

IUCN SSC Viper Specialist Group



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NUMBER OF MEMBERS

110

SOCIAL MEDIA AND WEBSITE

Facebook: @viperspecialistgroup

Instagram: @viper_iucn

Twitter: @viper_IUCN

Website: <https://viperconservation.org>

Mission statement

The Viper Specialist Group (VSG) is a platform from which conservation biologists can work to increase our scientific understanding of viper biology and can implement conservation actions to prevent declines and extinctions.

Projected impact 2021–2025

This quadrennium marks the period where our group increases our activities to preserve viper species and habitats. A thorough reorganisation of our group to start working based on committees, together with a new website and a more active role in social networks, has allowed us to propose 76 targets for the quadrennium that will impact positively the knowledge and conservation of viper species globally.

Targets 2021–2025

ASSESS

T-002 Identify knowledge gaps in species assessments.

T-010 Project the impact of climate change on selected species of vipers in Mesoamerica and obtain missing ecological information for poorly known viper species in Mesoamerica.

T-011 Analyse the use of short distance translocation for rattlesnakes as a strategy to mitigate conflict with humans.

T-012 Develop an understanding of the potential effects of climate change in the North American region on viper activity, distribution, range shift and interactions with other members of the biological community.

T-013 Examine how environmental factors and habitat influence activity patterns, reproduction and defensive behaviour in different regions of southern California.

T-014 Examine the efficacy using intra- and extra-home range translocations to manage human-rattlesnake conflicts at state properties in West Virginia, with Timber/Canebrake Rattlesnakes (*Crotalus horridus*) through 2022.

T-016 Use long-term monitoring data of Eastern Diamondback Rattlesnakes (*Crotalus adamanteus*) to examine how rattlesnakes respond to habitat changes in military training areas.

T-017 Assess the snake diversity of Meghri Ridge, Syunik Province, Armenia.

T-018 Assess the status of pathogens, such as atadenovirus, nidovirus and cryptosporidiosis, in viperids of the southeast.

T-020 Conduct population monitoring of montane populations of rattlesnakes in the Huachuca Mountains, to determine baseline population of *Crotalus lepidus* and *Crotalus willardi* and assess impacts of grazing and herpetological tourism on the area.

T-021 Document the population ecology and natural history of *Crotalus durissus cascavella* in Brazil, determine risks for human-snake conflict and how to reduce negative effects, and assess pathogen risk in populations.

T-022 Understand urban population ecology of the Eastern Diamondback Rattlesnake (*Crotalus adamanteus*) around Florida Gulf Coast University and assess current risks to populations from a known exotic pentastomid.

T-023 Serve as sample and data repository for rattlesnake research.

T-024 Continue the Eastern Diamondback Rattlesnake (*Crotalus adamanteus*) long term research project on habitat selection, population ecology, vital demographic rates, conservation genetics, natural history and health assessments at Jekyll Island, Georgia.



Bitis worthingtoni or the Kenyan Horned Viper is considered Vulnerable in the Red List
Photo: Wolfgang Wüster

T-025 Determine if hazing of rattlesnakes could be an effective strategy to mitigate nuisance snake conflicts with humans.

T-026 Conduct long-term mark-recapture monitoring of rattlesnake populations in Arizona.

T-027 Assess ecology, behaviour, habitat use (including using telemetry techniques), reproduction and human conflict mitigation for the Chococoan Bushmaster (*Lachesis acrochorda*).

T-028 Use whole genome sequence data to assess the genetic costs of living in small, isolated populations in Eastern Massasauga Rattlesnakes (*Sistrurus catenatus*).

T-029 Use whole genome sequence data to assess the genetic costs of living in small, isolated populations of Timber/Canebrake Rattlesnakes (*Crotalus horridus*) in Ohio.

T-030 Continue ongoing long-term analysis of demography and status of Timber/Canebrake Rattlesnakes (*Crotalus horridus*) at the northern extent of their geographic range.

T-031 Update distribution maps for African vipers.

T-032 Assess the neutralizing capacity of antivenoms against Mesoamerican viper venoms.

T-035 Identify Black-headed Bushmaster (*Lachesis melanocephala*) distribution in relation to human presence.

T-037 Continue working with the Mangshan Pit Viper (*Protobothrops mangshanensis*) and *Deinagkistrodon* project in national parks in China.

