

African Rhino Specialist Group report

Rapport du Groupe de Spécialistes du Rhinocéros d'Afrique

Mike Knight, Chair/Président

Executive Manager (Act.), Conservation Services Division, South African National Parks, PO Box 76693, Nelson Mandela Metropolitan University, Port Elizabeth, South Africa 6013
email: m.knight@nmmu.ac.za

Rhino numbers and trends

In the light of additional information end 2015 estimates have been very slightly revised (+1.0% and +0.2% increases in white and black rhino point estimates) to 20,584 white rhino and 5,261 black rhino. The overall trend reported, of levelling-off of white rhino numbers, and continued significant increase in black rhino numbers, remains unchanged. Estimated 90% bootstrapped confidence intervals around revised end 2015 point estimates are 19,871-21,292 (white rhino) and 5,053-5467 (black rhino).

As with previous years the AfRSG-rated **Key** populations continue to conserve the bulk of the rhinos accounting for only an estimated 9% and 16% of the white and black rhino populations, but 80% and 70% of the rhino. While the majority of all rhinos continue to be conserved on state land (62% and 60% of white and black rhinos respectively), this proportion continues to decline down from 71% and 67% respectively a decade earlier. The private sector now manages just over a third of all white and black rhino. While the majority of white rhino under private management continue to be privately owned, the majority of black rhino under private or community management continue to be managed under some form of custodianship agreement.

Figures 1 and 2 put recent changes in numbers in the context of longer term historical changes in estimated numbers since 1960 and since 1977.

Les chiffres de rhinocéros et les tendances

A la lumière des informations supplémentaires, les estimations à la fin de 2015 ont été très légèrement révisées (+1,0% et +0,2% d'augmentation des estimations ponctuelles des rhinocéros blancs et noirs) à 20.584 rhinocéros blancs et 5.261 rhinocéros noirs. La tendance générale signalée, la stabilisation du nombre de rhinocéros blancs, et l'augmentation constante continue du nombre de rhinocéros noirs, restent inchangées. Des estimations de 90% des intervalles de confiance entre les estimations de fin 2015 sont de 19.871-21.292 (rhinocéros blancs) et de 5.053-5.467 (rhinocéros noirs).

Comme les années précédentes, les populations clés évaluées par le GSRAF continuent de conserver la majeure partie des rhinocéros et ne représentent que 9% et 16% des populations de rhinocéros blancs et noirs, mais 80% et 70% des rhinocéros. Alors que la majorité de tous les rhinocéros continuent à être conservés sur les terres de l'Etat (62% et 60% des rhinocéros blancs et noirs respectivement), cette proportion continue de diminuer par rapport à 71% et 67% respectivement une décennie plus tôt. Le secteur privé gère maintenant plus d'un tiers de tous les rhinocéros blancs et noirs. Alors que la majorité des rhinocéros blancs sous gestion privée continue d'appartenir à des particuliers, la majorité des rhinocéros noirs sous gestion privée ou communautaire continue d'être gérée sous une forme d'accord de garde.

Les figures 1 et 2 mettent les changements récents dans le contexte des changements historiques à long terme en chiffres estimés depuis 1960 et depuis 1977.

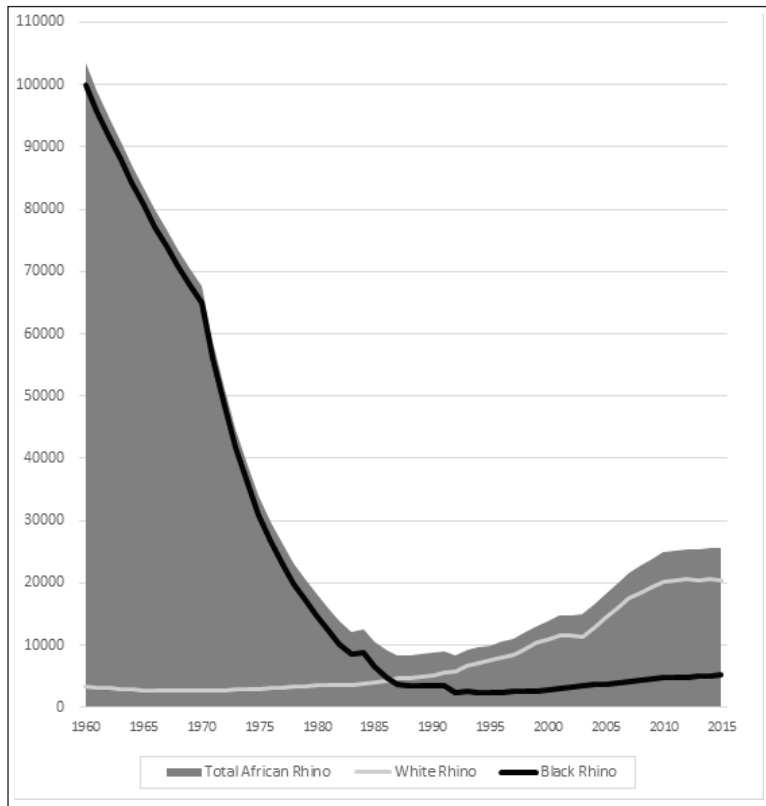


Figure 1. Estimated changes in African rhino numbers since 1960. Numbers have been interpolated for years without estimates. White Rhino numbers represent the total of both Northern and Southern White Rhino. AfRSG began compiling continental statistics in 1992.

La figure 1. Modifications estimées du nombre de rhinocéros d’Afrique depuis 1960. Les nombres ont été interpolés pour les années sans estimation. Le nombre de rhinocéros blancs représente le total de ceux du nord et du sud. Le GSRAF n’a commencé à compiler les statistiques continentales que depuis 1992.

Poaching latest

Reported continental African rhino poaching statistics have been updated to include figures for 2016. These show the first decline in total numbers of rhinos recorded poached in seven years. NB there are minor revisions to previously reported Malawi 2014 and Namibian 2015 totals.

Récent braconnage

Les statistiques mises à jour du braconnage rapportées pour 2016 (un total de 1.160 rhinocéros ou 3,17/jour) révèlent la première baisse en sept ans (Tableau 1).

CITES

CITES CoP 17 was well hosted by South Africa and took place in October 2016. Documents for the meeting included the CITES’ Secretariat’s rhino report (which included a DNA sample collection protocol annexure document submitted

CITES*

La CdP17 de la CITES, accueillie par l’Afrique du Sud, s’est tenue en octobre 2016. Les documents pour la réunion comprenaient le rapport du Secrétariat de la CITES sur le rhinocéros (qui comprenait un document annexé sur le protocole de la collecte d’échantillons d’ADN soumis par l’Afrique du Sud). Le rapport conjoint de l’UICN/TRAFFIC, comme d’habitude, a été inclus en annexe au rapport du Secrétariat. On peut le télécharger

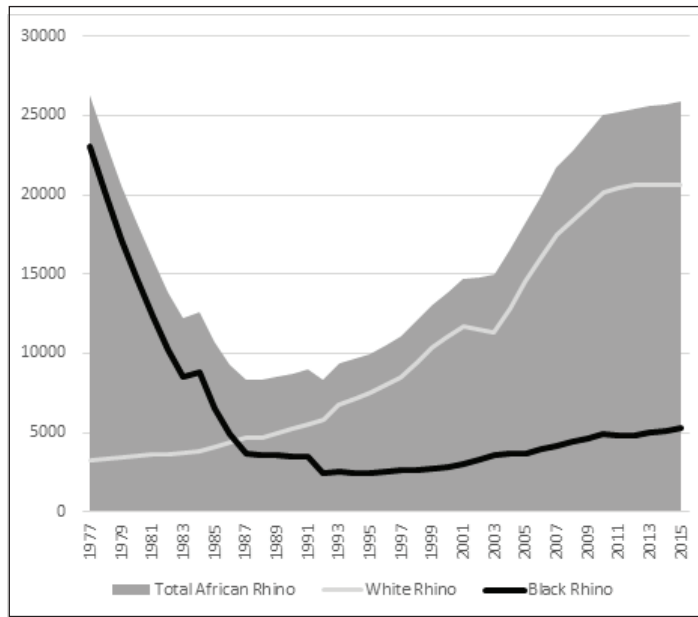


Figure 2. This figure shows more changes in estimated African rhino numbers since 1977. Numbers have been interpolated for years without estimates. White Rhino numbers represent the total of both Northern and Southern White Rhino.

La figure 2. Montre encore des changements du nombre de rhinocéros d'Afrique estimé depuis 1977. Les nombres ont été interpolés pour les années sans estimation. Le nombre de rhinocéros blancs représente le total de ceux du nord et du sud.

