In 1999, 4 out of the 11 AfRSG-rated *key* white rhino populations in the world and a further 17 of the 35 AfRSG-rated *important* white populations occurred on private land. One of the five *key* populations was a national park linked to adjacent private game reserves.

In contrast to the pattern with white rhinos, there are many black rhinos on private land in Kenya, Namibia, Swaziland and Zimbabwe that are managed on a custodianship basis for the state (as opposed to being privately owned). In 1999, the 11 AfRSG-rated *key* populations of black rhinos included 2 Zimbabwean conservancies and 1 Kenyan sanctuary; with a further 5 *important* custodianship populations. From 1997 to 1999, numbers of black rhino managed by the private sector on a custodianship basis increased from 394 to 483.

Black rhino numbers have in general declined markedly over the last decade on much of the communal land where they used to occur. At present, 17.64% of the south-western black rhinos and 2.04% of the eastern black rhinos are conserved on communal land. Overall, 5.18% of Africa's black rhinos were found on communal land in 1999, compared with only 0.19% of Africa's white rhinos. In South Africa and Kenya, local area or municipal authorities run a limited number of reserves and conservation areas. The Masai Mara National Reserve in Kenya is run by the local Narok and Trans Mara county councils, while in Tanzania the Ngorongoro Area Authority manages Ngorongoro and the surrounding area. South Africa also has seven small municipally owned and run parks that have a few white rhinos. In 1999 such municipal or county council or local-area-authority parks held 39 white rhinos and 42 black rhinos, accounting for about 0.62% of Africa's rhinos. All such black rhinos are of the eastern subspecies, making up 8.57% of this subspecies in the wild.

Progress with developing statistical models to determine the source and species of recovered illegal rhino horn in Africa based on analyses of its chemistry

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It is often said that 'you are what you eat'. Because elements and different isotopes present in food plants, affected by climate, geology and type of plant, can be absorbed into rhino horn through the digestive processes, chemical analysis of rhino horn offers the potential of determining both the source of the horn as well as the species of rhino that produced it.

Results of the WWF-funded AfRSG continental horn fingerprinting project, which aims to develop forensic techniques to determine the source and species of rhino horn based on analysis of its chemistry, have been written up in a detailed confidential final report submitted to WWF.

This report discusses the statistical analysis of rhino-horn chemistry data for samples of horn from populations holding approximately 70% of Africa's rhinos. After dealing with problems of high data dimensionality, multicolinearity and zero values, successful species and source-identification models were built using discriminant functions—often with 100% post-hoc classification success. Horn chemistry was also related to rainfall and primary productivity, and horn tips were found not to differ consistently chemically from the rest of the horn. The best source-determination models used data from all three labs and analysed data for the two species separately at the finer spatial scale of park or area within a park. Graphical presentation of the results (canonical plots, traces and icon plots) also enables them to be understood by laymen.

However, despite these successes, results should be treated as preliminary until they are validated

independently using jack-knifing, which requires the acquisition of more advanced statistical software. Further work is also required to improve identification of samples that have come from areas not yet covered by the horn fingerprint atlas.

As part of the process of taking the analyses further, with the ultimate aim of developing a routine forensic source-determination technique, the AfRSG Scientific Officer will inform the peer review of the work done at the Southern African Statistical Association Conference in November 2000. Dr Rajan Amin of the Zoological Society of London has offered to assist with further statistical analysis.

Sandwith's rhino identification training course for field rangers revised by the Africa Rhino Specialist Group

Richard H. Emslie

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A revised training course has been produced by Keryn Adcock and Richard Emslie. In revising the course, they consulted users of the original Sandwith ID training course and experts in adult environmental education and training methods to give feedback and suggest how the original course could be improved. The results are as follows:

- AfRSG should extensively revise the posters, manuals and videos.
- The training exercises should be made as participatory as possible.
- The terrain model should be scrapped.

The people who participated in the exercise recommended to the trainers how best to present the course. They suggested that the revised version be expanded to include information on the white rhino and the revised recommended rhino age-classification system. The standardized condition-scoring system was described in issue no. 26 of *Pachyderm*. The course has been made easier for trainers to conduct and for students to understand.

The African Rhino Specialist Group produced 25 revised training course sets, 23 of which have been distributed to the field in Kenya, Namibia, South Africa and Tanzania. Responses from the field to the revised course have been very positive.

The ID training course can lead to more game scouts and field rangers being able to collect quality ID data, which can be used to assess rhino population sizes, health and performance. With these data, better-informed metapopulation management decisions can be made. Such a course also plays a major role in standardizing rhino monitoring (for example, age classes, condition scoring), making it possible to compare results across countries and parks, for the benefit of rhinos.

With the exception of the video presentations, the course can be conducted under a tree in the bush. Once trained, observers need only a pencil, field data recording forms and a pair of binoculars to work. The technology being used is appropriate, given declining budgets for conservation in the field in Africa.

Acknowledgements. The production of the revised training course was made possible primarily by a grant from the US Fish and Wildlife's Rhino and Tiger Conservation Fund. WWF also helped cover much of the cost of distributing the sets. The production of the revised course was made possible by the many people who assisted by grossly undercharging for work done or by donating time free or facilities free. In particular, thanks are due to the consultant Keryn Adcock for providing so much additional time free of charge; Don Guy and Victor Hugo for charging so little for use of the video studio and editing facilities, and for giving their time without charge; the AfRSG Scientific Officer's sponsors (especially WWF, the International Rhino Foundation, the UK Department of Environment, Transport and the Regions, the US State Department) for covering the cost of his time; all the photographers and film producers (including SABC) who provided AfRSG with permission to use their material; Ecoscot Consultancy Services for provided computers, printers and software to produce master copies of the posters and manuals; and KwaZulu-Natal Nature Conservation Service, who kindly donated the time to allow Philip Brown to make the ear models.