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Environment Agency - ABU DHABI

WONDER GECKO CONSERVATION ACTION PLAN WORKSHOP REPORT

Workshop held at Mercure Hotel, Jebel Hafeet, Al Ain, United Arab Emirates on 13th - 14th December 2017

July 2018

CONSERVATION PLANNING SPECIALIST GROUP
Changing the Future for Wildlife

WONDER GECKO CONSERVATION ACTION PLAN WORKSHOP: December 2017, Jebel Hafeet, Abu Dhabi

Report and Interim Conservation Plan

Contributors

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Environment Agency - Abu Dhabi

Facilitating organization

Conservation Planning Specialist Group - South Asia

Cover photo:

EAD

Citation:

Soorae, P. S., Mohamed, A. A., Els, J., O'Donovan, D., Pedo, V. Jr., Alzahlawi, N., Jones, B. W. & Molur, S. (2018) Wonder Gecko Conservation Action Plan. December 2017 Workshop Report. Environment Agency-Abu Dhabi and Conservation Planning Specialist Group, 47pp.

A contribution of the IUCN SSC Conservation Planning Specialist Group

CONTENTS

Dr. Shaikha Al Dhaheri

Executive Director, Terrestrial & Marine Biodiversity Sector

Environment Agency-Abu Dhabi

It is my honor and pleasure to write this foreword for the first ever workshop dedicated to the Wonder Gecko and to develop its conservation action plan in the United Arab Emirates (UAE).

The Wonder Gecko is one of the largest gecko species in the UAE with a very colorful body and large eyes, which gives its name the Frog-eyed or Wonder Gecko. This species is restricted to coastal dunes, stretching from Abu Dhabi city into Ras Al Khaimah emirate. They are only found in localized sensitive habitats.

The Environment Agency-Abu Dhabi took an initiative to conduct a workshop involving partners from other Emirates and international institutions to prepare a conservation action plan which will guide conservation actions for this species over the next several years.

I would like to thank all 41 participants from 13 different institutions, both local and international, and the EAD team who worked tirelessly to ensure the workshop was a success.

It is very encouraging to see tangible outcomes from the workshop in the form of a conservation action plan for the species. I sincerely hope that these actions will be implemented with greater urgency so we can successfully conserve the species in the wild with viable captive colonies as an assurance against extinction in the wild.

Dr. Drew Gardner

Specialist in Arabian Peninsula Reptiles & Amphibians

It is with pleasure that I write a brief forward to the report of the Wonder Gecko Conservation Action Plan Workshop 2017. The timely and very successful workshop has resulted in an impetus to move forward in research, education and conservation for this beautiful and charismatic species. The Wonder Gecko was first recorded in the UAE (and Arabia) in 1971 by Dr Nick Arnold of the British Museum (Natural History) from near Jebel Fayah, and then by Michael Gallagher from 15 km WSW of Dhayd (E.N. Arnold, 1977). Arnold briefly reported on its ecology in his study of lowland lizards of the UAE (E. N. Arnold, 1984), and Patrick Osborne described his observations of these geckos (Osborne, 1994).

When I first arrived in the UAE in 2001, I was excited to see the Wonder Geckos, and made several trips specifically to look for them around Jebel Fayah and Jebel Ali, all without success. I first saw them on what is now the site of the Al Maktoum International Airport. Here they were living in a fairly dense population in *Pennisetum*-dominated sand sheets and low dunes, and using their distinctive eye-shine, I was able to locate many individuals. In subsequent years I observed them from Umm al Quwain in the north to as far south as the Abu Dhabi International airport.

However it was clear that their prime habitat was fast disappearing with the development of residential and industrial zones, airports, golf courses, and highways (Andrew S. Gardner, 2009; A. S. Gardner, 2013). This trend has continued, leading to the proposed assessment of the population as Critically Endangered by the Workshop. This Arabian population, presumably physically isolated from the Iranian populations since the last glaciation, has now being further fragmented and much reduced.

While the Wonder Gecko in the UAE remains little studied, the Workshop has identified various areas of research to fill gaps in knowledge, and along with better awareness and publicity, the future of the population may be less bleak. I congratulate the working groups, and hope that the momentum engendered by the Workshop can be continued over the coming years so that future generations will also be able to enjoy observing these beautiful animals.

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1. Wonder Gecko Conservation Planning Workshop

Introduction

The first Wonder Gecko Conservation Action Planning workshop was held on 13th & 14th December 2017 at Mercure Hotel on Jebel Hafeet, Abu Dhabi, United Arab Emirates (UAE). Participants included several stakeholders from the various emirates of the UAE. The principle aim of this workshop was to assemble all the concerned agencies and experts on the Wonder Gecko to conduct a workshop at a national level and draft a Conservation Plan that will guide conservation activities of the species over the coming years.

Workshop attendees at the Wonder Gecko Workshop

The Wonder Gecko (*Teratoscincus keyserlingii*), a recently recognized species from a bigger complex has a wide distribution in portions of countries such as Afghanistan, Pakistan, Iran and the UAE. The population of the Wonder Gecko on the Arabian side is much smaller than that on the Persian side, separated by the Arabian Gulf for several millennia. Although the populations on either side of the Gulf are genetically isolated, there is ongoing research on this. Nonetheless, the population in the UAE is considered distinct for all practical purposes as the chances of the two populations mixing naturally is highly improbable. On this basis, it was considered that the Arabian population would benefit from its own regional assessment so that appropriate conservation actions can be initiated. The information emanating from the experts at the workshop will help in developing a better understanding of the species' distribution, threats, needs and status.

Organizer:

The Environment Agency of Abu Dhabi was the lead organizer, host and sponsor of the workshop.

Participants:

A total of 41 participants attended the two-day workshop and provided their inputs in a series of presentations as well as group working sessions on a regional Red List assessment, and five key themes for the development of the species' conservation action plan. The participants included - Abid Mehmood, Adil Abdullah Al Hosani, Ahmed Al Dhaheri, Ahmed Ali Mohamed, Anitha Saji, Arshad Haroon Toosy, Brendan Whittington Jones, Declan O'Donovan, Eissa Al Hammadi, Gazzali, Greg Simkins, Hassina Ali, Johannes Els, John Pereira, Junid N. Shah, Khaldoun Al Omari, Linda Uyeda, Lisa Banfield, Maher Kabshawi, Mark Preston Wright, Mohammed Mustafa Eltayeb Mohammed, Mohammed Al Remeithi, Myyas Alqarqaz, Nessrine Alzahlawi, Obaid Al Shamsi, Priscilla van Andel, Pritpal Soorae, Rashed Al Zaabi, Ricardo Pusey, Sabitha Sakkir, Sai Ravi Krishna Tubati, Salvador Carranza, Sanjay Molur, Saoud Faisal Badaam, Sapna Ramapriya, Shahid Bashir Khan, Shakeel Ahmed, Tariq Al Kharusi, Virgilio Jr. Valdez Pedo, Walid Shabaan Badr and Yassir Hamdan Al Kharusi. A total of 13 institutes from within and outside of UAE participated and two free lancers not affiliated to any institute.

Facilitator:

The workshop was facilitated by Dr. Sanjay Molur, Chair of the Conservation Planning Specialist Group - South Asia Regional Resource Centre, and who is also the Executive Director of Zoo Outreach Organization based in India.

Workshop overview

The aim of the workshop was to develop a conservation plan and Red List assessment for the Arabian population of the Wonder Gecko based on its risk assessment from its past, present and future status in the wild. Four working groups were identified including the vision and mission working group, research needs and action working group, conservation action working group and education and awareness working group. A fifth group on policy was formed within the education working group with the participation of members from the vision group.

