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Mongabay Series: Asian Rhinos

When it comes to captive breeding, not all Sumatran rhinos are equal

by Jeremy Hance on 23 July 2019

- *A new partnership called Sumatran Rhino Rescue aims to capture critically endangered Sumatran rhinoceroses to reinvigorate a captive-breeding program.*
- *Most experts agree that captive breeding is necessary to prevent extinction; with wild populations small and fragmented, too few baby rhinos are being born to keep the species alive.*
- *The current plan approved by the Indonesian government focuses on capturing "doomed" or "isolated" animals in populations too small to survive in the long term.*
- *However, female Sumatran rhinos living in isolation are particularly susceptible to reproductive problems, leading some experts to argue that it makes more sense to focus on capturing rhinos from healthier populations where rhinos are known to be breeding successfully — perhaps at the risk of harming the survival prospects of those populations.*

In November 2018, a small female Sumatran rhino plunged into a pit trap in Kalimantan, the Indonesian part of the island of Borneo. Pahu, as she came to be called, was the first of what is hoped to be a number of captive animals for a new partnership called Sumatran Rhino Rescue. The partnership's plan is to capture enough wild Sumatran rhinos (*Dicerorhinus sumatrensis*) to build a sustainable captive-breeding program, one that could finally ensure the species' survival. But the question now is, where to start? With four distinct populations, some almost totally obliterated, the question of which rhinos to catch takes on a terrible weight.

Currently, the plan, with approval from the Indonesian government, is to first target the so-called isolated or doomed animals. These are animals like Pahu, stuck in small fragments of forests in groups too small to survive in the near term, let alone the long term.

"We are currently focusing on finding and capturing the small, isolated populations," says Barney Long, the senior director of species conservation at Global Wildlife Conservation, one of the partners of Sumatran Rhino Rescue. But he adds that capturing isolated animals "has never been stated as the only thing the alliance and project will focus on."

He points to the expert advisory board that will counsel the Indonesian government on where to target rhinos for capture. The board is part of Sumatran Rhino Rescue and made up of 13 voting experts from around the world. A board meeting is currently scheduled for July 29 to Aug. 1 in Jakarta.

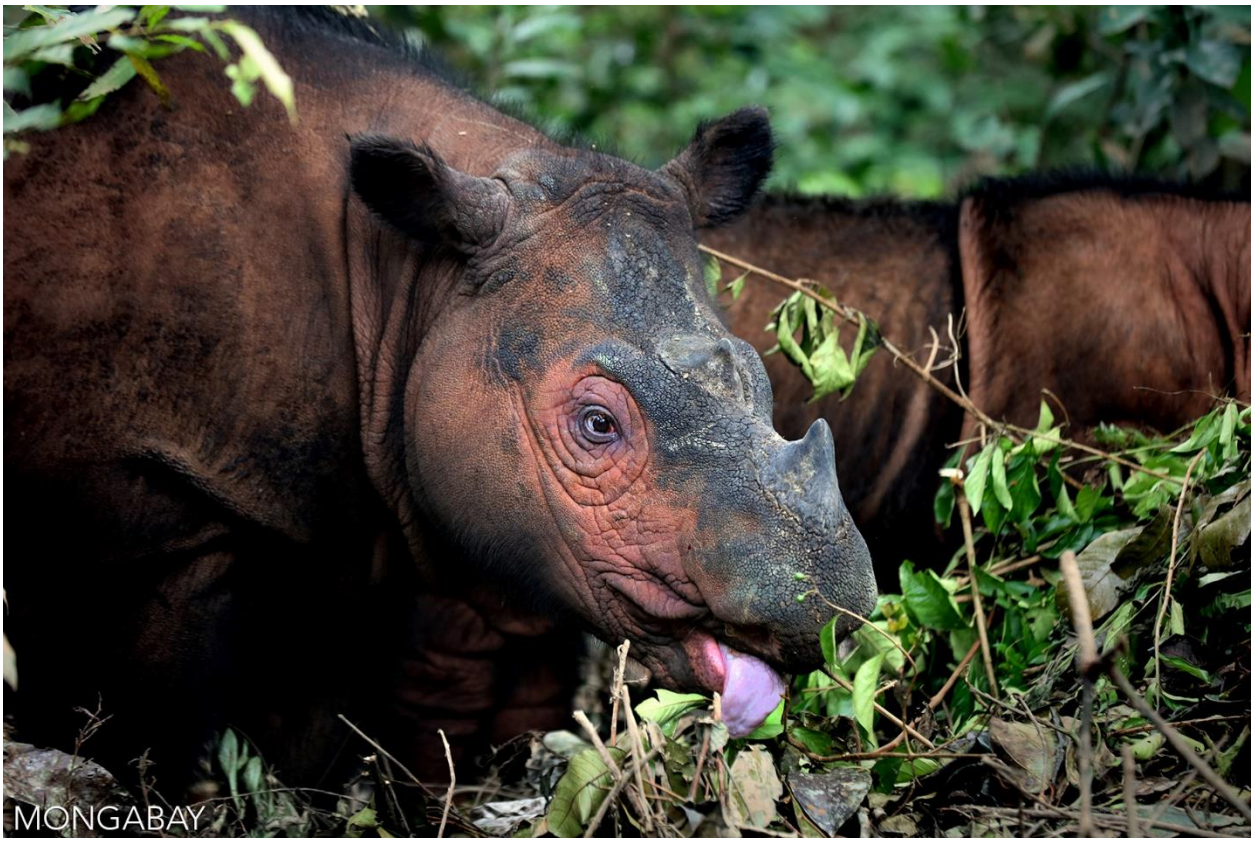
“The project will adapt based on the recommendations made by this group,” Long notes.