T-038 Continue work on the *Protobothrops jerdonii* complex.

T-039 Analyse phylogeny and evolutionary morphology of New World pitvipers.

T-040 Launch surveys to obtain natural history information for *Vipera latastei* and *Vipera monticola*.

T-041 Launch surveys to obtain natural history information for all Anatolian vipers.

T-043 Conduct field studies to collect data on distribution of Halys Pit Viper (*Gloydius halys*) in Russia.

T-044 Conduct national monitoring of Meadow Viper (*Vipera ursinii*).

T-045 Conduct regional atlas project (Lazio Region) of the Meadow Viper (*Vipera ursinii*) and *Vipera aspis*.

T-046 Search potential sites of yet-to-be discovered Greek Meadow Viper (*Vipera graeca*) populations.

T-047 Collect and compile statistics on snakebite envenomation in Siberia and the Far East (Russia).

T-055 Review current systematics of Asian pitvipers.

T-056 Assess conservation status of other island endemics.

T-058 Review contribution to mortality from roadkill/deliberate killing of vipers.

T-059 Assess true extent of human conflict/snakebite involving vipers.

T-062 Complete Red List assessments for as many species of vipers in the world as possible.

T-063 Conduct reassessments of the Red List status for the more than 70 species of vipers in Mexico.

T-072 Gather baseline data for conservation management of Broad-banded Temple Pitviper (*Tropidolaemus laticinctus*) in Sulawesi.

PLAN

T-003 Develop a Viper Action Plan with specific actionable items.

T-073 Establish a breeding colony of Eastern Diamondback Rattlesnakes and Timber/Canebrake Rattlesnakes (*Crotalus horridus*) to support reformed rattlesnake roundups.

T-075 Complete and publish the VSG strategic plan.

T-077 Perform a conservation gap analysis for South American vipers.

T-078 Launch surveys to obtain natural history information for Nose-horned Viper (*Vipera ammodytes*) complex.

T-079 Launch surveys to obtain natural history information for *Vipera ursinii ursinii*.

T-081 Implement ex situ viper conservation programmes in the South American region.

T-083 Identify priority sites for the conservation of vipers and promote the creation of areas for the conservation of vipers in each region.

T-085 Conduct Pindos Mountain alpine meadow restoration.

T-086 Establish Montane Rattlesnakes Conservation Working Group.

T-087 Develop bag limits/hunting guidelines for states that do not currently have regulations for viperid species.

ACT

T-005 Prepare a database on killing (e.g. deliberate killing/roadkills) and illegal trade of vipers throughout the region (Asia) at local and national levels to identify the trends of threats to vipers from those activities.

T-088 Examine effects of urban development on rattlesnakes.

Symposium on the Conservation of the horned vipers endemic to Mexico *Mixcoatlus* and *Ophryacus*
Photos: Jesús Sigala



Participants of the Red List Training session for *Mixcoatlus* and *Ophryacus* in Aguascalientes, Mexico
Photos: Jesús Sigala



Bothriechis aurifer, a pitviper found in Mesoamerica listed in the Red List as Vulnerable
Photo: Justin Elden

T-089 Conduct long-term ecological research on Tiger Rattlesnakes (*Crotalus tigris*) in the Sonoran Desert.

T-090 Study ecology of Prairie Rattlesnake (*Crotalus viridis*) populations at the southern extreme of their distribution in Southwest New Mexico.

T-091 Assess snake fungal disease (SFD) in free-ranging rattlesnakes of the American Southwest (North American Region).

T-092 Survey general recovery of *Vipera ursinii ursinii* habitats in 'Campo Imperatore', the core area of its distribution in Gran Sasso and Laga Mountains National Park (Central Italy).

T-093 Protect Greek Meadow Viper (*Vipera graeca*) populations with highest threats.

T-094 Reduce number of rattlesnake round-ups and pressure on local populations of various rattlesnake species.

T-095 Establish the Eastern Diamondback Working Group.

T-096 Address inaccessibility in science through Bridge the Gap – a programme designed to establish mentors for youth and provide hands-on opportunities and experiences in science and reptile conservation.

T-097 Train the general public, military installations, zoos, consultants and researchers how to safely contain, reduce pathogen transmission, and relocate venomous reptiles to reduce human-snake conflict.