After the formal welcome, introductions, logistics and vote of thanks, the workshop began with an overview of the program, schedule and proceedings. Additionally, explanation of the IUCN Conservation Planning Specialist Group (CPSG) process, by Sanjay Molur, including the history of the organization, and the important aspects of conservation planning. This was followed by

presentations from the three Wonder Gecko range Emirates - Abu Dhabi by Ahmed Ali Mohamed, Dubai by Junid N. Shah, and Sharjah by Johannes Els. A scientific presentation on the genetics of the Wonder Gecko was also given by Salvador Carranza, which provided the basis for the justification for the regional assessment and planning.

Sanjay provided a very brief overview of the IUCN Red List and led the participants as a group through the regional Red Listing process for the Wonder Gecko. The population data that was initially compiled by a few experts, was enhanced by more information from the field through the input provided by participants at the workshop. The earlier regional assessment for the Wonder Gecko within the UAE, which was categorized as Endangered due to restricted distribution and threats, was revised by the group based on the collective knowledge of the experts present. The participants arrived at a new risk assessment for the Wonder Gecko in UAE as ***Critically Endangered*** based on the past, ongoing and predicted declines in the populations due to the various developmental activities such as urbanization and development throughout almost all of the species' distribution range.

The new information opened up a wide-ranging discussion on the distribution, ecology, threats, and population decline, which resulted in a combined understanding of what is required to ensure the long-term viability of the species in the Arabian Peninsula. Discussions on the cultural considerations and local beliefs about the species were held, with the group indicating that there is an urgent need to work towards the conservation of the species, given that its presence represents a source of pride and that its protection would be in line with local, national and international strategies and commitments. Based on the new assessment the participants decided to have four working groups looking at the various topics.

VISION & MISSION

This group reviewed draft statements and based on the discussions during the Red Listing process came up with more defined statements.

Vision: Conserve viable and genetically diverse populations of Wonder Gecko in their natural habitats within the United Arab Emirates.
Mission: To understand the status, ecology and threats of the Wonder Gecko in the UAE, and use this research to develop science based conservation, education and policy programs that help achieve viable populations in their natural habitats.

RESEARCH NEEDS

Specific actions discussed by the group included, but were not restricted to:

- **AIM 1**: Understanding the distribution, abundance, biology and threats of the Wonder Gecko within the UAE.

⇒ Conduct literature reviews and baseline surveys for Wonder Gecko.

⇒ Conduct site-specific biological studies to assess the species abundance and other aspects related to the species ecology.

EDUCATION & AWARENESS

This group dealt with outreach and ways to raise the profile of the Wonder Gecko and ensure its conservation was seen as a national priority:

- **AIM 1**: Raising awareness about the Wonder Gecko amongst government, private sectors and key stakeholders including local communities
  - ⇒ Utilize existing social media platforms to spread information on the species.
  - ⇒ Communicate with relevant government stakeholders on the important habitat and sites.
  - ⇒ Mainstreaming the Wonder Gecko into the biodiversity of the UAE e.g. importance as other charismatic species.
- **AIM 2**: Highlighting the important ecosystem function of the species and the ecosystem services provided by its preservation. Specific functions associated with the species include soil aeration through burrows, preying on insects, as well as serving as indicator species of healthy sand sheets and low dunes, in addition to their intrinsic value. This would allow the community to understand the benefit of this species. Specific actions could include:
  - ⇒ Citizen science and community engagement.
  - ⇒ Information both at a national and regional level (focusing first on national).
  - ⇒ Developing guidelines on the ethics of handling and photographing wildlife species in the UAE.

CONSERVATION ACTIONS

Specific actions discussed in the group centered around the below topics:

- **AIM 1**: Ensuring Wonder Gecko important areas/habitats are integrated into land-use planning and protected areas networks.
  - ⇒ To identify and map Wonder Gecko important areas.
  - ⇒ To integrate these habitats into existing and planned Protected Area networks.
- **AIM 2**: Ensuring all captive conservation programs are managed to internationally acceptable standards and linked to *in-situ* conservation programs.

- ⇒ Create and develop standards e.g. guidelines, protocols, etc. (including translocation protocols).
- ⇒ Promote the implementation of the guidelines at a Federal level by all relevant institutions.

- **AIM 3**: To develop scientifically sound recovery and reintroductions programs that follow relevant guidelines, protocols and legislation.
  - ⇒ Create and develop standards e.g. guidelines, protocols, etc.
  - ⇒ Promote the implementation of the guidelines at a Federal level by all relevant institutions.
- **AIM 4**: *In-situ* management
  - ⇒ Research and monitoring.
  - ⇒ Protected area status and development.
  - ⇒ Disease surveillance.
  - ⇒ Genetic research and meta-population management.
  - ⇒ Coordination between Agencies.
- **AIM 5**: *Ex-situ* management and conservation translocations and re-introductions.
  - ⇒ Captive collections and coordination.
  - ⇒ Studbook development.
  - ⇒ Disease and genetic management.
  - ⇒ Develop basic guidelines which can be used by conservation agencies and for managing any translocations involving development projects.

POLICY

This group worked within the education and awareness working group and recommended the below specific policy actions for the conservation of the species:

- Federal and local laws - there is a need to revise the appendices of UAE Federal law 24 of 1999 to include Wonder Gecko. These laws must be well integrated in the development permitting process and well enforced.
- Development mitigation policies need to integrate measures that prioritize the protection of the species. Catch and release (relocation) conducted by developers does not usually conserve species successfully. Stricter conditions must be implemented in development permits to allow for the successful protection and monitoring of the species *in-situ*.

Wonder Gecko workshop organization details

Technical Core Committee

A technical committee comprising of the below mentioned people and organizations managed the coordination before and after the workshop.

Technical Core Committee	
Person	**Organization**
Pritpal Soorae/Ahmed Ali	EAD
Johannes Els	Breeding Center for Endangered Arabian Wildlife (BCEAW)
Junid N. Shah	Dubai Municipality
Mayas Al Quarqaz	Al Ain Zoo
Sanjay Molur	Conservation Planning Specialist Group

Workshop Organization & Venue Location

The workshop was held at the Mercure Hotel, Jebel Hafeet, Al Ain.

Timing

- 13th December 2017
  - ⇒ Registration from 3 pm to 8 pm
  - ⇒ Barbecue dinner and ice-breaker
- 14th December 2017
  - ⇒ Breakfast - 6:30 am to 7:45 am
  - ⇒ Workshop - 8:00 am to 5:00 pm

Agenda	Person	Time
Welcome Speech	Dr. Shaikha Al Dhaheri, Executive Director, TMBS - EAD	08:00 - 08:20 hrs
Overview of the workshop process, housekeeping, etc.	Pritpal Soorae	08:20 - 08:30 hrs
Introduction to the CPSG workshop process	Sanjay Molur	08:30 - 08:40 hrs
Abu Dhabi emirate Update	Ahmed Ali	08:40 - 08:50 hrs
Dubai emirate Update	Junid N. Shah	08:50 - 09:00 hrs
Sharjah emirate update	Johannes Els	09:00 - 09:10 hrs
Genetic research on the Wonder Gecko	Salvador Carranza	09:10 - 09:30 hrs
Start of the main workshop process	Sanjay Molur	
Quick overview of the IUCN Red List process and Wonder Gecko status assessment	Sanjay Molur	09:30 - 10:30 hrs
Overview of the Conservation Action Plan Strategy and Vision and setting up working groups	Sanjay Molur	10:30 - 11:00 hrs
Coffee break		11:00 - 11:20 hrs
Working groups	All participants	11:20 - 12:10 hrs
Plenary	All participants	12:10 - 12:30 hrs
Lunch break and checkout		12:30 - 14:00 hrs
Working groups	All participants	14:00 - 14:50 hrs
Plenary	All participants	14:50 - 15:10 hrs
Commitments, responsibilities and future action	All participants	15:10 - 15:40 hrs
Coffee break and brainstorming on other herpetological issues for the UAE	Johannes Els	15:40 - 16:00 hrs
Workshop closure	All participants	16:00 -16:10 hrs

The workshop participants worked on an initial draft of the Vision, but redrafted it after the regional Red List assessment, which assessed the Wonder Gecko as a Critically Endangered species, threatened with extinction in the next three generations (in 25 years) due to threats from urbanization and development. The reworked Vision took the predicted decline into account and focused on working towards eliminating the extremely high risk of extinction to the species in the United Arab Emirates.