Table 1. Updated reported African rhino (both species) poaching statistics

Country	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	Total
Botswana	0	0	0	0	0	0	2	2	0	0	0	4
DR Congo	0	0	2	2								4
Kenya	3	1	6	21	22	27	29	59	35	11	10	224
Malawi	0	0	0	0	0	0	2	1	1	1	1	6
Mozambique	0	9	5	15	16	10	16	15	19	13	5	123
Namibia	0	0	0	2	2	1	1	4	30	94	60	194
South Africa	36	13	83	122	333	448	668	1004	1215	1175	1054	6151
Swaziland	0	0	0	0	0	2	0	0	1	0	0	3
Tanzania	0	0	2	0	1	2	2	0	2	2	0	11
Uganda	0	0	0	0	0	0	0	0	0	0	0	0
Zambia	0	1	0	0	0	0	0	0	0	0	0	1
Zimbabwe	21	38	164	39	52	42	31	38	20	50	30	525
Total	60	62	262	201	426	532	751	1123	1323	1346	1160	7246
Poached/day	0.16	0.17	0.72	0.55	1.17	1.46	2.05	3.08	3.62	3.69	3.17	

by South Africa). The joint IUCN/TRAFFIC report as usual was included as an Annexure to Secretariat report. It can be downloaded from the CITES website as Doc *E-CoP17 68-A5* or at http://www.rhinoresourcecenter.com/pdf_files/147/1470753643.pdf. (NB The total number of greater one-horned (GOH) rhinos in Table 8 should be 3,557. Individual country GOH totals and GOH total in report text are correct).

In plenary, the Secretariat's report was introduced by Ben van Rensburg, who then passed over to Richard Emslie and Tom Milliken who introduced the joint IUCN/TRAFFIC report drawing attention to its main findings and issues. Parties were also encouraged to consider the report's recommendations.

As has been the case with previous joint IUCN/TRAFFIC rhino reports, the latest report was well received by both Parties and Observers. As part of approved Decisions at CoP17, CITES Standing Committee was mandated to consider the recommendations in IUCN/TRAFFIC report, and especially the identification of priority countries for attention and reporting (which most importantly now included China).

Swaziland's white rhino down-listing proposal was considered at CoP17. As could be expected polarised views were expressed in debate with plenary hearing arguments from both sides. Without going into detail, the issues discussed included ... Protectionism versus Conservation approaches; the critical need for sustainable funding for rhino conservation; the potential of demand reduction efforts to work, and the impact on these efforts should trade in Swazi horn be legalised; whether or not CITES has failed or worked for rhino; the importance of communities and need for increased incentives to pay for conservation (and especially enhanced law enforcement and protection efforts now required); and concerns about controls and risks of potential illegal laundering of horn that might occur if a trade were not properly controlled. The lack of sufficient detail in the Swazi proposal, relating to who would trade with whom, and the mechanism was raised. This was expected as the proposal had been put together very quickly by Swaziland with the aim of ensuring debate occurred on the issue of trade and the need for sustainable funding at CoP17. (South Africa had just prior to the proposal submission deadline indicated it was not going to submit a down-listing

à partir du site Web de la CITES comme Doc *E-CdP17 68-A5* ou sur http://www.rhinoresourcecenter.com/pdf_files/147/1470753643.pdf. (NB Le nombre total des grands rhinocéros unicornes dans le tableau 8 devrait être de 3.557. Leurs totaux pour chaque pays et dans le texte du rapport sont corrects).

Comme cela a été le cas pour les rapports conjoints précédents de l'UICN/TRAFFIC sur le rhinocéros, le dernier rapport a été bien accueilli par les Parties et les Observateurs. Dans le cadre des décisions approuvées à la CdP17, le Comité Permanent de la CITES était chargé d'examiner les recommandations contenues dans le rapport de l'UICN/TRAFFIC et, en particulier, d'identifier les pays prioritaires auxquels il fallait faire attention et faire des rapports (dont le plus important maintenant est la Chine).

La proposition de déclassement du rhinocéros blanc du Swaziland a été examinée à la CdP17. Comme on pouvait s'y attendre, des opinions polarisées ont été exprimées en débat avec l'audition des arguments en plénière des deux côtés. Comme prévu, la proposition n'a pas réussi à obtenir la majorité des deux tiers nécessaires. Avec les votes de l'UE en bloc, la proposition a été rejetée par 100, soutenue par 27 avec 17 abstentions. Un fait intéressant est que, selon s'ils ont appuyé ou rejeté la proposition dans leurs interventions à la CdP17 et les rapports des discussions pré-CdP de la SADC, les pays qui conservent ~96,6% des rhinocéros blancs d'Afrique ont probablement voté en faveur de la proposition du Swaziland; alors que le Kenya, le Botswana et l'Ouganda ont probablement voté contre.

Les 67 et 68èmes réunions du Comité Permanent de la CITES se sont tenues avant et après la CdP. Le Vietnam a été surtout critiqué, en particulier à cause de ses efforts limités en matière d'application de la loi et son échec continu et répété à fournir des informations demandées sur les condamnations et les peines. La mise en œuvre du nouveau code pénal du Vietnam prend du temps. Il ressort clairement des discussions qu'on commence à perdre patience. Il a été reconnu que le Mozambique avait fait quelques progrès même s'il restait encore beaucoup à faire. Ce qu'il fallait que ces pays mettent dans leurs rapports a été précisé. Il se peut que des mesures soient prises contre le Vietnam suite à son échec de répondre adéquatement. Le mandat du Groupe de travail sur les Rhinocéros de la CITES a été prolongé à la CP68. Un nombre record d'événements parallèles sur le rhinocéros ont eu lieu à la CdP17.

proposal to CoP17). The vote was by secret ballot. As expected the proposal failed to get the necessary two-thirds majority. With the EU voting as a block, the proposal was rejected by 100 Parties (member countries), supported by 27 with 17 abstentions. Interestingly, (based on whether they supported or rejected the proposal in their interventions at CoP17 and reports from SADC pre-CoP discussions), it was probable that countries that conserved ~96.6% of Africa's white rhino voted in favour of Swaziland's proposal; with Kenya, Botswana and Uganda probably voting against.

CITES Standing Committee Meetings 67 and 68 were held either side of the CoP. Vietnam came in for special criticism, especially for its limited Law Enforcement efforts and its continued and repeated failure to supply information requested on convictions and sentences. The implementation of Vietnam's new penal code has also been delayed. It was clear from discussions that patience is wearing thin. Some progress with Mozambique was recognised; although it was noted that more still needs to be done. Reporting requirements for these countries were set out. Failure of Vietnam to respond adequately may open the way for compliance measures to follow. The CITES Rhino Working Group Mandate was extended at SC 68. Unfortunately Chair Michael Sigsworth (who is widely recognised as having done an excellent job chairing the working group) has had to stand down due to his redeployment by DEFRA in the UK.

There were a record number of rhino side events at CoP17—including:

- Strengthening capacities to combat poaching and illegal wildlife trade
- INTERPOL Wildlife Crime Working Group
- Regional Wildlife Enforcement Networks meeting
- Launch of African Rhino Range States African Rhino Conservation Plan (discussed above)
- Dr Lyle Pienaar and Julian Rademayer—Need for multi-sectoral police led approach in SA to tackle trafficking across whole value chain not just poaching.
- SADC strategy launch
- Using DNA forensics to combat wildlife crime (a speaker gave RhoDIS as an example)
- Private sector challenges and rhino horn trade

Réunions et initiatives pour favoriser la conservation régionale des rhinocéros et combattre le braconnage*

Au cours de la période considérée, plusieurs réunions ont eu lieu, y compris la 20^{ème} réunion du Groupe de Gestion du Rhinocéros de la SADC, la 29^{ème} réunion du Groupe de Sécurité du Rhinocéros et de l'Eléphant et une réunion régionale des groupes de travail sur la criminalité faunique.

Plan continental de conservation des rhinocéros d'Afrique des Etats de l'aire de répartition et plans nationaux

- **Plan de conservation des rhinocéros d'Afrique des Etats de l'aire de répartition ***

Le nouveau plan continental pour la conservation des rhinocéros d'Afrique des Etats de l'aire de répartition a été formellement lancé lors d'un événement parallèle de la CdP17 de la CITES. Au moment du lancement, tous ces Etats, sauf deux, avaient déjà indiqué leur soutien au plan. Le lancement a également fait l'objet d'un rapportage mondial sur le site Web de l'UICN (https://www.environment.gov.za/sites/default/files/strategic_plans/africanrhino_conservationplan.pdf) et le plan peut être consulté à l'adresse https://www.environment.gov.za/sites/default/files/strategic_plans/africanrhino_conservationplan.pdf

Le Plan de conservation des rhinocéros d'Afrique des Etats de l'aire de répartition constitue un cadre général dans lequel les initiatives régionales et les Plans nationaux s'insèrent. Il cherche à compléter et non pas reproduire ce qui est dans les plans nationaux. Le plan reconnaît que de nombreuses questions sont mieux traitées au niveau national. Le plan continental met en lumière les domaines nécessitant une collaboration entre les Etats de l'aire de répartition des rhinocéros pour atteindre les objectifs communs de conservation des rhinocéros, tels que le partage et l'analyse des informations du renseignement, le rétablissement du rhinocéros à travers les frontières et l'amélioration du financement efficace pour la conservation.

Révisions et développement des plans pour le Rhinocéros*

En avril/mai 2017, le Kenya a organisé un atelier des

- Pembient bioengineered horn proposal (presentation was not well received by the majority of the audience who raised a number of concerns)
- SA National Prosecution Service–rhino crime cases update
- Cooperation between South Africa and Mozambique–Implementation of MoU
- RhODIS stand in exhibition hall.

