



2018 ANNUAL REPORT



CONSERVATION CENTERS
FOR SPECIES SURVIVAL

LETTER FROM THE CEO

Photo Credit: The Wilds

Dear Colleagues,

In the face of devastating worldwide declines of wildlife, the Conservation Centers for Species Survival are taking unprecedented, collective action to save animals from extinction. By putting 'Wildlife First' and forging new partnerships with public and private stakeholders in the US and abroad, we are able to achieve the vast scale needed to build assurance populations of endangered wildlife.

The results are in---it's working. The 144% growth of the original four Source Population Alliance meta-populations has proved our concept in a period of just five years. The resulting network of conservation-minded landowners has been leveraged not only to ensure assurance populations of the Alliance's original four focal species, but also for an additional six species and provided new space for southern black rhinos.



Photo Credit: Lauren Zarama

Our approach is also yielding phenomenal results for the Cheetah Sustainability Program, growing the North American managed population by 22% over the last five years. In 2017 and 2018, the Cheetah Sustainability Program funded surveys by Action for Cheetahs Kenya and Oxford University to study trends and distribution of cheetahs in their shrinking range. Concurrently, genomics research led by Smithsonian Conservation Biology Institute and funded by the Cheetah Sustainability Program is linking wild populations to those in human care in unprecedented ways.

The growth of assurance populations outside species' native range serves its ultimate purpose when enabling reintroductions back into the wild and thereby supporting balanced ecosystems. This year, C2S2 participated in the reintroduction of scimitar-horned oryx to Chad through our partnership with the Sahara Conservation Fund. Through these releases, the once extinct species now has a healthy and genetically diverse wild population, and the Source Population Alliance herds have been a key resource in achieving this outcome.

These reintroductions are proof that seemingly impossible goals today can become a reality tomorrow through strategic action and collaboration. By focusing on our common goals, people and organizations of all different affiliations and philosophies can work together to take unified action guided by conservation science. Together we are a powerful force for species survival.

Onwards and Upwards,

A handwritten signature in black ink, appearing to read 'Katy Palfrey'.

Katy Palfrey
Chief Executive Officer

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C2S2 MEMBERS

Photo Credit: Budhan Pukazhenth

FULL MEMBER CONSERVATION CENTERS

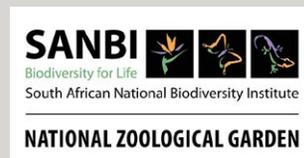
- African Lion Safari
- Austin Savanna
- Fossil Rim Wildlife Center
- North Carolina Zoo
- Omaha's Henry Doorly Zoo
- Smithsonian Conservation Biology Institute
- The Wilds
- White Oak Conservation

African Lion Safari
Canada's Original Safari Adventure™



AFFILIATE MEMBERS

- Disney's Animal Kingdom
- Endangered Wolf Center
- Fort Worth Zoo
- Monarto Zoo
- Nashville Zoo
- National Research Foundation/National Zoological Gardens of South Africa
- Oklahoma City Zoo
- Taronga Conservation Society Australia
- Zoo Tampa at Lowry Park



Thank you for your ongoing commitment to conservation.



FULL MEMBER CONSERVATION CENTERS

NORTH CAROLINA ZOO | Asheboro, NC | NCZoo.org



Nestled in Asheboro, North Carolina Zoo's goal is to encourage an understanding of and commitment to the conservation of the world's wild animal and plant species, the need for healthy natural habitats and recognition of the interdependence of people, their natural environment and its component resources.

AFFILIATE MEMBERS



FORT WORTH ZOO | Fort Worth, TX | FortWorthZoo.org

The mission of the Fort Worth Zoo is to strengthen the bond between humans and the environment by promoting responsible stewardship of wildlife and ensuring diverse, high-quality educational and entertaining family experiences through effective and efficient management of its resources.



OKLAHOMA CITY ZOO | Oklahoma City, OK | OKCZoo.org

Oklahoma City Zoo's mission is to connect people and our world's vanishing wildlife and wild places. OKC Zoo cares for 54 endangered species throughout over 100 landscaped areas on 119 acres in Oklahoma City, Oklahoma.

To learn more about C2S2 membership, visit
www.CONSERVATIONCENTERS.org

Welcome to C2S2!



CHEETAH SUSTAINABILITY PROGRAM

Photo Credit: Fossil Rim Wildlife Center



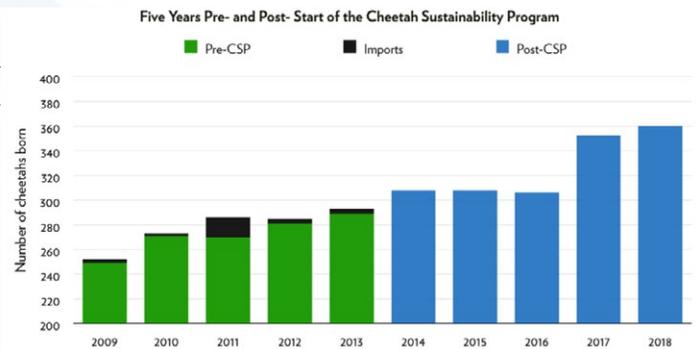
CHEETAH SUSTAINABILITY PROGRAM

Cheetah populations in the wild plummeted to a new low this past year. Today, there are only 7,000 cheetahs left, down from the 25,000 that roamed free less than 20 years ago¹. The assurance population now makes up an increasingly critical ~20% of cheetahs worldwide. Given widespread habitat loss and population fragmentation, breeding cheetahs outside of their natural range may be our last chance to prevent extinction.

