

## The challenges of breeding Sumatran rhinos

The secretive, solitary lifestyle of the forest-dwelling Sumatran rhino and its associated behaviour, coupled with its unique reproductive physiology, makes this species by far the most difficult rhino to breed.

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**I**n contrast to white rhinos that are compatible housed in social groups comprised of one bull and numerous cows and calves, or black rhinos that can be housed in pairs, the adult Sumatran rhino really does prefer to go it alone – so much so that it tends to be very aggressive when it encounters another rhino in its ‘territory’.

Therefore, pairing Sumatran rhinos for mating is particularly tricky and must be timed perfectly for when the females enter their very brief period of receptivity. Even then, there

is no guarantee that some aggression will not occur, as the natural courtship behaviour can

highly irregular, but when she does ovulate, her cycle is about 21 days. Of the four rhino species in captivity, the Sumatran species is the only induced ovulator. After discovering this phenomenon, the scientists soon learned exactly what size follicle is associated with oestrus in the female rhino. Since then, frequent ultrasound examinations have become a routine part of the breeding programme at Cincinnati Zoo and at the Sumatran Rhino Sanctuary (SRS) in Indonesia, which celebrated the birth of its first calf in June 2012.

Although the breeding programmes at the Cincinnati Zoo and SRS follow similar protocols, there are subtle differences. At both, ultrasound exams are conducted frequently to follow the development and growth of any new follicles developing on the ovaries. Daily exams are conducted when a dominant follicle approaches 20mm in

diameter which is the size of a pre-ovulatory follicle in this rhino species.

At the SRS, on the day that the follicle measures 20mm, the male and female rhinos are introduced to each other between bars, and are only put in the same enclosure if proper receptive behaviour is displayed. In contrast, Cincinnati Zoo staff has found rhino behaviour to be unreliable and the rhino pair are introduced when the follicle reaches 20mm regardless of their behaviour towards each other that morning. Although the rhinos in the Zoo also often chase each other and spar for some time, copulation usually occurs within two hours of introduction. The keepers are critically important because they are tasked with separating the rhinos if the interactions become too aggressive.

Actual copulation can last 15-45 minutes; the rhinos are separated immediately afterwards and not reintroduced until the next cycle if the female does not become

pregnant. Unfortunately, even when the introductions go well, the female often does not conceive. Cincinnati Zoo’s proven rhino pair produced just three successful pregnancies following a total of 31 attempted matings. Patience and perseverance are absolute necessities for those trying to breed Sumatran rhinos, but the reward is well worth it!

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be rather rough and often includes chasing, sparring and biting prior to actual mating. As if these challenges are not enough, oestral behaviour in the Sumatran rhino can range from absolutely no overt behavioural signs of oestrus to flamboyant urine squirts, vocalisations and activity from either, both or neither of the pair.

At Cincinnati Zoo, where three Sumatran rhino calves have been born, scientists working at the Zoo’s Center for Conservation and Research of Endangered Wildlife (CREW) have been able to overcome the many obstacles to breeding this species by incorporating good science. After years of studying hormone concentrations and performing thrice-weekly ultrasound examinations of the ovaries, the scientists made a key discovery – Sumatran rhinos are induced ovulators, meaning that the female only ovulates after being paired with a male during oestrus. If not paired

with the male, she will not ovulate, and her reproductive cycle becomes