Working Group Participants:

Abid Mehmood, Arshad Haroon Toosy, Myyas Alqarqaz, Nessrine Alzahlawi, Shahid Bashir Khan and Salvador Carranza.

Institutions:

Al Ain Zoo, Barari Forest Management, Environment Agency Abu Dhabi, Institute of Evolutionary Biology (CSIC-UPF).

VISION

Conserve viable and genetically diverse populations of Wonder Gecko in their natural habitats

A small group of participants worked further on the Mission based on the Vision statement to incorporate the different discussion points arising from the Red Listing as well as the presentations on the taxonomy, genetics, threats, ground situation, protected areas, land use, and other factors affecting the species' range and status. Working on some common points that were highlighted, the group drafted the Mission statement to encompass all of the possible and much needed strategies to ensure a viable future for the Wonder Gecko in UAE.

MISSION STATEMENT

To understand the status, and ecology of the Wonder Gecko in the UAE, and develop science based conservation, education and policy programs that help achieve viable populations in their natural habitats.

2. Research Needs and Actions Working Group

Based on the discussions during the regional Red List assessment of the Wonder Gecko in UAE, several key components were identified as requiring special attention to compile a holistic conservation action plan. Research needs were specifically identified for this area, which would help the Conservation Actions group and its mandate to be followed up scientifically and systematically with protocols developed and administered by research on the ground.

The Research Needs and Actions working group discussion on the Wonder Gecko was broken into a number of strategic points. The primary requirement was to set a standard survey protocol. This should be both easy for data collection as well as repeatable by subsequent researchers/ surveys.

In this respect the discussion was broken down as follows:

Item	Details and Actions	Time Scale
STANDARDISE THE SURVEY PROTOCOL	1. It was agreed that to avoid confusion and make the process accessible to all, a paper first approach would be taken. Once the base data was collected on paper forms, others could work on converting this to more complex collection suites such as ARCGIS collector app or other databases as they see fit. 2. It was agreed that a tick box format was best to avoid too much writing. **Actions:** 1. As the design of the form would be a complicated procedure, it was decided to leave it to the final working group to be set up after the workshop. 2. Examples of data collection forms from participants such as for example **Salvador Carranza** who would share a sample data collection form for genetic analysis and **Lisa Banfield** who also agreed to share an example used in sand cats. **Declan O'Donovan** also agreed to share his forms for *Uromastyx sp*. These would be forwarded to the facilitator who would then incorporate all of these points in a final data collection form. The working group would develop the final protocol and a grid based survey system while taking into account data ownership and an agreed identification protocol.	**Time Scale:** **Mid 2018**

Item	Details and Actions	Time Scale
STANDARDISE IDENTIFICATION PROTOCOL	1. There was a discussion as to the practicalities and options available for the permanent identification of the species. Of the two potential identification methods which were identified, the first would require a detailed morphometric analysis of the animal (possibly using photos and associated software). While this is certainly a possible means of identification, a standard data collection and analysis protocol would again have to be developed to allow repeatability and follow up census techniques. 2. The second method of identification would involve the application of RFID/PIT (Radio-frequency identification/ Passive Integrated Transponder) tags. However, there were many comments as to how thin the skin of this species was and the associated risk of damage when using conventional 11 mm animal RFID units. **Actions:** 1. **Junid N. Shah** agreed to look at morphometric identification using photo based software analysis. He also agreed to look at developing a correlation factor to calculate age etc. **Johannes Els** to send photos with known aged animals from BCEAW (with measurement scale) to assist in the development of the age correlation factor. 2. There are also 8 mm units of which **Salvador Carranza** was to leave a sample for **Johannes Els** to test on some of his animals. Non encrypted ISO chips should be used to enable easier reading by the variety of reading modules now available.	**Time Scale: Mid 2018** **Time Scale: Mid 2018** **Time Scale: Mid 2018** **Time Scale: Mid 2018**

Item	Details and Actions	Time Scale
DATA SHARING	1. This was recognised as an important action point in taking surveys and monitoring protocols for Wonder Gecko forward. 2. It was agreed by all that it was essential to identify priority areas which have not been surveyed previously and target these for future surveys. **Actions:** 1. As a precursor to future data sharing **Salvador Carranza** agreed to share historic and current locality information. This information would be reviewed by current researchers and any areas where people have data that is not in the global database should be added to the database. If an area is surveyed, presence/absence should be recorded to allow for inclusion or exclusion in future or follow up surveys 2. Both current and historical data should be mapped using GIS to determine priority areas on an Emirate basis. **Coordinators:** **Ahmed Ali Mohamed** / **Ricardo Pusey** for Abu Dhabi; **Junid N. Shah** for Dubai and **Johannes Els** for Sharjah.	**Time Scale: Mid 2018** **Time Scale: Mid 2018** **Time Scale: Mid 2018**

<table>
<tr><th>Item</th><th>Details and Actions</th><th>Time
Scale</th></tr>
<tr><td>DATA SHARING</td><td>A general discussion ensued about the behaviour of the species and most suitable times post full moon to complete any survey work.</td><td>Time Scale:

<table><tr><th>Month</th><th>Duration</th></tr><tr><td>May 2018</td><td>8th to 22nd</td></tr><tr><td>June 2018</td><td>6th to 20th</td></tr><tr><td>July 2018</td><td>6th to 19th</td></tr><tr><td>August 2018</td><td>4th to 18th</td></tr><tr><td>September 2018</td><td>3rd to 17th</td></tr><tr><td>October 2018</td><td>2nd to 16th</td></tr></table></td></tr>
<tr><td></td><td>One of the priority areas to consider is data ownership and how the ownership of this shared data is managed.
Actions:
It is suggested that this is looked at by the Executive of the Conservation Action Plan/Working Group as a priority.</td><td>Time Scale: On priority.</td></tr>
<tr><td>TAXONOMIC SURVEY</td><td><u>Salvador Carranza</u> has stated that funding is available and work is ongoing on the taxonomy of the species. Further results will be published as they are determined.</td><td></td></tr>
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Item	Details and Actions	Time Scale
POPULATION TRENDS	1. It was suggested that a comprehensive literature search be completed to determine best practice for similar species. After discussion no one could definitively state what the best repeat period to determine actual population trends would be. 2. It was also suggested that more intensive surveys of known populations be conducted using standardized methodology to help determine population trends. Suggested sites would be Ghantoot/Sharjah/Dubai. **Actions:** 1. **Junid N. Shah** agreed to look at this. 2. **Salvador Carranza** agreed that as a start he would use past and current data layered on google earth to determine survey area and to reduce the possibility of repeat surveys of low value sites. **Salvador Carranza** has the data and can calculate and distribute these maps.	**Time Scale: Mid 2018** **Time Scale: 2018 survey period** **Time Scale: Mid 2018** **Time Scale: 2018 survey period**
DETAILED SURVEY	In tandem with the above population trend data, it was agreed that more detailed surveys were required. **Actions:** 1. Some volunteers to manage these would be in Abu Dhabi, western region, coastal area Environment Agency - Abu Dhabi and Al Ain Zoo with **Mark Preston Wright** from Emirates Park Zoo who also volunteered to assist; **Junid N. Shah** volunteered for Dubai, while **Johannes Els** volunteered for the northern Emirates. 2. It was suggested that a Survey Working Group should meet in Jan 2018 to discuss the Survey Protocol developed by **Johannes Els** and **Ricardo Pusey**. A general call was sent out that anyone with data capture forms which might be of use should send to **Johannes Els** and **Ricardo Pusey** to extract relevant points by Mid 2018.	**Time Scale: Mid 2018**

