

to Critically Endangered. *Pseudoscaphirhynchus hermanni* of the Amu Darya has been rediscovered after almost 20 years (Sheraliev et al., 2021, *Oryx*, 55, 332). These are signs that if adequate protection measures are put in place, sturgeons will benefit from them. The Pan European Action Plan approved by the Bern Convention in 2018 provides a guideline for the conservation of sturgeon species. If we are able to organize and support international recovery projects based on the scientific knowledge acquired in the last few decades, we can still hope to save sturgeon species from extinction.

We thank all experts of the Sturgeon Specialist Group and the IUCN assessment team for their contributions and support.

LEONARDO CONGIU\* ([orcid.org/0000-0002-9293-9837](https://orcid.org/0000-0002-9293-9837), [leonardo.congiu@unipd.it](mailto:leonardo.congiu@unipd.it)) University of Padova, Padova, Italy. JOERN GESSNER\* ([orcid.org/0000-0002-1675-0549](https://orcid.org/0000-0002-1675-0549)) Leibniz-Institute for Freshwater Ecology and Inland Fisheries, Berlin, Germany. ARNE LUDWIG\* ([orcid.org/0000-0001-8839-411X](https://orcid.org/0000-0001-8839-411X)) Leibniz-Institute for Zoo and Wildlife Research, Berlin, Germany  
\*Also at: IUCN SSC Sturgeon Specialist Group

This is an Open Access article, distributed under the terms of the Creative Commons Attribution licence [CC BY 4.0](https://creativecommons.org/licenses/by/4.0/).

## The crested porcupine in Tunisia's semi-arid steppes

Arid lands and their biodiversity are undervalued and often considered an inefficient investment for conservation funding. However, although they may hold relatively low species richness and population densities compared to global biodiversity hotspots, the fauna and flora of these harsh ecosystems are highly adapted and often unique.

The crested porcupine *Hystrix cristata*, one of North Africa's endemic mammals, is a relatively large rodent (c. 10 kg), but because of its nocturnal habit little is known about its behaviour and distribution across its presumed range. It is categorized as Least Concern on the IUCN Red List, but with an unknown population trend. In particular, occurrence data are lacking for Tunisia. Early references suggested the crested porcupine occurs extensively from the north to the southern edge of the Sahara. This reported range covers diverse habitats from Mediterranean conifer forests in northern Tunisia to Saharan steppes in the south. However, the IUCN Red List assessment for the species reports a narrower range, with a declining distribution restricted to the north of the country.

As part of the post-release monitoring of reintroduced large herbivores, camera traps were established in three National Parks in the south of Tunisia; Dghoumes (8,000 ha) and Sidi Toui (6,315 ha) in steppe habitat, and Jbil (7,700 ha) in the desert. The camera traps were placed at a spacing of c. 1.5 km along visible animal trails, at knee-height, and set

to take three photographs at each trigger. The intervals between successive triggers were set to the lowest value allowed by the camera model (0.6–5.0 seconds). In a total camera-trapping effort of 20,382 days during April 2018–March 2022 in Dghoumes National Park, and 10,383 days during October 2020–March 2022 in Sidi Toui National Park, there were 39 and 160 detections of crested porcupines, respectively. In 14,398 camera-trap days during April 2019–October 2021 in Jbil National Park, the species was not recorded.

Our findings thus concur with the geographical range reported for the crested porcupine in Tunisia in the 20th century, and indicate that the species Red List account requires updating.

MOHAMED KHALIL MELIANE ([orcid.org/0000-0003-1979-3998](https://orcid.org/0000-0003-1979-3998), [meliane.medkhalil@gmail.com](mailto:meliane.medkhalil@gmail.com)), AMIRA SAIDI\* ([orcid.org/0000-0002-3813-7163](https://orcid.org/0000-0002-3813-7163)), MARIE PETRETTO ([orcid.org/0000-0002-5975-7601](https://orcid.org/0000-0002-5975-7601)), TIM WOODFINE† ([orcid.org/0000-0003-1007-1403](https://orcid.org/0000-0003-1007-1403)), PHILIP RIORDAN† ([orcid.org/0000-0001-6285-8596](https://orcid.org/0000-0001-6285-8596)) and TANIA GILBERT† ([orcid.org/0000-0002-3898-1508](https://orcid.org/0000-0002-3898-1508)) Marwell Wildlife, Winchester, UK.

EZZEDINE TAGHOUTI ([orcid.org/0000-0002-4987-1398](https://orcid.org/0000-0002-4987-1398)) and HELA GUIDARA ([orcid.org/0000-0002-8862-7726](https://orcid.org/0000-0002-8862-7726)) Direction Générale des Forêts, Ministre de l'Agriculture, des Ressources Hydrauliques et de la Pêche Maritime, Tunis, Tunisia

\*Also at: Faculty of Science of Tunis, Research Laboratory of Biodiversity, Management and Conservation of Biological Systems, University of Tunis El Manar, Tunis, Tunisia  
†Also at: School of Biological Sciences, Faculty of Environmental and Life Sciences, University of Southampton, Southampton, UK

This is an Open Access article, distributed under the terms of the Creative Commons Attribution licence [CC BY 4.0](https://creativecommons.org/licenses/by/4.0/).

## Wildfire kills Endangered Barbary macaques in Bouhachem mixed oak forest, Morocco

In 2022, Morocco experienced a serious drought, resulting in numerous forest fires. One of the most serious of these occurred in Bouhachem mixed oak forest in the Rif mountains, a stronghold for the Endangered Barbary macaque *Macaca sylvanus*. This population of the Barbary macaque is important in a global context because it resides in continuous forest habitat and is unaffected by the unmanaged primate tourism seen elsewhere in Morocco.