Nan Schaffer, the founder of SOS Rhino and a veterinary expert on Sumatran rhinos, says that going after animals simply because they’re isolated is the wrong course of action. Instead of focusing on doomed animals, she says there should be one goal in mind: capturing animals that are proven breeders. The current course of action would largely focus captures in Indonesian Borneo and in southwestern Sumatra’s Bukit Barisan Selatan National Park, if there are any rhinos left there. Captures may also begin in some areas of Aceh in northern Sumatra if rhinos there are found to be separated from the main population. But Schaffer, who is also a member of the expert advisory board, says she believes the first course of action should be capturing females from Way Kambas National Park, in southeastern Sumatra, and Aceh, both areas where camera traps actually have footage of baby rhinos.

The priority, according to Schaffer, is to “produce as many babies as fast as possible.”

Officially there are fewer than 100 wild Sumatran rhinos left on the planet; the actual number probably ranges anywhere from 30 to 80 animals, though no one really knows for certain. There are nine Sumatran rhinos currently in captivity, but only one pair of proven breeders. Six of the captive rhinos are female, but only one has borne children (Ratu); three appear incapable of breeding (Iman, Rosa, and Bina); one has yet to be tried (Pahu); while the last is still too young (Delilah).

“This is an emergency,” Schaffer says, adding, “we have to be efficient and effective.”



Female Sumatran rhino with calf at the Sumatran Rhino Sanctuary in Indonesia's Way Kambas National Parl. Following two successful rhino births, the facility is home to seven rhinos. Image by Rhett A. Butler for Mongabay.com.

A plague of infertile females

Schaffer's argument for catching proven breeders rests on history.

In 1984, conservationists began catching Sumatran rhinos in the wild for captive breeding. The program, for decades, was a disaster. While the project at first suffered from a lack of knowledge about the species, the biggest hurdle was that many of the females already had or quickly developed severe reproductive pathologies, including tumors, cysts, cystic endometrial hyperplasia (abnormally thick lining of the uterus), and a propensity to lose fetuses even when able to get pregnant. It took the program 17 years and dozens of rhinos to finally produce a baby, in 2001.

While there is still some debate as to the exact causes of these fertility problems, experts generally believe that if a female rhino doesn't get pregnant and bear young frequently, she will eventually lose the ability to do so.

“We think that the repeated exposure to fluctuating hormone concentrations that occur in females who cycle regularly but never get pregnant cause or exacerbate the development of [a reproductive] pathology,” says Terri Roth, the head of CREW, a research facility at Cincinnati Zoo and the scientist who finally figured out how to breed Sumatran rhinos in captivity. “In a healthy wild population, the female would rarely cycle because she would always be pregnant or lactating.”

Upon reaching maturity, a steady exposure to hormones such as estrogen may turn females nearly infertile within a few years.

Schaffer, who was the first to ultrasound a female rhino, discovered the various pathologies in 1991, and has been studying them ever since. In a still-unpublished paper, Schaffer describes how most of the females captured over the last 35 years developed reproductive problems.

“What I discovered over subsequent years was that almost all the females had the same pathology in their uterus,” Schaffer says.

