

Highlights of activities – Species Conservation Toolkit Initiative

May 2018 - September 2018



The **Species Conservation Toolkit Initiative (SCTI)** is a partnership to ensure that the new innovations and tools needed for species risk assessment, conservation planning, and managing populations are developed, are globally available, and are used effectively. The initiative leverages expertise in population biology, computer programming, and species conservation planning to: build and support modeling tools that are essential to guiding conservation actions for thousands of threatened species in the wild; facilitate the intensive management of hundreds of species that are being protected within *ex situ* programs; and integrate conservation efforts across the spectrum of management approaches.

New partners!

The Association of Zoos and Aquariums (AZA) and the European Association of Zoos and Aquaria (EAZA) have joined SCTI as major sponsors. They value both the SCTI software tools that guide scientific management of the *ex situ* populations and the contribution that a SCTI tools make to conservation and management of species in their natural habitats. We are equally excited that several more partners from Europe, Asia, and USA plan to join SCTI in 2019 (but we can't yet tell you who they are).

Planning for the future

The SCTI team (Jon, Onnie, Bob, Taylor, and Sara) met at the CPSG offices in Minnesota to reaffirm our mission, describe the primary areas of expertise that are needed to meet our goals, identify what roles can be filled by existing SCTI staff and by colleagues at partner organizations (e.g., IUCN CPSG, Species360, and the zoo associations), and determine what additional staffing or partners are needed to fulfill our mission. The primary areas in which SCTI needs to have access to expertise either on staff or via partnerships are the development of the science of species conservation methods, software coding, training and user support, and assisting in the use of the software to improve species conservation planning. It might be tempting to see SCTI as primarily a “coding shop”. However, SCTI was formed to sustain innovation in species conservation tools, and that means that we need also to be developing the science so that we can identify the next tools. To meet this mission, SCTI also needs to make sure that practitioners can use the software and use it appropriately, and that means that we need to provide adequate documentation, training, and support. In order to understand and serve the needs of the conservationists and managers who use our tools, SCTI needs to work collaboratively with them –

especially on analyses that push the limits of our current knowledge and technologies. To enable our small team to be effective, we also need support for office management and communications and for organizational leadership and oversight.

Although we can and will rely heavily on collaborative partners to help fill some of the roles above, we recognize that currently the SCTI team is too small (with one conservation scientist programmer, one leader of our training efforts, and some donated time of two senior conservation scientists) to keep advancing and supporting the innovations that are needed by the species conservation communities. Minimally, we need to start developing technical expertise and experience in species conservation planning in a second conservation scientist-programmer, we need a person both to lead communications with our diverse audiences and to assist with creating training materials, and we need to develop more formal relationships and commitments for collaborative work from partner organizations that share our mission.

Building the capacity of SCTI to serve the conservation community

Due to the support of all the SCTI partners, we are now able to address at least one of the needs identified above: We have begun a search for a second full-time postdoctoral level conservation scientist-programmer! We know that we are looking for someone with special talents, but we are optimistic that we can find the right person to fill the position before the end of 2018.

Strategic thinking

The creation of SCTI was a bold initiative that was hatched out of discussions at CPSG (then, CBSG) meetings. We had optimism that the communities in which we work would be willing to form a partnership to support a small and flexible think-tank to sustain and grow innovation that serves the broader species conservation needs. We are now approaching the end of the first three years of the Initiative, and we need to determine how we can best serve the needs for the next three years and beyond. We need to make use of the expertise in our partners and our Advisory Group to help us think creatively about how to meet our broad mission.

Accordingly, we are planning to have a strategic thinking meeting with primary partners and advisors. We will be conveying more information about these plans soon, but we are thinking about a 2 to 3 day meeting, with an external facilitator, probably sometime in early 2019.

