



## IN DEPTH

### RESEARCH POLICY

# Indonesia tightens grip on conservation science

Five foreign scientists banned after critical op-ed; animal population estimates shelved

By Dyna Rochmyaningsih

**E**ven before Dutch conservation scientist Erik Meijaard submitted an opinion piece to *The Jakarta Post* last month, he was worried about how the Indonesian government would react. In the article, he and four other Western scientists challenged the government's claims that orangutan populations in the country are thriving. Meijaard was aware that Indonesia is increasingly wary of "foreign interference" in conservation matters and had invited eight Indonesian collaborators to co-author the article. None agreed to do so.

After the piece ran on 14 September, the reaction was swift. In a letter issued that same day, Indonesia's Ministry of Forestry and Environmental Affairs (KLHK) said the authors had "discredited" the government and banned them from doing research in Indonesia. It also ordered national parks and KLHK offices around the country to tell the ministry's headquarters

about any research conducted by foreign scientists. KLHK said that from now on, it would monitor and control all data from foreign researchers.

The move has no direct impact on the five authors' work. None of them is currently doing fieldwork in Indonesia, and all are based abroad. Meijaard runs a consulting company named Borneo Futures in nearby Brunei; his co-authors are based in the United States, Malaysia, Germany, and the United Kingdom. But the ban signals a deeper problem, Meijaard says. To head off interference in the government's ambitious development goals, KLHK has tightened control over research on the country's enormous biological diversity by both Indonesian and foreign scientists. Data on wildlife populations have been shelved and criticism of the government has been met with repercussions. "Our KLHK ban is not the issue," Meijaard says. "The real issue is the independence of Indonesian science in general and conservation science more specifically."

Many Indonesian scientists concur, but

very few will talk about it publicly. "Our voices are silenced," says a conservationist in Sumatra who asked to remain anonymous for fear of reprisals.

There is little doubt about the threats to Indonesia's biodiversity. Sumatra, home to five critically endangered, iconic mammalian species found nowhere else—the Tapanuli orangutan, the Sumatran orangutan, the Sumatran tiger, the Sumatran rhinoceros, and the Sumatran elephant—has lost more than 80% of its lowland forests since the 1990s, to make room for pulpwood and oil palm plantations. Conflicts between humans and wildlife have become increasingly common. News stories frequently report elephants poisoned by angry farmers, tigers snared by poachers, and orangutans stranded in plantations.

Scientists and nongovernmental organizations (NGOs) say producing reliable population estimates and mapping remaining habitats are crucial to conservation. The environment ministry's provincial conservation agencies (BKSDA) and national park

Fewer than 50 Sumatran rhinos are left in the wild, the International Union for Conservation of Nature says. The Indonesian government insists the number is larger.

rangers have supported such work on the ground, for example by counting orangutan nests, collecting elephant dung samples, and setting camera traps for tigers. But researchers say KLHK's headquarters has kept data from such efforts under wraps.

Wulan Pusparini, an Indonesian wildlife conservationist at the University of Oxford, says her DNA-based population survey has shown the elephant population in a national park in southern Sumatra declined by 75% between 2001 and 2015. Provincial BKSDA officials were "very supportive" when she presented those data in 2018, she says, "but it got stuck in Jakarta." KLHK's central office has not allowed her to publish the findings, Pusparini says.

In 2020, the Sumatran Elephant Conservation Forum, a consortium of scientists and conservationists from various NGOs and BKSDA offices, produced what it called an Urgent Action Plan describing remaining elephant populations, the threats they face, and how they could be protected. KLHK's director of conservation signed and released the document, but the ministry retracted it a year later. Among the reasons was what KLHK called "a counterproductive statement against the government" in the plan.

Studies on other species have met a similar fate. KLHK has not approved a consortium's estimate for Indonesia's tiger population, submitted in 2016; the data remain unpublished. ("It is the best available knowledge so far," says an Indonesian member of the team.) The ministry also disputes a recent report from a specialist group at the International Union for Conservation of Nature that estimates there are fewer than 50 Sumatran rhinos left in the wild. KLHK says it's between 67 and 75.