The Cheetah Sustainability Program (CSP) is acting now to secure and grow a long-term, globally connected population of cheetahs to ensure the species' survival. The CSP was launched in 2013 by C2S2 in collaboration with the Cheetah SSP in support of the North American cheetah assurance populations. In partnership with cheetah breeding centers, conservation partner zoos, and field biologist grantees, the CSP is working to reverse the global population declines. The CSP partners have accelerated and improved North American conservation breeding efforts, generated over \$120,000 for peer-reviewed grants for priority conservation and applied research for the species, and has offset a small percentage (on average <5%) of added costs for the care of cheetahs at the Breeding Centers Coalition (BCC) facilities.

The CSP is systematically tackling the biggest challenges to cheetah breeding, by growing populations and space for cheetahs, optimizing their reproduction, genetic diversity and health, and returning animals to the wild when possible. Grow-Optimize-Return is our path forward. As with all C2S2 programs, we are taking a One Plan Approach with all stakeholders working together for the survival of the global population.

GROWING POPULATIONS & SPACE



Costs associated with raising the cubs and caring for the cheetahs are \$5,027 in variable costs on average per facility and \$477,565 in total added costs across all breeding centers attributed to the program. Cost recovery funds provided by the program in 2018 totaled \$17,930 across all centers. We are in conversations with several facilities about to come online with new cheetah facilities.

BREEDING CENTERS COALITION:



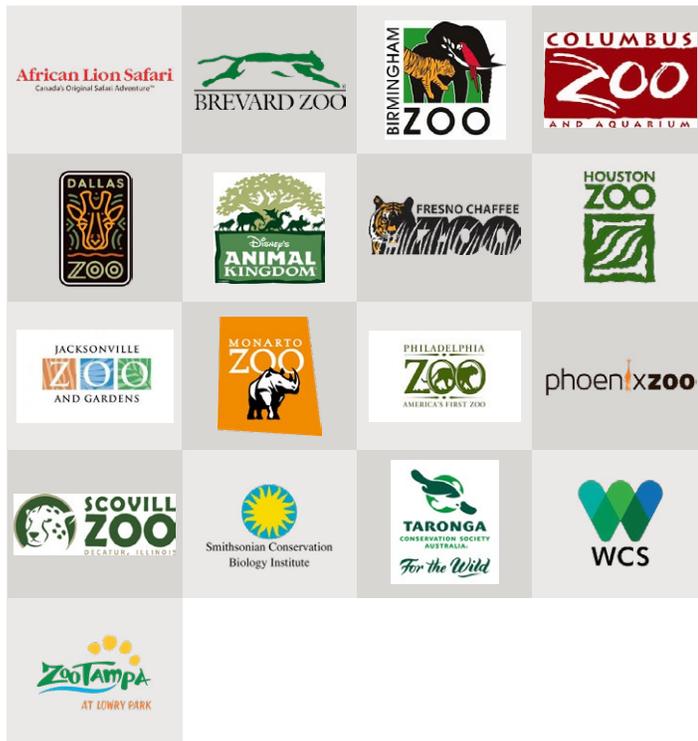
<h3>40</h3> <p>NUMBER OF BIRTHS IN 10 DIFFERENT LITTERS</p>	<h3>22%</h3> <p>GROWTH IN BREEDING POPULATION</p>	<h3>185</h3> <p>CHEETAHS THRIVING AT THE BREEDING CENTERS IN 2018</p>
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¹ Panthera, 2016

OPTIMIZING CHEETAH REPRODUCTION & HEALTH

The cheetahs bred in human care at one of the Breeding Centers thrive under naturalistic settings, with mate choice, and benefit from regular sharing of knowledge and expertise through the Coalition, resulting in record high birth rates and low mortality rates in the population. A veterinary workshop held in October 2018 at White Oak Conservation in Yulee, FL strengthened this expertise and will, ultimately, enhance the health of the population.

PROGRAM CONTRIBUTORS



Cheetah Transfers

The CSP progressed this year on initial transfers to Canada increasing connectivity and genetic diversity, and Australia to follow. Fossil Rim Wildlife Center and Memphis Zoo collaborated to transfer 3 cheetahs (0.1 from FR and 2.0 from Memphis) to African Lion Safari (ALS). The cheetahs flew to ALS via an international FedEx flight, with Memphis Zoo staff accompanying the cats throughout their travels. We're now working with Taronga Western Plains Zoo and Monarto Zoo to increase population connectivity through exports of cheetahs with different and valuable genetics to Australia to ultimately diversify the global One Plan population. In related research, SCBI and African Lion Safari (ALS) collaborated on genomic research quantifying paternity in cheetah cubs born at Parc Safari.