Lyle Pienaar (South African Security Analyst for the South African Government) in his side event with Julian Rademayer (available on You Tube) argued that rhino crimes need to be tackled as a national security/organised crime issue and NOT just a crime against conservation. He argued a whole new government approach was needed with support from civil society. He noted that part of the problem is that the wrong people have been around the table or making MoU's, and there needed to be a paradigm shift to a multi-sectorial police-led approach, with law enforcement agencies supported by other departments to combat transnational organised crime (TOC). In South Africa, he explained this approach is in the final stages of being authorized, and will replace the current Integrated Strategic Management approach. Dr Pienaar also called for co-operation against wildlife crime because this approach achieves results. He emphasised the need for intelligence-driven investigations aimed at curbing the entire illicit value chain and not just focusing on poachers (aiming to disrupt their businesses). A key take home message was that we are dealing with a trafficking problem (and not just poaching which is just a part of it).

Meetings and Initiatives to further Regional Rhino Conservation and to address Poaching

20th SADC Rhino Management Group (SADC RMG) Meeting

The meeting was held from 28th February–3rd March 2017 in Skukuza, Kruger National Park. It was attended by 14 RMG members (representing South Africa, Namibia and Zimbabwe) and 23 invited observers. The RMG plays an pivotal role in bringing regional state conservation representatives, government officials, rhino experts, NGOs, private

parties prenantes facilité par le Dr Raj Amin pour examiner et réviser son plan national de rhinocéros. Avec l'aide du Dr Peter Goodman, un plan de rhinocéros rwandais a été développé par le Rwanda comme précurseur nécessaire à ses projets visant à réintroduire le rhinocéros dans le pays. Le Responsable scientifique a été invité à contribuer au développement d'un plan tchadien pour le rhinocéros qui sera un précurseur nécessaire aux plans de rétablissement du rhinocéros noir dans ce pays.

Project d'investissement de l'impact sur le rhinocéros*

Un projet d'investissement de l'impact sur le rhinocéros, mis en œuvre par une collaboration entre les principaux partenaires du secteur de la conservation, de la finance et du secteur juridique, y compris le GSRAF et les partenaires d'*United for Wildlife* (UfW), et mené par la Société Zoologique de Londres vise à élaborer un mécanisme de financement pour canaliser les fonds d'investissement d'impact vers des sites sélectionnés ayant des populations clés de rhinocéros afin de financer des interventions de gestion pour la conservation des rhinocéros.

Les experts acceptent d'améliorer les tests internationaux d'ADN des rhinocéros à l'atelier RhODIS en Afrique du Sud*

Les travaux nécessaires pour faciliter l'expansion internationale des tests d'ADN de la corne de rhinocéros en utilisant un seul système mondial compatible ont été entrepris en Afrique du Sud dans l'atelier scientifique d'ADN de Rhinocéros RhODIS® au parc national Kruger et au Laboratoire de Génétique Vétérinaire (LGV) de l'Université de Pretoria en février 2017. RhODIS® est un système de profilage et de base de données d'ADN de rhinocéros développé par le LGV en collaboration avec ses partenaires. A ce jour, tous les Etats de l'aire de répartition du rhinocéros d'Afrique, sauf un, ont apporté des échantillons au LGV pour l'analyse RhODIS®. L'atelier a réuni des médecins légistes de l'ADN de la faune, des agents d'application de la loi et des enquêteurs venant des pays de source, de transit et de consommation de la corne de rhinocéros. Plusieurs départements de la police sud-africaine étaient représentés, tout comme le Ministère des Affaires Environnementales du pays.

Selon le Dr Cindy Harper, directeur de LGV, un

sector and other experts to discuss rhino issues. The meeting placed more attention on non-security related subjects.

The meeting was divided in two parts—a South African focused session and a SADC Range states section collectively dealing with general rhino conservation issues. Issues of interest that were discussed included: Population status of black and white rhinos in South Africa (Provincial, SANParks and Private); Impact of poaching on private land; Feedback from Rhino Lab and implications for the RMG; Combined black and white rhino reporting for the Biodiversity Management Plans; the Big picture on status of rhinos; Implications of the domestic trade in rhino horn; Minimum standards for captive breeding operations; Conditions for approval of semi-wild rhino operations—guidelines; Criteria for appropriate and acceptable destinations for rhino; Role of trophy hunting of rhinos; CITES COP17 report back; Report back on RESG INTERPOL meeting; Regional Red Listing of rhinos; The WWF Black Rhino Range Expansion Project—latest; Update on rhino veterinary issues in SANParks; How do we arrange sustainable funding—Rhino Impact Investment option; Update on rhino veterinary issues in SANParks; Proposed methods of domestic trade in Rhinos and the role of the central stock pile of horn; Update on population genetics and forensics (RhODIS) and; New genetic research—implications for rhino conservation management and; Community-focused rhino conservation projects.

Rhino and Elephant Security Group (RESG)

The RESG was invited to attend and present at the 2nd Global Wildlife Enforcement Network meeting and also at the INTERPOL Wildlife Crime Working Group meeting held during CoP17 in Johannesburg, South Africa. The opportunity was used to share our progress and achievements with international professional colleagues. Discussions had a direct positive impact on the following RESG meeting held three months later.

The 29th meeting of the Rhino and Elephant Security Group was held in Kruger National Park, South Africa from the 9 January–12 January 2017. A total of 32 delegates from 13 countries or organizations attended the meeting chaired by Mr Renatus Kusamba of TANAPA.

The RESG is striving to become the Regional

résultat majeur de la réunion était qu'il précisait les détails d'une méthode simplifiée pour faciliter le partage et la distribution d'un système d'analyse RhODIS[®] compatible et amélioré à de multiples laboratoires à travers le monde laquelle peut devenir la norme internationale capable de produire des profils d'ADN comparables qu'on peut charger sur une base de données mondiale. Le plan consiste à sélectionner un meilleur sous-ensemble à partir d'un ensemble existant et un ensemble de nouveaux marqueurs potentiels pour produire un ensemble de marqueurs révisé et amélioré qui peut ensuite être validé scientifiquement et utilisé par différents laboratoires dans le monde entier afin de générer des profils d'ADN comparables. Cela permettra également un certain degré de compatibilité avec les nombreux milliers de profils déjà sur la base de données RhODIS. Alors que le système RhODIS[®] est déjà un outil éprouvé pour les enquêtes sur le braconnage des rhinocéros et qu'il a été utilisé dans de nombreuses poursuites, le raffinement et le déploiement d'une norme d'ADN de rhinocéros médico-légale internationalement reconnue devraient favoriser l'application des lois et les enquêtes sur les routes commerciales à l'échelle internationale. RhODIS[®] peut déjà déterminer l'espèce de rhinocéros africain à partir de la corne récupérée et la réunion a reconnu qu'il faudrait l'améliorer pour qu'il puisse aussi être utilisé pour distinguer les espèces de rhinocéros d'Asie. Après la réunion, l'Inde a confirmé son intention de procéder au développement et au test de RhODIS et de l'utiliser pour le grand rhinocéros unicolore dans la sous-région. S'il sera possible ou non pour un ensemble de marqueurs d'analyser les données pour les rhinocéros blanc, noir et unicolore, ou s'il faudra plutôt inclure les marqueurs d'identification du grand rhinocéros unicolore dans la méthode afin que les échantillons de cette espèce puissent être analysés à l'aide d'un ensemble distinct de marqueurs spécifiques n'est pas encore connu. On peut télécharger le compte-rendu de l'atelier à partir de http://www.trafficj.org/publication/17_RhODIS_Proceedings.pdf.

L'analyse d'ADN commence à améliorer la connaissance des itinéraires commerciaux. RhODIS informe aussi d'autres aspects de la gestion des rhinocéros, tels que l'identification récente des rhinocéros noirs *D.b.michaeli* assez purs pour être adaptés à la translocation vers leur ancien habitat. Les données de RhODIS ont également été utilisées pour étudier les variations génétiques panafricaines et la manière dont les rhinocéros existants pourraient être regroupés.

mirror of International Consortium on Combatting Wildlife Crime (ICWC) partners and supporters. To this end a number of presentations of international importance were shared with the delegates. These included ARINSA who focuses on asset recovery within the Region. The advantages of this approach is that it can allow for confiscation of assets well before anyone has been convicted in court; and can significantly hamper those whose assets have been seized. Other international presentations were from the AfRSG; an update on the RhODIS rhino DNA programme; a TRAFFIC presentation on the ETIS and MIKE programs. Representatives of the Wildlife Crime Working Group of INTERPOL (International) and some local INTERPOL National Coordination Bureau (NCB) representatives were also present.

One of the matters which had to be addressed at the meeting was the authority under which the RESG retains its mandate. It had been many years since the RESG was given the OK to continue its work formally under the SADC umbrella via SADC Forestry and Natural Resources (FANR). However due to it operating under the radar without seeking publicity, and staff turnover in SADC, institutional memory had been lost with current SADC staff unaware of its history and continued existence and as a result it was not taken into account by the consultant at the time the new SADC Law Enforcement and Anti-Poaching (LEAP) strategy was initially developed. Contact between the RESG and LEAP was made at the Regional WEN meeting which coincided with CITES CoP17.

