague. The more likely story is that in the 1600s European settlers trying to avoid livestock taxes brought them to the island, which stretches along the coastlines of Virginia and Maryland in the United States.

No matter how the horses ended up there, they've become an essential part of the island's character, drawing thousands of visitors each year who come to see them wandering free in their coastal habitat. There are festivals and events to celebrate the horses and opportunities to view them and experience their beauty firsthand.

But the horses are an introduced species to the barrier island ecosystem, which is also home to many threatened species and rare plant communities. Over time, the herd grew exponentially and began to negatively affect the island's unique ecology.

## Complicated Goals

Barrier islands are typically long, narrow spits of land that play an important role in protecting coastlines from the worst wind and weather coming off the ocean. Assateague's rich salt marsh ecosystem provides habitat for diverse wildlife, and on the dune side facing the open sea, native plants help hold the sand in place, resisting erosion.

The grazing of the horse herd was reducing the abundance of species such as American beach grass and sea oats; without sufficient grasses to stabilize the dunes, the island would be at risk of being washed away by the waves. Also, the feeding and movement patterns of the horses were altering plant and animal communities, particularly in the salt marshes, allowing invasive plants to take hold and disrupting natural ecological processes and the nesting of many bird species.

The National Park Service, which manages Assateague Island National Seashore where the horses live, was faced with a challenge. In 1994, it had begun using noninvasive contraception on mares to slow the growth of the herd, but it wanted to define a target population size and determine the most effective way to get there. The goal was to manage the expanding population of horses to minimize negative effects on the island, and to do so in a way that would respect the public's love for the horses—which meant not removing them from the island—and keep the herd robust and genetically diverse.

To help resolve the inherent conflicts between protecting both the feral horse population and the ecological integrity of Assateague Island, the National Park Service commissioned CBSG to lead them, along with several other stakeholder groups, through evaluating different management strategies for reaching their specific—and complicated—goals.

In early 2006, a group of stakeholders worked with CBSG to produce a horse population model that reflected the current situation on the island. Later in the year, the group gathered again to use this model to examine how the horse population and the island's plant life would be affected by different management activities, such as modifying contraception rates.

After much discussion about potential options and competing goals for managing the island, the group agreed on a population target of 80 to 100 horses as the sweet spot. Any larger and the island's plant communities would continue to decline; any smaller and the



Sea oats have recovered in areas where they had been reduced due to grazing pressure.

herd's genetic health would suffer. This target could be adjusted as the effects of changing the population size were monitored.

**“The CBSG workshop process worked remarkably well. . . . It really was the cornerstone of a very successful plan.”**

### **Balancing Act**

The workshop results contributed a scientific foundation to a larger decision-making process organized by the Park Service to assess management options for the island. The chosen strategy reflected the workshop discussions and population model results, but also incorporated public comments and further interpretation of the best way to balance maintaining a healthy horse herd and restoring plant communities on the island.

“There’s no doubt that we will be referring to the workshop report for years,” said Carl Zimmerman, former National Park Service superintendent of Assateague Island. “It provided a great base for developing an environmental assessment of management strategies.”

Wildlife managers implemented the new plan to strategically decrease reproduction rates and over time successfully reduced the number of horses on the shores of Assateague. By 2015, the horse population was sitting around 93—right on target.

The positive effects on the island’s ecosystem are apparent: American beach grass has rebounded, and sea oats now flower in places

where they used to suffer under heavy grazing pressure. Other plants, like smooth cordgrass, have grown denser again in the absence of intensive grazing. As predicted, this horse population size has proven to be the right range for balancing multiple objectives in order to maintain the overall health of Assateague Island.

“The CBSG workshop process worked remarkably well and successfully navigated some very difficult issues,” said Zimmerman. “It really was the cornerstone of a very successful plan.”

## At a Glance

**Species:** Assateague horses (*Equus caballus*) and native plant species such as American beach grass (*Ammophila breviligulata*) and sea oats (*Uniola paniculata*)

**Region:** Maryland, United States

**Then (2006):** The ecological health of Assateague Island was compromised by overgrazing of introduced horses that are beloved by locals and visitors alike.