CSP Merchandise

C2S2 has produced the first line of CSP merchandise that will provide funding to operational and programmatic needs. The merchandise rolled out in 2018 includes the CSP T-Shirt, screen printed locally in Austin, Texas (minutes away from our downtown office) on sustainable organic bamboo blend fabric.



OTHER PROGRAMMATIC UPDATES

Go Pros

The Breeding Centers have been utilizing GoPro cameras and mounts provided by C2S2 to facilitate knowledge of sharing and training on procedures, behavioral and health issues, and to capture footage of cubs for communications materials.

³ Based on the number of additional cheetahs beyond the estimated number that BCC institutions would have if not breeding for other facilities (baseline estimated at 10 cats per facility for a total of 90 cats). The cost to care for these additional cheetahs (\$5027 per cheetah in variable costs) are used to calculate the added incremental costs for breeding centers of participating in the program.

To purchase your very own CSP or C2S2 merchandise, visit

www.CONSERVATIONCENTERS.org

CSP CONSERVATION AND RESEARCH GRANTS

Conservation Partners have funded \$123,272 in critical field work and priority research. Through a peer-reviewed process, we granted \$18,060 in funding in 2018 for the second and final years of the following three projects:

- Wide-range cheetah surveys using dogs to detect cheetah scat with Action for Cheetahs in Kenya
- Cheetah population trends and distribution with Oxford University
- Genetic variability, kinship and uniqueness in the North American and free-ranging Namibian cheetah populations with Smithsonian Conservation Biology Institute (SCBI)

Mary Wykstra, MEM *Action for Cheetahs in Kenya.* 'Fecal Genetics and Prey Selection on a Rangewide Scale.' Total funding: \$10,000.

The objective of this project is to conduct wide-range cheetah surveys using dogs to detect cheetah scat in order to further knowledge of cheetah genetics and indicators of large scale cheetah population sustainability. Scat samples were collected across 5 regions within 20 kilometers and Mara samples were collected by Mara Meru Cheetah project.

The regions chosen to be sampled highlight critical cheetah populations in affiliation with the Kenya Wildlife Services (KWS), Cheetah Conservation Fund (CCF) and the University of Nairobi (UoN). Satellites were used to identify target regions for the survey. The project objectives includes habitat evaluation (based on Kuloba's niche models), and conducting formal field work. After fecal matter had been collected, the samples were analyzed providing several completed genotypes from various regions.

Amy Dickman, PhD *Oxford University.* 'Researching Cheetah Population Trends and the Threat of Bushmeat Snaring in Tanzania's Ruaha Landscape.' Total funding: \$19,000.

Multiple reports from Ruaha National Park staff and other stakeholders suggest that Ruaha's cheetah population is rapidly declining. Between 2011 and 2013, cheetah sightings were slowly increasing from

210 to 290 but by 2014 sightings had dropped to only 147 cheetahs spotted that year. In 2015, there were less than 40 cheetahs spotted. Given the international significance of this population, this project was established to urgently investigate these trends and determine what necessary action may be required.

Adrienne Crosier, PhD *Smithsonian Conservation Biology Institute.* 'Determining Genetic Variability, Kinship, and Uniqueness in the North American Cheetah Population.' Total funding: \$8,660.

The objective of this project is to understand cheetah physiology and improve management of the species through investigation of early pregnancy and using genomics to better understand population relatedness. Using a recently annotated genome, researchers are completing the first step of analysis on over 220 cheetahs from the North American population to more closely determine why a female induced to ovulate by the male who has an increase in progesterones does not produce cubs. Currently, it is unknown if the female never establishes pregnancy or experiences fetal loss.

A series of microsatellite markers from highly variable regions of the cheetah genome were developed from a comparative population analysis on kinship and relatedness. Preliminary analysis has revealed that the current North American population differentiates into two distinct groups: those that align with the Namibian population and those that are of South African origin. The genetic results will help us better understand the overall relatedness of cheetah populations, improve our breeding matches, and incorporate cheetahs of unknown lineage in to our breeding matrix.



Photo Credit: Action for Cheetahs in Kenya

SOURCE POPULATION ALLIANCE

Photo Credit: Gavin Livingston



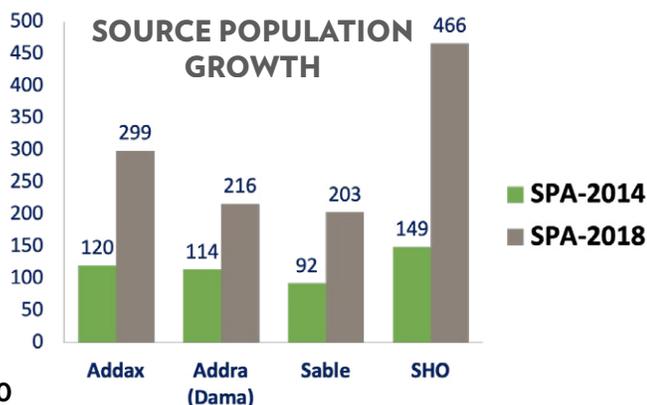
SOURCE POPULATION ALLIANCE

2018 was an incredibly successful year for the Source Population Alliance (SPA). The past year saw an expansion of the program's metapopulation, participants, and *in situ* conservation support.