Item	Details and Actions	Time Scale
TRAINING	1. There was a short discussion on the possibility of training volunteers in survey techniques. While this was welcomed, caution was advised with regards to site privacy and security. **Actions:** 1. It was suggested a possible source for volunteers would be the Natural History Groups (NHG) of the respective Emirates.	**Time Scale: This was not considered a priority and should be considered for the 2019 season.**
LIFE HISTORY & ECOLOGY	1. Little is known about the life history and ecology of the species in the wild. **Actions:** 1. **Lisa Banfield** had recently acquired GPS tags and she suggested that she would test these on an Al Ain Zoo population for effectiveness. Depending on the results of these it would be rolled out to a specific site after trial. This site would be determined by the Conservation Action Working Group.	**Time Scale: Al Ain Zoo trial to be done Mid 2018 and in the field by late 2018.**

Item	Details and Actions	Time Scale
DIET REQUIREMENTS/ FAECAL ANALYSIS	1. It was suggested that during survey events, faecal samples should be collected fresh from the animal or when seen at the burrow if they can be linked to an animal. 2. There was another suggestion to install light traps to determine prey species available as food source. **Actions:** 1. **Anitha Saji** agreed to do the invertebrate analysis for these and agreed to complete this in association with the animal surveys. A further protocol needs to be developed for this.	**Time Scale: The collection and handling protocol of these samples should be developed before the survey season commences in May 2018.**
HABITAT/MICRO HABITAT REQUIREMENTS	1. It was suggested that data returned from any GPS tags or RFID traps be utilised to determine issues such as burrow fidelity, burrow requirements, sex preferences, etc. It was suggested that population monitoring should be carried out in the 3 specific sites listed above. 2. Further suggestions included the possibility of conducting soil surveys to determine microanalysis of the substrate and to determine any commonalities between sites. This was not taken further and would require input from geology professionals.	
ANIMAL HEALTH	There has been no health monitoring of the populations. **Actions:** 1. It was suggested that a possible baseline survey be completed on the captive populations at **Breeding Centre for Endangered Arabian Wildlife** and **Al Ain Zoo**. 2. Techniques developed here could be used during the survey and capture parts of future surveys. 3. A detailed health investigation protocol would need to be developed in consultation with the veterinary personnel from both **Breeding Centre for Endangered Arabian Wildlife** and **Al Ain Zoo** or any other facilities that would be interested.	

Item	Details and Actions	Time Scale
COMPETITION FROM OTHER SPECIES/ DISTURBANCE	One of the limiting factors which has not been investigated during the past surveys was whether there were any consequences of disturbance or competition from other species. **Actions:** 1. It was suggested that this could be a sub part of the data collection protocol for the general survey of potential and existing sites. 2. This would include looking at possible competition from other species, disturbance from tourism/cars. 3. A resilience factor could be added which would indicate how the surveyor believed the animals coped with any disturbance/competition.	**Time Scale: During surveys**

Adult Wonder Gecko © EAD

Item	Details and Actions	Time Scale
THREATS	1. As time was running out there was not a great deal of time allocated to threats either recognised or perceived. Those that were covered included feral species such as cats and red foxes. Development was considered to be a major threat either in the form of new roads, construction of fenced areas and industrial developments. One of the more common threats was that of recreational land use for desert camping and off-roading. With the associated change in land use, the potential of larger negative impacts through overgrazing increases dramatically. 2. With the increased information available about the species publically, a potentially new recreational threat would be that of herping whereby guides bring tourists to herpetological sites highlighted in these Conservation Action Plans (CAP's) and through other media. This can lead to serious disturbance to the site as well as disturbing the behaviour of the animals observed. There has been no information collected on the impact of collection for trade purposes or whether this exists. Perhaps, as with tourist herping, this might be a possible future threat. 3. Climate change, while a continuing threat, would be a little harder to quantify without proper baseline data in relation to distribution and numbers. A possible further related threat would be that of climate modification as might be the case with cloud seeding throughout the UAE.	

Item	Details and Actions	Time Scale
THREATS	**ACTIONS** 1. Actions which are currently been worked on include the development of the survey protocol. This should be available before the proposed first 2018 survey session in May. 2. In tandem with this it was agreed that there should be coordinated surveys between emirates as above. These can be organised by the executive from the Working Group. 3. It was also suggested that bridges be built between Universities both locally and internationally with a view to the possibility of post graduate research programmes such as Masters or PhD's. 4. Using tools such as Google Earth, it should be possible to identify potential protected/conservation areas which should be the focus of future survey/conservation efforts. This would tie in with a further action whereby potential translocation sites would be identified and where potential future areas of threat would be identified. 5. The question was also asked whether there should be future research workshops and whether these should be either annual or biannual or once in 3 years. 6. It was also suggested that requirements which should be included in EIS procedures be developed and attempts made to include it in future Governmental legislation. **Important note:** At all times the health and welfare of the animal is of paramount importance. This has to be followed by the health and welfare of the researcher/survey personnel. Detailed SOP's/Management Protocols should be developed to manage the handling and capture of the species. These protocols should include detailed instructions on the safe capture/restraint, implanting of RFID/PIT tags, tracking devices, etc. Consultation with veterinary advisers in the development of these would be advised.	

Item	Details and Actions	Time Scale
THREATS	**Research Needs & Actions Working Group participants** Ahmed Ali, Anitha Saji, Declan O'Donovan, Junid N. Shah, Eissa Al Hammadi, Gazzali, Greg Simkins, Johannes Els, Lisa Banfield, Mark Preston Wright, Pritpal Soorae, Ricardo Pusey, Sabitha Sakkir, Salvador Carranza, Saoud Faisal Badaam, Shakeel Ahmed, Walid Shabaan Badr and Yassir Hamdan Al Kharusi. **Institutions:** Al Ain Zoo, Breeding Centre for Endangered Arabian Wildlife, Environment Agency - Abu Dhabi, Emirates Park Zoo and Institute of Evolutionary Biology (CSIC-UPF).	