Many years ago, INTERPOL's Southern African Regional Bureau set up an Environmental Crime Working Group (ECWG). A few years of SADC RESG and INTERPOL Sub Regional ECWG meetings held back to back (to save on costs given some shared membership) paved the way for joint combined meetings. Eventually the two groups voted to merge and developed joint terms of reference. However, it was recently discovered that INTERPOL's regional southern African bureau had named and set up its long established ECWG and agreed to merge with the RESG without reference to, or without formal approval of INTERPOL head office in France which had set up its own official global wildlife crime working group (WCWG). Representatives of INTERPOL's WCWG attended the RESG meeting, and one option discussed was for

Liste rouge régionale et continentale*

Le système de la Liste Rouge de l'UICN est un système fondé sur des règles et il est essentiel d'appliquer équitablement ses critères. Toutefois, lors de l'établissement de la Liste rouge régionale (l'Afrique du Sud, le Swaziland et le Lesotho) du rhinocéros d'Afrique, il était évident qu'il fallait répondre à plusieurs questions. Par exemple, la crise du braconnage et son impact potentiel sur le nombre de rhinocéros à l'avenir devraient être clairement pris en compte dans les évaluations de la Liste rouge, mais comment devrait-on modéliser le braconnage et pour combien de temps devrait-on le prévoir? Les différentes questions posées et les approches utilisées dans le processus régional de la Liste rouge du rhinocéros d'Afrique sont décrites en détail dans les évaluations régionales du rhinocéros noir et, dans une moindre mesure, du rhinocéros blanc qu'on peut télécharger à l'adresse https://www.ewt.org.za/Reddata/pdf/RLA_Diceros%20bicornis_EN.pdf et sur https://www.ewt.org.za/Reddata/pdf/RLA_Ceratotherium%20simum%20simum_NT.pdf. Les mêmes approches sont utilisées pour mettre à jour les évaluations de la Liste Rouge pour le continent. La Liste Rouge régionale pour l'Afrique du Sud, le Swaziland et le Lesotho se trouvent dans le tableau 2.

Rétablissement au Rwanda

Dix-huit rhinocéros noirs *D.b.michaeli* de la population privée de l'est en Afrique du Sud ont récemment été transférés au Rwanda pour rétablir le rhinocéros noir dans le pays après leur extinction pour la deuxième fois suite au braconnage. Les rhinocéros ont été rétablis dans le parc national Akagera, qui est géré par l'Agence de Gestion d'Akagera (une collaboration entre le Réseau des Parcs Africains et le Bureau de Développement du Rwanda). On s'attendait à ce que 12 autres fondateurs du Kenya renforcent le nombre de fondateurs génétiques et la diversité de la population d'Akagera. Malheureusement, le parlement kenyan n'a pas approuvé cette décision. Espérons que cela sera reconsidéré. Dans le futur, les tentatives continueront pour assurer une diversité génétique fondatrice supplémentaire avec la possibilité de faire venir certains animaux des zoos européens. Il est prévu de tenir la prochaine réunion du Groupe de Gestion du Rhinocéros de la CAE dans l'Akagera, et l'approvisionnement des fondateurs supplémentaires pour l'Akagera sera l'une des questions discutées.

the RESG to submit an official INTERPOL project proposal so that the RESG can take on the status of an INTERPOL WCWG program. This proposal is currently being prepared. A further advantage of this option is that the current membership extends beyond the SADC Region and furthermore, falling under the INTERPOL banner, this would encourage greater participation by INTERPOL representatives from the member countries.

Another possibility within SADC was for RESG to take on the status of the Wildlife Crime Investigation Unit, as described in the SADC Law Enforcement and Anti-Poaching (LEAP) strategy. At a high level SADC meeting held in February 2017 in Swaziland, the SADC representatives indicated they wanted to continue developing its broader LEAP strategy (covering more countries and having a more comprehensive focus than RESG), and that it wishes to develop its own WCIU body. However, at the meeting it was reported that SADC were keen to learn lessons from the RESG's functioning over the years, and hoped to incorporate it and its members in some way as part of the new broader SADC LEAP. At this stage RESG's exact relationship to and with LEAP is unclear.

In the light of these developments, the RESG has dropped SADC and INTERPOL ECWG from its name and the RESG Secretariat are pursuing and investigating future options. For now the RESG will continue but under what umbrella, mandate and form, is at the time of writing still to be decided.

At the meeting exploratory discussions also took place, with Dr Holly Dublin of the IUCN SSG African Elephant Specialist Group who had sought to work closer together with the RESG in the future (as the AfRSG has done for many years), in dealing with elephant related crimes.

Continental Range States' African Rhino Conservation Plan and National Rhino Plans

- **Range States' African Rhino Conservation Plan**

During the reporting period the AfRSG completed and circulated a draft version of the new continental African Rhino Range States African Rhino Conservation Plan to all range States for comments and for approval. This plan had been developed at three range States workshops with facilitation

Malheureusement, cette introduction très appréciée a conduit à la triste perte de Krisztián Gyöngyi, un scientifique hongrois et chercheur expérimenté sur le rhinocéros, qui a été tué en surveillant les rhinocéros introduits (une nécrologie figurera dans le prochain numéro de Pachyderme ; consulter aussi le document de Krisztián intitulé: Choix de fourrage du rhinocéros noir réintroduit et la disponibilité de certaines espèces de brout dans la Réserve de la Faune de Majete, au Malawi, dans la section Recherche de ce numéro). Je viens d'apprendre qu'un écolier expérimenté, Lawrence Munro, a été récemment jeté en l'air par un rhinocéros noir et sérieusement encorné au Malawi après s'être interposé entre l'animal et les visiteurs qu'il guidait ce jour-là et protégeait. Au nom du GSRAf, je voudrais souhaiter à Lawrence un établissement rapide.

Avant la réintroduction, les questions avaient été soulevées à savoir s'il convenait de transférer ces animaux suite à la découverte imprévue que tous les animaux *D.b.michaeli/D.b.minor* mélangés n'avaient pas été retirés de l'ancienne population d'Addo *D.b.michaeli* quarante ans auparavant comme on l'avait supposé pendant longtemps. Cette population d'Addo a ensuite été transférée vers une réserve privée en Afrique du Sud, où le nombre a rapidement augmenté. Compte tenu de la nouvelle preuve qu'il y avait un certain mélange dans cette population fondatrice potentielle, les Parcs africains ont demandé au Groupe de Spécialiste du Rhinocéros d'Afrique de la CSE/l'UICN de commenter la translocation proposée d'un groupe fondateur de rhinocéros noirs de l'est (*D.b.michaeli*) venant de cette réserve privée dans le cadre de la réintroduction prévue du rhinocéros noir au Rwanda. Le Responsable scientifique et le Président du GSRAf ont consulté des généticiens reconnus et des biologistes de la conservation pour avoir leurs opinions et leurs points de vue sur le problème. Il s'agissait du Dr Bob Lacy, du Dr Eric Harley, du Dr Cindy Harper, du Dr Steve O'Brien, du Dr Phil Seddon, du Dr Desiré Dalton, du Dr Yoshan Moodley, du Dr Oliver Ryder, du Dr Nikki Le Roex et du Dr Shadrack Muya. Le Secrétariat du GSRAf tient à remercier tous ces experts pour leur temps et leurs commentaires détaillés, ainsi que le Dr Cindy Harper d'avoir entrepris les analyses de STRUCTURE génétique qui nous ont beaucoup aidés à élaborer des recommandations pour les Parcs africains. Certains des experts consultés ont également commenté avec amabilité un projet de lettre et nos recommandations proposées aux Parcs africains.

La majorité de la population source proposée a été échantillonnée génétiquement (principalement au

by the AfRSG Chair and Scientific Officer and hosting support from South Africa's Department of Environmental Affairs. Every single African rhino range State (Botswana, Kenya, Malawi, Mozambique, Namibia, South Africa, Swaziland, Uganda, United Republic of Tanzania, Zambia and Zimbabwe) and also Angola contributed to the development of this plan at these workshops. The plan was formally launched at a well-attended side event at CITES CoP17. By the time of the launch of the Plan at a side event at CITES CoP17 all but two of the range States had already indicated their support for the plan.