SPA welcomed 6 new participants this year including Cypress Creek Ranch, Monarto Zoo, The Living Desert Zoo, Tanganyika Wildlife Park, Wildlife Conservation Center (Holm), and Fort Worth Zoo. At the start of 2018, the program was able to collect a census from 100% of the SPA participants.

A significant effort was put into industry and public outreach to spread the word about the importance of SPA's unique conservation model. The SPA Program Manager gave 20+ presentations to industry groups, facilities, and other interested parties.

In October, SPA held its most successful Fall Gathering event at Natural Bridge Wildlife Ranch. The Fall Gathering boasted a 20% increase in attendees and included several new educational presentations, with topics including ungulate nutrition and holding pen design.



PARTICIPATING FACILITIES:

4-F Exotics
 8 Bar 8 Ranch
 African Lion Safari
 Austin Savanna
 Bamberger Ranch
 Bear Creek Exotics
 Camp Creek Wildlife
 Cross Bar C Ranch
 Cypress Creek Ranch
 Fort Worth Zoo
 Fossil Rim Wildlife Center
 Game Creek Ranch
 Griffin Point Ranch
 Hatada Ranch
 Hemker Park Zoo
 Lion Country Safari
 Micanopy Zoological Preserve
 Monarto Zoo
 Natural Bridge Wildlife Ranch
 Red Wire Wildlife Ranch
 Rough Hollow Preserve
 Safari Enterprises
 Smithsonian Conservation Biology Institute
 Six Flags Great Adventure Safari
 Stewards of Wildlife
 Tanganyika Wildlife Park
 Ten Triple X Ranch
 The Living Desert Zoo & Gardens
 The Wilds
 Triple C Ranch
 White Oak Conservation
 Wildlife Conservation Center

46.4%
METAPOPULATION
INCREASE IN
2019

32
PARTICIPANTS

\$9,500
IN-SITU SUPPORT
(DONATIONS &
IN-KIND)

PARTICIPATION IN CHAD ORYX RELEASES



Photo Credit: John Newby, Sahara Conservation Fund

One of SPA's biggest undertakings in 2018 was stepping up its involvement in field conservation.

The Source Population Alliance (SPA) has been involved with the scimitar-horned oryx reintroduction project through our program participants since before SPA was formalized as a conservation program. Fossil Rim Wildlife Center and the Smithsonian Conservation Biology Institute have contributed to this project in a variety of ways including providing expertise, studies on the effect of the GPS tracking collars on the oryx, and on-the-ground support in Chad.

SPA Executive Committee member, Larry Johnson of Safari Enterprises, was responsible for assembling the group of 42 scimitar-horned oryx that were sent to Abu Dhabi in 2015 to provide new genetics to the 'World Herd'. The 'World Herd' is the group of animals in Abu Dhabi that serve as a source for the reintroduction project in Chad.

Last year, in 2017, Source Population Alliance and Sahara Conservation Fund created a formal relationship through the signing of a Memorandum of Understanding (MoU). Both organizations are working to combine our collective strengths to maximize our conservation impact for Sahelo-Saharan species.

In July of 2018, the SPA Manager, along with representatives from, amongst others, Fossil Rim Wildlife Center, the Smithsonian Conservation Biology Institute, White Oak Conservation, and Living Desert Zoo and Gardens traveled to Chad to assist the Environment Agency Abu Dhabi (EAD) and Sahara Conservation Fund (SCF) in collaring over 70 scimitar-horned oryx for release into the wild. The mission to fit GPS tracking collars on the next group of oryx slated for release back into their native range proved successful.

Prior to this project's beginning in 2016, the scimitar-horned oryx had been extinct in the wild for three decades. Now, with the support of the EAD, the hard work of SCF, and the dedication of breeding centers around the world, the oryx once again roams the deserts of Chad.

SPA is proud to have been able to take part in this effort and to support SCF through both donations and in-kind support.



Photo Credit: Gavin Livingston



SOUTHERN BLACK RHINO

Photo Credit: Karen Meeks, White Oak Conservation

2018 was the first full year of the C2S2 and IRF partnership to jointly administer the globally managed Southern Black Rhino Sustainability Program (SBRSP).

To kick off the new partnership and establish direction for the program, a SBRSP re-launch meeting was held March 5-6th, 2018 at Fossil Rim Wildlife Center in Glen Rose, TX. The meeting was attended by 27 representatives from 17 institutions who came together to ensure the future sustainability of the *ex situ* southern black rhino population. Through the work of this meeting it was concluded that only through recruiting new holders with an emphasis on private landowners with large properties would this species be able to thrive.

As a result of this meeting, C2S2 identified several potential ranch facilities that are interested in working with black rhinos. Going forward, our aim is to continue to foster these relationships and grow the number of facilities working with southern black rhinos.

Also, a research priority has been identified to collect blood samples from all animals in the SBRSP population in order to conduct mitochondrial sequencing and whole genome sequencing analysis for baseline assessment of the population. This research will be done at the Smithsonian Conservation Biology Institute (SCBI) and was made possible, in part, by a grant from the International Rhino Foundation.