Highlights of the Wonder Gecko workshop

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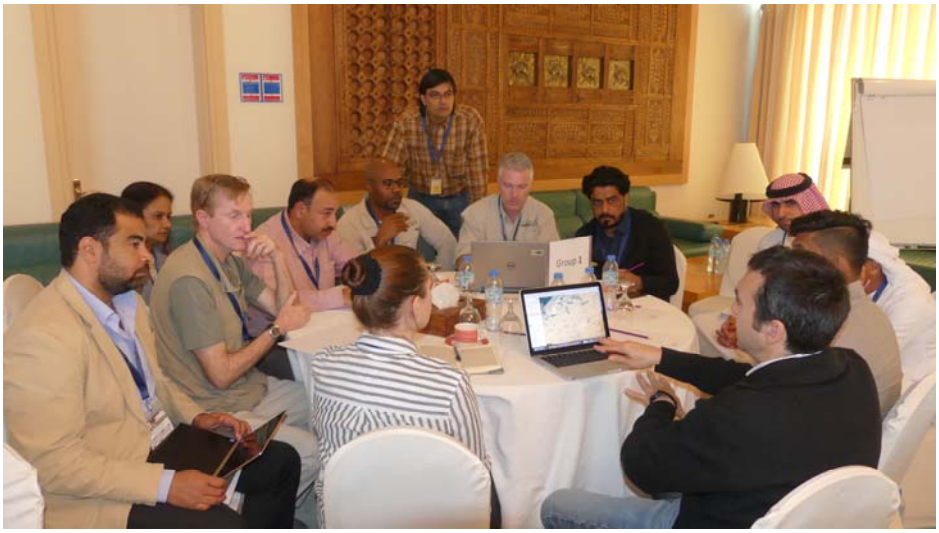


Photo credits © EAD

3. Conservation Needs Working Group

The Conservation Needs Working Group focused on actions in place and needs for the conservation of the Wonder Gecko based on the details of the IUCN Red List of Threatened Species - Species Information System. Following the regional Red List assessment of the Wonder Gecko for the United Arab Emirates distribution, and the risk assessment indicating the status of the Arabian population as Critically Endangered, it was imperative to understand the conservation actions in place, and identify priority areas of need for conserving the species as per the Vision. The group discussed available information (both literature and personal experiences) and the specific needed actions.

It was broadly understood that the organizers and hosts in Abu Dhabi would be the primary stakeholders responsible for following up with the recommendations along with equivalent organizations of the other emirates in which the species is currently known from. Although broad budget requirements were not provided due to paucity of time, the action points provide the direction for a meaningful follow up to help conserve the Wonder Gecko in the UAE.

Working Group Participants:

Brendan Whittington Jones, Hassina Ali, John Pereira, Khaldoun Al Omari, Linda Uyeda, Maher Kabshawi and Mohammed Al Remeithi.

Institutions:

Environment Agency - Abu Dhabi, Environment & protected Areas Authority (EPAA), Ministry of Climate Change & Environment (MOCCAE), zoOceanarium Group

Juvenile Wonder Gecko © EAD

Conservation Action	In-place	Required
1. Land Protection		
1.1 Site/area protection	Limited formal site protection is in place specifically for the Wonder Gecko. Only Misanad in Sharjah Emirate is protecting area specifically for the Wonder Gecko. Areas of protection in the UAE the Wonder Gecko is currently believed to occur Sharjah emirate - Misanad Sharjah emirate - Dhuleimah Dubai emirate - Jabal Ali Dubai emirate - Al Marmoon (possible) Abu Dhabi emirate - special environmental area - Kizad triangle Abu Dhabi emirate - Ghantoot (possible) Other Emirates - Unknown	**Short to Medium Term:** ⇒ Environment agencies for each Emirate to clarify areas to be surveyed - Abu Dhabi, Sharjah & Dubai in process. ⇒ Identify the relevant agency or organization to carry out the field survey/distribution range studies. ⇒ Define coordinates of protected areas or areas of special habitat for Wonder Gecko to clarify spatial layers. ⇒ Get clarity on who the stakeholders are for approval for development projects and especially where multiple agencies are involved - urban planning councils, public works, and municipalities. These agencies have the decision-making authority to eliminate or avoid developing Wonder Gecko range areas. ⇒ Issue high level, multi-agency bulletin to inform high level decision makers about sensitivity of specific areas (based on known data). ⇒ Standardization of data across emirates for habitat mapping and classification in a format that is clear and understandable. ⇒ Immediately share current plot data with relevant development stakeholders as survey planning takes place in the background. ⇒ Ensure inter-agency consultation for land allocation process -decision makers must be informed by current and possible future distribution data. **Long Term:** ⇒ Conservation planning must ensure habitat connectivity is secured. ⇒ National prioritization of the species in a similar manner to Ghaf - a local tree species. ⇒ More protected areas with the clear intention of securing Wonder Gecko habitat and populations.

Conservation Action	In-place	Required
1. Land Protection		
1.2 Resource & habitat protection	Limited formal habitat protection is in place specifically for the Wonder Gecko. Only Misanad in Sharjah Emirate is protecting area specifically for the Wonder Gecko.	⇒ Clarification on microhabitats required for persistence of Wonder Gecko. ⇒ Distribution must be refined to increase requirement stringency for development plot allocations. Refined areas will guide more stringent processes. ⇒ Distribution mapping must include relevant buffer zones to allow for distribution plasticity in response to climate change and development threat.
2. Land Management		
2.1 Site/area management	No direct management for Wonder Gecko in place.	⇒ No management requirements have been identified as needed yet.
2.2 Invasive/ problematic species control	No studies in place.	⇒ Understanding of actual risk to Wonder Gecko persistence vs assumed risk.
2.3 Habitat & natural process restoration	No active restoration and recovery of areas by natural dynamics after fencing to reduce direct anthropogenic and livestock impact. Abu Dhabi where listed impacts are restricted from white sands by fencing, vegetation is recovering. Sharjah fence exclusion is allowing vegetation recovery in the absence of public-access vehicles and camels.	⇒ Clarification on microhabitat requirements will explain what restoration (if any) is required at particular sites to ensure Wonder Gecko persistence. ⇒ With above understanding, decisions to be made on total fenced exclusion of vehicles, recreational campers and livestock or on partial exclusion of potentially damaging activities.

Conservation Action	In-place	Required
3. Species Management		
3.1 Species management		
3.1.1 Harvest Management	Not applicable as this is not an issue.	⇒ None Required.
3.1.2 Trade management	Not applicable as this is not an issue.	⇒ None Required.
3.1.3 Limiting population growth	Not known.	⇒ Not known, but not identified as a priority research area.
3.2 Species recovery	No specific species recovery actions in place.	⇒ Identify habitat based on feedback from research in or adjacent areas to where it is being or intended to be protected. ⇒ Establish a potential source population of Wonder Geckos *in-situ* or *ex-situ* if recovery is agreed on. ⇒ Define the parameters of a "viable population" of Wonder Gecko. ⇒ Understand site size requirements for establishment of viable population. ⇒ Establish recovery guidelines based on IUCN Reintroduction Guidelines. Research must inform the finer ecological and behavioral details required to implement viable recovery. ⇒ Define what a viable recovery is. ⇒ Secure protection for those sites by relevant designation agency i.e. EPAA, EAD, etc. ⇒ Implement active rehabilitation where relevant or isolate and allow for natural recovery. ⇒ Agency species specialist must agree habitat suitable for recovery/ reintroduction. ⇒ Post-release monitoring.

Conservation Action	In-place	Required
3. Species Management		
3.3 Species re-introduction		
3.3.1 Reintroduction	None in place. Prior reluctance for this action was due to genetic concerns and those have now been clarified.	⇒ Follow same steps as for species recovery.
3.3.2 Benign introduction	Not in place.	⇒ Not identified as a priority action.
3.4 *Ex-situ* conservation		
3.4.1 Captive breeding/ artificial propagation	Not in place.	⇒ Identify any Wonder Gecko populations under immediate or likely threat from development. ⇒ Establish founder population in each Emirate based on areas designated for development. ⇒ If no immediate threat identify areas which can provide individuals to be basis as an *ex-situ* propagated founder population. ⇒ Establish a joint Emirate population based on an SSP with a studbook and driven by BCEAW. ⇒ Characterize genetic identity of the founder population and set diversity parameters that need to be maintained. ⇒ Depending on the results sample again in 5 years.
3.4.2 Genome resource bank	Yes, in place.	⇒ Yes and continue to maintain genome resource bank.