And this isn’t an issue that only develops in captivity: it’s happening in the wild too. The first Indonesian female caught in 1986 had tumors in her uterus, according to Schaffer, and necropsies on rhinos killed by poachers have shown them to suffer from similar reproductive problems.

In many ways, these reproductive problems explain why wild populations have collapsed over the last four decades: when a population falls to a certain size, or becomes too disconnected, females simply don’t have enough children to stave off major fertility problems. Eventually they become incapable of breeding, and the number of deaths in the rhino population begins to eclipse births.

“After ten years and survey after survey the only information we had about the Malaysian Borneo population was that the population had not rebounded, the estimates just continued to decline,” Schaffer says. “The remnant population was not viable and we needed to bring them into captivity. Just a few years later, this ghost population was gone. The same thing is happening across each of the remaining populations in Indonesia.”

Schaffer says the problem isn’t limited to older females, but can even show up in young rhinos.

“Rosa had tumors five years after she reached maturity,” she says of one of the females residing at the Sumatran Rhino Sanctuary in Way Kambas National Park, in southern Sumatra. “The quick progression of fertility loss makes immediate action critical.

“Doomed [or isolated] animals are likely infertile,” Schaffer adds. “This policy [of catching doomed rhinos] has set the program back since the 80s. We focused capture efforts on areas that contained [reproductively] compromised rhinos, but didn’t know it. At this point we should know better.”

For Schaffer, rhinos stuck in isolated, or doomed, forests should be put on the backburner to make way for animals that she says will be much more likely to successfully produce offspring.

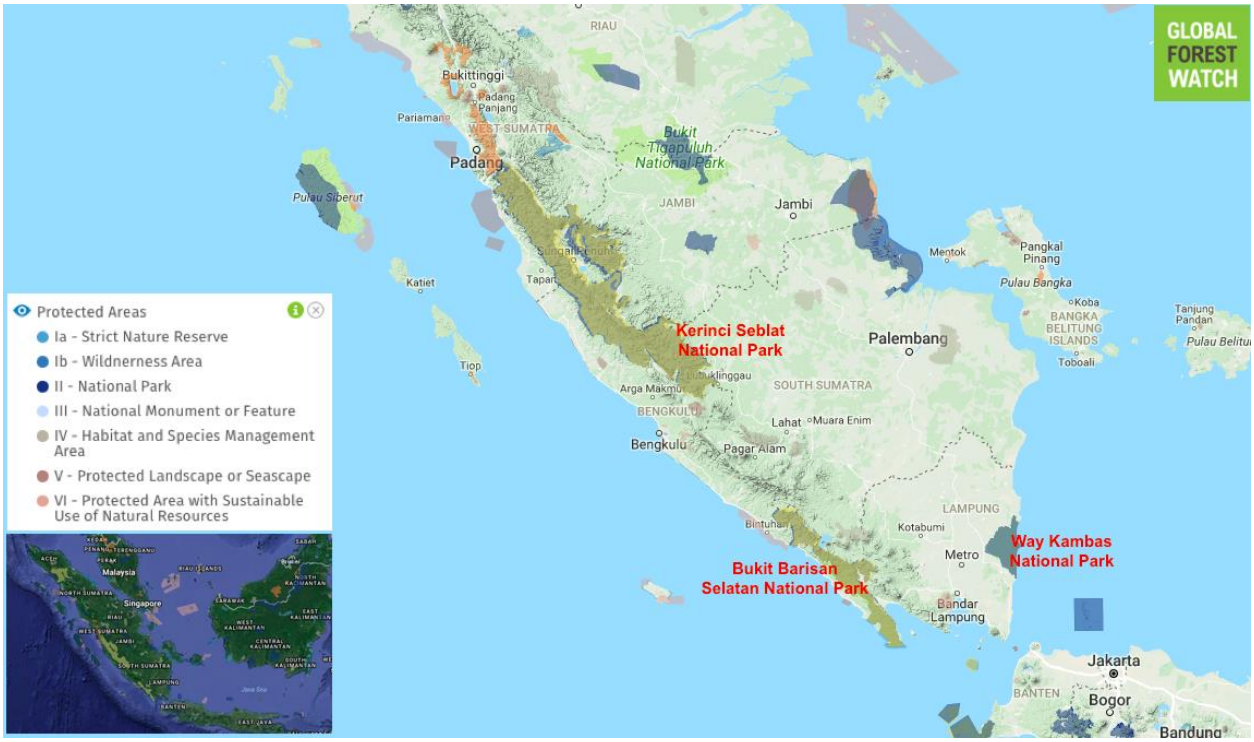
In addition, Indonesia’s hesitance so far to attempt advanced breeding technologies, which can come with their own challenges and dangers, has meant that infertile rhinos are not utilized. For example, Schaffer says Rosa could still be useful to the larger population if here eggs were collected.