As for orangutans, the op-ed by Meijaard and his colleagues took issue with an upbeat assessment by KLHK Minister Siti Nurbaya on World Orangutan Day, on 19 August. The minister stressed Indonesia's commitment to conservation and said all three species in the country—including the Tapanuli orangutan, whose existence is threatened by a hydropower project in North Sumatra—would continue to "grow and thrive." The authors countered in *The Jakarta Post* that "A wide range of scientific studies ... show that all three orangutan species have declined in the past few decades and that nowhere are populations growing."

KLHK did not respond to queries from

*Science*. In a response published by *The Jakarta Post* on 26 September, however, a ministry spokesperson said Meijaard's analysis was based on "outdated information" and ignored many steps KLHK had taken to protect orangutans, including ending some concessions for new plantations. Nurbaya's assessment "was intended to build optimism," the rebuttal said.

KLHK has also blocked conservation initiatives. In late 2019, the ministry unilaterally ended a joint program in forest conservation with the World Wildlife Fund (WWF) after the organization criticized the government's handling of forest fires. The move forced WWF to lay off about 400 staff at offices across Indonesia. That same year, KLHK asked the Center for International Forestry Research in Bogor to retract a sobering estimate of the area burned during the fire season. As *Science* has reported (14 February 2020, p. 722), the spat led to the deportation of David Gaveau, a French landscape ecologist who worked with the center.

Some NGOs have chosen to adapt. PanEco, a Swiss-based organization, once campaigned against the Batang Toru hydropower project in North Sumatra, which poses a threat to the 800 or so remaining Tapanuli orangutans. It did an about-face in 2019 and decided to work with the Indonesian government and the company building the dam (*Science*, 13 September 2019, p. 1064). But a new population estimate produced by the group since then has not yet been released; a PanEco representative says it's up to the BKSDA office in North Sumatra to do so.

Meijaard says the Indonesian government should open up about the state of its biodiversity by making results from population and habitat surveys public and storing them in Indonesian and international databases. But with foreign researchers squeezed out and their Indonesian colleagues increasingly fearful, that seems unlikely to happen.

One Indonesian scientist says criticizing the government publicly could mean losing their job. "And it's not only about me, but about hundreds of people working in the same organization," the researcher adds. Since the *Jakarta Post* article, at least one-third of the Indonesia-based co-authors on an upcoming paper about orangutan conservation have asked Meijaard to remove their names, he says: "This fear is doing real damage to Indonesian science." ■

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## EVOLUTIONARY BIOLOGY

# Secrets of Tibet's hot-spring snakes revealed

Mutations helped animals adapt to extreme temperatures, low oxygen

By Elizabeth Pennisi

**J**ia-Tang Li knows firsthand how tough life can be on the Tibetan Plateau. The air at 4500 meters is so thin that just a few steps take one's breath away. Despite bitter cold, the Sun is intense enough to quickly burn the skin. Yet the small grayish brown snakes this herpetologist at the Chengdu Institute of Biology at the Chinese Academy of Sciences studies have been thriving in the plateau's northern reaches for millions of years. The Tibetan hot-spring snake, *Thermophis baileyi*, keeps from freezing to death by hanging around the region's geothermal pools, feasting on frogs and small fish living there.

Now, advances in genome sequencing are giving Li and others a more detailed look at how the snake has adapted to its extreme environment. In recent work, his team has pinpointed genetic adaptations that may help the snake find waters that are just warm enough and withstand the low oxygen and intense Sun. Li's team has also reconstructed the snake's evolutionary history, work that could guide efforts to save these reptiles as they face ever-greater threats from humans.

"This is a pretty extreme place for snakes to be living," says Sara Ruane, a herpetologist at the Field Museum. The work "just shows how adaptable snakes are." Says Alex Pyron, a herpetologist and evolutionary biologist at George Washington University: "For reptiles, we generally assume if it's too cold, there won't be any snakes or lizards. Not so fast, says *Thermophis*!"

Although the Tibetan Plateau has more than 100 species of snakes, *T. baileyi* is the only one that lives at about 4500 meters. Two other hot-spring snakes, the Sichuan hot-spring snake and the Shangri-La hot-spring snake, live at lower elevations and are less dependent on the hot springs, says Song Huang, a herpetologist at Anhui Nor-

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