Conservation Action	In-place	Required
4. Education & Awareness		
4.1 Formal education	Not in place.	⇒ Yes, urgently needed.
4.2 Training	Not in place.	⇒ Yes, urgently needed.
4.3 Awareness & communications		⇒ Yes, urgently needed. ⇒ Integrate with other species along the flagship concept ⇒ Must be caution around the tourism/photographic pressure associated with profiling the animals
5. Law & Policy		
5.1 Legislation		
5.1.1 International level	No	⇒ No
5.1.2 National level	No	⇒ Yes, needed on priority. ⇒ Federal Law 24 (1999) and need to review the annexes and include Wonder Gecko. ⇒ Letter by any/each Emirate to Biodiversity department at MOCCAE to justify additional protection for the Wonder Gecko. This can then be protected by ministerial decree or as an annex to Fed Law 24. No hunting, catching, selling, etc. unless approved by the competent authority. Any violation can be prosecuted by law. ⇒ Hunting Law (1983). ⇒ Animal Welfare Law. ⇒ Should be added to the list of animals that it is illegal to hold in captivity.

Conservation Action	In-place	Required
5.1.3 Sub-national level	Not in place.	⇒ Yes, needed on priority. ⇒ Each Emirate has its own laws to prevent any harm - killing, hunting, damage etc. so particular law must be amended to allow prosecution if this violation occurs. ⇒ Every development listed for Wonder Gecko territory needs a thorough EIA review process and should ideally be prevented by the earlier listed process of engaging with stakeholders.
5.2 Policies and regulations	Not in place.	⇒ Yes, needed on priority. ⇒ National and emirate scale policies related to agricultural allocation and livestock grazing spatial use needs to be clarified and spatially mapped. ⇒ In addition to other species under threat, areas of higher priority conservation should be listed as restricted from development and/or livestock grazing and/or public vehicle access.
5.3 Private sector standards & codes	Not in place.	⇒ Should be subject to stringent national environmental policy and open to prosecution and/or penalties if violate federal or emirate policy.
5.4 Compliance and enforcement		
5.4.1 International level	Not in place.	⇒ Not identified as an urgent need.
5.4.2 National level	Not in place.	⇒ Yes, needed on priority. ⇒ Must be protection enforced according federal and emirate laws. ⇒ Workshop/discussions to be held with respective law enforcement authorities in regard to habitat sensitivity and where to drive when carrying out duties. Significant concern remains about driving patrols or enforcement actions causing habitat damage of sensitive Wonder Gecko habitat. ⇒ Consensus should be reached between conservation planners and law enforcement representatives about considerations on where to drive if there is no clear track access.
5.4.3 Sub-national level		⇒ Yes, needed on priority and similar to the needs at the National level.

Conservation Action	In-place	Required
5. Livelihood, Economic & other incentives		
6.1 Linked enterprises & livelihood alternatives	Not applicable as there are no communities or stakeholders dependent on the species.	⇒ None required.
6.2 Substitution	Not applicable as there are no communities or stakeholders dependent on the species.	⇒ None required.
6.3 Market forces	Not applicable as there are no communities or stakeholders dependent on the species.	⇒ None required.
6.4 Conservation payments	Not applicable as there are no communities or stakeholders dependent on the species.	⇒ None required.
6.5 Non-monetary values	Not applicable as there are no communities or stakeholders dependent on the species.	⇒ None required.

4. Education and Awareness Working Group

Naturalists from every corner of the world have at least one experience that is common - interactions with nature in our formative years that instilled in us a basic love for wildlife and wilderness. That love eventually led each of us to a career in natural science. While no single interaction with nature is necessarily life changing, the cumulative effect of spending time outdoors is a deep love of and respect of nature.

For many environmental education programs, facilitating connections to nature is the end goal, which may also have benefits both for students and for the natural areas they are exploring. Exposure to nature can be one of the best ways to hone skills in observation and critical thinking about the world around us. Some argue that in our increasingly urban modern world, a deficit in interactions with nature is actually detrimental to a child's development.

An education in natural history certainly instills conservation ethics, but the more we learn about the challenges wildlife face, the more we realize that it is necessary to change peoples behaviors in ways that can solve environmental problems. Conservation education projects come in many different forms, there are small scale conservation awareness efforts such as distribution of posters to inform the public. The key to making environmental education into a conservation action is to establish a solid foundation of natural history knowledge and then take it a level further, changing people's behavior in a way that will mitigate a conservation threat. The education and awareness working group in the Wonder Gecko Conservation workshop consisted of similar-minded participants with an interest in putting the species on the map and in the minds of the people of UAE.

OBJECTIVES

The working group started the proceedings with the following objectives:

1. To be able to educate the public, children, enthusiasts and the like to save and preserve the Wonder Gecko.
2. To be able to raise awareness through national campaigns in all print and media platforms.
3. To develop a strategic plan on how to integrate environmental education into conservation action.

CAMPAIGNS AND CONSTITUENCY-BUILDING

A strategic and comprehensive campaign over a sustained period of time can do more than just tell a good story about the Wonder Gecko conservation project - it is the instrument in shaping how people think and talk about wildlife, biodiversity and conservation. Communications campaigns rely on a number of channels to reach a few target audiences. These channels include

stories in newspapers, on the radio, on TV, and in professional Blogs, digital media like social media, e-newspapers, websites and organizational blogs and community outreach such sponsorships, tabling at events and film screenings. While a single story in a national newspaper may not change the hearts and minds of its readers, the repetition over time of targeted messages through compelling stories and beautiful images of Wonder Gecko can encourage seeing the intrinsic value of the natural world and its connection to nature.

SCHOOL CURRICULUM INTEGRATION

The first step in building an effective campaign for this project is targeting the school or academic audiences. Through integrating Science and Biology classes and biodiversity related topics within the curriculum, information on on the ecosystem importance of the Wonder Gecko can be provided.

Many teachers are interested in bringing science and other curricula to life through hands-on, local opportunities for their students to learn critical thinking skills and problem solving skills. Teachers also seek opportunities for professional growth, particularly those that align with the lesson and concepts they are required to deliver in the classroom.

Once classroom activity or lesson combined with a school field trip to Al Ain Zoo, Dubai Safari, Sharjah Conservation Center or any local nature center could allow students to learn to identify reptiles and learn the differences between geckos and other lizards first hand and what to do if they encounter Wonder Geckos in the desert.

Some practical designs in educational programs for school children:

1. Work closely with local teachers to pilot activities and materials linked to local school curriculum and standards.
2. Emphasized place base activities rooted in the natural history and concerns of the community.
3. Create opportunities for teachers and students to work with scientist solving real-world problems, for example, field trips in Al Ain Zoo, Sharjah Conservation Center, Dubai Safari, etc.
4. If offering fieldtrips, follow up with activities and materials for use back in the classroom and support their implementation.
5. Suggest ideas for supplementary activities that can be modified for a variety of age and ability levels.
6. Make a detailed plan for teacher training programs, distributing the program materials to teachers, and for follow up activities.
7. Front end evaluation and through learning outcomes measure the success of the programs

directly through surveys.

8. Promote ideas for how interested students might help you achieve the “Wonder Gecko Conservation Program” like volunteering and fund-raising activities for these particular conservation programs.

CONSERVATION FESTIVALS

Wildlife festivals promote a variety of social, educational, economic, recreational, and community development goals. As ecotourism activities, wildlife festivals should also promote conservation goals.

