

# Javan Rhino Genetic Study

## Development of molecular tools



© WWF Indonesia/Ujung Kulon National Park Authority

A genetic study conducted by the WWF and Queen's University (Canada) has enabled scientists to develop essential molecular tools to help further research of the elusive Javan rhino (*Rhinoceros sondaicus*), possibly the rarest large mammal in the world.

The study resulted for the first time in development of a set of molecular tools called 'primers' that will enable accurate genetic mapping thus opening up new possibilities for scientific approaches to conserving the critically endangered Javan rhino.

The biggest challenge in conducting a genetic research for animals as rare as the Javan rhino is finding fresh tissue samples viable for genetic studies. Such a piece of tissue was acquired in the form of sample from ~ 10 year old piece of skin salvaged from a poached Vietnamese Javan rhino from Cat Tien National Park in Vietnam, where a small population of ~ 4-8 individuals are thought to survive.

Using skin from Cat Tien and archived tissue samples from museums in the USA, a scientific team led by Drs. Peter Van Coeverden De Groot and Peter Boag of Queen's University Ontario Canada, was able to optimize 9 Javan rhino primer pairs which are used to amplify Javan rhino microsatellites. Microsatellites are molecular markers which are highly variable among individuals and can be used to potentially determine population numbers from non-invasive samples from rare animals. The genetic tools will enable the scientists to estimate historical population dynamics and increase the chance of estimating minimum known alive Javan rhinos in Ujung Kulon and Cat Tien national parks.

With support from WWF and USFWS we managed to create genetic markers from and for the Javan rhino. Along with markers from other rhino species, we have a bank of primers that we know work on Javan rhinos. With this set of genetic tools, we have the best chance of evaluating faecal genotyping as a valid method of estimating the number unique Javan rhinos represented in a sample of faecals from the Cat Tien and Ujung Kulon populations. We hope to complete such an analysis for the Vietnam population in the next 6 months - Dr. Peter V.C.D. Groot, Queen's University

With as few as about 60 isolated individuals surviving in Indonesia's Ujung Kulon National Park in the remote western peninsula, the conservation of Javan rhino is of much interest and importance to the scientific and conservation community. Prior conservation efforts have been based on habitat protection and establishing visual databases of the animals using census methods and behavioral study using digital camera trap technology.

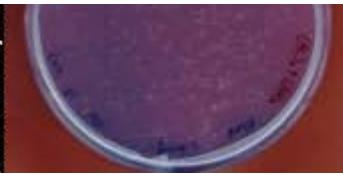
WWF has identified more than 35 different individuals living in the park and is working to evaluate innovative management interventions intended to minimize the risk of increased inbreeding depression within the small rhino population and mass mortality from disease and natural disasters. The present genetic study may provide crucial insights into possible cross breeding these rare

rhinos from Vietnam and Indonesia to ensure their long term survival. ■



plate showing many bacterial colonies with inserted sequences of Javan rhino DNA with a high probability of containing

estimating minimum known alive Javan rhinos in  
Ujung Kulon and Cat Tien national parks.



high probability of  
containing  
microsatellites.

# Video camera traps in Ujung Kulon

steal a glimpse at  
the world's rarest  
rhinos.

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Ujung Kulon National Park, Indonesia

In an attempt to get a closer look at the elusive Javan rhinos using non intrusive methods, scientists have installed 34 video camera traps working round the clock in different strategic locations inside Ujung Kulon National Park, Indonesia. In just over a month after deployment, the cameras have yielded never seen before footages of 9 individual Javan rhinos that provide rare glimpses into their behavior.

The new cameras recorded both male and female Javan rhinos sharing the same mud wallow, proving that both sexes share the same territory. It has also revealed the rhinos' behavior at their wallows, for example a clip shows a Javan rhino taking over a warty pig's mud wallow, chasing the owner away. It is a first-of-its-kind video clip recording Javan rhino aggression towards another species. Of the two video traps installed in April 2008 one was able to capture a mother and calf (possibly male) in a mud wallow and in the initial stages of separation.

WWF-Indonesia and Ujung Kulon National Park officials first installed 4 video cameras in 2007. They added another 30 video camera traps in December 2008 in order to better understand the distribution and behavior of Javan rhinoceros that live in deep in the jungles of the national park. The new cameras were donated by the International Rhino Foundation (IRF), Asian Rhino Project (ARP) And WWF-AREAS

Programme.