Schaffer’s views are supported by a number of other experts.

John Payne, the head of the Borneo Rhino Alliance, says the focus on catching isolated animals “failed spectacularly” because isolated animals tended to be older, less healthy, and came into captivity with pre-existing reproductive issues.

Payne has been desperately trying to breed females with reproductive problems for decades, with no success to date. Now, the last known male rhino in Borneo, Tam, has died.

“After 35 years we should know not to keep on doing the same thing and expecting a different result,” he says. “The focus must now be on locating those rhinos that are most likely to be fertile.”



Two of the remaining Sumatran rhino habitats, Way Kambas and Bukit Barisan National Parks, lie on opposite coasts at the south of Sumatra Island.

Location, location, location

For those who support Schaffer's views, the first targets for capture should be the rhinos of Way Kambas National Park and Aceh, not Bukit Barisan Selatan National Park. (Capture efforts could still go ahead in Kalimantan given the rhinos there, if any indeed survive, are a distinct subspecies.)

Payne says it should be "easy" to get five reproductively healthy female rhinos out of Way Kambas, given the flat terrain and the fact that experts believe the park is home to 20 to 30 animals. But he also warns the population will be "severely inbred" — a reality at this point potentially for all surviving animals, except perhaps in Aceh.

Petra Kretzschmar, an expert on rhinos and advanced reproductive techniques with the Berlin-based Leibniz Institute for Zoo and Wildlife Research, believes Aceh to hold the only "healthy population" left and therefore the best place to begin captures.

Officials are currently considering building a new captive breeding facility in Aceh.

The challenge with Aceh is that the mountainous and remote terrain may make captures difficult, according to Payne.

"And in some locations practically almost impossible," he adds.

The focus should also be on younger rhinos, even juveniles. Payne also advocates targeting mothers and babies using a surface trap designed in Malaysian Borneo to catch rhinos without relying on them falling into a pit.

Still, some point out that there is a downside to catching very young rhinos: they would have to spend years in captivity before mating could be attempted.

Some rhino experts, however, don't view the issue as quite so black-and-white.

Both Roth of Cincinnati Zoo and Margaret Kinnaird, global wildlife leader with WWF International, say that while the best way to find breeding females is to go into areas where babies are known to be present, there is still value in capturing isolated animals.

"The isolated animals are probably doomed if we do not do anything, so it seems worthwhile to at least capture them and see what they look like," Roth says.

Kinnaird agrees, noting that some of these animals have only become isolated "recently," meaning they still could be reproductively healthy.

Removing animals from Way Kambas and Aceh also comes with risks. Not only could animals be injured or killed during capture, as happened with Najaq a female in Borneo, but the efforts could harm the chances for survival of the two wild populations.

"That is a hard decision to make," Roth says. "If populations are reproducing well in the forest, the tendency is to leave them there and protect them. After all, that is ultimately what we are striving for with this species."