A SBRSP Executive Committee and advisors have been assembled that represent stakeholders and researchers. This group will work with the program manager to steer the direction of the SBRSP going forward.

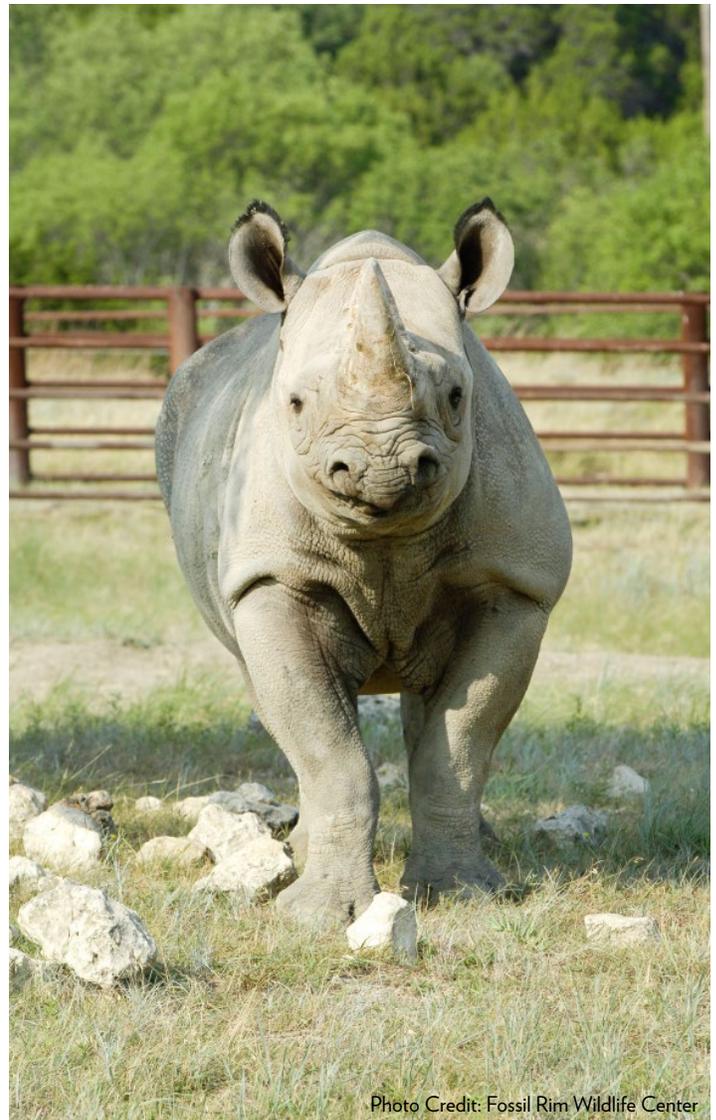


Photo Credit: Fossil Rim Wildlife Center

NATIVE BIODIVERSITY INITIATIVES

C2S2 helps to facilitate and grow new and existing native species conservation breeding, reintroduction efforts, and regional biodiversity initiatives led by the Conservation Centers & Affiliate Members. Private landowner engagement also distinguishes these initiatives. Initial efforts for the native species initiatives are: (1) the North America Songbirds Initiative (NASI) which includes Shrike Force, (2) the Red Wolf Program, and (3) Natural Resource Management.

SONGBIRDS

SAVING SONGBIRDS WORKSHOP

The second annual C2S2 Saving Songbirds Workshop at Columbus Zoo was attended by 25 participants from 11 institutions, bringing together the species' champions along with experts from *in situ* and *ex situ* songbirds conservation to co-create the long-term vision for the initiative and come to a consensus on key objections, activities, and short-term goals. The workshop built on the success of last year's workshop at Smithsonian Conservation Biology Institute, where C2S2 launched its North American Songbirds Initiative. The Initiative is taking a One Plan Approach, linking *ex situ* breeding/management populations to *in situ* populations to improve the sustainability of the species wherever they exist.

At this workshop, a vision and mission statement were created.

Vision statement: A world where songbirds thrive.

Mission statement: Assuring sustainable songbird populations through a collaboration of private and public entities taking strategic and coordinated in situ and ex situ actions.

PORTFOLIO SPECIES



Baltimore Oriole



Bobolink



Common Yellowthroat



Eastern Meadowlark



Grasshopper Sparrow



Loggerhead Shrike



Wood Thrush

The workshop used the process outlined in the *IUCN Species Survival Commission Guidelines on the Use of Ex situ Management for Species Conservation*. Key components of this process are to:

- "Define the role(s) that *ex situ* management will play in the overall conservation of a focal species.
- Develop a clear statement on quantifiable benefits and how the proposed *ex situ* aspect for specific species will contribute benefits to the conservation of the species and/or address specific threats or constraints.
- Determine the characteristics of the *ex situ* population needed to fulfill the roles.
- Define the resources and expertise needed for the *ex situ* management program to meet its role, and appraise feasibility and risks over a 25 year time frame."

The workshop concluded with a visit to The Wilds.