Five potential conservation benefits of wildlife festivals generated by providing:

1. Incentives to establish protected areas.
2. Revenue for wildlife and habitat management.
3. Economic impact to nearby areas, encouraging residents to conserve wildlife.
4. Alternatives to practices that cause huge environmental damage.
5. Support for conservation by educating local and non-local participants. The discussion includes wildlife festival examples, along with research and management needs.

EDUCATIONAL INTERACTIVE MOBILE APP

Information technology is one best tool to reach the millennials in catching their attention by developing iOS and Android Apps.

One of the most important things in the fight to save endangered species is data. Just good, plain old data, such as, the size of animal populations, the frequency and location of sighting, environmental conditions, the state and behavior of animal populations, etc. much in the lines of popular apps such as the iNaturalist or eBirds can be of massive importance to researchers and conservation efforts of all Wonder Geckos and other desert species.

Crowd sourcing is where data collection is handled by a large number of people in order to get much better results and more data than would otherwise be possible. Crowd sourcing solves a fundamental problem of data collection with the help of mobile technology, enabling anyone with a smart phone or tablet to collect useful data, which can be of help in conservation efforts.

Real World Examples

The World Wildlife Foundation (WWF) is already operating a crowd sourcing program aimed at helping researchers better understand freshwater fish populations. The project, called

Freshwater Fish BioBlitz, works quite simply: users upload their photos of fresh water fish and tag the location where they took the photo. The photos are then looked over by the curators of the program and expert volunteers including scientists and graduate students who identify the fish in the photos and select photos for inclusion in data archives used by scientists.

The challenges faced by fresh water fish are quite extreme, with nearly one third of all fresh water fish species threatened with extinction. Conservation efforts must act quickly to understand why these populations are being threatened and how it can be stopped, which is where crowd sourcing efforts like Freshwater Fish BioBlitz enable researchers to collect data on previously unprecedented scales.

Such crowd sourcing efforts even offer the possibility of new discovery. There are over 13,000 species of fresh water fish identified so far, with more being discovered surprisingly frequently. An unwitting photo of a fish captured on a mobile could prove a new discovery for the eyes of a seasoned scientist, and crowd sourcing efforts are the way to bridge that gap.

The Instant Wild app provides anyone who wants to help with conservation efforts an easy method of doing so. Providing access to a network of motion sensitive cameras around the world, users of Instant Wild can tune into live feeds to see the latest from these cameras as they snap shots of all sorts of different species. By suggesting identification of the species, users of the app can help build a comprehensive database of information associated with these photos, assisting in the tracking of animal populations and organization of conservation efforts.

WONDER GECKO FILM - A FULL DOCUMENTARY PROGRAM

Exposing people to environmental issues alongside images and sounds of what they could be losing is bound to create a strong argument for conservation. Documentaries are therefore a powerful tool for spreading both information and wonder. Without realizing the consequences of our own action or inaction, both as individuals and nations, we may lose some of the most beautiful species in the world. Nature is not just out there somewhere, in the wilderness of UAE or the Australian outback or rainforest of the Philippines, it is part of every piece of land and sea and we have a responsibility to preserve it and let it flourish.

A full documentary film produced by EAD and MOCCAE with scientific research results and discussed with scientists, environmentalist, conservationist, or alike to become a host on the said film.

NATIONWIDE CAMPAIGN

Stakeholders should launch a national campaign in protecting and preserving the Wonder Gecko and there should be monthly educational programs that may change the people's behavior. The campaign should aim to create awareness on Wonder Gecko and their habitat.

Campaign Story

It may be easy to identify the main messages you would like to push out to the public, but those messages need to be delivered in the form of a story. With some exception, telling a story that people will remember requires incorporating three or four elements of the nine elements of a good story:

1. Timeliness
2. Superlatives
3. Relevancy
4. Conflict
5. Prominence
6. Consequence
7. Proximity
8. Human Interest
9. Quirkiness

REPTILE AWARENESS DAY

On 21st October of every year "Reptile Awareness Day" is celebrated and during this day reptile fanatics can celebrate and share their passion, educate others who may not know about these amazing creatures, and communicate the perils of habitat loss and threats leading to the risk of extinction of many reptile species.

History of Reptile Awareness Day

Reptile Awareness Day (RAD) was created by a group of reptile enthusiasts intent on changing the public image of their beloved scaly friends. Since then RAD has been a popular event for the herpetologically inclined to gather and share their love of the cold-blooded critters that share their lives. From the magnificent Bearded Dragon, playful Geckos, Turtles, and the huge but cuddly Forest Boa, reptiles are increasingly popular pets the world round.

Even zoos get in on the action, using these days to promote awareness of their alligator and crocodile exhibits, and helping to alert the world to the plight of endangered reptiles like the Leatherback Sea Turtles. For reasons from human predation of their eggs to destruction of their habitats, these are many of the worlds reptiles who are nearing extinction.

Reptile Awareness Day is a great opportunity to help educate people on how to protect them, and to launch new programs for Wonder Gecko conservation such as "Adopt a Wonder Gecko"

this is also a good opportunity to sell merchandise such as toys, shirts, caps, mugs, etc. with conservation messages to increase the awareness by wearing and using the said merchandise.

How to Celebrate Reptile Awareness Day

There are a myriad of fascinating and educational ways to celebrate Reptile Awareness Day. If you are looking for a RADical time, you can gather together with local enthusiasts to share your pets, and your stories of love and living with them.

Visit your nearest zoos and see the variety of options they have for making reptiles a part of your life, or just volunteer at a local rescue to help familiarize yourself with the critters that give so many the shivers.

Finally, organize a trip to a local zoo to see the larger reptiles in the world today, and maybe stop in at your local museum to discover their ancient ancestors, the dinosaurs. Everything animal today, at one point or another, is descended from reptiles, so go get to know your ancient ancestors.

SUMMARY AND CONCLUSION

Taking a broader view of education, building interdisciplinary partnerships, and exploring all the different educational tools at your disposal can be a fun and powerful endeavor. While education is often seen as an inherently valued activity, not all educational activities are equally effective at changing peoples behavior in a way that will make a difference for conservation. While most education efforts have indirect value for conservation, the most powerful reptile conservation efforts are those that have a clear understanding of how their education actions directly affect conservation outcomes.

Working Group participants

Ahmed Al Dhaheri, Obaid Al Shamsi, Priscilla van Andel, Rashed Al Zaabi, Sai Ravi Krishna Tubati, Sapna Ramapriya, Tariq Al Kharusi and Virgilio Jr. Valdez Pedo.

Institutions

Al Ain Zoo, Environment Agency - Abu Dhabi, MOCCAE

Teratoscincus keyserlingii

Taxonomy

Kingdom	**ANIMALIA**	**Phylum**	**CHORDATA**	**Class**	**REPTILIA**
Order	**SQUAMATA**	**Family**	**SPHAERODACTYLIDAE**		

Scientific Name: *Teratoscincus keyserlingii*

Species Authority: Strauch 1863

Common Name(s): Keyserlingís Wonder Gecko/ Wonder gecko/ Frog-eyed gecko

Synonym(s):
Teratoscincus keyserlingii STRAUCH 1863
Teratoscincus zarudnyi NIKOLSKY 1896
Teratoscincus keyzerlingii TERENTJEW & CERNOV 1949: 128 (ex errore)
Teratoscincus kevzerlingii - CERNOV 1959: 29 (ex errore)
Teratoscincus scincus keyserlingii - SZCZERBAK & GOLUBEV 1996: 38
Teratoscincus keyserlingii - MACEY et al. 2005
Teratoscincus scincus keyserlingii - ANANJEVA et al. 2006
Teratoscincus keyserlingii - RASTEGAR-POUYANI et al. 2008
Teratoscincus keyserlingii - GARDNER 2009

Taxonomic Notes: *Teratoscincus keyserlingii* from Iran and United Arab Emirates are genetically similar. Arabian population isolated and restricted only to the United Arab Emirates.