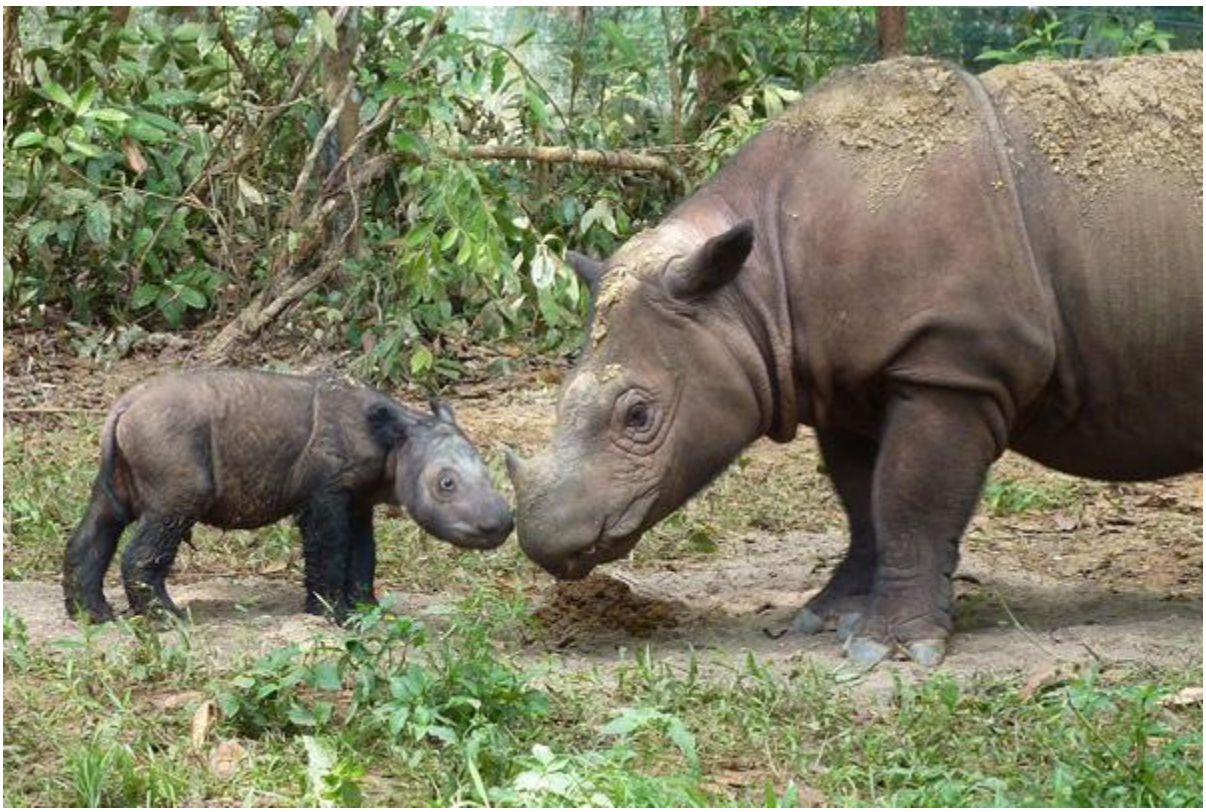
Of course, the question then becomes, are any of these populations actually viable in the long term? Do births actually outnumber deaths anywhere? And are rhinos, even in remote Aceh, actually protected from the threats of poaching and snaring? Rhinos in captivity are safer from those threats, yet that only assumes they can be successfully and safely captured, which isn't guaranteed.

"Many feel that giving this option of [catching isolated rhinos] is worth the risk of leaving the two known breeding populations in the wild for a couple more years until we have captured some isolated rhinos and assessed their reproductive potential," says Long, who declines to take a side on the issue.

This debate isn't new. It's been going on for decades, but since Indonesia has now agreed to new captures for the first time since the 1990s, it has gone from a hypothetical to the need to make tough decisions.

“I don’t think there is a clear right or wrong here, but opinions behind each option are strong,” Long says.

The challenges of the decision are highlighted by the most recent animal caught, Pahu.



Ratu with her firstborn, Andatu, four days after his birth in June 2012. Ratu is currently the only female Sumatran rhino in captivity known to be capable of bearing live calves. Image courtesy of the International Rhino Foundation

The Pahu puzzle

Pahu was an isolated rhino and is believed to be quite old, around 25 years. But experts say they’ve found no obvious reproductive problems or tumors with Pahu. So far, Pahu may have bucked the trend and arguably provides support for the idea that catching isolated rhinos may bear some fruit.

“If we had abandoned Pahu, she would have very likely died in a snare. There was no chance of her remaining in her forest fragment, which was rapidly being encroached by logging, mining and other activities,” Kinnaird says. “Although other females captured in Bornean Malaysia have shown reproductive problems, Pahu does not at this point.”