**Challenge:** There was no clear, long-term path for balancing two seemingly opposing objectives.

**Turning Point:** CBSG’s models of different future scenarios helped wildlife managers delineate the sweet spot for the horse population.

**Now (2016):** The herd has reached the predicted ideal population size, and native plant life has rebounded.



Activities emerging from recent workshops and ongoing projects for species like whooping cranes, greater bilbies, Vancouver Island marmots, and eastern hellbenders have already provided important conservation benefits.

# Rewriting the Stories of Species Survival

These stories of hope and second chances for endangered wildlife are just a few of the many we could tell.

CBSG's global network of experts is prepared to respond to the complex conservation challenges facing our planet. At the invitation of governments, nongovernment conservation agencies, or coalitions of interested stakeholders, we will help to identify the need, bring together the right people and the right science, and reach consensus around sustainable solutions for species in peril.

To ensure continued success takes vision, commitment, action, and resources. It takes the wildlife managers who recognize a need and take the initiative to do something about it. It takes the planning practitioners who bring expertise in risk assessment and consensus building, to ensure that achievable solutions are created and embraced. It takes the wildlife champions who drive the plans forward, bringing them to life on the ground. And it takes engaged

donors who recognize how, where, and when to deploy their financial support, to maximize its impact.

CBSG's culture of collaboration and our commitment to innovation enable us to play a critical role in rewriting the stories of species survival, now and in the future.

That's good news—and it means that more stories like these are within reach. Because when we work together for endangered species, hope becomes second nature.

# Acknowledgments

This book, the successes in it, and the many similarly hopeful stories in the CBSG archive exist thanks to the commitment of CBSG's global membership and our dedicated regional network teams. None of this work would have been possible without the loyal and generous support of the individuals and institutions that financially support CBSG's work through the Global Conservation Network.

Special thanks go to Bengt Holst and the Copenhagen Zoo for funding the book's editing and design, and to Susan Kripke Byers for providing writing, editing, and style suggestions throughout the course of this project.

We are extremely grateful to the contributors listed below who helped us immensely with story content. Many other people contributed, too, and in many different ways. To each of you: thank you.

Also included below are links to the reports from each workshop highlighted in this book. These reports contain the detailed conservation actions recommended, the partners involved, and the sponsors who financially supported the workshop. Additional links provide up-to-date details about each ongoing conservation effort.

## **1. Wattled Cranes (Moving Parts)**

Contributor: Kerryn Morrison (International Crane Foundation /  
Endangered Wildlife Trust)

Workshop report, sponsors, and partners: <http://www.cbsg.org/content/wattled-crane-phva-2000>; <http://www.cbsg.org/content/wattled-crane-phva-review-2009>  
More information: <https://www.ewt.org.za/accp/accp.html>

## **2. Kihansi Spray Toads (Into the Mist)**

Contributors: Jennifer Pramuk (Woodland Park Zoo), Alyssa Borek (Woodland Park Zoo)

Workshop report, sponsors, and partners: <http://www.cbsg.org/content/kihansi-spray-toad-phva-2007>  
More information: <http://www.wildtoledo.org/kihansi-spray-toads-2/>

## **3. Governor Laffan's Ferns (Planting a Seed)**

Contributors: Marge From (Omaha's Henry Doorly Zoo), Douglas Armstrong (Omaha's Henry Doorly Zoo)

Workshop report, sponsors, and partners: <http://www.cbsg.org/content/western-prairie-fringed-orchid-phva-1997>  
More information: <http://www.omahazoo.com/conservation/rare-plant-research/>

## **4. Okinawa Rails (Resisting Intruders)**

Contributor: Kumiko Yoneda (Japan Wildlife Research Center)  
Workshop report, sponsors, and partners: <http://www.cbsg.org/content/okinawa-rail-phva-2006>

More information: <http://www.ufugi-yambaru.com/shiryou/documents/2014zuttoyambaruEG.pdf>

### **5. American Burying Beetles (Burying the Hatchet)**

Contributors: Bob Merz (Saint Louis Zoo), Lou Perrotti (Roger Williams Park Zoo)