T-098 Examine ecology and conservation of the federally threatened New Mexico Ridge-nosed Rattlesnake (*Crotalus willardi obscurus*).

T-099 Study spatial ecology of Armenian Mountain Viper (*Montivipera raddei*) in two different landscapes: human-modified vs recovered-natural.

NETWORK

T-001 Increase representativity in membership.

T-006 Develop effective partnerships between zoos and VSG.

T-008 Increase the efficiency and amount of internal and external communication.

COMMUNICATE

T-004 Create a new website about the Viper Specialist Group with taxonomic updates to make this information more widely available.

T-101 Host the Venomous Herpetology Symposium (<https://www.venomsymposium.com>).

T-102 Restructure the editorial board of the Viper Specialist Group newsletter to restart its publication.

T-103 Increase the efficiency and amount of internal and external communication.

T-104 Increase communication between ex situ programmes.

T-107 Connect youth with the natural world and instil an appreciation and deeper understanding of rattlesnakes and other misunderstood species through STEM Station – a programme that teaches science in the outdoors.

T-108 Establish distance learning opportunities that teach students about rattlesnake ecology and conservation through a comprehensive curriculum that aligns with state educational standards.

T-109 Run Conservation Camp – a ground-breaking youth programme meant to give students experiences in habitat evaluation, environmental monitoring and wildlife surveys to foster a connection with the natural world and install a deeper understanding of rattlesnakes and other misunderstood species.

T-110 Create outreach materials that can be customised by region for living with vipers.

Activities and results 2021

ASSESS

Red List

T-062 (KSR 6)

Number of new Red List assessments published per species group, region, and biological realm on the IUCN Red List of Threatened Species: 1

Result description: The first assessment is being carried out; we started with six species of vipers in Mexico and will continue with other species in the region.

T-063 (KSR 6)

Number of species groups that are comprehensively reassessed in a timely manner: 1

Result description: This target is being worked on. The Co-Chairs obtained funding at the end of 2021 from the Edge Foundation to assess/reassess the status of six species of Mexican vipers in two genera: *Mixcoatlus* and *Ophryacus*. We already started visiting type localities and will finish the assessments by mid-2022. Taking advantage of this, we plan to assess/reassess all the other Mexican viper species by the end of 2022 with the help of our Red List Authority Coordinators.

Research activities

T-002 (KSR 6)

Number of species that have been assessed through the different tools: 0

Result description: The COVID-19 pandemic delayed the start of Red List assessments, but we have several programmed for 2022.

T-010 (KSR 5)

Number of research projects completed or supported by SSC members per taxonomic group and region: 0

Result description: We are in the process of finalising a publication for a species in southern Mexico.

T-011 (KSR 5)

Number of research projects completed or supported by SSC members per taxonomic group and region: 0

Result description: We have completed the experimental phase of short distance translocation for rattlesnakes and quantification of results and are proceeding with the data analysis phase.

T-012 (KSR 5)

Number of research projects completed or supported by SSC members per taxonomic group and region: 0

Result description: We have started the data collection phase, establishing three focal sites for Prairie Rattlesnakes at the northern, central and southern portion of their range, and have started gathering detailed data on behaviour and spatial ecology with respect to temperature and other environmental variables.

T-013 (KSR 5)

Number of research projects completed or supported by SSC members per taxonomic group and region: 1

Result description: This target has started but does not yet have results. The project is still underway.

T-018 (KSR 5)

Number of scientific publications about species research that acknowledge SSC affiliation: 1

Result description: Monitoring is still ongoing. We are in need of additional samples from Canebrake/Timber Rattlesnakes to test for pathogens. Atadenovirus and cryptosporidiosis have been confirmed in Eastern Diamondback Rattlesnakes (*Crotalus adamanteus*) and Agkistrodon *conanti* in Florida and Georgia.

T-020 (KSR 5)

Number of research projects completed or supported by SSC members per taxonomic group and region: 1

Result description: The project is currently in the planning phase with intent to begin field work in 2024.