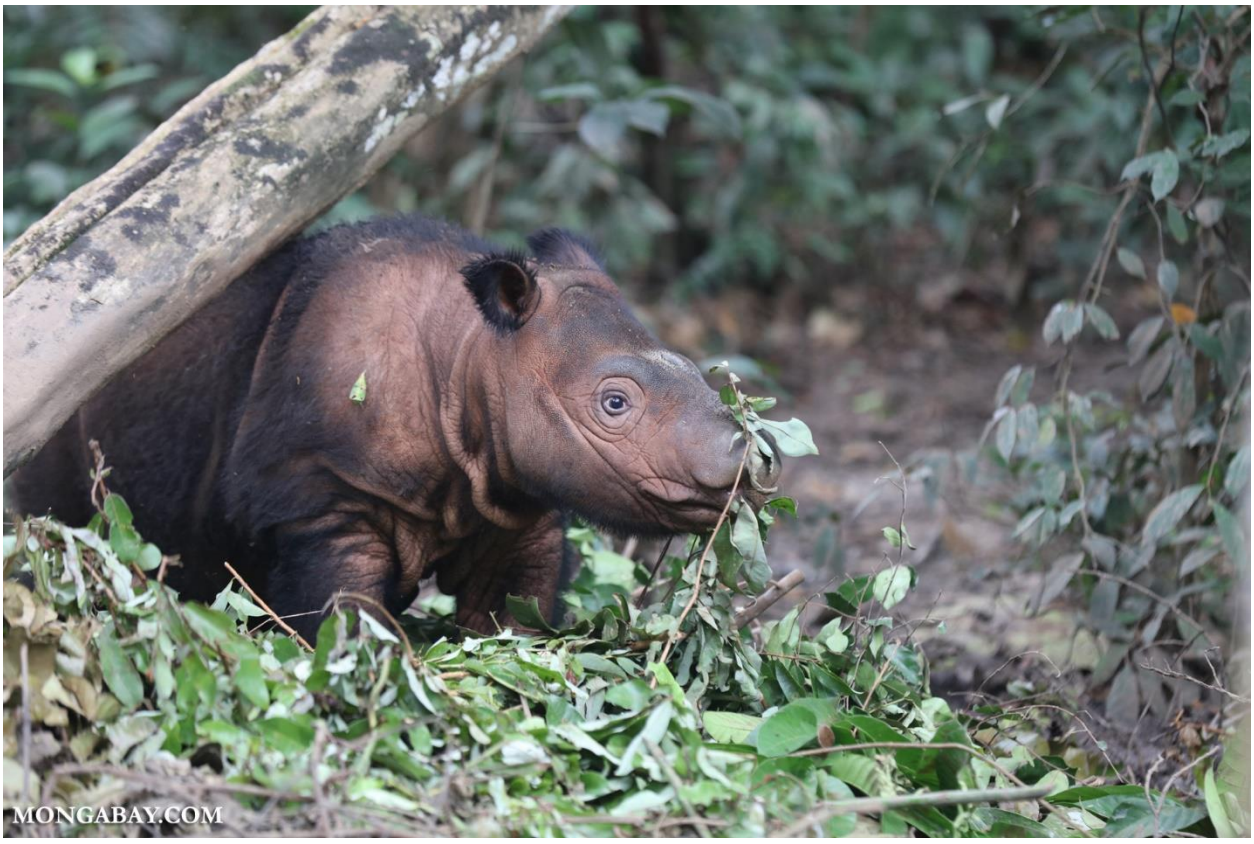
But there are other problems with mating Pahu. She's small — very small: she weighs around 360 kilograms (790 pounds), and while this may sound large, the average weight of a Sumatran rhino is more than double that. Schaffer says she may even be suffering from dwarfism. And some fear that attempting to mate her with a male could lead to injury or even death; Sumatran rhino mating is a violent, raucous affair. Others fear that, given her size, she would be unable to safely birth a regular-sized baby. Breeding success with her remains untested and unknown.

Currently, Pahu sits in a facility in Kalimantan while experts decide the next course of action.

But the rhinos of Kalimantan provide another last-ditch opportunity. They are distinct representatives of a nearly extinct subspecies. Tam, who recently died, may have been the last male Bornean rhino. Capturing more animals in Kalimantan, assuming any are there, could maintain at least some of the subspecies' distinct genetics, even if it means mating them with the Sumatran line.

For her part, Kinnaird says a strategy of catching both isolated animals and some from core populations is the best way forward.

She notes that isolated animals include males, which don't suffer from the same reproductive pathologies. New males are needed almost as desperately today as females, given that all three males currently in captivity are directly related.



A rhino calf, photographed in 2016 at the Sumatran Rhino Sanctuary in Way Kambas. The park that hosts the sanctuary is also home to a population of wild rhinos. Image by Rhett A. Butler/Mongabay.

No easy way forward

Although there's finally a plan to capture wild rhinos, it doesn't mean the way forward is clear or easy.

"Each of the last seven animals that have come into captivity have had fertility problems — abortions, cysts and tumors. How many more will it take before we shift our focus?" Schaffer says.