South Africa's Minister of the Environment Ms Edna Molewa introduced the African Rhino Range States' African Rhino Conservation Plan at its launch before handing over to the AfRSG Chair and Scientific Officer to outline the plan structure and proposed implementation arrangements. Prior to questions from the audience there were a number of short speeches supporting the new plan from dignitaries present including the Namibian Minister of the Environment and Tourism Mr Pohamba Shifeta (the Permanent Secretary, Mr Malan Lindeque of MET was also in attendance), the Director General Mbatia Kitili of Kenya Wildlife Service, The CEO of Swaziland's Big Game Parks Mr Ted Reilly the Deputy Director, Botswana Department of Wildlife and National Parks Deputy Director Dr Cyril Taolo, the Principal Wildlife Officer of the Ugandan Ministry of Tourism, Wildlife and Antiquities Mr George Owoyesigire, and a Conservation Director from Angola. The launch was also the subject of a global web story on the IUCN Web Site <https://www.iucn.org/news/secretariat/201609/unified-voice-african-rhinos-continent-wide-conservation-plan-launched> and the plan can be viewed at https://www.environment.gov.za/sites/default/files/strategic_plans/africanrhino_conservationplan.pdf

The African Rhino Range States' African Rhino Conservation Plan provides an overarching umbrella under which Regional initiatives and National Plans fit. It seeks to complement and not duplicate what is already in National Plans. The plan recognises that many issues are best dealt with at the National level. The continental plan highlights areas requiring collaboration between rhino range states to achieve shared rhino conservation goals, such as sharing and analysing intelligence information, re-establishing rhino across boundaries, and enhancing effective

début de l'année 2017) en utilisant des kits RhODIS (maintenant une chaîne de preuves d'échantillons d'ADN relatifs aux rhinocéros individuels). Le docteur Cindy Harper (Laboratoire de Génétique Vétérinaire, Université de Pretoria) a ensuite entrepris des analyses de STRUCTURE génétique bayésienne et a quantifié la probabilité inférée d'ascendance de chacun des 81 individus échantillonnés de cette population, ainsi que 633 échantillons de référence de toutes les sous-espèces. L'analyse du Dr Harper a trouvé que le mélange dans cette population était limité. Heureusement, la population était encore surtout *D.b.michaeli* et la grande majorité des animaux étaient *michaeli* purs ou très purs. Son analyse la plus récente et la plus complète a révélé que l'ascendance moyenne inférée de cette population était de 92,53% *D.b.michaeli* avec un échantillon médian de 98,80% *D.b.michaeli*. Seuls 6 animaux (7,5%) ont été considérés d'avoir moins de 70% d'ascendance de *D.b.michaeli*.

Le Dr Yoshan Moodley nous a indiqué que la population source sud-africaine a conservé un matériel génétique de haplotype CE précieux, qui est maintenant moins fréquent en Afrique de l'Est qu'il ne l'était autrefois avant le braconnage intense des années 1960, 70 et 80.

Alors qu'on n'a vu aucun signe de problèmes d'exogamie depuis le mélange limité à Addo il y a plus de 40 ans (cette population étant par la suite très reproductrice), nous avons néanmoins recommandé que seuls les animaux *michaeli* purs ou très purs soient transférés au Rwanda.

Sur la base des discussions, nous recommandons que tous les animaux fondateurs potentiels soient échantillonnés génétiquement et qu'un seuil de rigueur de $\geq 85\%$ de *D.b.michaeli* soit utilisé pour décider des animaux à transférer vers le Rwanda. L'analyse STRUCTURE du Dr Harper a indiqué que les scores moyens de % d'ascendance *michaeli* pour tous les animaux fondateurs potentiels « purs » ou « très purs » ayant dépassé les seuils de rigueur de $\geq 85\%$ (c'est-à-dire après exclusion des individus mélangés identifiés comme non adaptés à la translocation au Rwanda) était de 97,9%. Ainsi, l'utilisation du seuil de rigueur de $85\%+$ ne signifie PAS que l'on obtiendrait un groupe fondateur en moyenne 15% *de minor*.

Nous avons également recommandé que des échantillons génétiques soient prélevés sur d'autres fondateurs et que, lorsque les bébés rhinocéros sont nés dans la nouvelle population, qu'ils soient également opportunément échantillonnés pour l'ADN (par exemple, au moment de l'entaille des oreilles). De cette façon, une histoire génétique de la population d'Akagera peut être

funding for conservation.

The long term vision of the plan is “*Secure, viable, growing and valued rhino populations across the African landscape*” and the goal target for duration of the plan was to “Ensure that continental rhino numbers increase over the next 5 years (by end 2020)”.

The Range States identified eight **Key Components** to form the pillars of the new Continental Plan, with all these components contributing to meeting the goal and making progress towards achieving the long-term vision. A number of cross-cutting issues were also identified. Each Key Component has an associated Objective, with the plan then giving illustrative actions, possible projects and two to three Key Performance Indicators (KPIs) per Key Component. The plan contains a “*Plan at a Glance*” figure illustrating how meeting all the Key Component Objectives will contribute towards meeting the Plan Goal Target. (See Figure 3).

The plan in particular highlights the actions, **KPI**’s and possible projects that are of a continental nature requiring collaboration between range states.

Range States are to be accountable for oversight of the plan and to identify focal points in their country to have oversight over implementation. They are encouraged to make use of the AfRSG official range State representatives to report back to principals to ensure that the plan is being implemented effectively. It is recommended that existing structures within range States that manage national plans should be used. For example, should a country have a national rhino coordinator, this person could be tasked with assessing and following up on the continental plan implementation as part of their work. Range State focal points are encouraged to interact with their counterparts in other range States to give effect to the plan. The AfRSG will assist range states to develop and prioritise projects for funding as well as investigating potential sources of sustainable funding.

A small number of KPI’s are listed at the end of each Key Component section in the plan and can serve to evaluate its implementation. The IUCN SSC AfRSG meeting can provide a forum for Range State reporting of their implementation of the plan against the KPI’s, every two to three years. SADC Rhino Management Group, East African Community Rhino Management Group (EAC RMG) and RESG meetings will also provide forums where progress

maintenue et utilisée pour guider la gestion future (y compris les translocations, lorsque la population devient éventuellement assez grande pour devenir une population de donneurs). La majorité des généticiens et biologistes de la conservation que nous avons consultés (énumérés ci-dessus) a appuyé ces recommandations.

Les possibilités de créer de nouvelles populations avec assez de fondateurs (idéalement 20+) dans un habitat approprié, ayant la capacité à se transformer en populations de rhinocéros noirs clés d’importance continentale, où la bonne gestion, le suivi et la sécurité sont susceptibles d’être fournis et où les rhinocéros fondateurs sont disponibles sont très limitées. A notre avis, et selon les personnes consultées, de telles opportunités devraient être prises chaque fois qu’elles se présentent, compte tenu du faible nombre des ces grands mammifères qui vivent longtemps mais se reproduisent lentement, et compte tenu du fait que la majorité qu’on a consulté dit que le mélange entre les sous-espèces est naturel et susceptible d’avoir des répercussions positives en stimulant la diversité génétique.

Génétique des Rhinocéros

- **Le Rhinocéros blanc du nord et du sud***

Dans un article publié en 2016 dans Conservation Genetics, Eric Harley et ses collaborateurs ont comparé les séquences génomiques mitochondriennes entières de quatre rhinocéros blancs du nord et trois du sud (*Ceratotherium simum*) et l’article a conclu que la désignation du statut de sous-espèce est plus applicable aux rhinocéros blancs du nord et du sud.

- **La structure génétique du rhinocéros à travers l’habitat en Afrique***

Une étude de Yoshan Moodley et al. (2016, Scientific Reports 7: 41417: 1-16) a examiné la structure génétique à travers l’habitat des populations historiques et modernes en utilisant un large échantillon le plus représentatif géographiquement du rhinocéros noir jamais assemblé. Ils ont décrit une perte historique stupéfiante de 69% de la variation génétique mitochondriale de l’espèce, avec seulement 20 (31%) des 64 haplotypes observés dans l’ensemble complet des données détectées dans les échantillons provenant des populations existantes.

Cindy Harper et ses collègues (en préparation) ont également analysé les échantillons RhoDIS de 883 rhinocéros noirs (*Diceros bicornis*), et leurs résultats confirment la classification existante de trois sous-espèces

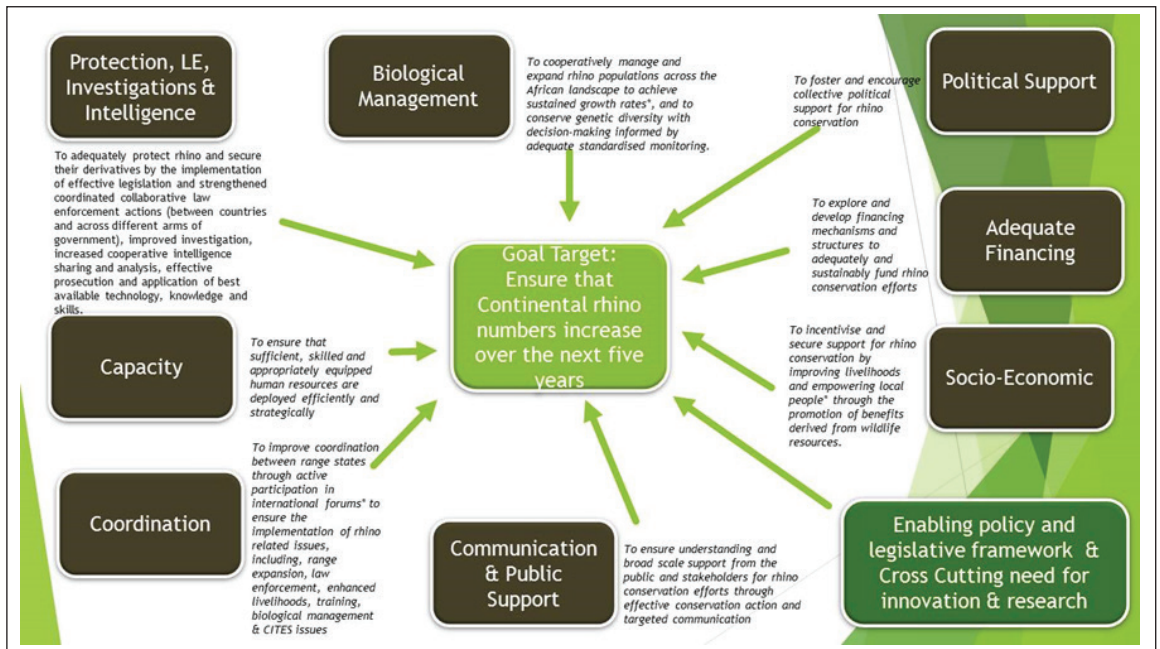


Figure 3. Plan at a glance illustration of new African Rhino Range States' African Rhino Continental Plan

can be discussed, and opportunities for regional collaboration identified. Importantly, the plan can hopefully be used as a means of raising funds for regional projects. In this regard, the possibility of establishing some form of sustainable funding mechanism such as from Rhino Impact Investment (RII) output funding could play a pivotal role in bringing the plan to reality.

