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World Rhino day 2014: Research by the University of Pretoria to aid in in the Rhino's fight for survival

World Rhino Day on 22 September celebrates all five species of rhino – the Black, White, Greater One-Horned, Sumatran and Javan rhinos- living abundantly and free. Initiated in 2010 by WWF-South Africa when poaching started to escalate, it has since become an international event, uniting people and organisations from across the world who are committed to saving these animals.

While the day is intended to be a celebration, the stark fact is that three rhinos per day are lost to poaching in South Africa – a rate at which no more wild rhinos will be left by 2020.

Dr Gerhard Steenkamp of the Veterinary Science Faculty at the University of Pretoria (UP) says the world should realise this has far surpassed a mere poaching problem. Rhino horn is the most expensive commodity today. “This is organised crime and a war we are losing,” he says. But UP is dedicated to learning more about this species which very little is known in an attempt to save them from this tragic fate.

UP is the only university in South Africa that has a Veterinary Faculty and it has made significant discoveries in research to protect rhinos against the poachers' butchering as well as treat those that survive the brutal attacks.

Considering how its expertise could protect rhino in this international war, UP's Veterinary Genetics Laboratory (VGL) established a method of obtaining DNA profile from rhino horns. This evidence is now used in criminal cases against those found in possession of rhino horn or other evidence relating to rhino poaching. It has proved a game changer in securing harsh prison sentences for poachers and rhino horn smugglers, with sentences of up to 29 years imprisonment having been handed out.

Director of the VGL, Dr Cindy Harper, developed a unique DNA profiling database of individual rhinos, named the Rhino DNA Index System or [RhODIS®](#), deriving its name from the FBI's human DNA database, CODIS. RhODIS® is a collection of DNA profiles and samples of live and poached rhinos, as well as stockpiled horns, used to assist with tracing recovered rhinoceros horn and evidence items back to a specific poached animal. Remarkably, less than 0,1mg of horn is sufficient to provide the trace evidence needed to link poachers back to the scene of the crime.

The South African Department of Environmental Affairs (DEA) amended legislation because of this UP discovery. It is now mandatory for samples to be collected from all poached rhinos and other rhinos that are immobilised or die, using RhODIS® kits. All kits need to be submitted to the VGL for

inclusion onto the RhODIS® database. The VGL also offers training on RhODIS® procedures to the internationally related community, the South African Police Service (SAPS) investigators, prosecutors, Government's Green Scorpions, veterinarians and wildlife officials.

This UP brainchild has been recognized by CITES (The Convention on International Trade in Endangered Species of Wild Fauna and Flora) for its role in assisting with tracking wildlife products and prosecuting international wildlife criminals.

The database also contains DNA profiles and samples of rhinos not only from South Africa, but other African countries including Namibia, Malawi and Kenya. During a recent trip to India, Harper initiated moves to include that country's greater one-horned rhinos on the database. "There is value in having all rhinos across the world on one database because horns from all over ultimately end up in the same consumer countries," Harper said.

Moving from the lab to the field, UP vets Drs Gerhard Steenkamp and Johan Marais have also spent much time researching unknown territory that is the rhino's anatomy, as well as its response to medication and even what instruments to use when treating live rhinos that survive poaching attacks.

Their expertise makes a formidable combination for treating rhinos. Steenkamp specialises in maxillofacial surgery and Marais in equine surgery. Marais explains: "out of all mammals, the rhino and horse are probably the most similar." Steenkamp's background particularly benefits facial traumas as a result of horns being hacked off. However, once they started working in the field, they soon realised how much more needed to be done in order to save this species after poaching escalated exponentially in South Africa and set up the project, [Saving the Survivors](#).

Fortunate to be UP academics able to spend time on research, they focused their attention on finding procedures that most effectively and efficiently treat such injuries. A lot of their research is guided by the questions that other veterinarians are asking them. Through the South African Veterinary Association (SAVA), an annual rhino workshop is held across all the provinces of the country. This is an opportunity for vets working on rhinos to come together to share their experiences and expertise. "Our work is clinically driven. Everything that we research is so that we can apply it tomorrow in the field and so that other vets can benefit. We want to train others so there are more hands to treat this very big problem," says Steenkamp.

Having treated several rhinos for facial trauma, they now have a protocol that works, cleaning the wound and applying wound material. A fibreglass-based dressing is then screwed into place over the wound so that the rhino is not able to remove the cover against the nearest tree. While rhino tissue heals incredibly well, large gaping wounds do take a long time to heal. Because it is impossible to treat a wounded rhino daily, they had to find material that would only need to be changed every six weeks.

Despite incredible efforts like these in DNA identification and traceability and treatment of injured rhinos, rhino poaching continues to escalate. With 769 rhinos already poached this year, and 3231 killed since 2010¹, time to find a solution is rapidly running out. Harper says radical solutions will have to be found to save this species from extinction. In a ridiculous war fuelled by greed for something as good as human fingernails, one of the biggest challenges South Africa's rhino face today is the lack of money and time, says Steenkamp and Marais. The reality on World Rhino Day 2014 is sadly not one of celebration, but of grave concern for the future of this majestic creature.

¹ Data made available by Oxpeckers: <http://oxpeckers.org/2014/08/vets-to-the-rhinos-rescue/#/loc=-25.756660049999997,28.227455253614714,12>

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Caption: Drilling for DNA: less than 0,1mg of rhino horn is needed to provide the necessary data for DNA profiling.