Workshop report, sponsors, and partners: <http://www.cbsg.org/content/american-burying-beetle-phva-2005>

More information: <https://www.stlzoo.org/conservation/wildcare-institute/americanburyingbeetleconse/>

### **6. Tasmanian Devils (Devil's Advocates)**

Contributors: Caroline Lees (CBSG), Rebecca Spindler (Taronga Conservation Society Australia), David Pemberton (Save the Tasmanian Devil Program), Paul Andrew (Taronga Conservation Society Australia)

Workshop report, sponsors, and partners: <http://www.cbsg.org/content/tasmanian-devil-phva-2008>

More information: <http://www.tassiedevil.com.au/tasdevil.nsf>

### **7. Hungarian Meadow Vipers (Aristocrats on the Steppe)**

Contributors: Miklós Persányi (Budapest Zoo), Endre Sós (Budapest Zoo)

Workshop report, sponsors, and partners: <http://www.cbsg.org/content/hungarian-meadow-viper-phva-2001>

More information: <http://www.rakosivipera.hu/en/>

### **8. Tree Kangaroos (Three Claps for Conservation)**

Contributors: Chris Banks (Zoos Victoria), Peter Clark (Zoos South Australia), Jim and Jean Thomas (Tenkile Conservation Alliance)

Workshop report, sponsors, and partners: <http://www.cbsg.org/content/tree-kangaroo-phva-and-camp-1998>

More information: <http://www.tenkile.com/>

### **9. Golden Lion Tamarins (Beating the Odds)**

Contributor: Bengt Holst (Copenhagen Zoo), Kristin Leus (Copenhagen Zoo)

Workshop reports, sponsors, and partners: <http://www.cbsg.org/content/lion-tamarin-phva-i-1990>; <http://www.cbsg.org/content/lion-tamarin-phva-ii-1997>; <http://www.cbsg.org/content/lion-tamarin-phva-iii-2005>

More information: <http://savetheliontamarin.org/>

### **10. Assateague Horses and Native Plants (Balancing Act)**

Contributors: Mark Sturm (National Park Service), Allison Turner (National Park Service); Carl Zimmerman (National Park Service, retired)

Workshop report, sponsors, and partners: <http://www.cbsg.org/content/horses-assateague-island-phva-2006>

More information: <https://www.nps.gov/asis/upload/feralhorsemanag.pdf>

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Black-footed ferrets were nearly extinct in the 1960s. Starting in the 1980s, CBSG conducted multiple planning workshops for them. Today around 300 live in the wild, the result of a massive reintroduction effort and the work of many conservation partners.



The iconic and much beloved giant panda is recovering in the wild and thriving in zoos, thanks in part to CBSG's scientific contributions to their conservation for over 20 years. Because of these collaborative efforts, giant pandas are no longer classified as Endangered.



CBSG's workshop for western pond turtles helped recovery groups evaluate threats and prioritize next steps. This contributed to the success of the conservation effort in Washington (US), where the turtle population has grown from 150 in 1990 to around 1,500 today.

# When we work together for endangered species, hope becomes second nature.

**W**ith so many challenges facing nature today, it can be hard for conservationists not to become discouraged. But there is good news. There are successes. And calling attention to them celebrates the many scientific and collaborative efforts that make them happen, bolstering the resolve of specialists and concerned citizens alike.

*Second Nature* tells ten of these success stories—about what’s possible when dedicated people who have a common purpose collaborate to save a threatened species. Mammals from the coastal scrublands of Tasmania, amphibians from a unique gorge in Tanzania, birds from the forests of Japan, and plants from the rocky caves of Bermuda represent many more conservation successes around the world.

Behind these stories is CBSG, a small but effective catalyst for changing the futures of endangered species. After more than 35 years of conservation planning in partnership with conservation organizations, governments, zoos, and NGOs, CBSG has a long list of success stories to tell—and many more to generate.

Visit us at [www.cbsg.org](http://www.cbsg.org).

“The workshop helped us realize that we were partners already.”



The Conservation Breeding Specialist Group’s mission is to save threatened species by increasing the effectiveness of conservation efforts worldwide.