Advisory Group

SCTI benefits from an Advisory Group comprised of both representatives of major organizational partners of SCTI (a number of zoos, zoo associations, and conservation NGOs) and experts in the application of our tools for species conservation. The SCTI Advisory Group provides strategic advice on our mission and scope, broad priorities for tool development and support, scientific advances, technological opportunities, and new innovations that are needed to address increasingly complex conservation challenges. To provide diverse perspective and expertise on the Advisory Group, we have recently worked to recruit additional experts – from more scientific disciplines, more countries, and more kinds of institutions.

The Advisory Group had its first meeting in Berlin in October 2017, and will meet next at the CPSG annual conference in Bangkok in October 2018. The group will have a 3-hour working meeting during

the CPSG conference. We are also organizing a mini-symposium for a CPSG plenary session in which several SCTI partners and colleagues will describe exciting and innovative methods that they are applying to species conservation planning.

Ensuring success for the next generation

A primary reason for the creation of SCTI was that we cannot rely on the same people forever to deliver the tools we need to succeed in species conservation and population management. We need to recruit the next generation of conservation scientists to serve our communities. SCTI is well on the way to doing just that, and perhaps just in time! We are fortunate that Jon Ballou – even a few years after his retirement from the Smithsonian Conservation Biology Institute – continues to devote substantial hours each week to work with the SCTI team on envisioning and building valuable tools. Bob Lacy has recently announced that he will be retiring from his position at the Chicago Zoological Society (CZS) in early 2019. However, Bob too will continue working with SCTI (following in Jon's footsteps, as always!). Moreover, CZS is committed to continuing its leadership in population biology and species conservation methods, and has begun a search for a Conservation Scientist with expertise in population biology and an eagerness to work with SCTI.

A manual for Outbreak

For several years, the OUTBREAK software has provided the means to model the spread (and control) of infectious disease in wildlife populations. The model can be linked with Population Viability Analysis models (such as VORTEX) to enable consideration of disease in species risk assessments and population management. However, although the program was intuitive enough that a number of scientists and students picked it up and have used it effectively (especially in Australia and Brazil), wider use of the software has been hindered by the lack of a complete manual.

Thanks to the efforts of Carlo Pacioni of Australia, Sara Sullivan of SCTI, Caroline Lees and Phil Miller of CPSG, Bob Lacy of CZS, and others (and some funding from the US National Science Foundation), we have now released the first complete manual for OUTBREAK! The manual is available on-line, is included in the latest installation of the program, and has been integrated into the software as context-sensitive Help.

Software enhancements

We continually make refinements in all of our software tools. These include improvements to the user interfaces, adjustments to algorithms for handling unusual species and data, and changes to keep current with evolving operating systems and network implementations.

Among the recent enhancements to PMx is a completely revised Selection tab in PMx, allowing much easier identification of which animals are to be included in genetic and demographic calculations. The Demography section has been steadily enhanced, with new metrics for reporting the status of the populations and completeness the data.

To Outbreak, we added the ability to describe any input rates (such as disease transmission rates and recovery times) as functions of individual and population properties, rather than only as constant values. In Vortex, improvements were made in the ways that management of captive populations can be modeled, and to the graphical analyses of sensitivity tests of uncertain parameters.

Building capacity to use the tools

At the request of the Canadian government (and with funding from them), we taught a workshop, hosted by the Seattle Zoo, on advanced uses of VORTEX. The Canadian government and several NGOs are eager to have their scientists become experts in VORTEX, so that the agencies can assess the cumulative impacts of anthropogenic threats to species and test proposed management actions.