• **Kenyan Plan Revision Workshop held**
 In April/May 2017 Kenya held a stakeholders workshop facilitated by Dr Raj Amin to review and revise its national rhino plan. A number of AfRSG members including the Vice-Chair participated at the workshop. The sixth edition of the Kenyan Plan has been drafted and is currently being reviewed including by the AfRSG Chair and SO.

The draft plan has set a vision 'To have a metapopulation of at least 2000 black rhinos of the Eastern African subspecies (*Diceros bicornis michaeli*) in suitable habitats as a global heritage in Kenya' with a goal of securing a growth of at least 5% in a least six Kenyan rhino populations to reach a specific number of animals through a metapopulation framework. Following a similar format to the more recent rhino plans, this one has identified components: Rhino Protection and Law Enforcement; Biological Monitoring and Management; Communication and

de rhinocéros noirs: *D.b.bicornis*, *D.b.michaeli* et *D.b.minor*. Comme Moodley et al. (2017), Harper et ses collègues (en préparation) ont également trouvé une séparation importante des populations de *D.b minor* du Zimbabwe et du KwaZulu-Natal.

Les implications de ces études sur la variation génétique du rhinocéros d'Afrique incluent.

- Peut-être *D.b.michaeli* aurait été plus approprié pour la Zambie et le Malawi
- La grande population de *D.b.michaeli* en Afrique du Sud conserve des lignes génétiques utiles qui pourraient être réintroduites de manière rentable dans son ancien habitat en Afrique de l'Est.
- Tout rhinocéros de Selous encore survivant aura une variation génétique précieuse
- La classification en trois sous-espèces est en grande partie toujours alignée aux résultats de ces études.
- La conservation des *D.b.bicornis* séparément des *D.b.minor* est soutenue
- On a trouvé une variation est-ouest en Afrique de l'Est, même s'il y avait un chevauchement considérable des deux haplotypes principaux dans la région (en partie en raison des translocations passées).
- Les deux études principales ont révélé qu'il y avait une scission en *D.b.minor* entre les populations fondées avec des fondateurs ex-Zambezi et celles fondées avec des gènes KwaZulu-Natal moins diversifiés

Engagement; Sustained Financing and; Programme Management, Coordination and Collaboration. For each component a set of key performance indicators along with outputs have been identified.

- **Rwanda Plan developed**

With the assistance of Dr Peter Goodman a Rwandan rhino plan was developed by Rwanda as a necessary pre-cursor to Rwanda's plans to reintroduce rhino into the country. See separate section under "Rwanda re-establishment" below.

- **Chad Plan to be developed**

The Scientific Officer has been requested to help with the development of a Chad Rhino Plan that will be a necessary pre-cursor to plans to re-establish black rhino back into the country.

Rhino Impact Investment Project

The Rhino Impact Investment (RII) Project, is being implemented by a collaboration of leading conservation, financial and legal sector partners under the United for Wildlife (UfW) umbrella, with implementation being led by the Zoological Society of London (ZSL). A number of AfRSG members are providing input into this project. The RII Project is funded by the Global Environment Facility, the UK Government through the IWT Challenge Fund, UfW and ZSL. The RII has as its main objective to demonstrate a scalable outcomes-based financing mechanism that directs additional private and public-sector funds to improve management effectiveness of priority rhino populations.

At present, conservation managers are struggling to raise sufficient funds from traditional donor sources. One means of addressing this short-fall is through innovative financing mechanisms that draw on donor and impact-investor driven capital to drive improvements in protected area rhino management effectiveness. The RII aims to develop a financing mechanism to direct impact investment funds toward selected qualifying sites containing key rhino populations to fund management interventions for rhino conservation.

Impact investors invest with the intention to generate social and/or environmental impact alongside a financial return. Impact investing is now a \$77bn market, growing from just \$25bn in 2013. NatureVest research has found that there is currently

(parce que ces dernières ont été comprimées et ont perdu leur diversité en raison de la dérive génétique). Cependant, ces *D.b.minor* se chevauchent historiquement, et le consensus de la majorité (mais pas unanime) qui ressort des discussions avec les experts et lors de la réunion du Groupe de Gestion du Rhinocéros de la SADC, était qu'au lieu d'essayer de garder ces haplogroupes «purs» et les gérer dans des silos distincts, ces populations devraient être mélangées (comme c'est déjà le cas à Kruger, au Swaziland et ailleurs), surtout pour recouvrer la diversité génétique chez des populations fondées uniquement par des animaux du KwaZulu-Natal (en introduisant du matériel génétique ex-Zambezi).

Présentations, articles, télévision et radio*

Le Président et le Responsable scientifique ont été invités à faire des présentations et ils ont été interviewés à la télévision et à la radio. Ils ont aussi fourni des informations à de nombreux journalistes à travers le monde et ont écrit un article au sujet de l'utilisation durable et des moyens d'existence (SULi) sur la chasse à paraître dans *Unasylva*, la revue de la FAO.

Laboratoire de conservation du Rhinocéros*

Un atelier interdisciplinaire de trois semaines en août 2016 a permis de consolider les questions et les réponses requises à la crise du rhinocéros en Afrique du Sud. La réunion était unique en ce sens qu'elle a réuni des représentants haut placés de tous les ministères concernés, les organismes de conservation, les groupes de sécurité, les ONG, les experts du rhinocéros, le renseignement financier et le secteur privé. Au total, 44 actions ont été identifiées et chiffrées et le plan doit être soumis au gouvernement sud-africain pour le financement.

Remerciements

Le soutien continu et la coopération des Etats de l'aire de répartition sont appréciés. Le GSRAf est également reconnaissant à *Save the Rhino International* (SRI), à la Fondation internationale du Rhinocéros (IRF), à WWF Pays-Bas via le Programme africain de WWF

a \$23 billion market for investing in conservation, and over the next five years, private investment in conservation is expected to triple.

In the outcomes-based financing model, an impact investor assumes the risk of the investment based on an understanding or measurement of the risk and uncertainty associated with the interventions. A Key Performance Indicator (KPI) is used to inform the conservation outcome. A secondary set of interim KPIs are utilized for short-term payment triggers, based on the assumption that short-term KPIs influence the ultimate KPI. Based on the conservation outcome (measured by the KPIs), a donor then pays the impact investor back the original investment plus or minus a percentage relative to conservation outcome.

Informed by the AfRSG, the RII Project has identified 18 African priority rhino populations in Kenya, Namibia, South Africa and Zimbabwe for potential inclusion in the Finance Mechanism. The RII Project developed a rhino focused gap assessment tool to assess and score targeted sites' on their ecological, managerial and financial capacity to achieve additional impact, and estimated funding required to enable sites to reach investment-readiness. Gap assessments have so far been conducted at 15 of the 18 sites, and the results will be used to inform the screening, shortlisting, ranking and selection of sites for inclusion in the first phase of the RII Financing Mechanism (RIIFM).

The final mix of sites selected to enter the first phase of RIIFM needs to fit within the project's budget and timeframe, but it is expected that approximately 5 sites will be included in the first phase. If there is demonstrable success from this first phase, the Financing Mechanism will be scaled up to consider additional sites and other countries.

pour le rhinocéros et à WWF Afrique du Sud, le Fonds de conservation du Rhinocéros et du Tigre du Service de la Pêche et de la Faune Sauvage des Etats-Unis et l'*Endangered Wildlife Trust* (EWT) pour l'assistance fournie au Responsable scientifique du GSRAf pour lui permettre de rendre son service précieux au Groupe et aussi de préparer ce rapport. SANParks est également remercié pour son soutien à la Présidence. Le soutien inébranlable et les contributions de mon Vice-président (Dr B Okita) et du Responsable scientifique (Dr R Emslie) sont grandement appréciés.