T-022 (KSR 5)

Number of research projects completed or supported by SSC members per taxonomic group and region: 1

Result description: Eastern Diamondback Rattlesnakes (*Crotalus adamanteus*) appear to be stable around Florida Gulf Coast University. They often utilise edge habitats near roads/sidewalks, likely for thermoregulatory benefits and access to prey items such as rodents and rabbits that are abundant on campus. However, with development rapidly occurring surrounding the campus, this will eventually cut off the connectivity to landscapes outside of campus property. The long-term genetic viability of the population is still being studied, but obvious threats are expected. The risk of pentastomes to this species appears low. Prey sources for this species are not major intermediate hosts; Terry Farrell from Stetson University has more information. From approximately 30 Eastern Diamondback Rattlesnakes salvaged around SWFL, we only detected the exotic *Raillietiella orientalis* in 5–6 individuals, with the largest parasite load being maybe seven.

T-024 (KSR 5)

Number of research projects completed or supported by SSC members per taxonomic group and region: 1

Result description: Tracking of Eastern Diamondback Rattlesnakes (*Crotalus adamanteus*; hereafter EDB) continues since 2011, including collection of point locations on Jekyll Island EDBs. We have submitted a publication related to a hybrid between *C. adamanteus* X *C. horridus* that has been accepted by *Southeastern Naturalist* and is expected to be available by the end of 2022. We concluded a health study in which we learnt that we can predict EDB gravidity up to 11 months in advance of a birthing event and have used this technique to collect fecundity data on our local population. Finally, we have been working on partnerships and National Science Foundation (NSF) grants to further understand the relationship between habitat, spatial use and genetic isolation, and how these topics may be influenced by future habitat restoration campaigns.

T-028 (KSR 5)

Number of scientific publications about species research that acknowledge SSC affiliation: 1

Result description: Results addressing the use of whole genome sequence data to assess the genetic costs of living in small, isolated populations in Eastern

Massasauga Rattlesnakes were published: Ochoa, A. and Gibbs, H.L. (2021). 'Genomic signatures of inbreeding and mutation load in a threatened rattlesnake'. *Molecular Ecology* 30:5454–5469. <https://doi.org/10.1111/mec.16147>.

T-029 (KSR 5)

Number of scientific publications about species research that acknowledge SSC affiliation: 1

Result description: The complete genome of Timber/Canebrake Rattlesnakes (*Crotalus horridus*) was assembled using a combination of long read HiFi and short read PE data. The genome was annotated. High coverage genomes were generated for multiple individuals from three remaining Ohio samples. Assessment of levels of inbreeding and mutational load in small Ohio populations is ongoing as part of the PhD thesis of Marissa Roseman, PhD student, School of Environment and Natural Resources, Ohio State University, co-supervised by Bill Peterman and H. Lisle Gibbs. This work is supported by Ohio Biodiversity Conservation Partnership through Ohio Division of Wildlife.

T-030 (KSR 5)

Number of scientific publications about species research that acknowledge SSC affiliation: 0

Result description: William Brown will present the results of a four-decade career studying Timber/Canebrake Rattlesnakes (*Crotalus horridus*) in the field at a single locality in north-eastern New York at the Biology of Pitvipers IV conference in Rodeo, New Mexico, US, in July 2022.

T-031 (KSR 5)

Number of research projects completed or supported by SSC members per taxonomic group and region: 1

Result description: The regional coordinator has started gathering material and reaching out to personnel in the Red List Unit to consolidate distribution maps of African vipers generated.

T-035 (KSR 5)

Number of scientific publications about species research that acknowledge SSC affiliation: 0

Result description: We have produced an updated species distribution model for Black-headed Bushmasters based on over 20 recent observations collected through our Plato Negro Ecology research team. We are preparing a manuscript to publish the new model. Our team has also been reaching out to local landowners living on bushmaster

habitat and has created signs promoting bushmaster conservation that several landowners have posted on their land.

T-039 (KSR 5)

Number of scientific publications about species research that acknowledge SSC affiliation: 1

Result description: We recently concluded this activity with the development of a manuscript entitled 'Total-evidence phylogeny and evolutionary morphology of New World pitvipers' (Carrasco, P., et al.). In this study we obtained a phylogeny of New World pitvipers from the combined analyses of morphological and molecular data, we analysed the relationships among and within genera, and we analysed the evolution of the morphology of the group from a phylogenetic perspective. The manuscript was submitted in early June.