Earlier this year, SCTI began to develop online training materials for Outbreak and PMx. Among the first products of this effort are a series of introductory videos on the OUTBREAK software, first trialed at a Disease Risk Assessment workshop in Brazil and now available at <http://www.vortex10.org/Outbreak.aspx>. To determine priority training needs for PMx, we distributed a Training Needs Assessment on our website and various international listservs in March 2018. Over 130 PMx users from 23 countries responded, giving us a better understanding of where additional training is most needed and in what format our users are interested in receiving that training. Currently, three online formats are being tested, and PMx users are welcome to view these materials and leave feedback using the following links:

- Short, interactive module: [Creating a PMx Project with ZIMS export files](#)
- Comprehensive overview course: [The Genetics Module](#)
- Narrated video: [Who is in the Managed N?](#)

To distribute our training materials, we are developing a dedicated training section of our website. Here, toolkit users will be able to access materials through personal accounts, track their activity through user profiles, and interact with other users in dynamic forums. Additionally, the SCTI team will be able to gain insight into learning behaviors and pinpoint areas for improvement by tracking metrics related to completion rates, learner performance, and learner satisfaction. As these e-learning materials take time to design, build, and evaluate, we will also provide quick pdf-based technical guides and make updates to the user manuals as needed. Most recently, we partnered with Species360 to produce an online guide for testing ZIMS PMx exports. This pdf is available for download using the “Walk Me” tool on the Species360 website. We will continue to collaborate with partners providing their own online or in person training related to our tools and provide daily technical assistance to queries sent to help@vortex10.org.

Working with partners

The SCTI team met with the science team of Species360 to share new developments and discuss possible areas of collaboration. We are working closely with Species360 to ensure full compatibility and exchange of data between ZIMS and PMx. In the process, this has led to a number of enhancements to both PMx and ZIMS for Studbooks, and we are now working with Species360 to export additional data fields from ZIMS to PMx.

We continue to help regional zoo associations with the new exports of data from ZIMS to PMx. Documentation of data standards and guides were created to help user groups confirm the accuracy of data exports.

We are continuing to work with a group of botanical gardens to test the use of PMx and population management methods developed by zoos for guiding collaborative breeding programs for plants. We hosted a workshop for colleagues from 6 botanic gardens on the use of PMx for plant population

management. This project has led us to improve how PMx handles hermaphroditic (monoecious) species – an enhancement that will likely be useful for management of some fish and many invertebrate animal species as well.

SCTI provides expert advice (and sometimes debugging, as needed) to CPSG as it applies the latest features in Vortex to some of the most complex species risk assessments. When time permits, technical assistance is provided also to graduate students, researchers, wildlife agencies, zoos and aquariums, and others.

[Go to \[scti.tools!\]\(#\)](#)

A new SCTI website is about to be unveiled. (It is still in development as of 1 October.) The site provides much more information about SCTI, downloads of software and documentation, and more. It will soon provide access to on-line training modules and videos, and forums for supporting communities of users.

Some of our plans for the next few months

SCTI is flexible and responsive. We are constantly refining software and increasing support, and adding new features and even new programs, as suggestions, new ideas, and new science are identified by our team, our partners, or the broader conservation community. Among the developments underway, and which we expect to release within the next few months, are:

SCTI is participating in the annual conferences of EAZA, AZA, and CPSG to meet with partners and users of the SCTI tools.

A training workshop on the OUTBREAK software will be conducted in conjunction with the EAZVW/AAZV/IZW joint conference, held in Prague.

We will be completely revising the PMx manual, especially to describe the many newer features.

The SCTI Team

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SCTI Partners (as of August 2018)

Association of Zoos and Aquariums

Auckland Zoo

Chicago Zoological Society

Copenhagen Zoo

European Association of Zoos and Aquaria

Living Desert Zoo & Gardens

National Zoo/Smithsonian Conservation Biology Institute

Oceans Initiative

Raincoast Conservation Foundation

Saint Louis Zoo

San Diego Zoo Global

San Francisco Zoo & Gardens

Seattle Aquarium

SOS Rhino

Species360

IUCN SSC Conservation Planning Specialist Group

Zoological Society of London

Contract support for specific projects:

Canada Department of Fisheries and Oceans

The Nature Conservancy

US Institute of Museum & Library Services

US National Science Foundation