Participating Institutions: Akron Zoo, American Bird Conservancy, Brookfield Zoo/Chicago Zoological Society, Columbus Zoo and Aquarium, C2S2, Nashville Zoo, North Carolina Zoo, St. Louis Zoo, Smithsonian National Zoological Park, Wildlife Preservation Canada, The Wilds, U.S Fish & Wildlife Service

SHRIKE FORCE

Shrike Work in Texas



Many Zoos across North America and Source Population Alliance members throughout Texas, participated in the Shrike Force by conducting surveys for shrike, and, monitoring the seasonal use and reproductive success of banded birds. This

will provide us data for comparison among shrike populations, including those that are stable as well as those which are experiencing population declines. In Texas, the data will also be used for comparison of life history traits for shrike using non-native “urban” habitats versus traditional habitat, including pastures and other grasslands to determine if urban populations are self-sustaining (i.e., if they are population “sources” or “sinks”).

A Shrike Force logo was created in 2018 which will be used in the production of volunteer appreciation gifts for Citizen Scientists and items for sale to those interested in financially supporting the project in this way (e.g., tshirts, patches, hats, pins and travel mugs).

SHRIKE WORKING GROUP

The Loggerhead Shrike Working Group finalized data collection requirements for surveys and monitoring, which will be developed for use by Citizen Scientists in the ArcGIS Survey123 and Collector Apps. Data will be used to conduct Full Annual Life Cycle Models, the results of which will help to identify the life stage(s) where the species is most vulnerable, and help to develop a local and regional management actions to stabilize and recover populations.

Species Distribution Mapping was developed collaboratively by Dr. Stephen Spear from The Wilds, and Dr. Amy Chabot from African Lion Safari. Informed by previous work by Dr. Amy Johnson from SCBI, and students supervised by Dr. Chabot at Queen’s University.

Mapping has been finalized for northeastern states (Michigan, Missouri, New York, Maryland, Virginia, West Virginia, Pennsylvania, Ohio, Indiana, Illinois, Kentucky and Tennessee) and Ontario, which will be used to direct Shrike Force volunteers to survey sites. Work is underway to use their mapping to develop an online survey and data collection using ArcGIS Survey123 and Collector Apps on hand-held devices. An iNaturalist Citizen Science project has been developed to document the location of shrike



Photo Credit: Andrea Westmoreland

territories and gather information on diet items. The “Larder Locker” Project is open to anyone who would like to participate (volunteers may register on the iNaturalist website, www.inaturalist.org).

The adult shrike banding protocol, a key step to locate and monitor shrike, was adopted as standard operating procedure for the species by the North American Banding Council (NABC). Details regarding the banding protocol are currently available on their web site. Additionally, work is underway to revise Ontario’s shrike nestling banding protocol for NABC.

MOTUS



There are now 5 zoos with Motus stations. Participating zoos include Columbus, the Wilds, Riverbanks, Zoo Miami, and Toronto Zoo. By the end of 2018, there were several zoos in process of attaining Motus stations. For example, Fort Wayne Children’s Zoo is finalizing plans for 4 stations and Zoo Miami is working to

get one at every Florida state zoo (contingent on AZA accreditation).

- Canadian partners placed transmitters on 9 birds released in Ontario this year, 5 of which were hatched at SCBI.
- SCBI is in the process of putting up a MOTUS station on top of their NEON tower.

To learn more, visit

www.LOGGERHEADSHRIKE.com

RED WOLVES

Saving the red wolf from extinction and enhancing the success of future reintroduction efforts in multiple states will require a larger captive population than currently exists (growing from 225 to approximately 400 individuals), a spectrum of management intensity (some with near-wild management in large and secure habitats), refinements in husbandry and medical care (including disease surveillance), a concerted public education effort (that includes landowners), and sustained financial support.

SCIENCE WORKSHOP AT THE SMITHSONIAN

Smithsonian Conservation Biology Institute hosted ~50 representatives from the Conservation Centers & Affiliates, USFWS, and other organizations committed to save the red wolf. Mike Clifford of GLMV Architecture and Nucharin Songsasen of the Smithsonian led the workshop, and the group outlined plans and action items for the future of the species survival efforts, including research priorities, population management *ex situ* and *in situ*, landowner engagement, and communications.

USFWS RECOVERY CHALLENGE FUND

C2S2 submitted a grant proposal to U.S. Fish and Wildlife Service Recovery Challenge to expand the red wolf program. If awarded, C2S2 will form a review committee and release a request for proposals (RFP) for institutions seeking funding to increase space for red wolf captive breeding.



Photo Credit: Point Defiance Zoo and Aquarium



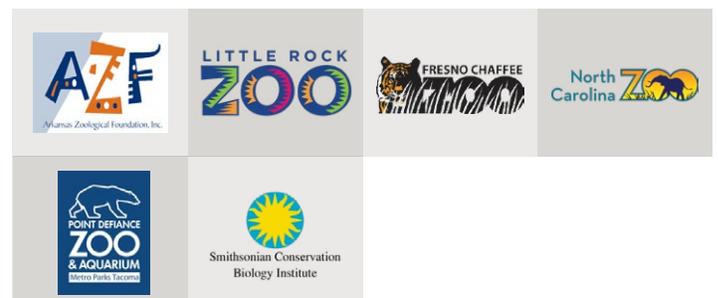
Photo Credit: Steinhilber, Endangered Wolf Center

RED WOLF FILM

C2S2 and the Endangered Wolf Center launched a film project highlighting the American red wolf, made by the award-winning filmmaking team, Running Wild Media. Film clips were featured on the Nat Geo Wild Facebook page, which is followed by 10.8M supporters of wildlife. The beautifully shot film illustrates the dire need to stand up for red wolves at this critical time. C2S2 is offering this film as a free, inspirational education tool to supporting NGOs, teachers, and wildlife organizations. The film will premiere at the 2019 Red Wolf SSP meeting.