Assessment Information
Red List Category & Criteria (Regional for the UAE): Critically Endangered A3c + 4c

Date Assessed: 14.12.2017

Assessor(s): Wonder Gecko Action Plan workshop participants.

Justification:
Although the species has a very wide distribution spanning Iran, Afghanistan, Pakistan and the United Arab Emirates, the population in the UAE is isolated from the bigger distribution in Iran, Pakistan and Afghanistan by the Arabian Gulf. The UAE population is declining rapidly and predicted to decline into the future by over 80% in 25 years or three generations due to various threats such as urbanization, development, and the associated habitat loss leading to severe fragmentation and isolated small populations with declines in the extent of occurrence, area of occupancy, and quality of habitat.
In the Arabian Peninsula the species was earlier considered Endangered due to its restricted distribution undergoing continuing decline under B1ab(iii) on the basis that it occurs over a distribution range of less than 5,000 km^2 and area of less than 100 km^2, occurs as highly localized subpopulations which are

considered severely fragmented and there is a continuing decline in the quality of its habitat and the number of mature individuals due to pressure from coastal development and harvesting.

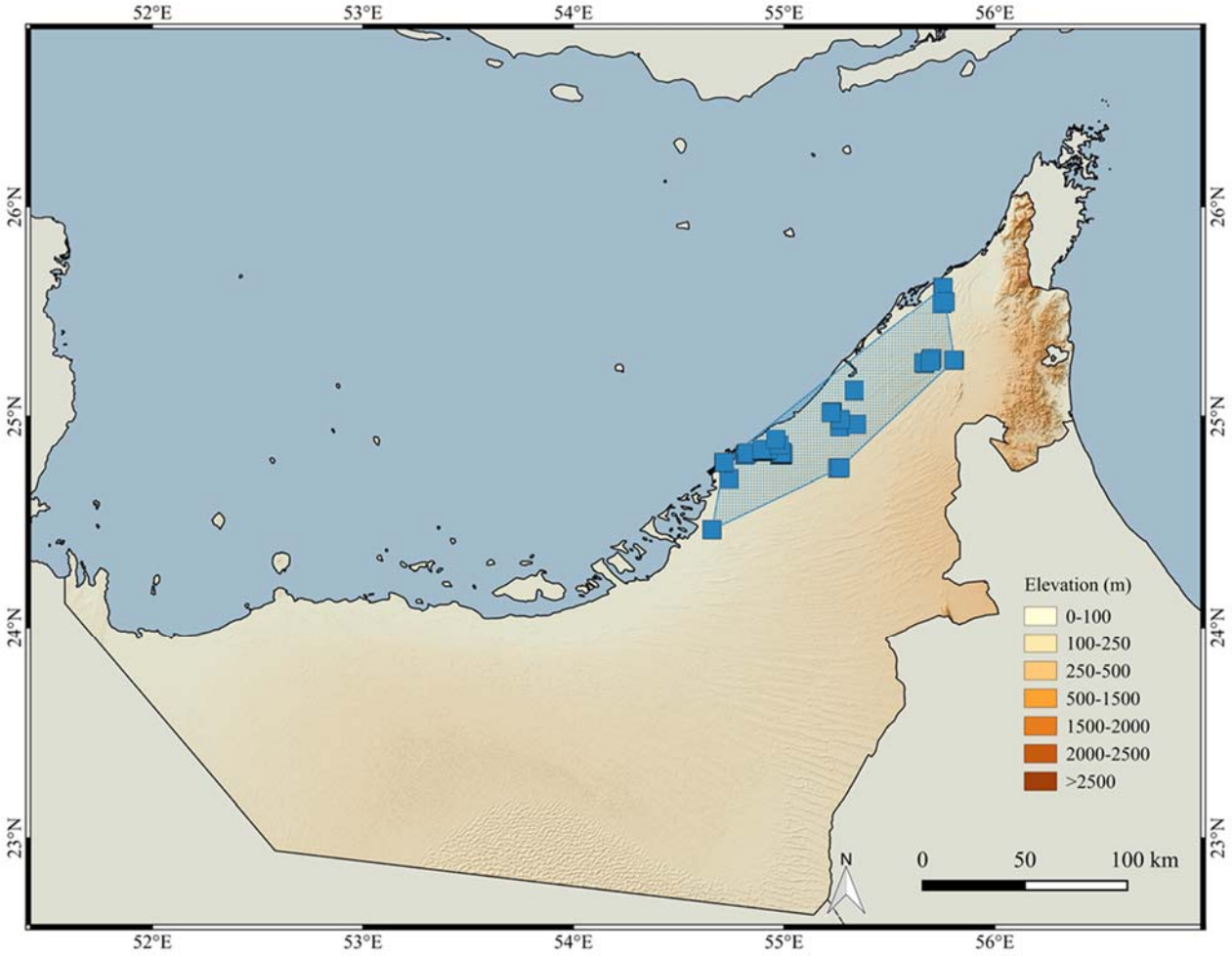
Geographic Range: Iran, southwestern Afghanistan, western Pakistan and United Arab Emirates.

Range Description: Palearctic

Countries of Occurrence: Afghanistan, Iran, Pakistan, United Arab Emirates.
Distribution - The Arabian peninsula population occurs over a distribution range of less than 5,000 km^2 and an area of fewer than 100 km^2. The gecko population is highly currently localized subpopulati□ons which are severely fragmented from each other.

Population: Regionally, it is seldom seen and is restricted to a few locations in the United Arab Emirates.

Population Trend: Declining - The species is declining currently and the population is predicted to decline by more than 80% in the next 25 years (3 generations) due to extensive and intensive urban construction currently ongoing and development planned in the future across its range.



Habitat and Ecology
A medium-sized gecko, it is a nocturnal and solitary species. It is mainly a psammophilus species (often found between sand dunes). It is largely recorded from fine, silty aedian soils, loose sand, salt-encrusted sand, sand mixed with gravel, occasionally also recorded on hard clayey soil (Minton 1996, Anderson 1999, Szczerbak and Golubev, 1996). The areas of occupancy have varying vegetation from dry open woodland through sparse shrubland and to dry grassland (Anderson, 1999). Animals live in burrows of about 25 to 40 cm depth; these are also used as shelters in the summer and winter (Minton, 1966). The female lays several clutches of one or two eggs annually (Szczerbak and Golubeve, 1996). Longevity in the species has been recorded as between 17-23 years in captivity. The species attains reproductive age at 2-3 years and breeds for many years before attaining senescense.

Habitat classification: 8.1 - Hot Desert

Systems: Terrestrial

Continuing decline in area, extent and/or quality of habitat:
Yes due to rampant development and urbanization in the distribution range.

Use and Trade: Species collected for international trade.

Threats
Major threats include habitat loss and severe fragmentation due to development and urbanization. Minor threats include driving off-road to target animals due to local stigma, and from feral cats. The major threats are ongoing and predicted to increase in the future and likely to affect the majority of the population (up to 90%).

Threats classification: 1.1 Housing & urban areas, 1.2 Commercial & industrial areas, 4.1 Roads & railroads, 6.1 Recreational activities

Major Threat(s): Development and habitat fragmentation.

Conservation Actions
Protection of populations from development are needed in the United Arab Emirates. Establishment of protected areas for the species and setting up of a solid and continuous education and awareness campaign to put the species on the map.

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