On 25 July, a wildfire spread rapidly in the forest, assisted by high winds and tinder dry leaf litter. The fire burned for a week and wiped out 7,500 ha of forest, killing wildlife and livestock, destroying crops and damaging surrounding villages. Post-fire, we found the burned bodies of > 50 macaques from the two groups closest to our base, which is in former agricultural land close to the forest. Our monitoring revealed that one of our study groups, which formerly

numbered c. 60, now only numbers seven individuals. Another group has not been seen since the fire and we presume all group members perished in the blaze, which burned very fast and hot and left the macaques no time to escape.

Twelve groups close to our project base were badly affected by the fire, suffering fatalities. Their food sources disappeared as the oak trees burned and all the acorns, invertebrates and fungi that the macaques find in the leaf litter and that sustain them through the winter were destroyed.

An overwhelming and prompt response to our emergency funding campaign, particularly from the European zoo community, meant we were able to supply five villages destroyed by the fire with basic provisions and medical supplies and assist villagers in repairing their houses. After reports of macaques foraging in village fields, we began to provide food to the macaque groups we judged at risk of starvation. In autumn, the macaques feed mainly on acorns but many of the oak trees were damaged by the fire. Acorns provide oil and protein, enabling the macaques to gain weight in preparation for winter. We have now constructed multiple feeders to place in trees, to provide the macaques with acorns we are purchasing from elsewhere in Morocco.

We are mindful of the risks of habituating the macaques to the presence of people and sensitive to the perceptions of villagers, who may resent our support of macaque groups. To mitigate against both issues, we are employing local villagers directly affected by the fire to transport the acorns to forest areas known to be used by the macaque groups, away from the paved road.

The forest is already beginning to regenerate but we need to ascertain how soon the oak trees will mast post-fire, as that will influence how macaques survive future winters and whether they will reproduce and the infants survive in 2023.

SIÂN WATERS ([orcid.org/0000-0001-9261-3629](https://orcid.org/0000-0001-9261-3629), [sianwaters@gmail.com](mailto:sianwaters@gmail.com)) and AHMED EL HARRAD *Barbary Macaque Awareness & Conservation, Tetouan, Morocco*

*This is an Open Access article, distributed under the terms of the Creative Commons Attribution licence [CC BY 4.0](https://creativecommons.org/licenses/by/4.0/).*

## Behaviour change conservation campaign for improved human–tiger coexistence in Nepal

In 2010, with a total of 121 tigers *Panthera tigris tigris*, Nepal committed to double its tiger population by 2022 as part of the TX2 St. Petersburg declaration, along with the other 12 tiger range countries. According to the Nepal National Tiger Survey 2022, the tiger population is now 355. Negative human–tiger interactions have, however, also increased. Tigers are occupying greater areas, and territorial fights

amongst them are increasing. Dispersing tigers are using marginal areas, increasing the likelihood of encounters with local people collecting forest resources.

The Bardia and Banke National Parks, in the western Terai, hold c. 150 tigers. According to the National Trust for Nature Conservation, there were 34 human casualties from tiger attacks in these two National Parks during 2019–2022. Problematic tigers are monitored by camera traps to identify individuals and monitor their health. Twelve tigers that were identified as having killed people, or that were weak or injured, were captured and released in the core of Bardia National Park, transferred to a zoo, or kept in a holding centre. In the case of a healthy tiger identified by the camera traps, local communities are advised to refrain from entering the forest until the tiger has left the area. Most attacks occur when people are collecting forest resources during the daytime. Local people enter the forest for the collection of grasses, fodder, timber and wild vegetables, and for livestock grazing and fishing.

To reduce human–tiger conflict and forest dependency, and to improve co-existence with the tiger, the National Trust for Nature Conservation and Bardia National Park have initiated a behaviour change campaign. In November 2021, 19 members of Community Based Anti-Poaching Units, representing every region of the National Park, were trained to carry out a behaviour change campaign for forest-dependent communities. The change agents discussed tiger behaviour and how to avoid encounters with tigers, and outlined safety measures. During January–June 2022, the change agents organized awareness sessions near the Park border for a total of 8,042 people (3,788 men, 4,254 women). These people do not have access to social media or FM radio and had not participated in previous conservation awareness sessions. As a result of these sessions, 317 farmers constructed predator-proof corrals to protect their goats and pigs from carnivores; 12,867 fodder seedlings were planted on private land, to minimize forest dependency for fodder collection; 559 farmers were involved in the cultivation of wildlife-friendly cash crops such as ginger, turmeric and lemon; and 19 farmers living adjacent to the Park began running homestays for tourists. Behavior change campaigns are considered effective for the reduction of human casualties from tigers, leopards and elephants, and for improving human–wildlife co-existence.

RABIN KADARIYA ([orcid.org/0000-0002-0490-6892](https://orcid.org/0000-0002-0490-6892), [rkadariya@yahoo.com](mailto:rkadariya@yahoo.com)), RABIN BAHADUR K.C. ([orcid.org/0000-0002-6877-0525](https://orcid.org/0000-0002-6877-0525)) and UMESH PAUDEL ([orcid.org/0000-0001-5868-5194](https://orcid.org/0000-0001-5868-5194)) *National Trust for Nature Conservation, Kathmandu, Nepal*. BISHNU PRASAD SHRESTHA ([orcid.org/0000-0002-9761-8688](https://orcid.org/0000-0002-9761-8688)) *Department of National Parks and Wildlife Conservation, Kathmandu, Nepal*

*This is an Open Access article, distributed under the terms of the Creative Commons Attribution licence [CC BY 4.0](https://creativecommons.org/licenses/by/4.0/).*