T-040 (KSR 5)

Number of scientific publications about species research that acknowledge SSC affiliation: 0

Result description: In 2021, we published one paper in which we updated the taxonomy of *Vipera latastei* and *V. monticola*. The first species is now restricted to the Iberian Peninsula (Spain and Portugal), while the second is restricted to North Africa (Morocco, Algeria and Tunisia). As a consequence of this update, the conservation status of both taxa must be re-evaluated. During 2022, we will work on the IUCN Red List assessments for these two species. We will most likely have a presentation about this topic at the next Societas Europaea Herpetologica (SEH) congress, in Belgrade.

T-041 (KSR 5)

Number of research projects completed or supported by SSC members per taxonomic group and region: 1

Result description: The project on Anatolian vipers is ongoing, and has extended deeper into Western Asia.

T-043 (KSR 5)

Number of research projects completed or supported by SSC members per taxonomic group and region: 1

Result description: We have published new distribution records advancing the known north-western range limits of the Halys Pit Viper 100 km west (see https://biozoojournals.ro/nwyz/content/v17n1/nwyz_e217501_Simonov.pdf). The surveys will be continued.

T-044 (KSR 5)

Number of research projects completed or supported by SSC members per taxonomic group and region: 0



Crotalus catalinensis or the Rattle-less Rattlesnake, Baja California Sur, Mexico
Photo: Scott Trageser

Result description: A total of 36 surveys were realised, but only in Gran Sasso Laga National Park and Velino-Sirente Regional Park (Abruzzo Region); data were collected during these surveys that could enable trend analysis of the conservation status of the species.

T-045 (KSR 5)

Number of research projects completed or supported by SSC members per taxonomic group and region: 0

Result description: In 2021, work focused on the overall setup of the collection of past presence data (to date), individual species sheets of the atlas, and species mapping.

T-055 (KSR 5)

Number of scientific publications about species research that acknowledge SSC affiliation: 0

Result description: We are on hold for a meeting of the VSG Taxonomy Committee. However, Anitha Malhotra is currently working on a review of the taxonomy of the *Trimeresurus* genus/subgenus, particularly the 'albolabris' group, which has seen several new species descriptions in recent years, many largely based on colour pattern differences which are relatively weak taxonomic characters. My analysis is largely based on mitochondrial and morphometric data. I do have nuclear genes for some, but they are proving rather uninformative as the divergence in this group is quite recent.

T-056 (KSR 5)

Number of scientific publications about species research that acknowledge SSC affiliation: 0

Result description: Part of the reason for the focus on the albolabris group above is that there are many species that are island endemics. We are also working on a large

pitviper multilocus phylogeny which will, as far as the data are available, give us some basis for this evaluation.

T-059 (KSR 5)

Number of scientific publications about species research that acknowledge SSC affiliation: 0

Result description: Vishal Santra's organisation is pioneering an app used by rescuers that will provide these data. Currently, there are ca. 500 records from one district in West Bengal which are being analysed by a member of that organisation, a PhD student Sourish Kuttalam. However, other districts and states are also being brought into this study and will start to provide more geographical coverage soon. There are other similar initiatives elsewhere in India and hopefully we will also be able to access their data, although it may not be entirely comparable.

PLAN

Planning

T-003 (KSR 8)

Number of conservation plans/strategies developed: 0

Result description: We have created committees that will be used to guide the action plan. We are still trying to figure out the best way to accomplish this with everyone's busy schedules.

T-073 (KSR 8)

Number of taxa (defined as species or subspecies) covered by a range-wide plan or strategy, or by a collection of plans or strategies, developed with SSC: 1

Result description: Chehaw Park and Zoo in Albany, Georgia, currently houses approximately 15 rattlesnakes (Eastern Diamondback and Timber/Canebrake Rattlesnakes). The Rattlesnake Conservancy met with the Association of

Zoos & Aquariums (AZA) Herp Tag to emphasise the need for zoos to be breeding these species for use in these types of events.

T-077 (KSR 8)

Number of taxa (defined as species or subspecies) covered by a range-wide plan or strategy, or by a collection of plans or strategies, developed with SSC: 1

Result description: This work is finished and the results have been submitted to the journal *Biological Conservation*.

T-079 (KSR 8)

Number of taxa (defined as species or subspecies) covered by a range-wide plan or strategy, or by a collection of plans or strategies, developed with SSC: 1

Result description: Results have been extensive in several areas of Central Italy thanks to many field trips, hundreds of hours of trekking, and many populations located: the species has been documented in many areas in Monti Sibillini National Park, Sirente-Velino Regional Park, and Monte Velino Nature National Reserve.