But there are other considerations here. Long says that Sumatran Rhino Rescue has only secured political will from Indonesia to catch isolated rhinos, but not yet rhinos from the core populations.

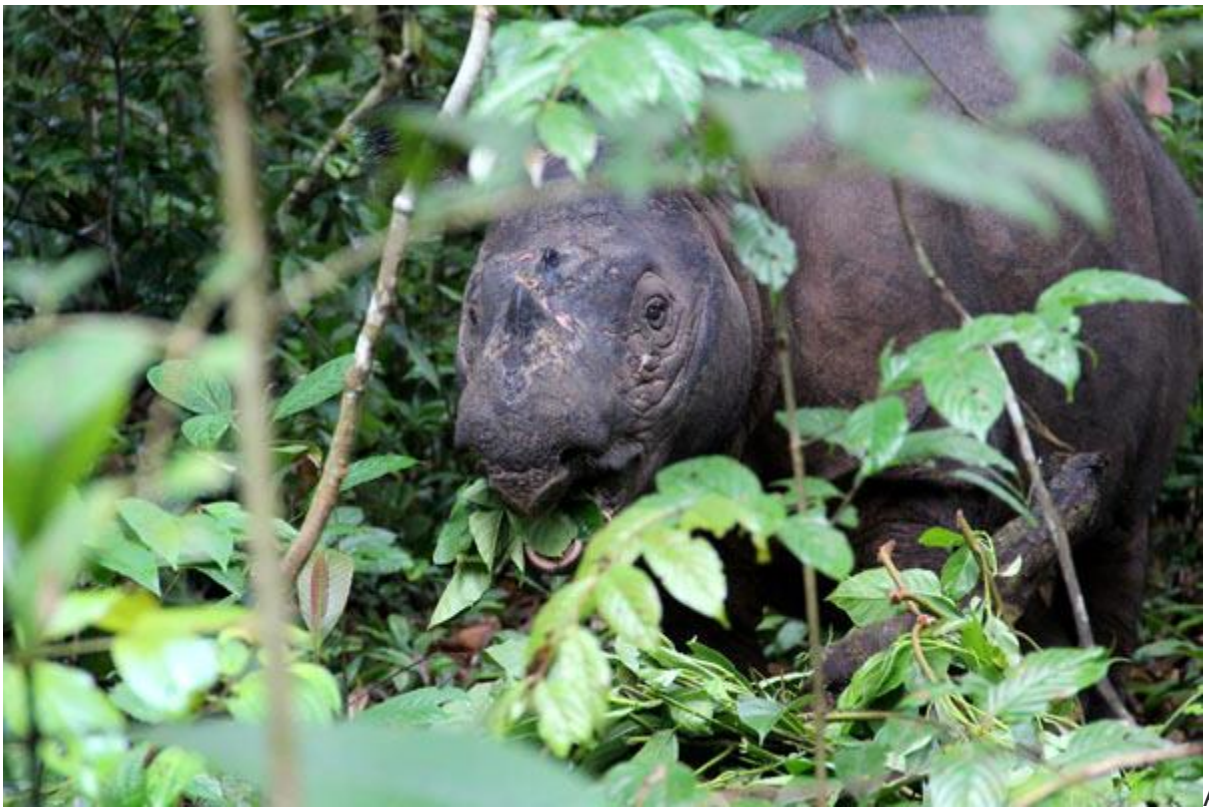
"This does not mean this support can't be secured or that we would not try to secure it," he adds, but notes that getting the support of the government would require "more work."

It took years to convince Indonesia to move forward with captures at all.

Time, space, resources and money are running out. Catching infertile females will mean spending limited resources on animals that will very likely not carry the population forward. Already there are three females in captivity that are unlikely to contribute to future generations, unless Indonesia finally agrees to go ahead with utilizing advanced technologies and success is swift. These females all require funding, space, and employee time.

“If we have limited time, limited capture teams, limited resources and limited space in our sanctuary, we have to take the most efficient route toward the goal of increasing birthrates,” Schaffer says. “Given that the emergency is the need for production of babies as soon as possible, the rescue of isolated animals is secondary.

“We are at the final crossroad,” she adds: “It truly is now or never.”



A Sumatran rhino at the Way Kambas sanctuary. Image by Tiffany Roufs for Mongabay.

Correction: this article has been updated to correct the name of one of the female rhinos, Iman, that is likely to be infertile.

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