Thank you to the Red Wolf Film sponsors:

ALPHA PACK LEADERS



BETA WOLF PARTNERS



WOLF GUARDIANS





NATURAL RESOURCE MANAGEMENT

With over 100,000 acres under the care of the C2S2 Conservation Centers and partners, land stewardship plays an important role in species conservation.

WORKING GROUP

Co-created by all the C2S2 Conservation Centers, the Natural Resource Management Working Group was put in place to foster greater collaboration on land stewardship activities of most interest to the facilities. Topics discussed included management of invasive species, cold and warm season grass restoration, and controlled burning management.

TEXAS WORKING LANDSCAPES

Modeled off of the successes of the Virginia Working Landscapes model pioneered by Smithsonian Conservation Biology Institute, the Texas Working Landscapes project was initiated at the end of 2018.

Dr. Wylie Harris was hired by C2S2 and Smithsonian to coordinate a pilot study for this project. The pilot is focused on developing an integrated, multidisciplinary strategy useful to SPA participant ranchers in incorporating native species habitat conservation and improvement in ongoing non-native, hoofed species conservation programs. The pilot study will be

conducted in 2019 at two sites in the Glen Rose, Texas area, C2S2 Conservation Center Fossil Rim Wildlife Center and SPA participant Ten Triple X Ranch.

The targeted objectives of the pilot study include:

- Collecting baseline information on presence and abundance of plant and bird species.
- Collecting soil health data from a small group of sites representing both C2S2 Conservation Centers and private ranches in Texas (current SPA participants).
- Disseminating results at SPA's 2019 Fall Gathering.
- Recruiting additional participants at SPA meeting for project expansion in 2020.

Assuming a successful run of this pilot study, project expansion could include:

- Additional study sites.
- Establishment of comparative treatments (e.g., ungrazed, single-vs-multi-species grazing, domestic-vs-non-native species grazing, etc.).
- Expanded biotic community sampling (herps, invertebrates, etc.).
- Expanded soil health sampling, including more time-consuming field assays and/or laboratory analysis.

CONSERVATION CENTERS DEVELOPMENT

Photo Credit: Peje suizo, Allpahuayo Mishana

AMAZON FOREVER



Photo Credit: Amazon Forever

C2S2 continues to advise Amazon Forever on their plan for strategic growth. Amazon Forever is a nonprofit organization that aims to promote conservation of Amazonian wildlife through environmental education, positive contact with nature, wildlife rescue, and research. One of the seven natural wonders of the world, the Amazon is a conservation priority for humanity. The forests, rivers, and animals of the Amazon are under constant assault and continuous exploitation. Activities such as illegal trafficking of species, deforestation, extraction of resources, and pollution are among the main threats. C2S2 advisors are bringing their expertise to bear on this important project.

In 2018:

- We worked with the Amazon Forever team and GLMV Architecture to outline potential infrastructure advances for the Amazon Forever biopark, creating a final site design and narrative.
- We provided the Amazon Forever team with a business plan for the White Sand Forest Conservation and Learning Center, the organization's new program taking place near Iquitos, Peru. The Center will focus on environmental education, interpretation of the White Sand Forest ecosystem, eco-tourism, use of research, and sustainable use of the forest.
- Amazon Forever received press about their new site for Amazonian conservation.
- Amazon Forever launched their social media presence on several platforms.
- C2S2 assisted Amazon Forever in obtaining grants from several institutions, including the William H. Moffat Jr. Foundation and Akron Zoological Foundation.



Photo Credit: Amazon Forever



ANNUAL MEETING

Photo Credit: Austin Savanna

2018 C2S2 ANNUAL MEETING

On April 18 & 19, Austin Savanna hosted the 2018 C2S2 Annual Meeting: Building Scale and Advancing Knowledge at their one-of-a-kind facility in Creedmoor, TX. Attendees experienced wildlife species and the award-winning waste management, recycling, composting and soil blending operation. The Austin Savanna crew served up great Texas hospitality, starting with BBQ, country music, and a meet-and-greet with a longhorn at the Welcome Icebreaker.

The morning sessions on Day 1 set the stage for critical discussions on creating opportunities for endangered species conservation. CEO Katy Palfrey provided an introduction to the ways that C2S2 is building scale highlighting the value of a collaborative, scaled-up approach across Conservation Centers, private landowners, and zoos. C2S2 Board Chair David Wildt (Smithsonian Conservation Biology Institute [SCBI]) provided an overview of the ways that C2S2 is advancing knowledge through multidisciplinary research and why this is a necessary component of achieving our goals. Keynote speaker, Michael Clifford, Curator of Innovative Partnerships at GLMV Architecture, gave a rousing address advocating for taking the “pace of a monk” while having the “determination of an explorer.”