Policy

T-083 (KSR 9)

Number of Multilateral Environmental Agreement meetings attended by the SSC group: 1

Result description: We continue identifying priority sites for the conservation of vipers. One area that we are exploring to see the possibility of purchase for conservation is in the southern part of Oaxaca state in Mexico.

T-086 (KSR 9)

Number of Multilateral Environmental Agreement meetings attended by the SSC group: 1

Result description: The working group has been established and meets quarterly to discuss current and future research



Conservation signs for the viper *Lachesis melanocephala* in Costa Rica
Photo: Roel de Plecker

needs. The last meeting the working group held, Tom Jones of Arizona Game and Fish Department (AZGFD) joined and discussed the future project to monitor *Crotalus lepidus* and *Crotalus willardi*. AZGFD is supportive of this project. Most recently, the Trinational Initiative between the US, Canada and Mexico identified a need for range documentation of montane rattlesnakes in Mexico. Mexican counterparts are likely to be underfunded for the project. The Rattlesnake Conservancy is currently seeking funding to help support this effort.

T-087 (KSR 9)

Number of policies where SSC members provided technical input: 1

Result description: The Rattlesnake Conservancy has established a multi-organisational working group, to secure funding for lobbying efforts with state legislators in Texas to establish bag limits for rattlesnakes native to the state. We expect to begin efforts in early 2023.

ACT

Conservation actions

T-088 (KSR 10)

Number of threatened species benefiting from in situ conservation action: 1

Result description: This project has started and results are being still obtained.

T-092 (KSR 10)

Number of threatened species benefiting from in situ conservation action: 1

Result description: During 2021, we carried out eight survey sessions of *Vipera ursinii ursinii* in the 'Fonte Vetica' study area, with time-constrained research method (cf. Luiselli & Akani, 2002), collecting 10 certain reports of presence.

T-094 (KSR 10)

Number of threatened species benefiting from in situ conservation action: 1

Result description: Whigham Roundup recently reformed from a collect-kill roundup to an educational event due to efforts by Georgia Reptile Society, Quail Forever, The Rattlesnake Conservancy and Georgia Department of Natural Resources. This event will continue to be held annually and snakes used at the event are supplied by the above referenced organisations. Recently, The Rattlesnake Conservancy discovered that the Evans County Wildlife Club (ECWC), which hosts the Claxton Rattlesnake Festival, is still exploiting rattlesnakes as part of their event, including teaching the public how to hunt and collect rattlesnakes.

T-095 (KSR 10)

Number of threatened species benefiting from in situ conservation action: 1

Result description: The Rattlesnake Conservancy continues to hold quarterly meetings with participants and are currently developing a Conservation Action Plan for the Eastern Diamondback Rattlesnake. The working group expects to have an early draft available for review by partners in late 2023.

T-096 (KSR 11)

Number of projects providing evidence that use is sustainable per taxonomic group and region: 1

Result description: The SCIFA Club or 'Science for All', formerly known as Bridge the Gap, begins meeting early in 2022 with the first cohort of students meeting for an evening of field herping with field researchers from The Rattlesnake Conservancy. We have made partnerships with Jacksonville Zoo, White Oak Conservation, St. Augustine

Alligator Farm and the Florida Forest Service to provide continued workshops on a regular basis to help youth get outdoors and learn about the many fields of conservation and education.

Technical advice

T-005 (KSR 11)

Number of unsustainable use practices tackled: 0

Result description: We changed the structure of our Specialist Group and planned the creation of a committee to look at this issue in 2022.

T-089 (KSR 10)

Number of technical consultations provided to support conservation actions: 1

Result description: This project started as planned and results are still being obtained.

T-090 (KSR 10)

Number of technical consultations provided to support conservation actions: 1

Result description: This project started as planned and results are still being obtained.

T-097 (KSR 10)

Number of technical consultations provided to support conservation actions: 1

Result description: During 2021, The Rattlesnake Conservancy provided training to a little over 200 students in eight different states across the United States. These training programmes were provided to state and Federal agencies, researchers, developers (including renewable energy companies), medical practitioners, veterinarians and general snake enthusiasts. This has created a network of individuals who are skilled in the handling of venomous snakes, are safe, and understand the habitat needs required to provide successful relocation of snakes when necessary.