"Video serves as a positive tool to provide evidence on the urgency of saving this species," said Agus Priambudi, head of Ujung Kulon National Park. "It is important to be able to show the real condition of Javan rhinos to local and central governments."

Video camera traps have proved to be an effective observation tool in monitoring behavior of rare animals in habitats like Ujung Kulon. Although naturally confined in the Ujung Kulon peninsula (120,551 ha, of which 76,214 ha are land and 44,337 ha are surrounding reefs and sea), Javan rhinos are difficult to observe or come across during field surveys. Their shy nature coupled with low numbers and general inaccessibility within the park, poses difficulty in gathering data. Previous attempts at gathering visual data included usage of tree platforms called 'Ranggons' made of bamboos and wooden platforms installed in trees and supporting up to 4 observers. Although successful to an extent, the nuances of setting up the structures and the dangers involved rendered it an impractical option. The promising results obtained via modern digital technology has proved to be a great help to scientists gather crucial information on the behavioral aspects of Javan rhino study. Of the remaining two populations surviving, the Ujung Kulon population still has proof of breeding and hence

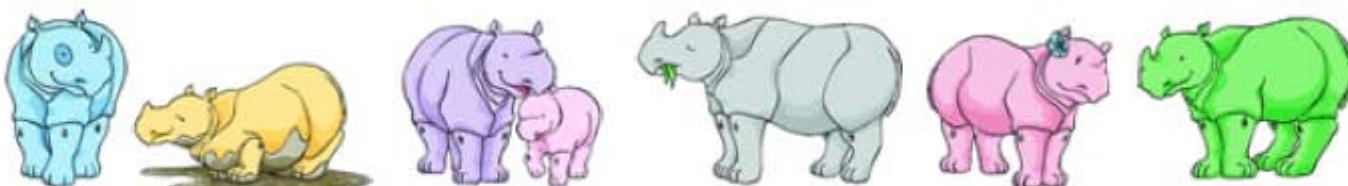
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has a better chance of survival. Commenting on signs of breeding in the Ujung Kulon population, Adhi Haryadi of WWF Indonesia said, "We are concerned because we have not seen many very young calves in Ujung Kulon National Park for several years and worry that the population may be dependent on two or three breeding females."

Rhino experts from all over the world met in Indonesia this week (2-3 March), under the umbrella of the IUCN Asian Rhino Specialist Group (AsRSG) to discuss plans and progress on protecting Indonesian rhinos. Experts want to identify another suitable site, where a second population could be established. "This will help diffuse the danger of all the animals living in one place, which is risky because of the danger of catastrophic events like disease, eruptions from nearby volcanoes and other unforeseen disasters," said Susie Ellis, Executive Director of the International Rhino Foundation. ■



## RhinoCare Adopt a Javan Rhino



Apart from conducting research on Javan rhino and supporting anti-poaching patrols, WWF effort in Ujung Kulon National Park is also focused on sensitizing the public and encouraging public and corporate engagement in its conservation. In 2007, WWF Indonesia launched the RhinoCare Program to upscale ongoing rhino conservation work by pooling in better funds and resources. The program has been accordingly designed to give individuals, families, groups, business/corporates and other organizations in Indonesia an opportunity to contribute towards the conservation of Javan rhinos in the wild. The RhinoCare program enables individuals to get personally involved in conservation by symbolically adopting a Javan rhino.

social spectrum in Indonesia have shown interest in Javan rhino conservation by donating in various capacities. In an aim to encourage people to secure the future of Javan rhinos, WWF-Indonesia is currently developing a scheme to expand support from all around the world. Based on camera trap pictures from Ujung Kulon, RhinoCare has developed a list of individual rhinos with unique names and characters, enabling members to adopt a particular rhino of their choice.

The adoption packages start from around US \$ 25 up to US \$ 10,000, which will directly contribute to support Javan rhino conservation efforts like patrol activities, habitat management, genetic and food

personally involved in conservation by symbolically adopting a Javan rhino.

The program is being up scaled in 2009.

Since its launch in 2007, members from a diverse

activities, habitat management, genetic and food supply research in Ujung Kulon National Park. The RhinoCare program is supported by Asian Rhino Project (ARP) and WWF. ■



[www.rhinocare.info](http://www.rhinocare.info)

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