BUILDING SCALE

Presenters spoke on the ways that C2S2 is building scale through its collaborative efforts supporting its focal species. Ideas and discussions were generated around how we might collectively increase connectivity through our programs and networks to create new opportunities across the board.

ADVANCING KNOWLEDGE

Key topics on advancing knowledge included population modeling for metapopulation and big herd management, genomics for informed decision-making, ungulate well-being study and banteng research updates. Other key points of the discussion revolved around native species in decline, understanding limiting factors multidisciplinary research development for red wolves, native species recovery programs in Australia, and reproductive research.

WORKING GROUPS

The meeting concluded with working group tracks for the Cheetah Sustainability Program, Source Population Alliance, Native Biodiversity, and Conservation Centers Development.



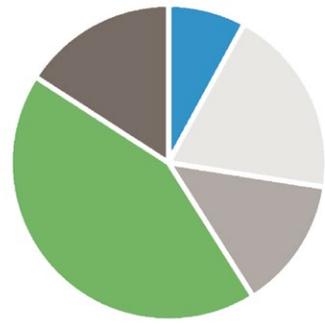


FINANCIAL REPORT

Photo Credit: The Wilds

REVENUE

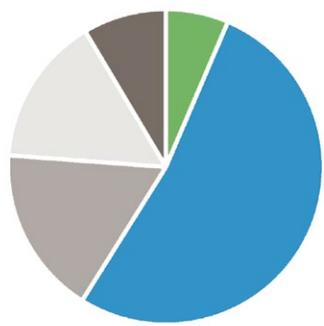
Annual Fund	\$23,786
Consulting & Capacity Building	\$58,386
Grants	\$40,500
Membership	\$128,888
Program Income	\$47,488



- ANNUAL FUND (8%)
- CONSULTATION & CAPACITY BUILDING (20%)
- GRANTS (14%)
- MEMBERSHIP (43%)
- PROGRAM INCOME (16%)

TOTAL REVENUE \$299,008

EXPENDITURES



- MARKETING & COMMUNICATIONS (6%)
- PAYROLL (52%)
- PROGRAM EXPENDITURES (17%)
- SALES, GENERAL & ADMINISTRATION (15%)
- TRAVEL (9%)

Marketing & Communications	\$ (28,283)
Payroll	\$ (231,011)
Program Expenditures	\$ (76,053)
Sales, General & Administration	\$ (67,227)
Travel	\$ (37,599)

TOTAL EXPENDITURES \$ (411,890)

IN KIND CONTRIBUTIONS TO C2S2 \$820,795



SUPPORT

Photo Credit: Adam Cairns, The Wilds

C2S2 would like to thank the following institutions, facilities, foundations and individuals who provided financial and in-kind support to our organization in 2018. We sincerely thank each and every one of you for making our work possible.

African Lion Safari
Austin Savanna
Fossil Rim Wildlife Center
North Carolina Zoo
Omaha's Henry Doorly Zoo
Smithsonian Conservation
Biology Institute
The Wilds
White Oak Conservation
Disney's Animal Kingdom
Endangered Wolf Center
Fort Worth Zoo
Monarto Zoo
Nashville Zoo
National Research Foundation/
National Zoological Gardens
of South Africa
Oklahoma City Zoo
Taronga Conservation Society
Australia
Zoo Tampa at Lowry Park

4-F Exotics
8 Bar 8 Ranch
Akron Zoological Foundation
American Association of Zookeepers
Arkansas State University
Arkansas Zoological Foundation, Inc.
Bamberger Ranch
Bear Creek Exotics
Birmingham Zoo
Brevard Zoo
Camp Creek Wildlife
Cincinnati Zoo
Columbus Zoo & Aquarium
Cross Bar C Ranch
Cypress Creek Ranch
Dallas Zoo
Fossil Rim Wildlife Center
Fresno Chaffee Zoo
Game Creek Ranch
Gimbel Foundation
Griffin Point Ranch
Hatada Ranch
Hemker Park Zoo
Horne Family Foundation
Houston Zoo
Jacksonville Zoo and Gardens
John Palfrey & Catherine Carter Foundation
Larry Johnson
Norman & Dale Kahn
Hayden Kelly

Lion Country Safari
Little Rock Zoo
Micanopy Zoological Preserve
Natural Bridge Wildlife Ranch
New Zoo Adventure Park
Judy & Sean Palfrey
Phoenix Zoo
Philadelphia Zoo
Point Defiance Zoo & Aquarium
Red Wolf Coalition
Red Wire Wildlife Ranch
Rough Hollow Preserve
Safari Enterprises
San Diego Zoo Global
Scovill Zoo
Six Flags Great Adventure Safari
Smithsonian National Zoological Park
St. Louis Zoo
Stephen McDonough
Stewards of Wildlife
Tanganyika Wildlife Park
Ten Triple X Ranch
The Living Desert Zoo & Gardens
Triple C Ranch
Wildlife Conservation Society
Wildlife Conservation Center
Wildlife Safari
William H. Moffat Jr. Foundation
Wolf Haven International
Zoo Knoxville



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