T-098 (KSR 10)

Number of technical consultations provided to support conservation actions: 1

Result description: This target started as planned and is on track.

NETWORK

Membership

T-001 (KSR 2)

Number of SSC members recruited: 15

Result description: Our group is still large, but we have deleted several members that had not contributed at all since the beginning and invited several others that are already helping in many of the newly created committees.

T-008 (KSR 2)

Number of SSC members recruited: 1

Result description: With the change in the structure of the group to a committee-based one, the creation of the website and the listserv, we improved the internal communication of the group.

Synergy

T-006 (KSR 1)

Number of 'funding' partners established and maintained: 1

Result description: We have launched the ex situ VSG committee as part of the new structure of VSG and are currently discussing with European Association of Zoos and Aquaria (EAZA) and AZA members to create a plan to prioritise viper species for further ex situ conservation work.

COMMUNICATE

Communication

T-004 (KSR 13)

Number of communication products using innovative tools: 1

Result description: Our new website was constructed in the first half of 2021 and published on International Snake Day (July 2021). In addition to the website, we have created an email listserv that will serve as a communication platform among members. We are currently subscribing members to the list.

T-101 (KSR 13)

Number of SSC members' presentations developed in relation to specific taxonomic groups: 1

Result description: This Symposium is currently being organised and going well. It will take place in September 2022.

T-104 (KSR 12)

Number of media articles mentioning IUCN Species theme: 0

Result description: We have launched the ex situ VSG committee and are currently discussing with EAZA and AZA members to create a plan to prioritise viper species for further ex situ conservation work.

T-107 (KSR 13)

Number of SSC members' presentations developed in relation to specific taxonomic groups: 1

Result description: STEM Station is an active programme that is continuously hosted at our facility in Jacksonville, Florida. We have hosted over 100 students at these educational programmes.

T-108 (KSR 13)

Number of communication products using innovative tools: 1

Result description: Multiple activities are available online on our website at: <https://www.savethebuzztails.org/educator-resources>.

T-110 (KSR 13)

Number of print communications materials distributed in relation to specific taxonomic groups: 0

Result description: We were able to collect some existing outreach materials that are linked to the website with the permission of the original authors.

Scientific meetings

T-103 (KSR 12)

Number of scientific meetings: 1

Result description: This target is a work in progress. We have not held many virtual meetings but have increased our communication, especially after we created the different committees in the structure of our group, which allows us to work more focused on particular themes.

Acknowledgements

The Co-Chairs want to acknowledge the hard work of our 110 members, who through their individual activities make a difference to conserving the vipers of the world. The Regional Coordinators have been instrumental in the group's activities: Marcio Martins and Jelka Crnobrnja (Red List Authority Coordinators), Rulon Clark (North America Regional Coordinator), Mahmood Sasa (Mesoamerica), Marcio Martins and Paola Carrasco (South America), Jelka Crnobrnja and Evgeny Simonov (Europe and North Asia), Pritpal

Singh Soorae (North Africa/West Asia), Anita Malhotra and Kevin Messenger (East Asia) and Bryan Maritz (Africa). The Rattlesnake Conservancy and Orianne Society provided help and fiscal sponsorship to our group, and we are collaborating with several conservation agencies and NGOs. We have received support from the IUCN SSC and Re:wild. Jesús Sigala-Rodríguez thanks the authorities of the Universidad Autónoma de Aguascalientes for the flexibility and support to carry out his activities as Co-Chair of the group.

Summary of achievements

Total number of targets 2021–2025: 76

Geographic regions: 12 Global, 2 Africa, 42 America, 9 Asia, 12 Europe

Actions during 2021:

Assess: 25 (KSR 5, 6)

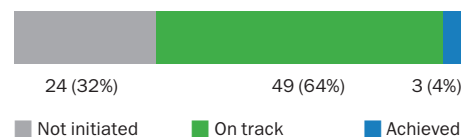
Plan: 7 (KSR 8, 9)

Act: 10 (KSR 10, 11)

Network: 3 (KSR 1, 2)

Communicate: 7 (KSR 12, 13)

Overall achievement 2021–2025:



■ Not initiated

■ On track

■ Achieved