Experts agree to enhanced international DNA testing of rhinos at South African RhODIS workshop

Work required to facilitate the international expansion of rhino horn DNA testing using a single compatible global system was investigated at the RhODIS® Rhino DNA Scientific workshop in South Africa at Kruger National Park and the University of Pretoria's Veterinary Genetics Lab

(VGL) in February 2017. RhODIS® is a rhino DNA profiling and database system developed by VGL in collaboration with partners. To date all but one of Africa's rhino range States have contributed samples to the VGL for RhODIS® analysis. The workshop was funded by USAID, through the Wildlife-TRAPS Project, and the WWF African Rhino Programme. It brought together wildlife DNA forensic scientists, enforcement officers and investigators from source, transit and consumer countries of rhino horn. Various branches of South Africa's Police Service were represented as was the country's Department of Environmental Affairs (DEA).

The workshop, organized by the VGL, TRAFFIC, WWF and TRACE Wildlife Forensics Network, took scientists and enforcement officers to a rhino crime scene in Kruger National Park. Scientists from Australia, Botswana, the Czech Republic, Hong Kong, India, Indonesia, Kenya, Malaysia, Namibia, Netherlands, South Africa, South Korea, Thailand, United Kingdom, and Vietnam participated in DNA sample collection training at the crime scene, using the specific forensic sample kits developed for RhODIS®. Delegates also saw the eRhODIS data collection app demonstrated and versions of these apps in other languages could be developed in future.

Another aim of this workshop was to build relationships between different scientists from countries important in the illegal rhino horn trade, and in this regard the workshop was successful. For example Dr Jeffrine Rovie from the National Wildlife Forensic Laboratory in Malaysia noted "This really brings home the reality of the rhino horn trade and justifies our recent transfer of 14 seized rhino horn samples to the South Africa Government for RhODIS DNA testing to aid enforcement."

Workshop delegates and all African rhino range States support the development and use of a single standardized and compatible forensic rhino DNA system globally as does the AfRSG, SADC RMG, EAC RMG and RESG. According to Dr Cindy Harper, Director of VGL, a major output of the meeting was that it detailed the requirements of a simplified method to facilitate the sharing and roll out of an improved RhODIS® compatible analysis system to multiple laboratories across the world that can become the international standard capable of producing comparable DNA profiles, which can be loaded onto a global database. The plan is to select a

best subset from existing and a set of potential new markers to produce a revised improved set of markers that can then be forensically validated with the intention of these being able to be used by a range of different labs around the world to generate comparable DNA profiles. This will also allow some degree of backwards compatibility with the many thousand profiles already on the RhODIS database. While the RhODIS® system is already a proven tool for the investigation of rhino poaching cases and has been used in a number of prosecutions; the refinement and roll out of a recognized international validated forensic rhino DNA standard should positively support enforcement action and investigation of trade routes at an international scale. RhODIS® can also already determine species of African rhino from recovered horn, and the meeting recognised the need to develop it further in the hope it can also be used to distinguish between the species of Asian rhino. Since the meeting India has confirmed its intention to proceed with the development and testing of RhODIS for use with GOH rhino in the sub-region. Whether or not it will be possible for one set of markers to analyse data for white, black and GOH; or if it will be necessary instead to include GOH rhino identification markers into the method so that any GOH samples can be then be analysed using a separate set of specific GOH markers is not yet known. Proceedings from the workshop can be downloaded from http://www.trafficj.org/publication/17_RhODIS_Proceedings.pdf.

DNA analysis is also starting to help improve knowledge of trade routes. RhODIS is also informing other aspects of rhino management, such as the recent identification of sufficiently pure *D.b. michaeli* black rhinos that would be suitable for translocation back to former range. RhODIS data has also been used to study pan African genetic variation and how best existing rhinos should be grouped.

Regional and Continental Red listing

IUCN's Red Listing system is a rules-based system and it is essential to fairly apply the criteria. However, during regional (South Africa, Swaziland and Lesotho) Red Listing of African Rhino it became clear a number of questions first needed to be answered. For example, the poaching crisis and its potential impact on future rhino numbers clearly should be taken into account in the Red List assessments, but how should the poaching be modelled and how long into the future is it reasonable to predict? The various questions that arose and approaches used in the African rhino regional Red Listing process are described in detail in the black rhino and to a lesser

extent white rhino regional assessments that can be downloaded at https://www.ewt.org.za/Reddata/pdf/RLA_Diceros%20bicornis_EN.pdf and https://www.ewt.org.za/Reddata/pdf/RLA_Ceratotherium%20simum%20simum_NT.pdf. Updated continental Red Listing assessments are currently being undertaken using the same approaches.

After coming up with proposed approaches, the Scientific Officer discussed these with some long-standing AfRSG Members. Together with Mike Knight, Keryn Adcock, Ben Okita and Rob Brett a consensus view was reached on the approaches. These were later shared and discussed with a number of IUCN Red Listing experts Reşit Akçakaya, Craig Hilton-Taylor, Mike Hoffmann, Carlo Rondinini, as well as Regional Red Listing Coordinator Matthew Child. The IUCN Red Listing experts were very supportive of the proposed approaches. They liked the novel graphical way of illustrating the results and range of possible outcomes that the AfRSG had developed. A couple of the Red Listing experts consulted encouraged the AfRSG to publish the approaches developed.

The South Africa, Swaziland and Lesotho regional African Rhino Red Listings are given in Table 2.

Rwanda re-establishment

Eighteen *D.b.michaeli* from the private eastern black rhino population in South Africa have recently been translocated to Rwanda to re-establish black rhino in the country after they had become extinct for the second time following past poaching. The rhinos have been re-established in Akagera National Park which is being managed by the Akagera Management Agency (a collaboration between African Parks Network and Rwanda's Development Board). It had been expected that 12 additional founders from Kenya would have boosted the genetic founder number and diversity

of the Akagera population. Unfortunately, the Kenyan parliament decided not to approve the move. Attempts will continue to secure additional founder genetic diversity with some animals potentially coming in future from European Zoos. It is planned to hold the next EAC RMG meeting at Akagera, and sourcing additional founders for Akagera will be one of the issues discussed.

Sadly this very welcome introduction, also led to the tragic loss of Krisztián Gyöngyi, a Hungarian scientist and experienced rhino researcher, was killed while monitoring the introduced rhinos. (An obituary will be included in the next edition of *Pachyderm* and see Krisztián's paper entitled Forage choice of the reintroduced black rhino and the availability of selected browse species at Majete Wildlife Reserve, Malawi, Under the research section). It has also just come to my attention that experienced ranger Lawrence Munro was recently tossed and badly gored by a black rhino in Malawi after he stepped into the animal's path to protect visitors he was guiding at the time. On behalf of the AfRSG I would like to wish Lawrence a speedy recovery.

Prior to this re-establishment, some concerns had been raised regarding the suitability of these animals for translocation given the unexpected finding that not all admixed *D.b.michaeli/D.b.minor* animals had been removed from the old Addo *D.b.michaeli* population forty years previously, as had long been assumed to have been the case. This Addo population was subsequently translocated to a private reserve in South Africa, where numbers have rapidly built up. Given the new evidence that there was some admixture in this potential source population, IUCN SSC's African Rhino Specialist Group was asked by African Parks to comment on the proposed translocation of an out-of range founder group of eastern black rhino (*D.b.michaeli*) from this private reserve as part of the planned reintroduction of black rhino back into Rwanda. The AfRSG Scientific Officer and Chair consulted a number of well recognised geneticists and conservation biologists for their opinions and their views the issue. These included Dr Bob Lacy, Dr Eric Harley, Dr Cindy Harper, Prof Steve O'Brien, Dr Phil Seddon,

Table 2. Revised Regional Red List Assessments of African Rhino for South Africa, Swaziland and Lesotho area.

Taxon	Common name	Assessment	Criteria
<i>Diceros bicornis</i>	Black rhino	Threatened–Endangered	C2a(i)
<i>D. b. bicornis</i>	Southwestern black rhino	Threatened–Endangered	D
<i>D. b. minor</i>	Southern Central black rhino	Threatened–Endangered	C2a(i)
<i>D. b. michaeli</i>	Eastern black rhino	Threatened–Critically Endangered	D
<i>Ceratotherium simum</i>	White rhino	Near Threatened (Conservation Dependent)	A4ad

Dr Desiré Dalton, Dr Yoshan Moodley, Dr Oliver Ryder, Dr Nikki Le Roex and Dr Shadrack Muya. The AfRSG Secretariat would like to thank all these experts for their time and the detailed comments provided; as well as to Dr Cindy Harper for undertaking the genetic STRUCTURE analyses that greatly assisted us in developing recommendations for African Parks. Some of the experts consulted also kindly commented on a draft letter and our proposed recommendations to African Parks.

The majority of the proposed source population was genetically sampled (primarily in early 2017) using RhoDIS kits (maintaining a chain of evidence of DNA samples relating to individual rhinos). Dr Cindy Harper (Veterinary Genetics Lab, Pretoria University) then undertook Bayesian genetic STRUCTURE analyses and quantified the inferred probability of ancestry of each of the 81 sampled individuals from this population, together with a further 633 reference samples of all subspecies. Dr Harper's analysis found the admixture in this population was limited, and that fortunately it was still predominantly a *D.b.michaeli* population with the bulk of the animals pure michaeli or very pure. Her most recent and most comprehensive analysis found that this population's sample average inferred ancestry was 92.53% *D.b.michaeli* with a sample median of 98.80% *D.b.michaeli*. Only 6 animals (7.5%) were deemed to have less than 70% *D.b.michaeli* ancestry.

Dr Yoshan Moodley also indicated to us, that the South African source population conserved some valuable CE haplotype genetic material, that is now less common in East Africa than it once was prior to the heavy poaching in 1960s, 70s and 80s.

While there have been no signs of any outbreeding problems since the limited admixing took place at Addo over 40 years ago (with this population subsequently breeding very well); we nevertheless recommended that only deemed pure or very pure michaeli animals be translocated to Rwanda.

Based on discussions, we recommended all potential founder animals be genetically sampled and that a stringency threshold of >85% *D.b.michaeli* be used to decide on which animals to translocate to Rwanda. Dr Harper's STRUCTURE analysis indicated that the mean % michaeli ancestry scores for all "pure" or "very pure" potential founder animals that passed stringency thresholds of >=85% (i.e. after excluding any admixed individuals

identified as not suitable for translocation to Rwanda) was 97.9%. Thus, the use of stringency threshold of 85%+ does NOT mean one would be getting a founder group from this population that is on average 15% minor.

We also recommended that genetic samples be taken from any other founders introduced and that as calves are born into the new Akagera population they are also opportunistically DNA sampled (e.g. at time of ear-notching). In this way a genetic history of the Akagera population can be maintained and used to guide future management (including translocations, when the population eventually becomes large enough to become a donor population). The majority of the geneticists and conservation biologists we consulted (listed above) supported these recommendations.

Opportunities to set up new populations with significant (ideally 20+) founders in suitable habitat, with room to grow to Key-rated black rhino populations of continental significance, and where good management, monitoring and security are likely to be provided, and where founder rhinos are available, are very limited. In our opinion, and the opinion of many consulted, such opportunities should be taken whenever available, given the low numbers of this long-lived, slow breeding large mammal; and also given the view of the majority consulted that a little bit of admixture between subspecies is natural and on balance is more likely to have positive impacts through boosting genetic diversity.

Rhino Genetics

- **Northern and Southern White Rhino**

In a 2016 paper published in Conservation Genetics Eric Harley and co workers compared whole mitochondrial genome sequences of four northern and three southern white rhinoceroses (*Ceratotherium simum*). The divergence time between the two mitochondrial DNA lineages was estimated to be between 0.46 and 0.97 million years ago. In discussion, the paper noted that the dating of the actual lineage split between NWR and SWR is likely to be significantly more recent than the mitochondrial genome split; given that lineage divergence times can be much younger than gene divergent times (by as much as 300 % for divergence times of <1 million years). Harley et al. (2016) concluded it is possible that the two white rhinoceros lineages could even have diverged as recently as 200,000 years ago. The Harley et. al. (2016) paper was highly critical of the use of the phylogenetic species concept to define species, rejecting the proposal

by Groves and co-workers (2010) that the northern white rhino should be treated as a separate species and the paper concluded that the designation of sub-species status is more applicable to northern and southern white rhinoceros.

- **Range wide genetic structure of rhino in Africa**

A study by Yoshan Moodley et al. (2016, *Scientific Reports* 7:41417: 1–16) examined the range-wide genetic structure of historic and modern populations using a large and most geographically representative sample of black rhinoceroses ever assembled. They used both mitochondrial and nuclear DNA datasets with samples from 20 countries. They described a staggering historical loss of 69% of the species' mitochondrial genetic variation, including the most ancestral lineages that are now absent from modern populations. Of the 64 haplotypes observed in the full dataset, only 20 (31%) could be detected in samples from extant populations.

The mitochondrial DNA variation was found to be unevenly distributed across the species range with:

- East Africa (Kenya Tanzania, Uganda) harbouring the highest levels of museum samples
- Followed by countries in southern Central Africa (Angola, Malawi, Zambia and Zimbabwe).
- In general, diversity was lower towards the limits of the species' range in West, North-East and South-West Africa.
- Across the entire species range, seven haplogroups (WW, NE, CV, EA, CE, RU and SN) could be identified. WW was extinct and the current status of RU in Selous is not known with only a few individuals confirmed North of the Rufiji river.
- Overlaps in the spatial boundaries of population/haplogroup distributions were observed in East and southern Africa.
- The main separation seems to have been north and south of the Zambezi river. There does however appear to have been the odd mixing across this divide, which is normal for subspecies.
- Historic range of the West African subspecies (*D. b. longipes*), declared extinct in 2011, was found to have just extended into parts of southern Kenya, where a very small handful

of individuals with the CV haplogroup survive as part of the population in the Masai Mara.

- In East Africa—EA (to east–central/northern Kenya) and CV (western and historically southern Kenya).
- Ex Addo (and now a private population in South Africa) conserve valuable CV genetic lines, that apparently now occur at a reduced to lower frequency in East Africa.
- For *D.b. minor*—the analysis revealed a division is between the more diverse Zambezi (SN) and less diverse Natal minor (SE) haplogroups (with the latter animals having gone through a bottleneck).
- *D.b. bicornis* and *D.b. minor* split more recently.

Cindy Harper and co-workers (in prep) have also been analyzing 883 Black rhinoceros (*Diceros bicornis*) RhODIS samples, and their findings support the existing classification of three black rhino subspecies, *D.b. bicornis*, *D.b. michaeli* and *D.b. minor*. Like Moodley et al. (2017), Harper and co-workers (in prep.) also found significant partitioning of the Zimbabwe and KwaZulu-Natal founded *D.b. minor* populations.

The implications of these studies of African rhino genetic variation included:

- Possibly *D.b. michaeli* would have been more appropriate for Zambia and Malawi
- The large *D.b. michaeli* population in South Africa conserves useful genetic lines that could beneficially be reintroduced back into former range in East Africa.
- Any Selous rhino still surviving will have valuable genetic variation
- The three subspecies classification is largely still aligned with results of these studies.
- Keeping *D.b. bicornis* separate from *D.b. minor* is supported.
- E–W variation was found in E. Africa, although there was considerable overlap in the two main haplotypes in the area (in part due to past translocations).
- Both major studies found there was a split in *D.b. minor* between populations founded with ex-Zambezi founders, and those founded with less diverse KwaZulu-Natal genes (due to the latter going through a bottleneck and losing diversity due to genetic drift). However, these *D.b. minor* historically overlapped, and the majority consensus (but not unanimous view) to emerge from discussions with experts and at the SADC RMG meeting, was that rather than trying to keep these haplogroups “pure” and managed in separate silos; these should be

mixed (as they already have been in Kruger and Swaziland); especially to help recover genetic diversity in populations founded only with KwaZulu-Natal animals (by introducing some ex-Zambezi genetic material).

Presentations, papers TV and Radio

The Scientific Officer (SO) gave an invited keynote presentation and took part in a rhino panel discussion at a rhino session at the 2016 Symposium of Contemporary Conservation Practice that took place in KwaZulu-Natal in October 2016. The Chair similarly gave key note addresses at the 9th International Ranching Congress and at the annual South African Veterinary Management of African Wildlife Conference. Both he and the SO presented at a CITES CoP17 side event. The Chair has done a number of TV interviews, and the Chair and SO have also provided a number of radio interviews. The Chair and SO also contributed to a SULi article on hunting for *Unasylva* the FAO journal. A link will be provided on the SULi homepage shortly.

Rhino Conservation Laboratory

An interdisciplinary three-week long workshop held in August 2016 consolidated the issues and required responses to the rhino crisis in South Africa. The meeting was unique in that it brought senior representatives from all relevant government departments, conservation organisations, the security cluster, NGOS, rhino experts, financial intelligence and private sector.

The meetings set an aspirational vision in the period 2016-2022 of ‘A robust integrated approach by all stakeholders to secure a meta population of rhino in South Africa through effective reduction in the number of rhino killed through poaching by 11.1%, resulting in increasing the population at 2% p.a. through 2020’. This would be achieved through:

- Law enforcement: Improved law enforcement to investigate, prosecute and adjudicate wildlife trafficking; Targeted disruption of criminal networks along the value chain; Coordinated law enforcement efforts at regional, national and international levels and; Reduction in

corruption through integrity testing and covert operations.

- Management of rhino populations informed by up-to-date research;
- Responsive legislation being used optimally and changed to close identified short falls;
- Community involvement through improved governance structures to create sustainable livelihood opportunities and reduce risk to wildlife;
- Demand management of rhino horn informed by evidence-based approaches to changing attitudes in consumer markets and driving down exaggerated prices of horn.

A total of 44 actions were identified and costed to deliver on the above objectives. The plan is to be submitted to the South African government for funding.

Acknowledgements

The continued support and cooperation of range States is appreciated. The AfRSG is also grateful to Save the Rhino International (SRI), International Rhino Foundation (IRF), WWF Netherlands via WWF ARP and WWF South Africa, the U.S. Fish and Wildlife Service’s Rhino and Tiger Conservation Fund (USFWS RTC) and the Endangered Wildlife Trust (EWT) for support provided to the AfRSG Scientific Officer to enable him to render his invaluable service to the group and also towards the preparation of this report. SANParks is also thanked for its support of the Chair. Unwavering support and inputs from my Deputy Chair (Dr B Okita) and Scientific Officer (Dr R Emslie) are greatly appreciated.